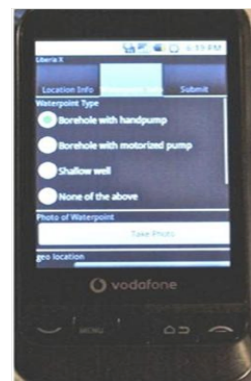


Project Summary: Waterpoint Mapping in Liberia Using FLOW Technology

Project Summary

The project has created a digital map and inventory of all safe waterpoints in Liberia using a new mapping and survey technology called FLOW (“Field Level Operations Watch”). The resulting map and inventory not only shows the location of every safe waterpoint, but also provides detailed information on each, such as functionality status, type of waterpoint, age, management, and so on. The map is now becoming the basis for a detailed atlas and investment plan of the Government of Liberia to increase safe water coverage.



Such investments are an urgent need, since after the end of civil war in 2003, the initial emergency response provided critical relief, but water sector interventions were often uncoordinated and not comprehensive. Safe water coverage is still low, with barely half of the rural population having access to an improved source (JMP/WHO). The critical impact of

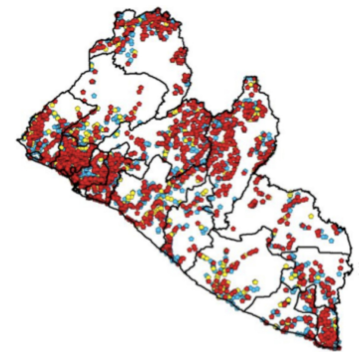
the project was thus to provide the basis for a coordinated, comprehensive, and well-targeted investment program to improve safe water coverage and reduce diseases.

The Technology

WSP adapted the innovative open-source software FLOW to implement the project in a time and cost efficient manner. The FLOW software can be loaded onto any Android smartphone with a GPS chip and camera (as shown below) and will transform it into an integrated mapping device connected to a central database. This means that a FLOW-enabled phone can be used to:

- Fill in a survey (e.g., on waterpoints) on the touchscreen.
- Take a picture of the survey object with the phone camera

- Capture the GPS location of the surveyed object with one click
- Submit all data to a central server



FLOW thus addresses three key challenges of any mapping and survey project: Firstly,

it minimizes errors during the data collection phase because it provides an easy-to-use touchscreen interface and combines all key tasks (answering questions, taking a picture and GPS location) into one simple application. Secondly, it facilitates monitoring and evaluation, as project management staff can review incoming data in near real-time (if there is network coverage).

Finally, FLOW helps securing data from the field and making it available to stakeholders. Once uploaded, a zoomable overview map is automatically created using Google basemaps, and the raw data is available for more detailed analysis in an online database. Even if there is no network coverage, data is stored safely on the phone’s SD card and can be extracted even if the phone itself breaks in the field. FLOW does all this comparatively cheaply: The software itself is open-source, i.e., free of cost; data hosting costs are minimal; and suitable Android devices are now priced below the US\$100 mark.

FLOW was developed by the NGO Water for People. WSP funded the further development of the software and piloted it at national scale in Liberia.

Project Implementation

The project to map all Liberian safe waterpoints was developed, prepared, and successfully implemented within 6 months from December 2010 to May 2011. Follow up

TIMELINE	TASK	DESCRIPTION
December 2010	Initiation Mission	During the initiation mission the WSP team was introduced to the local partner Ministry of Public Works and other stakeholders (UNICEF, WASH Consortium etc.). In a series of meetings, the government specified its precise needs, and local sector stakeholders discussed the precise form the waterpoint questionnaire was to take. Two local project managers were recruited. Thirty lead mappers (two from each county) were introduced to the device, and tasked with identifying suitable: (a) mappers; (b) motorcycles; (c) facilities for local trainings, fuel storage and so on. A small pilot mapping exercise was carried out.
January 2011	Final Project Preparation	All smartphone devices were brought to Liberia and tested in the field. The telecom provider Lonestar was selected for connecting the phones to mobile internet. The project ensured that necessary repairs to motorbikes were carried out in time, and that fuel supplies were ready and distributed.
	Local Training	WSP trained 150 locally recruited mappers in 2-day sessions. The mappers were grouped in teams of two, each equipped with one FLOW device and a motorbike. Lead mappers had primary responsibility at county level, and reported back to project coordination team in Monrovia. After one week of testing and a subsequent review meeting, the main phase of mapping began.
February 2011	Rural Mapping and M&E	75 motorized mapping teams mapped all of Liberia. WSP Project coordinators managed the successful implementation of the project, taking care of fuel-resupplies, replacement of broken devices, data retrieval where automatic network transmission failed, and so on. WSP employed 15-20 monitoring and evaluation staff to ensure data quality with diligent spot checks.
March 2011	Evaluation	During March, all rural data was evaluated, cleaned and a preliminary analysis report was written and presented to Liberian stakeholders. Some remaining waterpoints, which monitoring and evaluation staff found to be unmapped, were added to the database at this point.
April 2011	Urban Phase Preparation	In April, WSP and its local partners prepared the urban phase of the mapping i.e. the mobilization of funds and recruitment of local urban mappers.
May 2011	Mapping of Urban Areas	The mapping of all remaining urban areas was carried out in May. This formally concluded the mapping project. All safe waterpoints in Liberia are now mapped.
June-August 2011	Analysis & Follow-up	The final, detailed analysis of the collected data is scheduled for June to August. The outcome will be a detailed atlas and water investment plan.

activities, such as the creation of an investment plan, and water quality testing, are currently underway. The timeline was as follows:

Main Challenges

The primary challenges of this project were logistical given the difficult environment that Liberia still poses, especially with respect to basic infrastructure. Given the absence of paved roads in most of the country, keeping mapping teams supplied with fuel and motorcycle spare parts was challenging and imposed extra-costs. The widespread lack of grid-electricity or generators made it necessary to purchase external battery adapters for the FLOW devices to allow them to be powered by standard AA batteries.

The absence of mobile phone network coverage outside county capitals, and high costs of mobile data transfer, made it necessary to fall back on physical data collection (download directly from the SD storage card in the devices). However, this did not pose a great practical problem, as data could be collected during fuel and spare part resupply missions and monitoring and evaluation activities.

Partner Organizations and Project Funding

The project was funded by WSP (~60%), UNICEF (~35%) and CHF/USAID (~5%), with considerable logistical and

knowledge support coming from the Ministry of Public Works, the Liberian statistical agency LISGIS, the Ministry of Health, the US NGO Water for People, and the local WASH Consortium, in particular OXFAM. WSP's primary government partner was the Ministry of Public Works, which provided office space, local knowledge and contacts, help with recruitment, and official government support and legitimization.

More Information

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Short Documentary Film

<http://www.youtube.com/watersanitation#p/u/1/MdRDROpc8Ao>

Gallatin Systems (Developers of FLOW)

<http://www.gallatinsystems.com>