

# Case Study Community Monitoring Burkina Faso

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## Community groundwater monitoring in Burkina Faso

### What is Community-Based Water Resource Management (CBWRM)?

Community-based water resource management is an approach that promotes appropriate water management strategies by and for communities. This typically uses structures developed for WASH (water, sanitation and hygiene) management, and brings WASH and water resource management practices closer together.

Integrating the management of water resources (e.g. groundwater) and water supply infrastructure (e.g. wells and boreholes) enhances water security. This approach can help strengthen community operating strategies for water use, reduce conflict between different water users, and get early warning of threats such as drought. It also improves the ability of planners to design more effective WASH services; and it can help communities advocate for support to cope with water access problems.

## **The project**

The NGOs [WaterAid](#) and [Oxfam GB](#) adopted this approach in West Africa, in a project spanning six countries: Burkina Faso, Chad, Ghana, Mali, Niger and Nigeria. The project aimed to improve the management community water supply services in highly variable climates, through better groundwater monitoring, management and retention, and rainfall re-use (WaterAid 2013).

## **Measuring groundwater levels**

In Burkina Faso, the project focused on three villages where WaterAid has been working since 2006. The project worked with water user committees and community volunteers, and a local NGO partner (DAKUPA), training members of each in groundwater monitoring. It also worked with the National Meteorological Authority, which installed nationally-approved rain gauges in each village and provided forms to record rainfall data in line with national standards.

Groundwater monitoring was done in two ways:

- Trained community volunteers manually measured water levels in boreholes and hand-dug wells using a water level dip meter, usually once a week; and
- Electronic water level loggers were installed in boreholes to automatically log water level every two hours. This is done by staff from the regional office of the Ministry of Agriculture and Water, in partnership with the community.

Most boreholes equipped with hand-pumps do not allow access for groundwater level monitoring, and so they first had to be modified to allow water level loggers to be installed and dip meters to be used (see photos).



Adapting an India Mark II handpump so that a water level logger can be fitted. Image credit: Richard Carter / WaterAid (2013)



Dipping the water level in a borehole equipped with a hand pump. Image credit: Djibril Barry / WaterAid (2016)



Dipping the water level in a hand dug well. Image credit: Djibril Barry / WaterAid (2016)

## **Interpreting groundwater monitoring data**

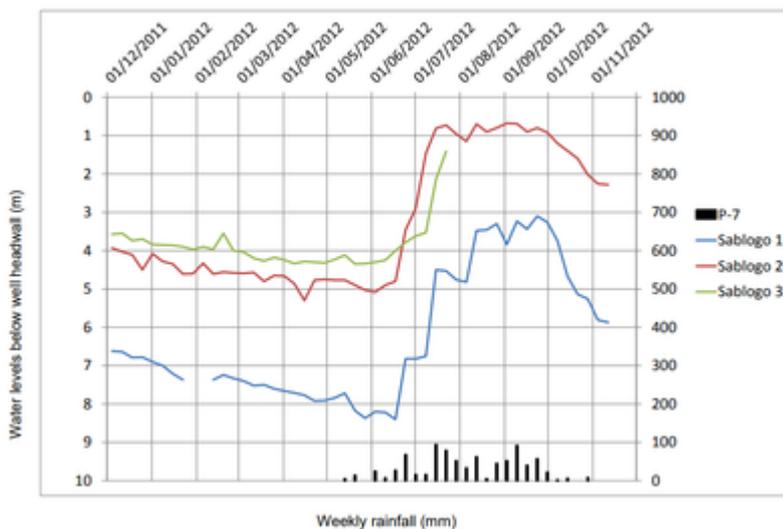
The groundwater level and rainfall data collected by the community volunteers were plotted on graphs and interpreted by them in order to see how they change over time. Interpretation was done in partnership with local water management committees, comprising government officials and staff

from the Ministry of Agriculture, and with WaterAid and local NGO partners. The data were shared with the whole community, and some were also shared with government and WaterAid databases.

It was important to interpret the groundwater level data in the context of local rainfall (measured by community rain gauges) and pumping patterns, so that the reasons for groundwater level changes can be understood.



Community members interpreting groundwater level and rainfall data. Image credit: Richard Carter / WaterAid (2013)

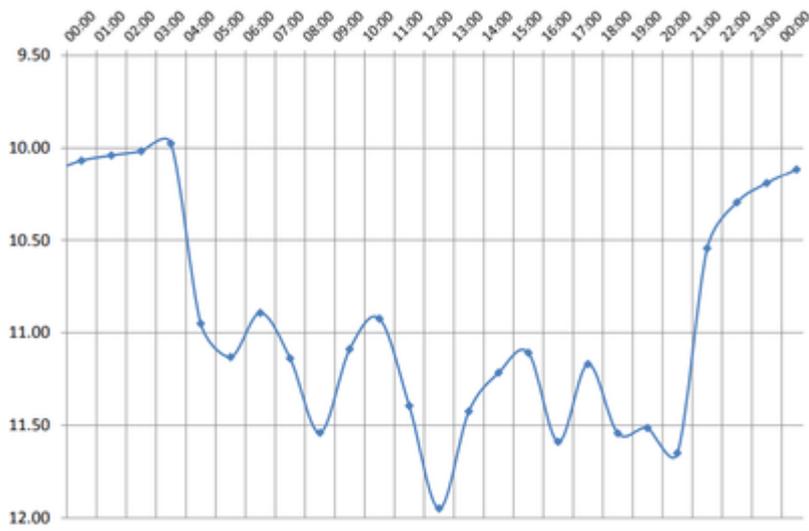


Rainfall and groundwater levels in three community boreholes at the end of the dry season and start of the wet season in 2012, showing how water levels start to rise after the rains begin. Image credit: WaterAid (2013)

## What do the monitoring data show about groundwater behaviour?

The monitoring data showed that groundwater levels in all the monitored wells and boreholes fell steadily during the dry season, followed by a rapid rise in response to the start of the rains in the wet season. In some cases, groundwater levels start to rise before local rainfall (but after rains elsewhere) – indicating that indirect recharge from other areas (e.g. infiltrating to the aquifer from rivers) is feeding local aquifers as well as local rainfall.

Daily fluctuations in borehole water levels are also seen, with falling water levels during the day caused by water pumping, followed by recovery overnight.



Hourly groundwater levels on 17 April 2012 in a community borehole, showing falling water levels during the day because of pumping, and water level recovery after pumping stops in the evening. Image credit: WaterAid (2013)

## How did the groundwater monitoring help communities manage their water resource?

The communities in the study reported that they understand the seasonal variations in rainfall groundwater levels much better since starting to monitor and plot data; and they have made changes to their water-use behaviour to ensure they are making best use of the groundwater resource.

Examples of water management strategies that were initiated by the villagers as a result of using the groundwater monitoring data are:

- In the later dry season, when water levels fall to near the base of the wells, villagers prioritised drinking water abstractions over other uses, and prioritised access to water points by women, rather than allowing water abstraction for all.
- They also took steps to reduce competition and conflict, by restricting users to one water container at a time, so that all receive some water, rather than the first taking it all.
- Water user committees introduced sanctions for water users who broke these rules.
- Knowledge of how groundwater levels change throughout the year is used to make decisions on when to plant certain crops, in order to optimise yields.

## Sources

This case study is based on these reports from WaterAid:

WaterAid. 2013. [Strengthening WASH services and community resilience through community-based water resource management](#). Briefing Note, WaterAid, Burkina Faso

Barry D / WaterAid. 2016. [Renforcement des services WASH et de la resilience des populations rurales a travers la gestion communautaire des ressources en eau](#). Presentation at RWSN 7th Forum, 29 November - 2 December 2016, Abidjan.

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