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NOTES FROM THE FIELD

Rising Drinking Water Insecurity in the Indian Himalayan Region of Sikkim: A multi-stakeholder perspective

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1. DWINDLING WATER RESOURCES AND DAILY TRAVAILS IN ACCESSING FRESHWATER

For the past 15 months, we are working on a project to assess drinking water security challenges in the Indian Himalayan Region (IHR) of Sikkim. One of our project's aim is to estimate the social and economic cost of drinking water scarcity in the rain shadow regions of the IHR. For this purpose, we have been assessing the water availability and water quality in the district of South Sikkim. In the IHR's mountainous terrains, freshwater is mostly available from natural springs and lakes. However, human-induced climate change impacts such as reduced snow-cover in the peaks, frequent landslides, and reducing vegetation cover are resulting in less water availability and drying up of many perennial springs and reservoirs (Wester *et al.* 2018).

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Even though there is a broader recognition of the looming water crisis in many parts of Sikkim (Government of Sikkim 2016), the actual realisation of its impact among residents is very diverse. In South Sikkim, household access to drinking water can broadly be categorised into three types: (a) government-supplied piped water, (b) private arrangements for piped water, and (c) non-piped water supply or drawing water from the nearest water sources. The first category of households is mostly confined in the urban areas and near to village centre. The respondents reported high level of satisfaction with the current water supply system compared to the past. We observed that waterworks developed by the government (such as the construction of reservoir tanks, maintenance of pipelines) have eased access to water in these villages. However, some of the respondents felt that real, sustainable solutions will need to be implemented to avoid any water crisis in the future. The second category of households often makes their own arrangements by paying a village plumber a monthly payment. The source can be any nearby public water spring or public water tank. The plumber maintains the pipelines and keeps a check on water availability. We observed this system working well. The members of the local government (panchayat) are aware of such arrangement of water supply. Interestingly, respondents too expressed a high level of satisfaction with the system and did not wish any government intervention. The final category of households made up those who had to trudge a distance of more than 100 meters in steep terrain to get water for their everyday needs. In such households, often the responsibility of household water provision rests on the womenfolk, who make multiple trips to meet their household water needs. Surprisingly, many respondents from this category were positively satisfied (although on a lower level) with the water supply system. We observed that these places also acted as social gathering sites, where women brought their kids and engaged in their daily chores such as washing clothes.

2. ELICITING FURTHER INSIGHTS FROM HOUSEHOLD SURVEYS

There is a clear evidence of drying up of spring water sources and temporal and spatial variation in rain patterns (Tambe *et al.* 2012). However, in our 58 interactions, people did not express major concerns for water shortages. As not many households experience water scarcity, a lack of concern for depleting water sources was a worrying observation because freshwater is also used for other purposes, predominantly agriculture. Major crops produced in the region are cardamom, ginger, turmeric, potato, maize, and spices. Even though many households realise that the rains have become

erratic, and that they used spring water for irrigation, we noted, that as long as there was enough water in the main source point, households did not mind carrying it to the house, while doing little to conserve rain water . Only 2 out of 58 households surveyed had installed rainwater harvesting system to tackle water shortages. For all villages we visited, we did not find village-level initiatives that encouraged water conservation.

In order to have a deeper understanding of water insecurity at the household level, we conducted 58 semi-structured face to face surveys. Our survey team typically included a male staff (local) and a female staff (non-local) accompanied by a local village member if the need arose. Our survey team helped to ease language barriers and promoted confidence among people. In cases where we informed a local member of the Panchayat, it was easier to elicit more and accurate information. In many instances, female members of the households were particularly keen to answer our questions as they are often responsible for household water provision. One of the female respondents told us to ask the questions only to her. We can also attribute our ease of access to households to the better social indicators of the state. We had no instance of household refusal to take part in the survey.

Households in rural areas were more forthcoming with their problems and even in suggesting potential solutions for water-related issues. They showed overwhelmingly greater participation and eagerness in the exercise. On the other hand, we observed households in urban areas expressed a suspicious or distrustful attitude towards the survey. One of the respondents remarked, 'But the government does not value all this. They will keep it in a file somewhere and never look at it.' In another case, we were told that 'it is better to make private tanks and tap water from the source rather than waiting for the government.' People also tend to overstate or understate the current situations depending on their expectations from the government. This has lead to incorrectness in the data in a few of the surveys. For example, we have often noted that people overstated the number of households depending on a particular water source, or understated the number of hours they have access to piped water supply. So, we had to confirm this information with Panchayat members. In many instances, we had to explain clearly that our survey team cannot change the state government policies.

3. WILLINGNESS TO PAY FOR SAFE WATER

During household surveys, water samples were collected on the spot and tested for physiochemical properties using field test kits. Testing and stating the results of the households' water quality not only improved their confidence, but also created awareness and benefits of clean drinking water. Post water testing exercise, households were more forthcoming with their queries on water issues. This indicated that transparency in discussing water issues was a win-win for both sides. It helped us to obtain a household's WTP for safe and regular drinking water. Households' valuation of clean and safe drinking water was captured in how much they are willing to pay to subscribe to such a service. Once again, there were huge variations among households depending on their income and gender. We found a negative relation between household WTP and income level. Lower-income households quoted a significantly higher WTP than higher-income households. A higher WTP among low-income households was understandable because those who live in remote villages will have a high socioeconomic cost of arranging water for themselves and are willing to spend a larger part of income for safe drinking water. We also found that the WTP for safe water was higher among the female respondents as the womenfolk are majorly responsible for arranging household water provision.

We also interacted with the stakeholders in the government to learn more about the “Dhara Vikas” project for springs and springshed rejuvenation in West and South Sikkim (Government of Sikkim 2014). Some officials agreed that though there are major initiatives by the government involving a new cadre of para-hydro-geologists, the experience of people can be very diverse. They drew attention to significant challenges in tapping water resources at higher altitudes and the water quality at lower altitudes. Such situation coupled with growing variability and uncertainty of climatic conditions makes many communities vulnerable. Since clean water is now a valued asset, the government will have to play the lead role in nudging people towards innovative and sustainable technological solutions.

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