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40th WEDC International Conference, Loughborough, UK, 2017**LOCAL ACTION WITH INTERNATIONAL COOPERATION TO IMPROVE AND SUSTAIN WATER, SANITATION AND HYGIENE SERVICES****Mobile based tracking system to ensure sustainability of sanitation programme: experiences from four Indian states***Asad Umar, Prasann Thatte & Satviki Varma (India)***PAPER 2696**

India's goal of achieving 100% sanitation coverage has been a long-standing one. While the recent push to eliminate open defecation has made significant progress taking India to a level of 61% coverage, the functionality of sanitary latrines and sustainability of open defecation free villages remain major challenges mainly due to the absence of a strong mechanism to track the progress of infrastructure and improvement in hygiene behaviours. The benefits of significant public investment made in the sanitation sector hence remain only partially realized. Against this backdrop, the Aga Khan Development Network (AKDN) under its ambitious multi-state sanitation initiative spread across Bihar, Madhya Pradesh, Uttar Pradesh and Gujarat has introduced GPS enabled mobile-based monitoring system to track the progress of sanitation infrastructure and hygiene behaviours. The initiative with the help of AKVO flow has so far tracked 19400 units till January 2017 to get the completion status, quality of construction and awareness levels and behaviour pattern of targeted communities.

Introduction

Proper water and sanitation is a key foundation for achieving the Sustainable Development Goals related to healthcare and gender equality. Yet, one of the most visible – and damaging – signs of India's development challenges is open defecation and the lack of sustainable sanitation for its large, diverse and growing population. Of the estimated one billion people who defecate in the open across the world, almost half reside in India. One in every ten deaths in India is linked to poor sanitation and nearly 44 million children under five remain stunted. All told, the country loses the equivalent of 6.4 percent of Gross Domestic Product due to inadequate sanitation (<http://www.un.org>).

The Swachh Bharat Abhiyan/ Clean India Campaign kick-started in October, 2014 by Prime Minister Narendra Modi to make India open defecation free (ODF) by the year 2019 reflects the top priority accorded to sanitation. The campaign has already received overwhelming support amongst key stakeholders and has set India firmly on the path of achieving ODF status and realizing the SDGs at a brisk pace. Latest government data shows that the overall coverage has in India has reached a significant level of 60 percent (MDWS, 2017), attributed mainly to the shift in policy towards the creation of demand for sanitation, the lack of which has often led to failure of sanitation initiatives. Demand-side approaches focus on collective triggering, health education, social marketing, community action, supporting behaviour change and enabling small-scale enterprises with state acting as the facilitator (Kathleen O'Reilly & Elizabeth Louis, 2014). The focus on creating demand has led to important findings that individual and households 'motivations to build and use toilets has more to do with comfort, convenience, status, privacy, and dignity than with perceived public health benefits (Evans, 2005; Jenkins and Scott, 2007; Jenkins and Sugden, 2006; Peal et al., 2010).

While the Campaign has made significant progress to address open defecation, its focus on achieving the ODF status has somehow left the issues of functionality and sustainability unanswered. The issue of sustainability of change is rooted in culture. In rural areas, open defecation continues to be a widely accepted practice. A RICEⁱ survey covering 3200 households in five states found that despite the presence of a working latrine, over 40% of households had at least one member who continued to defecate in the openⁱⁱ, thus confirming that latrine construction alone was not enough to change behavior. The findings suggest that

a combination of factors, including a lack of awareness of the potential health and economic benefits of better sanitation, perceived costs of building a toilet, perceived convenience of open defecation, and cultural beliefs associated with defecating away from household premises, act as major barriers to improvement.

Women and girls are affected particularly adversely by poor state of sanitation. Their dignity and safety is at risk because of a lack of access to sanitation facilities (WTD Advocacy Report-2014). An integrated approach that includes behaviour change communication, promotion of 100 percent household coverage, access to improved technologies, proper waste disposal and prevention of groundwater contamination, is most likely to help achieve and sustain the expected positive health outcomes of full sanitation coverage.

The AKDN Comprehensive Sanitation Initiative: the intervention model

AKDN under its multi-state sanitation initiative spread across 600 villages has already commenced intervention in 290 villages across 11 districts and 27 blocksⁱⁱⁱ in four states in Western and Northern India, namely Gujarat, Bihar, Madhya Pradesh, and Uttar Pradesh. In collaboration with the Government's national mission - the Swacchh Bharat Mission, it aims to address the issues identified above. So far, the intervention has helped 84 rural Habitation/villages to achieved 100% household sanitation coverage open defecation free status. This was achieved through community triggering intensive inter-personal communication, key stakeholder meetings and participatory planning exercises. The table below presents the overall coverage of Household toilet units in the intervention states. As presented in the table, the main focus of the intervention is in Gujarat and Bihar but now the programme outreach is increasing in Madhya Pradesh and Uttar Pradesh as well.

Intervention states	Year-2015	Year-2016	Total
Gujarat	6121	8849	14970
Bihar	4757	6311	11068
Madhya Pradesh	102	1378	1480
Uttar Pradesh	203	565	768
	11183	17103	28286

From the beginning, the Initiative has focused on strengthening capacities of Panchayati Raj Institutions^{iv}, Self Help Groups (SHGs), para-workers and frontline workers of public health & nutrition system viz. Anganwadi workers/ Accredited Social Health Activists (ASHA) to facilitate their effective involvement in demand generation and hygiene promotion. It is also engaged in the formation/ reactivation of village water and sanitation committees. In small meetings, the use of newly constructed toilets is promoted. In some instances, the water and sanitation committees have also established ODF monitoring norms.

The Initiative prioritizes awareness sessions and focus group discussions on impact of poor sanitation and water quality on health, followed by community led planning for collective action and CLTS exercises to generate demand for sanitation. Community participation during triggering exercises leads to the development of village sanitation plans and a time frame to achieve ODF status.

As a follow up to participatory planning exercises, messages on the need for household sanitation units are reinforced through inter-personal communication, and active involvement of women's groups, Self Help Groups, Farmer Interest Groups and watershed development committees formed as part of other AKDN programmes. Activities such as Gram Sabha (village level assemblies), household visits and focus group discussions with community are organized, which help in cleanliness drives, identifying households for building demonstration units, collective decision-making and planning of exposure visits.

Rationale for the use of mobile technology

While applying this comprehensive approach, the key to success is to ensure that the implementers have a tab on real-time basis on the community preferences, usage pattern, quality of infrastructure and pace of progress, so as to ensure the sustainability of sanitation coverage and usage at scale. However, tracking of

physical and functional status of toilets as well as of key behavioural indicators related to toilet usage and drinking water handling - two critical factors underlying the sustainability of ODF communities - is a laborious process for large-scale rural sanitation programmes. The traditional, paper-based surveys are cumbersome and prone to high error rates. Lot of such data is often not readily available for sharing and further use.

The AKDN Initiative addressed this by introducing a cloud-based GPS enabled technology tool named AKVO Flow. The choice of tool was guided by its five key strengths, namely, its ability to: (a) store and process large data files in offline environment on android-based phones and transmit it later to cloud when connectivity is available, (b) bring together multiple data capture technologies including GPS, camera and time stamping which are also useful means of data verification, (c) convert data automatically into graphics presentable on a web-based dashboard which is accessible anytime from anywhere, (d) plot data points to be plotted on Google Maps and Google Earth and (e) create, from the original set of questions, a smaller set to be used to monitor certain key performance indicators over a period. These are the features because of which the application has been found useful and implemented earlier on a large scale by organizations such as Nepal WASH Alliance, Community Water & Sanitation Agency- Ghana and WSP as well.

The above features of AKVO Flow make it possible to process large quantities of data to generate specific insights right down to the level of geo-referenced toilet units on both hardware and software aspects, replacing guesstimates with robust predictions and present these analyses on user-friendly dashboards to inform the decision-makers.

The evidence of user-friendliness of the tool comes from the project field teams, which include front line field workers, several of them being first time smart phone users. They have collected data for 19400 households. The in-built feature of the application is further being used to monitor behavioural practices of target beneficiaries. In the same villages, several water management committees and local village institutions have now expressed interest in using AKVO Flow to collect data around operation and maintenance of water supply facilities. These examples illustrate the user acceptability and friendliness of the tool, which has the capability to be adopted in several other development projects as well.

Prior to the use of AKVO Flow, the survey formats to track sanitation coverage, usage and hygiene behaviour along pre-determined indicators for each household were developed, further refined after field testing and digitized for viewing on a mobile device. Project staff and enumerators were trained on the use of the application especially on data entry, collection, and management. Programme Managers were oriented on data cleaning and visualization on the dashboard and to provide feedback to their teams on data collection,

Key indicators captured

For this paper, the key indicators were analyzed and tabulated as follows:

Key indicators	% Household/respondent
Percentage of vulnerable groups (Differently abled; children below 5 years of age; elderly) using constructed facilities	97%
Percentage of targeted households who have a built new toilets	98%
Percentage of households adopting pour flush leach toilets	85%
Percentage of APL ^v households who built single pit toilets	19%
Percentage of APL households who built Double pit toilets	67%
Percentage of BPL households who built single pit toilets	18%
Percentage of BPL households who built double pit toilets	75%
Convenience, safety and health concerns - the main motivating factors to build toilets	30%, 14% &13%

Percentage of respondents who were aware of safe water handling practices	61%
Percentage of respondents who were aware of the five critical steps of handwashing	33%

Result and discussion

The AKVO Flow tracking was initiated in May 2016. By January 2017 19400 households have already been tracked. By March 2017, all the remaining households with toilet will have been mapped.

Improved access to toilets

Data indicates that out of total covered household, in all new toilets are constructed in 98% households. These are households that had no option but to defecate in open earlier. Thus, the intervention has succeeded in improving the access to toilets substantially in the intervention areas. Data also informs us that the two key motivating factors that pushed these households to build toilets for themselves were convenience (30%), safety (14%) and also Health concerns (13%). The other important factors are safety from stray animals' snakes (11%) and government incentives (10%). It is also being noted that as a result of the constant messaging, communities are able to gradually establish linkages between health concerns with lack of sanitation access. This data will also help to prioritize the messaging and Behaviour change communication strategy for further improving the coverage and usage of household toilets.

As for awareness and practices, the study examined the awareness level of respondents regarding the critical times for handwashing with soap, and how they store and handle drinking water. We found that only 33% respondents could name all critical occasions for handwashing, and only 61% respondent knew about proper water storage and handling practices. These parameters clearly indicate that intervention has to focus more on personal hygiene behaviour not only to improve the awareness level but also to convert awareness into actual practice.

However, for this intervention to truly succeed, it is important that the improved access is sustained over a period and is accompanied by positive changes in awareness level and sanitation practices. The analysis of AKVO flow data revealed that majority of households are actually using the newly built toilets. But if this analysis is compared with above presented hygiene awareness data then it clearly indicates the need to further strengthen interpersonal communication strategy to ensure long term sustainability of Sanitation Intervention.

Data also reveals that across project locations, pour flush leach pit model is the most preferred technical option, as it is being adopted by 85% of the household surveyed. The remaining households are dependent on septic tank and toilets connected to sewerage networks. Out of total leach pits toilets, the analysis reveals that double pit toilets are being adopted by households, irrespective of their economic status. However, it is also observed that 18-19 % of households are constructing single pit toilets, owing to issues around land availability and due to the presence of hard rock.

Inclusion of vulnerable groups

While the intervention has focused on universal access, it has prioritized the needs of the most marginalized categories of potential users, thus bridging the gaps in access to and use of appropriate sanitation and hygiene services for differently abled; old aged and children under-five. We see that in this intervention, out of a total of 5,336 children under five who were surveyed, 94% of them are using the facilities; and out of 441 differently abled members surveyed, 94% differently abled responded were accessing the facilities. The high percentage of usage by vulnerable groups clearly reflects the adherence to quality and adoption of standards norms of construction by the field teams. The survey design for AKVO Flow provides the opportunity to capture the quality parameters of construction for every unit.

Conclusion

The project interventions have resulted in improved access of sanitation facilities for 28286 families across four intervention states. The AKVO flow tracking was initiated in May 2016 and by January 2017 19,400 households have already been tracked. The introduction of AKVO flow under AKDN sanitation intervention clearly indicates that mobile and digital applications can transform the whole concept of programme monitoring by providing real-time information on progress of sanitation facilities; quality of construction,

user preference, usage patterns and tracking of inclusive approach of programme by capturing and processing relevant details from each households.

Mobile & digital applications are global development trends that are mostly unexploited in sanitation space, applications like AKVO FLOW can effectively be used to ensure better sustainability of open defecation free villages by sharing real time information with local government.

Indeed, mobile based application can significantly improve the flow of information between communities and government institution via real-time, geo-referenced and digitized data. A continuous flow of information at centralized dashboard can help local government to understand community insights on technology preference, usage pattern, quality of infrastructure and pace of progress and thereby improve programming catered to the actual needs, preferences and demands of local communities.

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References

- Jenkins, M.W., Scott, B. (2007) *Behavioural indicators of household decision-making and demand for sanitation and potential gains from social marketing in Ghana*. Soc. Sci.Med.64 (12), 2427–2442.
- Kathleen O’Reilly & Elizabeth Louis, (2014) *The toilet tripod: Understanding successful sanitation in rural India* Health & Place 29 (2014) 43–51
- Ministry of Drinking Water and Sanitation – India (2017) <http://sbm.gov.in/sbmdashboard/Default.aspx>
- Peal, A.J.,Evans,B.,van der Voorden, C.(2010). *Hygiene and Sanitation Software: An Overview of Approaches*. Water Supply & Sanitation Collaborative Council (WSSCC), Geneva.
- <http://www.worldbank.org/en/news/feature> (2015), *Ending open defecation achieving clean and healthy-rural India?cid=EXT_WBSocialShare_EXT*
- Water, Environment and Sanitation, India: <http://www.unicef.org/india/wes.html>
- World Toilet Day Advocacy Report (2014), *We cannot wait, A report on Sanitation and Hygiene for girls*, by Domestose, Water Aid and WSSCC, 25p, <http://worldtoilet.org/wp-content/uploads/2014/02/WecantWait1.pdf>
- UN <http://www.un.org/sustainabledevelopment/water-and-sanitation> 2016

Notes

- ⁱ Research Institute of Compassionate Economics
- ⁱⁱ The findings are part of a sanitation, quality, access, use and trends (SQUAT) survey conducted by the Research Institute of Compassionate Economics. Full report can be accessed at: www.squatreport.in
- ⁱⁱⁱ Sub-district level administrative units
- ^{iv} Refers to the local self-government institutions that form the third tier of governance in India
- ^v Above Poverty line (APL)/ Below Poverty Line (BPL) is an economic benchmark used by the government of India to define economically well off and disadvantaged families. This categorization helps to identify individuals and households in need of government assistance and aid.

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