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**DELIVERING WATER, SANITATION AND HYGIENE SERVICES
IN AN UNCERTAIN ENVIRONMENT**

**Strengthening the 'W' in WASH: community based water
resource management for water security**

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This briefing paper describes the early experiences of a community-based water resources management (CBWRM) initiative carried out by WaterAid in Burkina Faso. Water supply services established as part of WASH programmes in Sudano Sahelian countries like Burkina Faso are frequently used for both domestic and livelihood purposes. The water resources upon which these services depend are subject to pressures and threats which change over time, making livelihoods and wellbeing vulnerable to shocks. An approach piloted in three rural communities has enabled villagers to monitor changing water availability in their environment, helping to inform collective action they take to mitigate pressures threatening their water resources. Working with local government authorities, the communities have been able to make well informed decisions to safeguard access for both domestic and productive usage, helping to ensure water supply systems deliver lasting benefits. The hydrological information they gather can compliment and support national water security plans.

Introduction

The water resources used by the communities of Sablogo, Basbedo and Kampoaga in the Tenkodogo area of Burkina Faso are subject to changing pressures and threats which include population growth, increasing water demands, the tendency to increased degradation of the environment and high levels of climate variability. There are only a very limited number of boreholes and wells serving both domestic and productive water needs. These are the only access points to the resource in the dry season which runs for six months of the year. Crop cultivation is largely rain fed but bucket irrigation is increasingly practised and large numbers of livestock depend upon water from boreholes. During dry periods there can be long queues at water points and competition for access between different water users. Conflicts between women, livestock keepers and farmers can emerge in the absence of operating principles which assure fair allocations. The pressure of livestock can also cause pollution around water sources. WaterAid has been working in these three communities since 2006 and has so far provided basic water supply and sanitation facilities to a significant proportion of the 7,549 people (1,166 households) present.

The CBWRM project was conceived in 2011 by WaterAid and Oxfam as a way of building on these earlier project activities which were more focused on the provision of infrastructure (wells and sand dams). The central aim has been to improve management of water resources in a highly variable climatic environment.

Because the impacts of many threats are difficult to predict accurately, it is essential that water resources and other factors that affect water availability and quality are carefully monitored over time. WASH programmes do not generally incorporate processes for ongoing monitoring of these factors. This is a critical shortcoming that exposes WASH interventions to possible failure because no account is taken of changing threats early enough for mitigating action to be taken. It is only through such monitoring that well-informed management decisions and operating principles can be devised to enhance water security¹ and ensure fair allocation for different purposes.

Some monitoring of water resources can be carried out by communities, and they can use the information generated to improve the management of their own water. Other aspects need support from local

governments and from technical agencies, but CBWRM, as the title suggests, begins with the community of water users.

What is community based water resource management?

CBWRM is a set of activities and relationships designed to improve local management of water resources, and so enhance resilience to threats. It will not be useful in all situations. It is not a panacea for the water crisis. It adds value where WASH infrastructure is used for both domestic and livelihood needs; where there are prolonged dry periods; where there are water shortages; where there is conflict over access between different water users and where there is a history of collective decision making at community level.

It involves practical activities that can be undertaken locally, even if higher level institutional capacity to manage water resources is weak. These activities are aimed at strengthening WASH approaches to account for long term environmental changes. CBWRM activities include:

- engagement of national, regional and local government institutions;
- community meetings to collectively understand possible threats to water resources and water supply infrastructure;
- collective identification of different water users, different water uses, different water sources and which sources are working / not working in the wet and dry seasons through participatory mapping;
- monitoring of water resources and related factors, by communities and specialist institutions;
- facilitation of meetings where communities establish operating principles and take management decisions governing water use with support from local Governments ;
- strengthening the voice of communities to call for assistance from higher authorities;
- complementary improvements to water supply and sanitation services, and hygiene practices;

Ongoing monitoring activities include observation of:

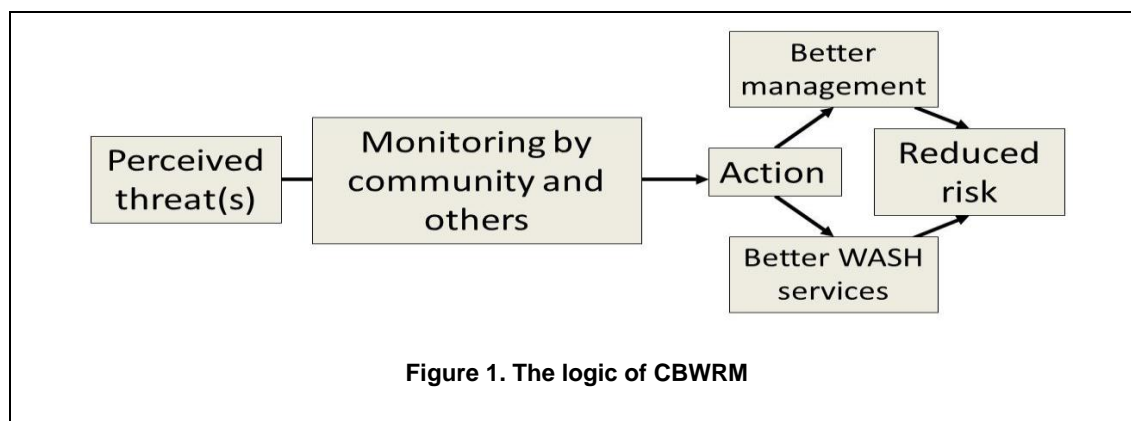
- rainfall, on a daily basis, by community volunteers;
- groundwater levels in open wells, carried out weekly, by community volunteers;
- groundwater levels in boreholes, monitored hourly using data loggers managed by local government (India Mark II handpumps can be modified by a local blacksmith to accommodate the loggers);
- water abstractions, carried out through a periodic water use survey, by local Government and local NGO;
- land use changes;

Management decisions taken at the local level can include any of the following:

- enforcing protection of water source catchments to safeguard water quality and quantity;
- agreeing allocations for different water uses and different users;
- rationing of water when it is known to be in short supply;
- temporarily restricting certain water uses, e.g. brick-making, when water is scarce;

Management decisions such as those just listed can go so far, but it is also important to combine these with progressive improvements to WASH services, including:

- investing in domestic rainwater harvesting;
- deepening or constructing new hand-dug wells;
- borehole construction;
- constructing water conservation structures to enhance natural recharge;
- bringing about total sanitation, to eliminate faecal contamination of the local environment;
- improving hygiene practices, especially around domestic water management, handwashing and food hygiene;



The key relationships are those formed between communities and their representatives; local Governments; local and international NGOs; and national Ministries and Technical Departments of Government. Each of these has a part to play in monitoring, taking joint management decisions, carrying out improvements to WASH services, advocating for wider implementation of the approaches set out in this briefing paper, and advocating for corresponding changes to national water sector policies and guidelines.

CBWRM in Sablogo, Basbedo and Kampouaga villages

WaterAid works directly with community volunteers and water user associations in these three communities. In addition it works with representatives from local government and local partner NGO DAKUPA. Activities undertaken in the three communities included:

- establishment of a committee to document and monitor implementation of the project;
- a survey of 150 households to assess collective water usage;
- training of 6 community volunteer water resource observers, 6 members of the water user committees and 5 animators from DAKUPA in water resource monitoring between December 2011 and March 2012;
- training of the local government on use of level loggers which were installed on boreholes;
- support from the National Meteorological Authority who installed nationally approved rain gauges in each village and provided forms for recording of rainfall data in line with national standards;



Photograph 1. A DAKUPA field officer positions a rain gauge in Kampouaga



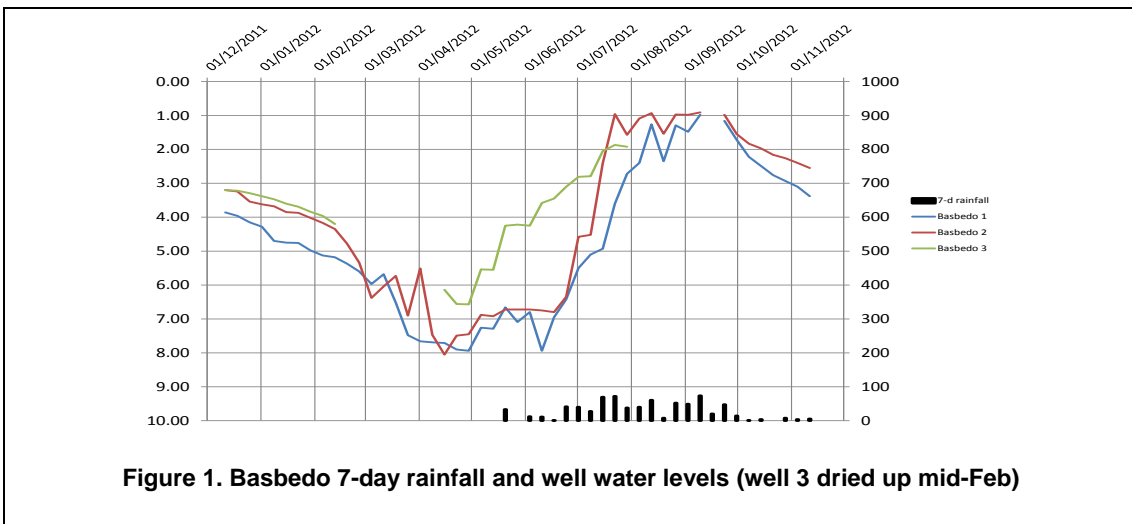
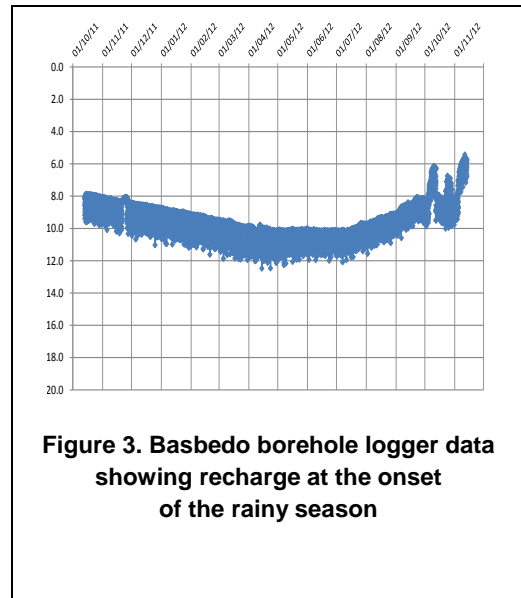
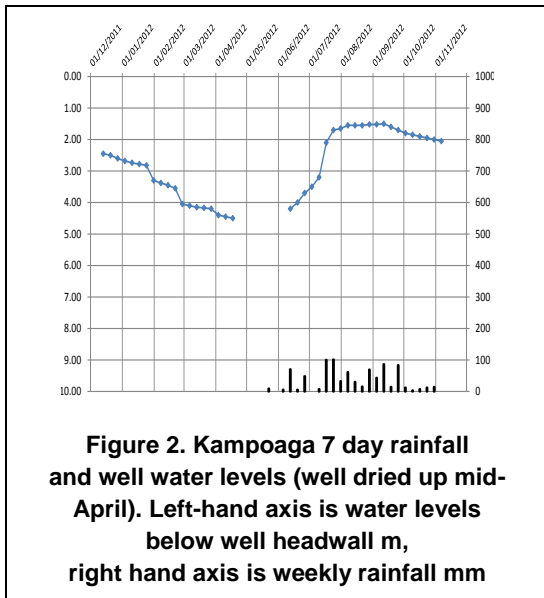
Photograph 2. An India Mark II handpump modified for installation of level loggers

An important driver for the project was that communities were highly motivated and perceived as having a real need or demand for improved water resources management.

Monitoring results – some examples

The villages of Kampoaga, Basbedo and Sablogo lie along a west-east line extending over a distance of about 16km. The following are examples of data that has been captured over the period December 2011 to December 2012, incorporating the rainy season which extended from mid-May to early November 2012.

| Variable | Kampoaga | Basbedo | Sablogo |
|---|----------|---------|---------|
| Total rainfall May - October | 826mm | 730mm | 827mm |
| August rainfall as a percentage of total | 25% | 29% | 24% |
| Number of rain days (non-zero) | 46 | 54 | 40 |
| Number of days with at least 5mm rainfall | 32 | 28 | 32 |
| Number of days on which all three stations received some rain | | | 20 |



Interpretation of monitoring data

Taken together, the data show the following general findings:

1. Rainfall is spatially variable over quite short distances, as is well known in the tropics and elsewhere;
2. Well water levels respond quickly to local rainfall-recharge, and, probably, to indirect recharge from river flows and flooding of the valleys;
3. After the rainy season high water levels, groundwater level recession in some of the wells is steep, leading to potential difficulties of water access in mid- to late-dry season;
4. Borehole water levels decline relatively slowly in the dry season, and they respond quickly to rainfall in June-July;
5. Diurnal variation in water level in the boreholes is caused by morning peak pumping (from about 0330h) and steady usage through the day, with cessation of pumping and recovery taking place after 2030;



Photograph 3. Women discuss the implications of changing water levels in their community wells. The information was collected and plotted by villagers

Using local data to inform management decisions

The three communities all claim to understand the seasonal variation of rainfall and groundwater levels much better since they have started monitoring and plotting data. In Basbedo for example, which has three boreholes and a number of hand-dug wells, the main concern is that the latter may dry up prematurely if abstractions are not controlled during the dry season. To date the boreholes have not failed (other than occasional mechanical problems which have been addressed).

Monitoring of water levels has led the village to prioritise drinking water abstractions and access for women in the latter part of the dry season, and take 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) when water is scarce. Sanctions have been introduced for water users who do not abide by the operating principles. These are implemented by the water user committee. As well as informing decision making about water use, communities report that monitoring has helped them to make decisions about when to plant certain crops which is another motivating factor to keep data collection going.

Enhanced water security

So far, the outcomes of the project for the three communities in the Tenkodogo commune are as follows:

- each community has trained water monitors / observers making regular measurements of rainfall and groundwater levels;

- the regional office of the Ministry of Agriculture and Water is undertaking monitoring of borehole water levels using automatic data loggers;
- community representatives, together with local Government authorities, WaterAid and WaterAid's implementing partner DAKUPA sit together in a "Documentation and Monitoring" committee, chaired by the Mayor of Tenkodogo. This committee monitors project progress and gives force to the decisions taken for the benefit of communities;
- water management decisions are starting to be taken, and acted on;
- there is better integration between WASH service implementation and water resource management;
- There are closer links between communities and the local authorities and greater awareness at local authority level of community water needs;

Conclusions

More needs to be done, and it is too early to conclude that the project is an outright success. However the first year's results are very promising, giving confidence to scale up in Burkina Faso to a larger number of communities. The monitoring and management of water resources at community level is heavily dependent on volunteerism and the strong motivation of individuals. It is important that progressive improvements are made to WASH services when threats are identified by communities otherwise, they could lose interest in the process. These improvements should acknowledge livelihood water uses. No work has yet been done to map and understand the watershed which feeds the valleys running south through the project area. It will be important to carry out such investigatory work, and perhaps collaborate with local authorities or other NGOs on watershed management and protection to conserve downstream water resources. Data from the three locations is available to national authorities but more could be done to improve the flow of information. So far CBWRM has strengthened implementation of WASH in the three communities, providing greater clarity around changing environmental uncertainties. More work must be done to test CBWRM in different settings to understand its value as a resilience mechanism for coping with threats to water resources.

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Note

¹Water security is defined by WaterAid as "reliable access to water of sufficient quantity and quality for basic human needs, small-scale livelihoods and local ecosystem services, coupled with a well-managed risk of water-related disasters".

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