



Environment

Water Community



Solution Exchange for the Water Community Consolidated Reply

Query: Survey on Household Water and Sanitation - Advice

Compiled by [Nitya Jacob](#), Resource Person and [Sunetra Lala](#), Research Associate
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From [Binayak Das](#), Arghyam, Bangalore
Posted 30 January 2009

I work on Research and Advocacy in Arghyam, an organization that supports water-related activities in India. In 2008, we conducted the Arghyam Survey on Household Water and Sanitation (ASHWAS), a participatory survey that covers 28 districts of Karnataka covering 17,200 households. This was a people's survey, and the surveyors were selected from the communities. They included students, women from self-help groups, local NGO partners and other volunteers. You can read more on the survey at <http://www.solutionexchange-un.net.in/environment/cr/res30010901.doc> (DOC; Size: 105 KB).

The survey was conducted through a questionnaire at the household (<http://www.solutionexchange-un.net.in/environment/cr/res30010903.doc>, DOC; Size: 199 KB) and village levels (<http://www.solutionexchange-un.net.in/environment/cr/res30010902.doc>, DOC; Size: 166 KB) on water, sanitation and health issues, and included a WATSAN village mapping and observation sheet (<http://www.solutionexchange-un.net.in/environment/cr/res30010904.doc>, DOC; Size: 122 KB).

Another interesting activity was the testing of water samples at the household and village levels for a few important parameters (fluorides, nitrates and bacteriological content). You can view a sample dataset from one village at <http://www.solutionexchange-un.net.in/environment/cr/res30010906.xls> (Excel; Size: 300 KB).

The output of the survey included:

- Gram panchayat report cards
- District report cards
- A state report card
- Advocacy document
- Workshop at district level for sharing findings

Since we have gathered a large amount of data on WATSAN, we are keen to understand from experts and other people working on rural WATSAN the most useful ways to analyze the data, and the way to present the output in a user-friendly way.

Based on the parameters above, I request members of the Community to share information on:

- What are the desirable parameters for analyzing ASHWAS data?
- How should this data be presented to be useful to practitioners working on water-related issues?

Your inputs will help us process and provide data from the ASHWAS study in a form that is most useful for water practitioners.

Responses were received, with thanks, from

1. [S. V. R. K. Prabhakar](#), Institute for Global Environmental Strategies (IGES), Japan
2. [Sacchidananda Mukherjee](#), WWF-India, New Delhi
3. [Pradosh Ranjan Jena](#), Independent Consultant, Nuapada, Orissa
4. [Arunabha Majumder](#), Jadavpur University, Kolkata
5. [Poulomy Chakraborty](#), Feedback Ventures (P) Ltd, Gurgaon
6. [Nitya Jacob](#), United Nations Children's Fund (UNICEF), New Delhi
7. [B. K. Sharma](#), Gwalior Children's Hospital Charity, Gwalior*

**Offline Contribution*

Further contributions are welcome!

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[Related Resources](#)

[Responses in Full](#)

Summary of Responses

The Arghyam Survey on Household Water and Sanitation (ASHWAS) was conducted in 17,200 villages across 28 districts of Karnataka to determine the quality and quantity of services. The survey yielded a wealth of primary information on how households and villages get and store water, and on individual awareness levels on sanitation and hygiene issues. Responding to a query seeking useful ways to analyze the data, including parameters, and inputs on how to present the data in a user-friendly way, respondents shared numerous suggestions on how to analysis and what to asses.

Before doing the analysis, members advised Arghyam to clean the data to eliminate gaps, and then conduct a statistical analysis using a purpose-built package, such as SAS, SPSS or Statistica, depending on the end-use of the data.

Discussants noted there are various ways to analyze the data, including regression analysis, correlation, factor analysis and variance. Broadly, they suggested analyzing the data to assess rural attitudes, access and use of drinking water in terms of water usage, demand and supply, type of water sources, time spent on water collection, sustainability of water sources, quality and mitigation of water quality problems. Further the analysis could yield information on the health condition of households and prevalence of water-borne diseases, as well as help determine how effective panchayats are in providing water, the level of people's participation in water and sanitation service delivery and provide success stories relating to the same.

Specifically, the data can be analyzed to understand the factors that influence farmers' willingness to take up certain practices for managing livestock waste. This is important learn in order to protect groundwater from non-point sources of pollution. For example, livestock waste contributes substantially to the total nitrogen load in groundwater. The ASHWAS data could shed light on what factors influence farmers' to adopt livestock waste management practices. It could also reveal their perceptions about groundwater

quality. This is important from the point of view of determining a strategy to protect drinking water sources, because once polluted, it is very expensive to treat groundwater.

Along with understanding how farmers handle animal waste, the ASHWAS data analysis can also indicate rural attitudes towards sanitation, and household and community collection, storage and use of drinking water, all of which is important from the public health and policy points of view. This understanding respondents felt was necessary in order to address the current gaps in behaviour change communication.

In addition, members suggested analyzing the data:

- To assess the sanitation coverage at the household and village level, the excreta handling systems utilized, and the impact of sanitation in terms of reduced disease burden
- To track subsidies provided to families below the poverty line, the demand-supply chain and capacity building requirements to promote sanitation
- To assess percentage of people defecating in the open and quality of toilets. It would indicate the distance between drinking and other water sources and toilets, critical for maintaining water quality.

The ASHWAS survey could also serve as a means to independently verify data collected by the [Department of Drinking Water Supply's](#) (DDWS) National Rural Water Quality Monitoring and Surveillance Programme. The final report could have national level implications, if the differences with DDWS' datasets are substantial. Under the Programme, five trained village volunteers collect data on water quality and quantity.

The data analysis can reveal household access to water and sanitation as against the current practice of habitation level coverage. It can also indicate the cost-effectiveness of different water supply schemes along with how well panchayats are affecting service delivery. This will help in design of future water supply schemes in villages.

Summing up, such a large-scale survey will provide insights into how people in rural Karnataka use water and their access to sanitation. By analyzing the data along the suggested parameters, it will be possible to understand the gaps at the state level and take corrective measures.

Related Resources

Recommended Documentation

Economics of Agricultural Nonpoint Source Water Pollution: A Case Study of Groundwater Nitrate Pollution in the Lower Bhavani River Basin, Tamil Nadu (from [Sacchidananda Mukherjee](#), WWF-India, New Delhi)

Paper; by Sacchidananda Mukherjee; WWF-India; New Delhi; 2008; Permission Required: Yes, contact Sacchidananda Mukherjee at for obtaining details

To avail of a copy contact Sacchidananda Mukherjee at sachs.mse@gmail.com

Discusses the groundwater pollution caused by nitrates in the Lower Bhavani River Basin, Tamil Nadu, which is affecting the water resources of the area

From [Nitya Jacob](#), Resource Person

National Water Policy 2002

Policy Paper; Ministry of Water Resources; New Delhi; 2002

Available at <http://wrmin.nic.in/writereaddata/linkimages/nwp20025617515534.pdf> (PDF, Size: 56 KB)
Provides details on the institutional mechanisms required for managing water resources, including drinking water supplies

Sanitation: A Human Rights Imperative

Report; by Maria Katsabanis; Centre for Housing Rights and Evictions, Water Aid, UN-Habitat, Swiss Agency for Development and Cooperation; Geneva; 2008

Available at <http://www.cohre.org/sanitation> (PDF, Size: 716 KB)

It is an advocacy tool to encourage more funding for sanitation, more debate and research into the barriers to accessing affordable sanitation and how to remove them

Going Public: Southern Solutions to the Global Water Crisis

Report; by High Warwick and Vicky Cann; World Development Movement; United Kingdom; 2007

Available at <http://www.wdm.org.uk/resources/reports/water/goingpublic14032007.pdf> (PDF, Size: 3.2 MB)

Features public water experts from Brazil, India and Uganda, describing the successes they have had in connecting the poor to clean water and the related funding obtained to accomplish this

From [Sunetra Lala](#), Research Associate

Sanitation Promotion

Book; by Mayling Simpson-Hébert and Sara Wood; Water Supply and Sanitation Collaborative Council (WSSCC) and World Health Organization (WHO); Geneva; 1998

Available at <http://bookorders.who.int/sig/en/login.php>

Compilation of articles and best practices by WSSCC and WHO designed to change public perceptions about the sanitation sector and attract crucial new investments

Designing Water Supply And Sanitation Projets to Meet Demand: The Engineer's Role

Report; Water Engineering Development Centre and UK Department for International Development; 2001

Available at

<http://web.mit.edu/urbanupgrading/waterandsanitation/resources/pdf-files/DemandResponsiveApproach.pdf> (PDF, Size: 284 KB)

Investigation of design strategies to effectively address demands for better sanitation based on a review of literature and field studies in South Africa, Tanzania, Nepal and India

Manual on the Right to Water and Sanitation

Book; Centre for Housing Rights and Evictions; 2008

Available at <http://www.cohre.org/manualrtws>

Designed to assist policy makers and practitioners in adopting the human right perspective to water and sanitation

Ecological Sanitation

Book; by Steven A. Esrey; Swedish International Development Cooperation Agency; Stockholm; 1998

Available at <http://www.gtz.de/ecosan/download/sida-ecosan-en.pdf> (PDF; Size: 1.24 MB)

Describes alternatives to conventional approaches to sanitation, approaches based on an ecosystem perspective and new technologies for constructing toilets

Recommended Organizations and Programmes

Swajaldhara, New Delhi (from [Pradosh Ranjan Jena](#), Independent Consultant, Nuapada, Orissa)

Ministry of Rural Development, Government of India, 9th Floor, Paryavarn Bhawan, CGO Complex, Lodhi Road, New Delhi 110003; Tel: 91-11-24361043; Fax: 91-11-24364113; jstm@water.nic.in; <http://www.ddws.nic.in/swajaldhara.htm>

Drinking water supply scheme, which aims at decentralised implementation of drinking water projects, based on empowerment of villagers to ensure their full participation

Arghyam, Bangalore (from [Poulomy Chakraborty](#), Feedback Ventures (P) Ltd, Gurgaon)

#599, Rohini, 12th Main, Indiranagar, Bangalore 560038 Karnataka; Tel: 91-80-41698941; Fax: 91-80-41698943; info@arghyam.org; <http://arghyam.org/content/view/63/92/>

Seeks to support strategic and sustainable efforts in the water sector that address basic water needs for all citizens

Department of Drinking Water Supply, New Delhi (from [Nitya Jacob](#), United Nations Children's Fund (UNICEF), New Delhi)

Ministry of Rural Development, Government of India, 9th Floor, Paryavarn Bhawan, CGO Complex, Lodhi Road, New Delhi 110003; Tel: 91-11-24361043; Fax: 91-11-24364113; jstm@water.nic.in; <http://www.ddws.nic.in/rwh.htm>; Contact Shanta Nair; Secretary; Tel: 91-11-24364113

Central government agency responsible for providing drinking water and sanitation services to rural areas across India

From [Nitya Jacob](#), Resource Person

Accelerated Rural Water Supply Programme, New Delhi

Ministry of Rural Development, Government of India, 9th Floor, Paryavarn Bhawan, CGO Complex, Lodhi Road, New Delhi 110003; Tel 91-11-24361043; Fax: 91-11-24364113; jstm@water.nic.in; http://ddws.gov.in/popups/arwsp_pop.htm

Scheme to assist states with 100% grants-in-aid to implement drinking water supply schemes in rural India, which is to be addressed in the NWM

Rajiv Gandhi National Drinking Water Mission, New Delhi

Department of Drinking Water Supply, Ministry of Rural Development, Government of India, 9th Floor, Paryavarn Bhawan, CGO Complex, Lodhi Road, New Delhi 110003; Tel 91-11-24361043; Fax: 91-11-24364113; jstm@water.nic.in; <http://ddws.nic.in/sustainability.htm>

Safe drinking water scheme of the central government which will be included under the National Water Mission to combat climate change

Ministry of Rural Development, New Delhi

9th Floor, Paryavarn Bhawan, CGO Complex, Lodhi Road, New Delhi 110003; Tel: 91-11024361043; Fax: 91-11-24364113; jstm@water.nic.in; <http://www.rural.nic.in/g1.htm>

Central government ministry in-charge of all rural development schemes, including sanitation, drinking water, rainwater harvesting employment and other welfare schemes

National Rural Health Mission (NRHM), New Delhi

Ministry of Health and Family Welfare, 401 & 404 A Wing, Nirman Bhawan, Maulana Azad Road, New Delhi 110011; Tel: 91-11-23061647; health@hub.nic.in; <http://mohfw.nic.in/>

Adopts a synergistic approach to improving rural health services by relating health to determinants of good health namely, nutrition, sanitation, hygiene and safe drinking water

Sarva Shiksha Abhiyan (SSA), New Delhi

Department of School Education, Ministry of Human Resource Development, Shastri Bhawan, New Delhi 110001; Tel: 91-11-23074113; webmaster.edu@nic.in; <http://ssa.nic.in/>

Seeks to open new schools and strengthen existing school infrastructure through provision of additional class rooms, toilets, safe drinking water, etc

From [Sunetra Lala](#), Research Associate

Sulabh International Social Service Organization, New Delhi

Sulabh Gram, Mahavir Enclave Palam-Dabri Road, New Delhi 110045; Tel: 91-11-25031518; Fax: 91-11-25034014; sulabh1@nde.vsnl.net.in; <http://www.sulabhinternational.org>

Provides sanitation services across India, and has built 1.2 million Sulabh Shauchalayas, which are used by 6 million people

Gram Vikas, Orissa

Mohuda Village, Berhampur-760 002, Ganjam, Orissa; Tel: 91-680-2261866 ; Fax: 91-680-2261862

iinfo@gramvikas.org; <http://www.gramvikas.org/>

Works to bring about sustainable improvement in the quality of life of poor, pioneered the cause of good quality toilets for the rural poor in Orissa

Water and Sanitation Management Organisation (WASMO), Gandhinagar

3rd Floor, Jalsewa Bhavan, Sector 10-A, Gandhinagar 382010 Gujarat; Tel: 91-79-23247170; Fax: 91-79-23247485; wasmow@wasmow.org; http://www.wasmow.org/cms.aspx?content_id=15

Working on construction and maintenance of village-level water supply infrastructure in Gujarat, this has helped to address the issues of drinking water availability in the area

Gramalaya, Tiruchirappalli

12, 4th Cross, Thillainagar West, Tiruchirappalli 620018, Tamil Nadu; Tel: 91-9443161263; Fax: 91-431-4021563; gramalaya@airtelbroadband.in; <http://gramalaya.org/contactus.html>

Implements sanitation projects and promotes community-managed toilet systems in the slums of Tiruchirappalli

Action for Food Production (AFPRO), New Delhi

25/1-A Pankha Road, D-Block, Janakpuri, New Delhi 110058; Tel: 91-11-28525452; Fax: 91-11-28520343; afprodel@afpro.org; <http://www.afpro.org/services.htm>; Contact D. K. Manavalan; Executive Director; Tel: 91-11-28525412

Has been supporting community-based water management practices, which has helped to provide drinking water to communities

Recommended Portals and Information Bases

From [Sunetra Lala](#), Research Associate

Both ENDS, Amsterdam

<http://www.bothends.nl/index.php?page=&Language=en>; Tel: 31-20-5306600; info@bothends.org

Provides resources on donors and funding opportunities for water and sanitation initiatives, along with descriptions of some 30 organizations worldwide providing assistance in the area

GlobalGiving, The GlobalGiving Foundation, Washington DC

<http://www.globalgiving.com/aboutus/partners.html#36>; Tel: 1-202-2325784

Provides descriptions of various corporate/institutional partners, project partners, and funding partners cooperating with GlobalGiving in sanitation and other water related projects

Related Consolidated Replies**Cost-Effective and Financially Sustainable Urban Water Supply and Sanitation Services, from Tushaar Shah, International Water Management Institute (IWMI), Gujarat (Experiences).**

Water Community, Solution Exchange India, Issued 16 June 2005

Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-16060501.htm>

Provides examples and experiences in context of cost-effective approaches for urban water supply and sanitation services

International Funding Agencies Supporting NGOs in Water Conservation, from Avani Mohan Singh, Hartika, Uttar Pradesh (Advice). Water Community, Solution Exchange India. Issued 29 July 2005

Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-29070501.pdf> (PDF, Size: 43 KB)

Identifies funding agencies providing financing opportunities for NGOs involved in water conservation activities

Low-Cost and Ecologically Sound Sanitation Practices, from Dinesh Kumar, IWMI, Anand (Experiences). Water Community, Solution Exchange India, Issued 3 October 2005

Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-03100501.htm>

Identifies low-cost, ecologically sound sanitation practices for urban and rural areas, and experiences in adopting these methods

Financing Urban Water and Sanitation Projects that Include the Poor, from Chetan Vaidya, USAID-India, New Delhi (Experiences). Water Community, Solution Exchange India, Issued 30 March 2006

Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-30030601.pdf> (PDF, Size: 150 KB)

Provides examples of commercially viable urban infrastructure investment projects, for extending access to drinking water and sanitation services for poor people living in cities

Ecological Sanitation, from S. Janakarajan, Madras Institute of Development Studies (MIDS) Chennai (Examples; Experiences). Water Community, Solution Exchange India, Issued 30 June 2007

Available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-05060701.pdf> (PDF, Size: 140 KB)

Details members experiences in promotion of ecosan across India, sharing their understanding, analysis of current problems and suggestions for scaling up the same

Responses in Full

[S. V. R. K. Prabhakar](#), Institute for Global Environmental Strategies (IGES), Japan

First, let me congratulate you on such an extensive survey exercise you carried out. I am sure you will have lot of work to do with it to get to a meaningful end. Secondly, your analysis depends on the objective for which you conducted the survey. We do not ask the question of analyzing the data before designing and implementing the survey. Most often surveys are done to know the facts or perceptions of people on a particular problem say access to water limited by social disparity, testing the question whether or not the access to water is closely linked to social disparity and other factors. Often times, perceptions do matter. Wrong perceptions make people behave inappropriately. For example, a misperception that one belongs to lower cast that is making him inaccessible to resources could be found out. To check if this hypothesis is correct or not, you need to categorize the data on social classes and see what their responses say.

You could even do statistical analysis of responses using a simple regression to test if economic status and access to water are related. Again, it all depends on the question you are asking. I would suggest you to follow this simple method.

1. List the questions you want to answer (as simple as what number families have access to safe drinking water to as advanced as what is the relation between government spending and access to water, does social status determines the access to quality of water with quality of water.
2. Decide whether you want to do a statistical analysis or not. Some you could simply express in percentages (usually called as descriptive statistics, say 20% of households had access to safe

drinking water in 2 km distance) and some others you can go for factual analysis. Again, it depends on the purpose. Policy makers may not be bothered to know what is the sampling error and confidence intervals but they would want to know simple to know percentages. You could have simple percentages and statistically significant numbers for the same question and use them wherever and however you want.

3. Proceed with cleaning of data first. I see there is a lot of scope for lot of missing data in your collection which will ultimately decide your sample error and confidence intervals at which you could say a relation exists.
4. You may want to gender disaggregate the responses. Also, disaggregate responses based on age, social background, socio-economic classes etc.
5. If you want to do analytic statistics (advanced than descriptive), you have choices such as regression (how much one factor is dependent on other factor, say income versus quality of water), correlation, factor analysis, analysis of variance, etc which require a good helping hand of a statistician.
6. There are several softwares that can help you with all range of analysis: SAS, SPSS, Statistica, Mstat, Sysstat, Sigmaplot, etc.

I would also suggest that you to visit a statistician in a nearby college who could help you do analysis.

Sacchidananda Mukherjee, WWF-India, New Delhi

I have attempted to provide some data analysis plan for the ASHWAS Dataset. I think there are tremendous academic and research prospects for the collected dataset, and in India there is a need for such surveys which are accessible to individual researchers. I hope the data set could be accessible and some good papers could be brought out from the same. The following comments are mine and not related to the institution where I am working.

ASHWAS Data Analysis Plan

To understand the factors influencing farmers' willingness to adopt best management practices for livestock waste

Adoption of best management practices for livestock waste is important to protect groundwater from nonpoint sources (NPS) of pollution. The study, done by Mukherjee (2008) in the Lower Bhavani River Basin, Tamil Nadu, shows that livestock waste contributes a significant portion of total nitrogen load in the groundwater, but it is often neglected in policy research in India. The level of nitrate in groundwater can be treated as signature of NPS pollution load in groundwater. Mukherjee (2008) shows that there are several factors - both household related (household size, education level, economically active person, sources of income, and environmental awareness etc.) and spatial factors (like rainfall, groundwater level, access to irrigation, herd size, groundwater quality etc.) - influence adoption of livestock waste management practices (e.g., household biogas plant).

The data collected through ASHWAS could be useful to understand the factors influencing farmers' willingness to adopt livestock management practices across the villages in Karnataka. Mukherjee (2008) has reconstructed a theoretical framework for adoption of best management practices and the model could be verified using the ASHWAS dataset. Application of logistic regression models (binary choice Probit models) could be useful. Cutting edge econometric models like Spatial Binary Choice Models could also help to understand the factors (spatial) which influence the adoption.

To understand the factors influencing farmers' perceptions about groundwater quality

Based on socio economic characteristics and access to General and Specific Information (Mukherjee, 2008), people draw a subjective risk perception on groundwater quality in general and drinking water in particular. The perceptions are important which influence their behaviour/ willingness to protect drinking water sources either individually or collectively. Self protection (purification of water) and collective

protection (source substitution or water treatment plant at the village level) are the general practices adopted to supply water in quality affected villages by the water supply authorities. However, protection of groundwater is also very important for sustainable access to safe drinking water. Once groundwater is polluted from NPS, taking curative measure becomes costly. The village level groundwater nitrate level will also explain the degree of NPS pollution in those villages.

To understand the factors influencing farmers' willingness to adopt best sanitation practices

Understanding the factors influencing farmers' willingness to adopt best sanitation practices is important from public health and policy point of views. Due to complexity involved, there is hardly any attempt in India to capture the factors significantly influencing farmers' behaviour to adopt best sanitation practices. Apart from socio economic factors related to household, there are several other factors (spatial and social capital) which influence adoption behaviour.

Better access to safe drinking water (from local sources) is highly dependent on access to better sanitation and adoption of best management practices for disposal and storage of livestock waste. Apart from quantity, groundwater quality is the major factor forcing the water supply agencies to go for source substitution (mostly from surface water sources - due to lower concentration of pollutants). The cost of water supply is growing up, and with the population growth, meeting demand (better access and acceptable quality) for safe drinking water for rural population is a major challenge that water supply agencies are facing today. There is a need for community involvement in groundwater protection, monitoring and better management of water and sanitation services.

Reference:

Mukherjee, Sacchidananda (2008), "*Economics of Agricultural Nonpoint Source Water Pollution: A Case Study of Groundwater Nitrate Pollution in the Lower Bhavani River Basin, Tamil Nadu*", Unpublished Ph.D. Thesis submitted to the University of Madras, Chennai, May 2008.

Pradosh Ranjan Jena, Independent Consultant, Nuapada, Orissa

Our objective is to provide safe drinking water within a definite time frame.

The first step is to determine whether the resources available in the village can provide adequate and safe drinking water. If not, then the next step is locating such a source. The third is to prepare a work plan to provide water with the advice from the villagers, so that it is acceptable.

It is not necessary to have a long process of survey-meeting-consultation-mobilization as it is costly and extremely time consuming. These processes can use up as much time and money as the cost of actually developing a system to provide water. Therefore, to be practical, the entire process should be done in a time-bound manner, and this is something we can learn from the private sector.

It has been my experience, for example, that under the Swajaldhara scheme, NGOs finalise their plans within a month and complete the project to provide safe drinking water to villagers in six months. However, under other government schemes, Panchayati Raj Institutions take much longer to finalise their plans and budgets, and implement the scheme.

Arunabha Majumder, Jadavpur University, Kolkata

I suggest the following for data analysis and presentation:

A. Water

- Water usage pattern
- Demand vis-a-vis water availability

- Type of water sources, accessibility, time spent for collection of water
- Water source depletion, drying up, sustainability
- Water quality, WQ problems, mitigation of problem
- Health condition, water-borne diseases, disease burden, disability days
- Operation and maintenance, role of panchayat
- Peoples participation, awareness level
- Sustainability of W/S system, contribution
- Good practices/ success story.
- Water quality monitoring and surveillance

B. Sanitation

- Coverage of on-site sanitation
- Different excreta disposal systems/sanitary/unsanitary toilets in use
- Use of toilets
- Cost, Low cost, affordability
- Subsidy, Special subsidy to BPL
- Demand Supply chain
- Capacity building
- Health aspect, disease burden
- Good practices/success story

The other components need to be highlighted as suggested above.

Poulomy Chakraborty, Feedback Ventures (P) Ltd, Gurgaon

It is a good initiative on the part of Arghyam, to carry out this survey.

I would like to suggest the following parameters, which could be the basis of analysis of the sanitary situation of the villages:

- Percentage of the community still practicing open defecation
 - Number of households with toilets
 - Types of toilets in the households: safe/unsafe
 - Cost of the toilets constructed: low cost/no cost/high cost
 - Sustainability of the toilets constructed
 - Availability of material in the local markets for toilet construction
 - General acceptance of the community on adopting safe sanitary practices
 - Method of disposal of children's excreta
 - Difference in the expenses on diseases pre and post adoption of sanitary practices
 - Water and sanitary borne disease records from the local PHC and also qualitative information on the existing disease situation from the households
 - Households following safe water handling practices
 - Situation of the village drains, ponds and other water bodies
 - Distance of the toilet from the drinking water sources
-

Nitya Jacob, United Nations Children's Fund (UNICEF), New Delhi

The Arghyam initiative is an excellent and extensive one. It will provide invaluable grassroots level data that can be analysed on different parameters. Having looked at the questionnaires and the sample data set provided, I feel the following analyses would be useful:

The survey can act as independent means to verify data being collected on drinking water quality by the trained volunteers of the Department of Drinking Water Supply (DDWS) under the National Rural Water

Quality Monitoring and Surveillance Programme. These village volunteers collect qualitative and quantitative data. It can also be an independent means of support for the DDWS initiative in terms of training requirements and procedures of collecting and testing water samples.

Another DDWS initiative is to assess the access to water at the individual level to work out the percentage of population covered. The Arghyam data can yield this information at the state level. Further analysis on the individual access, and cross-tabulation with the villages covered can help draw conclusions on the link between the two by assessing how closely the two datasets are related at the state level.

Another set of information provided by Arghyam pertains to the type of water schemes in villages. This can be cross-tabulated with individual and habitation level coverage to understand the efficacy of different water supply schemes. At the panchayat level, it will help to understand what mechanisms and systems work best for water service delivery.

The survey has gathered data on individual water storage habits. It will be useful to analyse this to understand how people store and use water from their vessels, the purification methods they employ and relate this to contaminants in drinking water. This will help modify water purification methods and the information communication strategy of hygiene campaigns, if needed.

Another set of data is funding of water and sanitation. Analyzing this can provide some answers on the efficacy of funding vis-à-vis the type of water supply scheme implemented in the village. For example, for how many hours in a day does a piped household water supply scheme, costing a certain amount, provide water to all households? Or is a scheme to provide water from stand-posts more cost-effective?

There are more permutations but I feel these analyses could be the starting point. They would yield useful information that can be built upon through more detailed analysis.

[B. K. Sharma](#), Gwalior Childrens Hospital Charity, Gwalior*

I will like to add to [Pradosh Ranjan Jena](#)'s observations, that Govt. schemes most of the time do not reach even to the needy and most of the time majority of money is pocketed by middlemen, agents, politicians and Bureaucrats. This is what we have seen happening every day every where and that is the reason that our majority of population does not get basic amenities for survival even.

I wonder if you could tell us about Swajaldhara scheme and if any help is available to provide safe drinking water in villages and slums. We are working in 40 villages surrounding Snehalaya for integrated development programme to include hygiene, sanitation, safe drinking water, health care, education and employment opportunities but find it difficult to implement the programme as we want for lack of funds and in spite of all efforts, we are not able to get any help reach these villages in spite of all the existing schemes. These villages include many tribal villages too where they are supposed to get every thing under so many Govt. Schemes but nothing has been done. We do not know where are we heading in our Country and at least I do not see any hopes for future for these poor people at least in my life time.

** Offline Contribution*

Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to Solution Exchange for the Water Community in India at se-wes@solutionexchange-un.net.in with the subject heading "Re: [se-watr] Query: Survey on Household Water and Sanitation - Advice. Additional Reply."

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