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38th WEDC International Conference, Loughborough University, UK, 2015**WATER, SANITATION AND HYGIENE SERVICES BEYOND 2015:
IMPROVING ACCESS AND SUSTAINABILITY****A mobile based system for monitoring usage of household latrines and hygiene practices in Madhya Pradesh, India***V. Nayak & M. Luckose (India)***BRIEFING PAPER 2132**

Major concern in India is not only to achieve MDG sanitation target but also how to address the issues of defunct, incomplete or not in use toilets. Lack of engagement of community causes major slip backs. This paper presents results from a project in Ichhawar block, Madhya Pradesh, India in year 2014-15 on Mobile Based Monitoring System (MBMS) designed to monitor household levels sanitation and hygiene practices. Triangular approach was adopted - survey through mobile by village level workers, validation of data with community and its use by concern authorities. Paper presents that how MBMS can improve community monitoring, strengthen village level workers and help community as well as decision makers to take corrective measures. MBMS captured evidences in the form of geo-tagging position of toilet infrastructure and photograph of toilet, which improve quality of data and reliability and helps to improve transparency and accountability in the implementation of sanitation programmes.

Introduction

India is severely off-track in reaching the Millennium Development Goals (MDGs) target on sanitation i.e. "Target-10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation". The Joint Monitoring Programme report 2014 of World Health Organization and Unicef stated that if the current rate of progress continues in sanitation, India will take 40 more years to meet the safe sanitation for all as many states are poor performing. This is the same with reference to drinking water where improvements have been achieved in access to water but have not been sustained, with high levels of slippage and increasing issues of poor water quality.

As per baseline 2012, about 25% Individual Household Latrines (IHHL) were found functional in rural Madhya Pradesh (MP). Through its various initiatives like *Swachh* Madhya Pradesh Campaign, Global Handwashing Day, *Bal Swachhata* Mission etc., the State is contributing towards achieving the MDGs. All these activities have helped Madhya Pradesh in improving the sanitation situation by construction of toilets and discouraging open defecation. Even while the State and Central schemes are facilitating access to toilets, it is equally important to monitor the usage of toilets and hygiene behaviour amongst the people. Periodical monitoring will help to achieve the larger goal of safe sanitation for all in the state.

Madhya Pradesh Water, Sanitation and Hygiene (MPWASH) a unit of Madhya Pradesh Health Sector Reform Programme (MPHSRP) is a WaterAid implemented programme with the support of Department for International Development (DFID) in Madhya Pradesh. The aim of the programme is to support state government to improve its planning, delivery and quality in Water, Sanitation and Hygiene (WASH) services in 16 high priority districts of Madhya Pradesh through various community led approaches. One of the major challenges faced today is the usage of toilets and hygiene practices among the users. MPWASH piloted Information and Communications Technology (ICT) based monitoring system to track information on toilet construction, use and hygiene practice in the *Ichhawar* block of Sehore district of Madhya Pradesh (India) between August 2014 and January 2015.

An Android based application, developed by – OneWorld Foundation - a technical agency, uses internet and Global Positioning System (GPS) assisted mobile technology to gather geo-spatial information of toilets in rural areas and its use by collecting and transmitting credible data in real-time. The application was

piloted in 70 Gram Panchayats (GPs) – the lowest tier of village level administrative unit comprising of a single village or number of villages - with approximately 25000 households in partnership with local Non-Government Organization (NGO) Samarthan.

Rationale

In India, more than 28,000 *Panchyati Raj* Institutions (PRIs) have been awarded *Niram Gram Puraskar* (NGP) in the last 10 years in recognition of their achievement in eliminating the practice of open defecation. It has been observed that sustainability of Open Defecation Free (ODF) status of NGP awarded GPs is an issue of concern in the State as well as in the country. Slip back of toilet usage is often noticed at household levels. The contributing reasons are lack of engagement of community while construction as well as the absence of a robust monitoring process. Community pressures, both the positive and the punitive kind are effective in getting individual households to construct and use latrines built. On the other hand, sanitation planning and monitoring are key functions of Village Health and Sanitation Committee (VHSC) and village level community workers i.e. *Swachhata Doots* whose role is to motivate the community for constructing toilet and its usage. However, it has been observed that they are not active and mostly exist only on paper. These issues are addressed at various levels, but the problems still persist due to lack of real time data on WASH services. Existing monitoring systems are limited to capture number of toilet constructed and tracking of usage and behaviour change in terms of adopting hygiene practices are beyond their purview. Key challenges include quality of data, reliability, standardisation, availability, reach to all social groups and scaling - up with quality services. There is a need to address all these aspects and it is an opportunities that mobile is more user friendly and offers instant communication even in rural area of the India.

Objectives

The key objectives of designing mobile based monitoring system are as follows:

- To develop and demonstrate ICT based improved system of monitoring for tracking usage of toilets and hygiene practices
- To develop baseline and progressively monitor sanitation infrastructures – toilets
- To strengthen role of village level community workers “Swachhata Doots” in improving WASH status of the villages

Methodology and approach

The Mobile Based Monitoring System (MBMS) is designed in a triangular approach. At the village level data is collected with the help of *Swachhata Doots*. This data shows the status of physical toilet availability and its usage, hygiene practises along with the photograph of the sanitation infrastructure – Individual Household Latrines (IHHL) with their locational parameters using GPS/Assisted GPS. It directly transmits the recorded data to a designated server through General Pocket Radio Services (GPRS), third generation (3G) or wireless internet connectivity. The central server compiles all data and anchors the reporting modules for the programme through generating web based Monitoring Information System (MIS) reports regularly. The “Google map view” feature surveyed households marking them according to their geo-tagging positions in green, yellow and red colours based on their status of toilet availability and its usage. The functional toilets appears in green, defunct and not in use toilet in yellow and households without toilets in red.

Most of the data is based on observations of the data collector and data provider. Hence it is important to validate the information, with community. Village level community worker “*Swachhata Doot*” facilitates the validation process with the community using reports and maps and shared WASH status of each family. The exercise helps community to understand the situation of each family as well as village on WASH status. This also improves understanding of “*Swachhata Doots*” role in WASH scenario and together with community initiates discussion on how to improve status, which leads to effective planning and follow up actions. Panchayat as well as Block officials monitor the progress with the help of the map. With the help of web MIS, officials can take corrective measures to improve sanitation status in the Gram Panchayat.

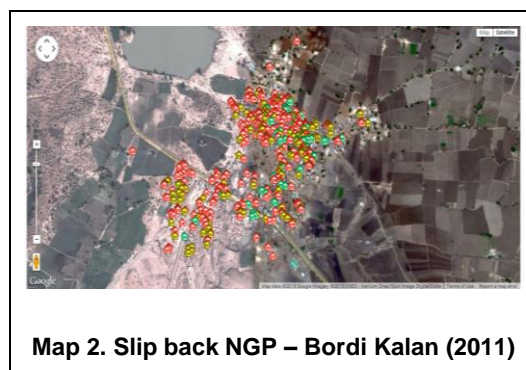
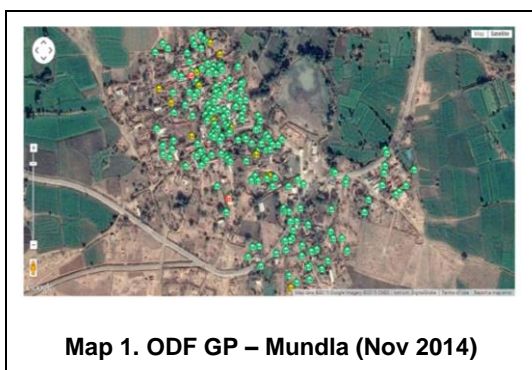
Following are key activities followed in the pilot process:

1. The household data collection format was approved by the department of Panchayat and Rural Development, Government of Madhya Pradesh.

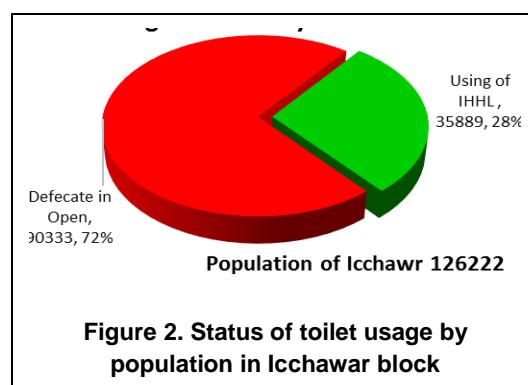
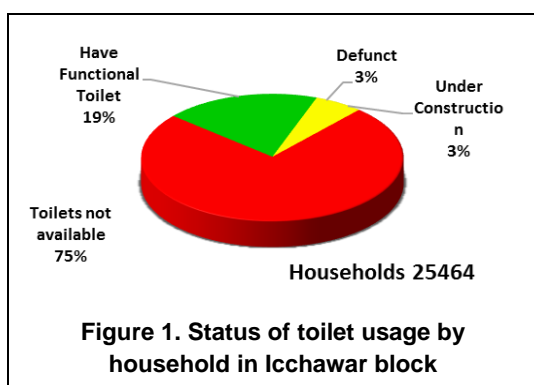
2. Installation of necessary software and technical set-up for mobile application and web based MIS system.
3. Orientation of concerned Block coordinators of Swachh Bharat Mission (SBM) – a programme of Government of India on Sanitation; *Sarpanch* – an elected President of a Gram Panchayat - and Panchayat Secretaries of all GPs of *Ichhawar* Block and other government officials on mobile application and its use.
4. Identify and select village level community workers “*Swachhata Doots*” in 70 GPs of *Ichhawar* Block. Special *Gram Sabha* – village level assembly of voters under MP Panchayat and Gram Swaraj Act, 1996 - meetings were organised for the approval of *Swachhata Doots*.
5. Facilitated one - day orientation of selected *Swachhata Doots* followed by a three day residential training on their roles in Swachh Bharat Mission and on mobile monitoring system.
6. Provided one smart mobile handset for two GPs to facilitate mobile survey. A total 40 handsets were used and an additional 127 *Swachhata Doots* were trained.
7. Handholding support was provided to *Swachhata Doots* by Block coordinator in data collection and validation exercises. The purpose was to promote community monitoring system for effective use of mobile MIS at GP level.
8. Share findings with Block and district administration on a regular basis.

Result and analysis

In this application every household can be easily located on the map with their details and photographs. The concentration of colours green, yellow and red in the given map represents the status of GP. In map-1, it appears that none of the households are practicing defecating in open, as most of the households are in colour green. It is a recently ODF status village where a *Swachhata Doot* took initiatives and within a course of six months, village achieved ODF status. There is also the case of NGP awarded *Bordi Kalan* (map-2) that practiced open defecation. However, in year 2011, open defecation was eliminated and this slipped back. However effective monitoring and follow up could have helped in highlighting this high slippage noticed. Sharing of these analysis with community triggered again and decision makers planned further strategies.



Besides, web based MIS reports provides various micro and macro analysis on the physical progress of toilets and its usage. It appears that only 19% households of *Ichhawar* Block have functional and in - use toilets. Analysis revealed that three-fourth households in *Ichhawar* block don't have access to individual toilet facilities (Figure 1). Though, analysis on population - wise usage, appears that out of 126222 household members of *Ichhawar*, 28% are using individual household latrines (Figure 2).



Age group - wise analysis revealed that high open defecation practice (75%) is found in age groups of 5 to 18 years, which largely consists of school going children. It is hearting that more women are using toilets than men. Similarly, usage of toilets are significantly better among senior members of a household. It is an issue of concern that high number of under five children are defecating in open (see Table 1). These analysis will help decision in developing focused strategies, example - analysis indicates that effective awareness programme need to be designed for school going children in *Icchawar* Block. Similarly, to improve use of toilets in under five children, *Anganwadi* center and worker can organise awareness activities with mothers of under-five on safe disposal of child excreta.

Age Groups	Defecate in Open				Using of IHHL				Overall		
	Female		Male		Female		Male		Defecating in Open (%)	Using of IHHL (%)	Total Household member
	Household members	% to Total	Household members	% to Total	Household members	% to Total	Household members	% to Total			
0-5 years	4927	71.3	6112	73.5	1987	28.7	2199	26.5	72.5	27.5	15225
5-18 years	13707	75.0	15559	75.1	4572	25.0	5163	24.9	75.0	25.0	39001
18-55 years	20441	70.7	22463	69.9	8453	29.3	9668	30.1	70.3	29.7	61025
Above 55 years	4023	65.5	3101	64.2	2117	34.5	1730	35.8	64.9	35.1	10971
Overall	43098	71.6	47235	71.6	17129	28.4	18760	28.4	71.6	28.4	126222

Source: MBMS survey of Icchawar block – Dec 2014

The advantage of MBMS is that it is not only capturing the physical progress of toilets but also data on availability of water for sanitation and drinking purposes, status of hygiene practices among the households, such as hand washing with soap before eating and after defecation, methods of disposal of child excreta, solid and liquid waste disposal are also gathered. The analysis reveals that only 18% household disposed child excreta in the toilets, 48% used water and soap for hand washing after defecation and 41% household safe handling of drinking water (see Table 2).

Safe Disposal of Child Excreta			Hand washing after defecation				Handling of Drinking Water		
Open Field	In Garbage	In Toilet	Water only	Water + Mud	Water + Ash	Water + Soap	With Glass	With Mug	With Ladle
6342 45%	5149 37%	2526 18%	4444 17%	1954 8%	6869 27%	12197 48%	4895 19%	10058 40	10511 41%

Source: MBMS survey of Icchawar block – Dec 2014

As per online portal of Swachh Bharat Mission, in Ichchawar Block 38% household have toilet facilities and majority of them belong to Below Poverty Line (BPL) families or poor. As per MBMS, 25% household have toilets (19% functional and 6% defunct toilets), rest 75% household are without toilets. In many cases toilets got fully damaged and there was no physical existence of pit and superstructure of the toilet. The key reasons of high damages are delay in supply of materials during toilet construction and incomplete toilets, poor quality due to engaging external contractors, without households demanding construction happened etc. Through this exercise *Swachhata Doots* are well informed about the WASH scenario of each family and village. Similarly, real-time data on various aspects of WASH situation at micro and macro level helps community as well as administration to understand the hurdles in the implementation.

Overall the learning of pilot reveals that MBMS is used as an effective tool to plan and monitor the toilet construction and usage. The most significant contribution of the piloting was activation of *Swachhata Doots* in all the 70 Gram *Panchyats* in Ichchawar.

Looking to the utility of the tool, department of Panchayat and Rural Development, Govt. of Madhya Pradesh has extended this piloting in four Blocks of the State, which includes one proposed ODF block i.e. *Budhni* of *Sehore* district with the aim to scale this to entire the state of Madhya Pradesh. Another important factor is that this is not a standalone system but can be easily aligned to state and national level monitoring processes making reporting and monitoring accessible to all.

However there are few challenges. The accuracy of the data predominantly depends on the observation and understanding of the data collector and data provider. This is further strengthened with community level validation. The second challenge is that *Swachhata Doot* plays a crucial role in MBMS data collection and follow up - but without incentive their motivation will be low.

Conclusion

The piloting of mobile based monitoring system demonstrated MBMS as an effective monitoring tool. Ownership of administration, *Swachhata Doots* and community driven approaches converted it into an important components in the implementation of *Swachh Bharat* Mission in Madhya Pradesh. It will also help in ensuring accuracy of data and reporting as household locations are geo tagged. It is a continuous process with a frequency of quarter or bi-annually where *Swachhata Doots* updates the data, which will provide comparative analysis of changes in terms of WASH progress happening in the GP.

Lessons

Though Mobile application is an effective tool to capture real-time data, this alone cannot be a solution for ensuring Open Defecation Free villages. Use of Mobile combined with community engagement and followed by corrective measures by concerned authorities can make every village ODF. This tool provide information to take appropriate decision at village, block and district level.

The role of village level workers is crucial in sanitation as sustainability of usage of toilets depends on behaviour change, which can be possibly through motivation. However, in Ichchawar their existence was found on paper or mostly found inactive due to various reasons. During MBMS survey the village level workers were identified, oriented and engaged in monitoring process. As a result, they were informed about WASH status of each household, which helped them in developing plan to improve access to toilet and its usage.

The quality and reliability of data is an issue of concern in sanitation programme of India, which resulted in problem of missing toilets in all the states of the country. The data of MBMS have captured evidence in the form of geotagging position of toilet infrastructure, its photograph and also it is validating by community. It is a continuous process and in further round of surveys data quality will definitely improve.

The application is customized in such a manner that it can be used in other locations of the country and with some customization other development country can also use this application in data collection.

It is a cost effective monitoring tool and in Madhya Pradesh, it can be replicated on the cost of 6% of total Information, Education and Communication (IEC) component of the sanitation programme. This is not a stand along monitoring tool, with appropriate adoption this can be linked to state as well as national information system in the country.

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