Scaling Up Rural Sanitation

Scaling Up Indonesia’s Rural Sanitation Mobile Monitoring System Nationally

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INTRODUCTION

More than 101 million people in Indonesia—41.2 percent of the population—lack access to improved sanitation that hygienically separates excreta from human contact. More than half of those individuals live in rural areas. The Government of Indonesia has addressed this lack of access through a community-based total sanitation program that includes demand creation, supply strengthening, and enabling environment support. Called Sanitasi Total Berbasis Masyarakat (STBM), the program started with a pilot in 2005 in six districts. Following the successful demonstration of the program’s ability to improve sanitation coverage, the pilot was scaled up, province-wide, to all 29 districts in the Province of East Java, home to more than 38 million people. The program continued to show successful results, so in 2008 the Ministry of Health1 issued a national decree endorsing STBM as the national strategy with five pillars:

1. Open defecation free (ODF) communities 2
2. Handwashing with soap
3. Safe and sustainable household water supply for consumption
4. Safe disposal of household solid waste
5. Safe treatment of household waste water.

In 2014, the Ministry of Health issued operational guidelines3 further detailing how the strategy is to be implemented, and US$9.5 million was allocated for STBM at the national level as its operating budget. STBM has set nationwide sanitation targets and has plans for countrywide activities in 20,000 villages.

The Government of Indonesia found that having limited data on rural sanitation access and hygiene behaviors created challenges in designing, implementing, and funding these interventions. In 2009, with the support of the World Bank’s Water and Sanitation Program (WSP), the Ministry of Health conducted a pilot to monitor rural sanitation in two districts in East Java using a mobile phone Short Message Service (SMS) text-monitoring (mobile monitoring) system. The

KEY FINDINGS

• A structured approach, which allows for adjustments and improvements to be made, is needed in order for real-time village data mobile monitoring to scale up from 2 to 119 districts in three years and all 500 of Indonesia’s districts by 2015.
• A national harmonized approach to rural sanitation, with sector-wide objectives and monitoring framework is necessary for scaling up data collection.
• Utilizing multiple data verification systems helps ensure data accuracy.
• To increase the use of the monitoring system as a management tool for programming, feedback loops, a larger set of customized data information tools, and channels to reach specific target users could be explored.

1 Ministry of Finance, Indonesia 2008
2 Open defecation free (ODF) communities are those in which no one defecates in public and all community members have access to some form of latrine or toilet.
3 Ministry of Health, Indonesia 2014
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The initiative showed that community progress toward becoming ODF and changes in household access to improved sanitation could be collected through SMS sent from mobile phones and stored in a district-level database (see Mukherjee 2011). After a stakeholder meeting at which the pilot was presented, the Government of Indonesia requested assistance to conduct a phased expansion of the mobile monitoring system. Motivation for the scale up came from the mobile monitoring pilot’s success, the scaling up of STBM nationwide, and the desire to have data to track the Millennium Development Goal (MDG) related to sanitation. In 2012, the mobile monitoring system was expanded to all 119 districts and cities in five of the country’s provinces, covering approximately 36 million households and 123 million individuals. The current rollout plan aims to reach all 500 districts in 34 provinces in the country by December 2015. As of August 2014, the mobile monitoring system is functional in 20 provinces.

PROBLEM STATEMENT
To monitor progress toward national targets, the STBM program is scaling up a mobile monitoring system countrywide. This learning note documents the typical challenges faced when scaling up a mobile monitoring system. It also documents improvements the government has made to the system and lessons learned while embedding it in existing government institutions. While country and institutional contexts differ, these emerging learnings aim to help other countries wishing to introduce or expand similar monitoring systems.

ACTION
To identify improvements since the first 2009 pilot and document lessons learned during the scaling up of the mobile monitoring system, a WSP team conducted qualitative research at the subdistrict, district, and provincial levels in 2014 in three locations in Pemalang, Semarang, and Brebes in Central Java. Team members interviewed individuals one on one, in small groups and in larger group settings, and tried to get viewpoints on the functioning of the monitoring systems from a wide array of stakeholders, including midwives, community members, sanitarians, clinic staff, and public works, home affairs, and health department employees. In total, team members spoke to over 170 stakeholders. This research then informed the adjustments and improvements made while further scaling up the system nationally.

FINDINGS
While improvements were made since the initial pilot in 2009, the team found certain challenges of the system in new locations similar to those found in the initial pilot (Mukherjee 2011), and some new challenges relating to the national scale up. This section discusses the system changes made in response to these challenges, such as: data collection protocol, verification of data, hardware investments, staffing capacity, incentives dissemination, and usage.

Data Collection Protocol: Roles and job descriptions are clarified and reflect the responsibilities for routine data collection
Similar to the pilot and other previous monitoring systems, the mobile monitoring system records village-level data. The number of rural households using each type of sanitation is recorded based on the STBM standard definitions: improved latrines, semi-permanent latrines, shared latrines, and open defecation in villages. In addition, a community’s progress towards ODF status is recorded. This village-level data is then compiled across subdistricts, districts, and provinces. However, who collects the data has changed between the pilot and scale up. In the pilot, data collection started with the creation of a village-level community map during the Community Led Total Sanitation (CLTS) triggering process (Kar 2008). A community leader was identified to assist with data collection and reporting. The community leader would send the results of the community mapping process to a district gateway server via two initial text messages. The first message would state the total number of households in the community. The second message would define the baseline situation, by stating the number of households using unimproved latrines, improved latrines, shared latrines, and open defecation. Later changes in the sanitation status of households in the community were sent through additional messages either by the sanitarian during regular visits to the community or directly by the community leader. During the scale up, the roles and official job descriptions have been changed to make the data collection more routine and to increase clarity on who has responsibility to collect the data. A district health officer enters all the baseline data for all

4 Rural sanitation officers, called sanitarians are employed by the District Health Office at each sub-district level in Indonesia.
villages within the district and the sanitarians send the updated progress reports via text message. In large villages with difficult-to-reach areas, the subdistrict sanitary may still work together with a local midwife, village chief, or health cadre to collect the data, but ultimate responsibility lies with the sanitary. These updates are intended to be sent during routine village visits, which should occur once or twice a month to complete other job responsibilities.

**Data Verification Process:** Automated error messages, random spot-checks and ODF verification field visits are used to validate data accuracy and reliability

Since the initial pilot, the data verification process has been improved for better accuracy in four ways. First, the current system automatically sends a response text message back anytime data is submitted. The response text message lets the individual who sent the data know if the information sent was correct or had errors. If the data has errors, the response text message will indicate what was wrong. Typical errors include SMS structure is incorrect, phone number of individual sending the message is not registered, village code does not match records, baseline data has not yet been entered, or data is inconsistent with previously received data. Second, the district health center and subdistrict sanitarians make verification visits to the communities and carry out random spot checks at the household level to assure validity of the community data. In some cases, this occurs multiple times a month when staff go to villages for other related job tasks. Third, when a village, district or city approaches 100 percent open defecation free status in the system, local stakeholders are notified to confirm the status. Fourth, when a community reports that all households have improved sanitation and the community wants to be declared ODF, a verification team makes a final trip.

**Institutional Arrangements:** National government takes lead role in data analysis and dissemination

During the pilot, most of the responsibility for the mobile monitoring system rested with the district government. Although the district and subdistrict still do most of the data collection and verification, during the scale up, the central government plays a major role in coordination and leads data dissemination and analysis. In addition, the central government maintains the website. Figure 1 shows the roles and responsibilities of the different levels of government related to data collection.

**Hardware Investments:** National scale up requires national government to invest in hardware and software while keeping costs low at district level

In order to scale up the system nationwide, the national government had to invest substantially in appropriate hardware, software, and phone credit whereas the district government only had to invest in limited hardware and operating costs. In the 2009 pilot, messages sent by sanitarians or community leaders were received by a district gateway server as well as the central server of the STBM program secretariat. Currently, an upgraded central server is used and district gateway servers are no longer needed. To minimize costs, open source software programs (such as PHP, MySQL, and Gammu) are used. In the scale up, the national government has also allocated funds to pay for the telecommunication cost of the automatic responses. To scale up, districts have had little need to invest in hardware as the only hardware needed is a mobile phone and text message credit. Most staff already have access to a mobile phone. This mobile phone can be a very simple model with a number keypad; there is no need for a smartphone. Although some districts pay for phone credit to send text messages, many do not as credit for messages is often given free when purchasing call time.

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5 That server contains an Intel Xeon processor and a GSM multiport modem. The server also includes 32 gigabytes of memory, more than double the memory capacity during the pilot.
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**Staffing Capacity:** *Structured training and back-up support is provided for primary data collectors*

Hardware investments are easily addressed compared to the staffing, capacity, and incentives required to actually make the system work. Initial investigations into why not all sanitarians were submitting data revealed that some sanitarians are not familiar with sending an SMS, ask younger family members to send SMS, find it hard to find time to validate the data given by the community, forget the village ID numbers, do not have good phone signal, do not have a mobile phone, are “lazy,” or prioritize other work. To address this, knowledge transfer has been required for data collection and management. At the national level, training has been conducted to ensure the responsible team in the Ministry of Health can manage both the hardware and software. Capacity building is also needed for personnel directly responsible for data collection, maintenance, and analysis. Currently, a cascading approach is used whereby the district environmental health officer, who is responsible for monitoring in the district, is trained in all aspects of the mobile monitoring system. These officers then train the 20 to 40 sanitarians (and supporting data collectors) in their districts and become resource persons for the sanitarians who may have questions and need back-up support to adequately use the system. Training of trainers was held for 34 provinces, during two training events in South Sulawesi and East Kalimantan, in March and May of 2014, respectively.

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6 Workshop reports from Nusa Tenggara Barat (NTB) and Jawa Tengah (Central Java) provinces.

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www.wsp.org
Incentives: Recognition and incentives are designed to improve data collection
To encourage staff to send data after being trained, groups at the national, provincial, and district levels are exploring incentives to further motivate staff to submit data. At the national level, the task has been added to the official job description of sanitarians and the website lists the top users each month. In West Tenggara Barat and Central Java provinces, the employee “performance indicators” have been adopted to include data submissions. In one district in West Java, staff can receive a prize, such as a new mobile phone, if their name appears as top performer on the website.

Data Dissemination: Data is hosted on STBM national website and accessible to the wider public
The current mobile monitoring system allows for easier dissemination of data. During the pilot, the data was kept offline in a local computer at the district level, but now the data is openly accessible to anyone. Seconds after receiving the data and carrying out automatic validity checks, the STBM program office displays the data on its website (http://stbm-indonesia.org/monev/). The website has a number of graphic interfaces, including tables, maps, and graphs, to display the regularly updated rural sanitation data (See Figures 2–4). In the pilot, the data was immediately available only to some stakeholders with system access, but now the information is available without restrictions to anyone with an Internet connection. The information can also be analyzed at the national, provincial, district, or subdistrict level. To increase traffic, the monitoring and evaluation system data is housed on the existing STBM website, which already attracts sanitation stakeholders by posting articles and displaying comments entered through social media sites such as Facebook and Twitter. District and provincial level staff can log into the monitoring website to view recent SMS entries and errors or enter additional information only available to those with a password, such as monitoring and evaluation training participants.

Data Usage: Data can be used as a program management tool to improve service delivery
Similar to the pilot, user feedback has been generally very positive at all levels. Sanitarians, district staff, and their superiors, are quite satisfied with the mobile monitoring system and reported that they valued the digital form of the data, saved time on cumbersome paper-based data collection, improved regular data flow, and eased data usage. During both the pilot and the current scaling up of the mobile monitoring system, use of the data has been manifold at all levels of government to improve performance. National government officers reported that the mobile monitoring system is becoming more accepted as a way to obtain updated, more valid data on the sanitation situation in rural areas to assess which areas need more assistance and which excel at service delivery. District health officers report using the data to justify budget requests for rural sanitation. Two district health officers at different clinics in Pemalang, Indonesia, even reported using the data to calculate the potential market in their respective areas to encourage entrepreneurs to get involved in sanitation marketing in their area. In total, during the period July 2013 to July 2014, an average of about 4,500 users per month and 15,131 page views were tracked; 38 percent of these are returning visitors. This number is still modest, as not all sanitarians have access to or are familiar with the Internet, but is

As of August 2014:
- 3,787 of the 10,559 health center sanitarians in the country have sent village sanitation data via SMS
- 800 to 1,000 messages have been received per month by the central server
- 50,850 messages with data have been collected
- Data for 20 provinces, including 40,470 villages and 42.9 million households, have been uploaded into the mobile monitoring system
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A national harmonized approach to rural sanitation, with sector-wide objectives and monitoring framework, is necessary for scaling up data collection. Currently, the Government of Indonesia has a national strategy that includes a national programmatic approach. Districts using the approach share the same objective, namely to reach 100 percent ODF and are therefore interested in collecting and monitoring similar data. A national harmonized approach also enables the national government to take the lead in data storage, analysis and dissemination, and enable standardized capacity building while still allowing districts to explore different incentive options.

A structured approach, which allows for adjustments and improvements to be made, is needed in order for real-time village data mobile monitoring to scale up from 2 to 119 districts in three years and eventually all 500 of Indonesia’s districts by 2015. It was helpful to conduct a pilot to ensure that the objectives were clearly defined with measureable indicators that were simple enough to be coded into a text message. The structured approach for scaling allowed for roles and responsibilities of those collecting and transmitting the data to be clearly defined.

Figure 2: Table of baseline and progress access to sanitation differentiate by improved sanitation, unimproved sanitation, Shared sanitation, and Open Defecation per province as presented on the STBM website. The far right column shows consistency (green bar) and completeness/progress entry of the data (blue bar).

<table>
<thead>
<tr>
<th>No</th>
<th>Nama Provinsi (Name of Province)</th>
<th>Identitas Data (Data Identitas) Data BPS (Data Identity actual/census)</th>
<th>Jamban Sehat Semi Permanen (Semi-Permanent healthy toilet); Jamban Sehat Permanen (Permanent healthy toilet); BABS = Buang Air Besar Sembarangan (Open defecation); KK = HH (Household)</th>
<th>Akses Jamban % (Access)</th>
<th>Status Data (Progress)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DI YOGYAKARTA</td>
<td>5/5</td>
<td>76/78</td>
<td>438/438</td>
<td>813/930</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>BALI</td>
<td>9/9</td>
<td>57/67</td>
<td>716/716</td>
<td>765/563</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>JAWA TENGAH</td>
<td>35/35</td>
<td>573/576</td>
<td>8,577/8,577</td>
<td>4,652/657</td>
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</table>

JSSP = Jamban Sehat Semi Permanen (Semi-Permanent healthy toilet); JSP = Jamban Sehat Permanen (Permanent healthy toilet); BABS = Buang Air Besar Sembarangan (Open defecation); KK = HH (Household)

expected to grow over time with increasing mobile Internet use. Whereas 78 percent of households in Indonesia have access to an Internet-capable mobile phone, only 21 percent of consumers reported they had used the Internet in the past 12 months when surveyed (Nielsen 2011).

KEY LESSONS

Several changes, discussed above, were made during the scale up of the monitoring system, and there will likely be additional changes as the scale up continues nationally. The key lessons from the experience of going from a pilot monitoring system in five districts to a system in 20 provinces are summarized below.

A structured approach, which allows for adjustments and improvements to be made, is needed in order for real-time village data mobile monitoring to scale up from 2 to 119 districts in three years and eventually all 500 of Indonesia’s districts by 2015. It was helpful to conduct a pilot to ensure that the objectives were clearly defined with measurable indicators that were simple enough to be coded into a text message. The structured approach for scaling allowed for roles and responsibilities of those collecting and transmitting the data to be clearly defined.
and some analysis are available for free to anyone who visits the STBM website, use of the online tool by key stakeholders, such as government, nonprofits, and the private sector, has been lagging. Possible reasons for the lack of data utilization could be a poor understanding of stakeholder data needs, not enough customization of data for various stakeholders, inappropriate dissemination channels, or inadequate analysis capacity among stakeholders.

WHAT ELSE DO WE NEED TO KNOW

As the mobile monitoring system continues in national roll-out, there are additional learning questions that should be explored related to data use, incentives, and system expansion.

Although some stakeholders are using results of the data collected, ways to analyze, customize, and disseminate the

Data usage in Klaten, Central Java

data can be improved so that community, subdistrict, district, provincial, and national government stakeholders, sanitation businesses, and the general public can increase sanitation coverage. Investigations could look at how other nations’ governments and ministries are using social media or hard-copy newsletters to share information.

Current efforts are underway to explore incentives that would motivate district health officers and subdistrict sanitarians to understand how data collection can be more sustainable. It could be worth exploring if a feedback loop can be created so that administrative levels not only report data but also use the information to improve planning and management.
Lastly, currently the mobile monitoring system only collects data related to one pillar of the STBM program. The Ministry of Health has expressed interest in exploring how the existing mobile monitoring system could be expanded to collect data for some of the other pillars of the STBM program, such as handwashing with soap.

REFERENCES

RELATED READING

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About the program
Today, 2.5 billion people live without access to improved sanitation. Of these, 71 percent live in rural communities. To address this challenge, WSP is working with governments and local private sectors to build capacity and strengthen performance monitoring, policy, financing, and other components needed to develop and institutionalize large scale, sustainable rural sanitation programs. With a focus on building a rigorous evidence base to support replication, WSP combines Community-Led Total Sanitation, behavior change communication, and sanitation marketing to generate sanitation demand and strengthen the supply of sanitation products and services, leading to improved health for people in rural areas. For more information, please visit www.wsp.org/scalingupsanitation.

Contact us
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