



Gender, WASH and education case study:

**Increasing children's access to safe drinking water
through low-cost technologies in Mali**

Introduction

This paper aims to share Oxfam GB's¹ experience of working in partnership with key stakeholders, including the private sector (local businesses), to provide low-cost water points to schools and villages in Mali.

Mali, in West Africa, is one of the poorest countries in the world. It is ranked 160 out of 169 countries in the United Nations Development Programme (UNDP) 2010 Human Development Index.² Of the country's 14.5 million people, 77 per cent live on less than US\$2 a day. Mali is ranked 13th in the world for its under-five mortality rate. It also has one of the lowest literacy rates, with 70 per cent of adults unable to read or write.³

Most people do not have access to clean drinking water or adequate sanitation facilities, and as a result, there are high levels of diarrhoeal disease and other preventable illnesses – one of the biggest reasons for the country's high child mortality rate. Many people are unaware of how their hygiene practices compromise their own health and their family's health.

What are the key education challenges?

The national literacy rate hides significant gender, ethnic and spatial disparities. For instance, among young people (aged 15–24), the literacy rate is 53 per cent for males and just 26 per cent for females.⁴ The secondary school enrolment ratio (2003–08) is extremely low, at 14 per cent for boys, and 9 per cent for girls. More than 70 per cent of the children who are out of school are expected never to enrol, with devastating consequences for the country's social and economic development.⁵

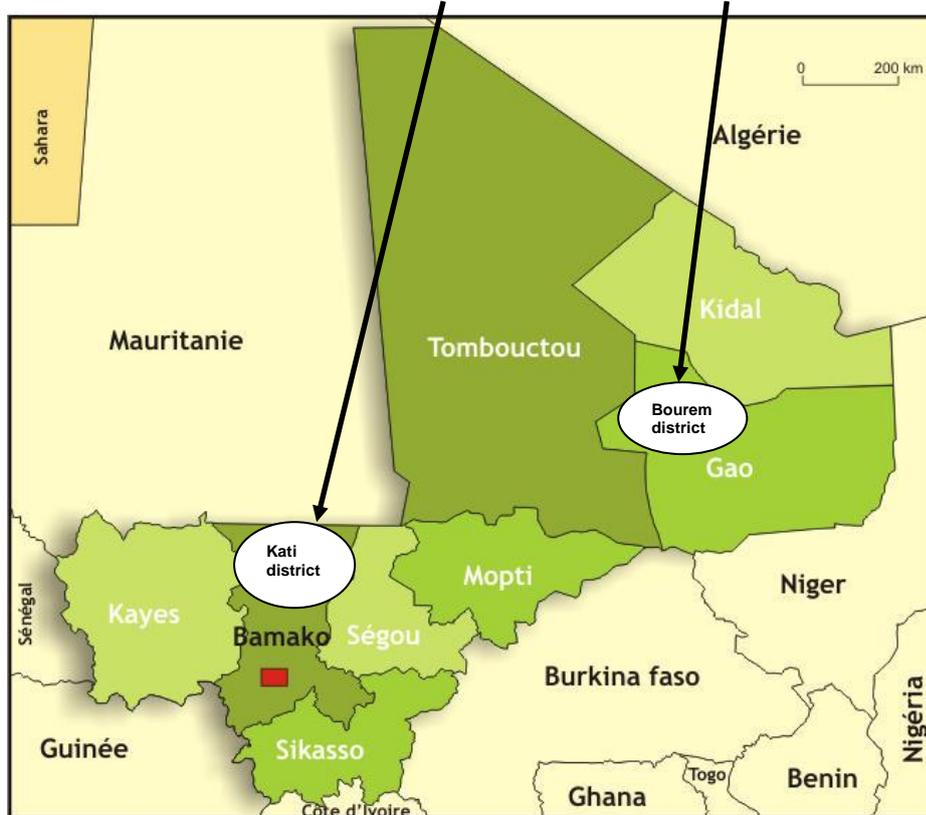
The government of Mali, working closely with external donors, has taken considerable steps to achieve the Millennium Development Goals (MDGs), particularly MDG 2 – to achieve Universal Primary Education (UPE). It has increased the share of national income spent on education by more than 50 per cent between 1999 and 2007.⁶ This has resulted in some major improvements – notably a big increase in the number of children attending primary school, from 21 per cent in 1990 to 61 per cent in 2008, and the recruitment of more than 20,000 new teachers. But despite significant progress in these areas, there is still a long way to go. One in three children aged 7–12 are still out of school, and more than half of them are girls.⁷ Girls are more likely to drop out of school early (marriage at the age of 14 is common).

In the areas where Oxfam works (see Figure 1), most communities are nomadic. This means that women and young girls have to travel considerable distances to collect enough water for the household and their animals. Our theory was that if water points were available in local schools, it would encourage parents to leave their children in the village with other family members during term times so that they could complete their schooling.

Children have a right to basic facilities in schools such as latrines, safe drinking water and hygienic surroundings.⁸ But in Mali, as in many other developing countries, lack of water, sanitation and hygiene (WASH) facilities in schools is one of the biggest reasons why large numbers of children, especially girls, miss out on education.

The lack of trained teachers is also a major problem (fewer than half of all primary teachers have had any formal training). But there are other important reasons why so many children are out of school. Many children have to work to contribute to the family income which means parents are less likely to send their children, especially girls, to school. Around half of all children in Mali aged 7–14 are involved in some form of work.⁹ Women and girls spend many hours collecting water, leaving little or no time for schooling or study.

Figure 1: Intervention areas for Oxfam WASH in schools project (Bourem district in Gao region, and Kati district in Koulikoro region)



Access to water, sanitation and hygiene in schools

In Mali, fewer than half of all schools (45 per cent) have a water point and just over half (56 per cent) have latrines. However, even where these facilities exist, they are often in very poor condition, and there are no handwashing facilities. Only 14 per cent of schools have separate latrines for girls, and only 20 per cent are equipped with hygiene kits (brooms, dustbins, etc).

Few of the country's schools meet the minimum standards for WASH facilities as set out in the recently updated guidelines from the World Health Organisation (WHO) and UNICEF.¹⁰

These guidelines recommend that schools:

1. **Provide basic sanitation facilities** that enable schoolchildren and staff to go to the toilet without contaminating the school grounds or resources such as water supplies. There should be separate latrines for boys and girls to afford privacy and security.
2. **Provide water and soap/ash for handwashing** after going to the toilet and before handling food.
3. **Provide safe drinking water** from a protected groundwater source (spring, well or borehole), or from a treated supply. Untreated water from unprotected sources can be made safer by simple means such as boiling, filtering or using simple household water treatment systems such as locally available chlorine solution.
4. **Plan and implement improvements** so that adequate conditions for the long term can be achieved without delay.
5. **Promote good hygiene practices** to enhance children's knowledge of the importance of hygiene and the benefits of a clean school environment.

Oxfam's integrated education and WASH programme

The programme areas

Since 2007, Oxfam's programme has been based in Bourem district, one of the poorest areas of Mali, in the arid north-east region of Gao. The Niger river runs nearby, but the area is mainly bordered by the Sahara desert. Most villages are located near the river, which is their water supply. But this means people are very vulnerable to catching waterborne illnesses, including diarrhoea, malaria and cholera. Nomadic populations in more remote areas, distant from the river, have very limited access to water sources.¹¹

The remoteness of the district, some 1,200km from the capital, Bamako, means that schools find it difficult to recruit and retain teachers. In 2009, there were just 453 teachers (217 of them women) in the whole of the district for 59 primary schools, serving more than 9,300 children (including 4,444 girls).

Aims of the programme

This programme consists of different components that together, aim to improve access to quality essential services (education and WASH), particularly for girls in intervention areas. This case study will focus specifically on our work around WASH in schools, as well as touching on complementary work on girls' education.

Since 2007, Oxfam has worked in partnership with local authorities, communities and other organisations to provide WASH facilities to villages and schools, using low-cost water technologies (hand-drilled boreholes and rope pumps, see Appendix 1). The main aims were:

- to improve the school and learning environment,
- to increase girls' access to education,
- to improve children's access to safe water and adequate sanitation,
- to promote good hygiene practices – both at school and at home,
- to reduce the risk of malnutrition and preventable illnesses among children under five through improved access to potable water.

The education and WASH teams worked closely together in schools and villages to achieve their objectives, with the WASH team installing water points and pumps in schools to support the education activities. To date, 33 schools have benefited from the interventions, and there are plans to scale up the intervention to 100 schools in Bourem and one other district (Kati, Koulikoro, in the south of the country), with support from Dubai Cares and other donors.

Finding cost-effective ways to provide water to schools and villages

The government of Mali's National Water Development Strategy, *Stratégie Nationale de Développement de l'Alimentation en Eau Potable au Mali*, is based on large-scale investment in infrastructure and equipment, and focuses on supplying the more densely populated urban areas. The strategy is reviewed every five years and is next due for revision in 2012.

Oxfam and its partners wanted to demonstrate that low-cost water technologies have the potential to reach many more people over a much wider geographical area. Not only are they more cost-effective – hand-drilling a 20-metre deep well costs around 2.2 million CFA francs (roughly £3,055), compared with around four times that amount if mechanical diggers were used – they are also more sustainable and easy to replicate. They are already used in neighbouring countries such as Niger and Burkina Faso, and in other parts of the developing

world. Adopting such low-cost technologies would help the Government move closer to meeting MDG 7, which includes targets for access to safe water and adequate sanitation.

Oxfam contracted Enterprise Works, an international non-government organisation (NGO) with experience of supplying low-cost technologies in Niger, to train two drilling teams initially and another two later on. The team worked with local authorities and communities in Bourem to select individuals to join the drilling teams, and after reviewing proposals from local businesses, one was selected to begin production of the rope pumps. After the training was completed, the drilling teams and local manufacturer signed contracts with Oxfam to provide water points to specified schools and villages.

Community representatives and the relevant local government department were consulted on the location of the new water points. Committees were set up for each new water point, comprising five members selected by the village council, with at least one female member. Their members and other individuals were trained in basic operation and maintenance, so that the communities can repair the pumps themselves. A partnership agreement was signed with the regional water authority which, together with the project team, will do regular follow-up visits to monitor how the water points are being managed and used.

'It's so easy to use!'

Karaba Traore, Director of the Regional Water Office in Gao (*Directeur Regional de l'hydraulique*), is absolutely delighted with the rope and washer pumps that have been introduced in his region. 'I saw one of the rope and washer pumps when I was visiting Bamba, and I tried using it myself to see if it is really true that the pump is easy to use. I heard that it was easy for women and children to turn the pump handle but I wanted proof! It was surprising to find that not only is the pump easy to use, but it has a flow rate of around 2,000 litres per hour.

'The pump is fairly low in cost, which is great, and we will be keeping an eye on it to see how it performs in the long term. In fact, the new pumps are so popular that we worry that they will break from over-use. Certainly, the number of people using these pumps is an indicator that the clean water is well liked by the villagers. Those villages are so close to the river... if they didn't like the pumps, everyone would just keep going to fetch dirty river water.

'The tube wells are a big improvement on the traditional open wells, and much less prone to contamination.' Karaba adds that he has found the results of a recent water quality analysis to be quite satisfactory. 'The tests were carried out by an expert from our national laboratory for water quality analysis, so I have total faith in the quality of his work, and the results show that the water from the tube wells is absolutely safe and clean. Nearly all of the households surveyed are practising safe water storage in the home, and this is borne out by the results of the household water quality analyses.'

How the activities were implemented

The integrated programme carried out a wide range of activities to achieve the shared aims. The project teams consulted with all relevant stakeholders at local, regional and national levels, including the water, education and health authorities, teachers, parents, pupils and representatives of the wider community. There was strong community participation at every stage, from planning through to implementation and monitoring and evaluation. For instance, at the very start, Oxfam used community radio stations to announce plans to install water points in Bourem district. This gave local communities and villagers a chance to be involved in the plans, including selecting the most suitable sites.

Improving access to clean water and sanitation in schools

Water points were installed in each schoolyard, and separate latrine blocks were built for girls and boys. Water point committees were set up; their members were trained in how to maintain the equipment, and given the necessary tools to carry out regular maintenance.

Improving hygiene practices and promoting public health

The project trained teachers, community health workers and pupils, and ran special campaigns to raise awareness of the importance of good hygiene. This enabled children to act as agents of change in their families and communities.

Hygiene clubs were set up in all schools. Their members were trained to promote good hygiene practices, and to help people understand how to keep themselves and their environment healthy and hygienic. Schools were given hygiene kits (including drinking cups, bins and brooms) to help them keep the water points, classrooms, schoolyards and latrines clean.

Improving the learning environment and building community structures

The project helped to set up school management committees and provided training for their members, which include school directors. Each committee is responsible for developing an action plan to improve their school. Often, these plans include installing water points and latrines, setting up canteens so that children can have a mid-day meal, finding housing for teachers to improve retention rates, and equipping classrooms with desks and chairs. Members also received training in gender issues to ensure that men and women were able to participate equally in the committees, having a say in the way their children's school is run. Each committee member is developing a good understanding of his or her roles and responsibilities. The school committees are now able to undertake needs assessments, and to plan and prioritise improvements.

Setting up adult literacy centres

The project set up literacy centres in ten villages to help adults learn to read and write. The aim is to improve literacy levels among local communities, enabling ordinary people to be effective members of school management committees and other civil society groups such as mothers' associations. Five more literacy centres will be set up in the coming years.

Advocacy with the local community and authorities to increase girls' access to education

The project provided support to mothers' associations, and helped to set up girls' clubs in schools. Their members received training and started campaigns to raise awareness about the importance of girls going to school, linking in with campaigns around good hygiene. They met with the school management committees to discuss issues and problems, and to ensure that school development plans address the needs of female pupils. Education advisors arranged for experts to visit the schools and hold discussions with teachers and parents about key issues, such as why parents should be more involved in their children's education.

The campaign to promote girls' education used an innovative approach to communications and media, recording radio broadcasts that were aired daily, reaching an estimated audience of 48,000 people. There were also school competitions with prizes, cookery demonstrations and drama groups, and a local artist helped to design posters and other materials to publicise the campaign's key messages. There will be further evaluation of the impact of the radio broadcasts in 2012, at the end of the current project.

Campaigning and advocacy

A key part of Oxfam's work in Mali is advocating at local, regional and national levels so that the low-cost water technology used by the project in Bourem can be included in the government's National Water Development Strategy. The project's main advocacy activities were as follows:

- a campaign was organised to inform local communities and the local and national authorities about the new water supply technology,
- two consultation workshops were organised in close collaboration with the national water authorities. Participants included pump users, manufacturers, partners (national and international NGOs, education and water coalitions), government representatives, water point committee members, pump repair staff and Oxfam representatives,
- flyers, posters and information papers were produced and disseminated to let villagers know about the new rope pumps,
- video production specialists made short films on the technology. One was broadcast on TV5 channel (French TV). Video clips were posted on websites, including YouTube, to show how the drilling process and the pump work.

Key targets

Targets for the education and WASH components of this programme included:

- 0 faecal coliforms (bacteria) per 100ml water at school water points (faecal coliform bacteria indicate the presence of sewage contamination, so the aim is to have a 0 reading),
- schools are managed efficiently by the committees: the committees meet monthly; at least 50 per cent of decisions taken are implemented; and information about the use of school resources is shared with the community,
- women hold 50 per cent of all management positions on the committees,
- 1,500 children have access to clean water, latrines, and hygiene promotion training,
- 65 per cent of all girls in the project area are enrolled in school.

Monitoring, evaluation and learning

Monitoring, evaluation and learning has been an integral part of the programme. A logical framework with clear objectives, indicators and verification methods was developed prior to implementation of both the WASH and education projects.

Mid-term monitoring and evaluation workshops were also organised. All stakeholders in the project took part: beneficiaries, village representatives, local authorities, representatives of partner organisations, women's groups, water point committees and schools management committees. These workshops discussed the approach to be used by the programme, the roles and responsibilities of different partners, monitoring tools, impact of activities, and lessons learned.

A final workshop will be organised to evaluate the programme in March 2012.

To monitor key aspects of the new water supply, Oxfam's public health engineer secured an agreement with the Regional Water Department on a plan to monitor water quality, incorporating the national guidelines (which cover water quality, water point cleanliness, and

maintenance). The plan ensures regular water quality monitoring, as well as sampling, not only at the pump sites but also in a selection of households.

The Department will continue to carry out monitoring visits at water points, providing support and advice to local communities, even after the project ends.

Key outcomes and achievements

Since 2007, the project has installed 90 water points in schools and villages in Bourem district, and rehabilitated 12 existing water points. Initially, the project only had permission to install 25 rope pumps, but through building a close working relationship with the *Direction Régionale de l'hydraulique* (the Regional Water Department), this number was increased to 90. Almost all of the water points are low-cost, hand-drilled boreholes, equipped with rope and washer pumps. More than 1,900 school children (933 of them girls) and 21,000 people in 12 villages now have access to clean water. It is hoped another 60 low-cost water points can be installed over the next four years.

In February 2009, a Knowledge, Attitudes and Practices (KAP) survey was carried out to assess whether the programme had been able to reduce the risk of malnutrition of children aged from 0 to 5 years through improved access to potable water and public health promotion at community level'. Compared with data from the previous year, the survey showed a notable reduction in cases of diarrhoea: in 2008, 63 per cent of households surveyed had sick children in the preceding two weeks, but this figure had fallen to 50 per cent a year later. The overall incidence of diarrhoea for children under five (the most vulnerable group) has also shown a tendency to decrease.

Other key achievements include the following:

- 28 latrines have been built or rehabilitated in 10 schools, benefiting 1,598 children (745 of them girls), and 15 hygiene clubs have been set up, which are active in promoting good hygiene and public health in schools and villages,
- according to the reference study carried out in 2009, the number of school children increased from 2,470 (1,141 girls) in 2008 to 3,350 (1,595 girls) in 2009 in the intervention schools,
- the project has expanded the skills base in the local area by training local people as members of the drilling team, and provided a boost to the local economy by contracting a local business to produce and supply the rope pumps,
- 105 members of the school management committees and mothers' associations received training in school management and planning,
- 127 adults (including 85 women) enrolled in the adult literacy centres in 2010,
- the project is organising campaign workshops for members of school management committees and mothers' associations to help them develop advocacy skills to lobby for improvements in local education services.

Adopting successful strategies

Several strategies helped to make the installation of low-cost water points replicable and sustainable:

- the technology chosen was deliberately simple to use and maintain. Training local people to operate and repair the water points, using locally produced parts, means the communities can keep the facilities working long after the project has ended,
- committees were set up in each area to manage the water points, and members were trained on how to operate and repair them. The committees are responsible for ensuring that necessary repairs are carried out, and liaising with local government technicians who will carry out regular monitoring visits (see below),
- the committees have selected certain individuals to act as operation and maintenance technicians, and they have received the necessary repair kits and maintenance tools,
- Oxfam has ensured that all replacement parts can be sourced locally and cheaply by engaging local businesses in the production and supply of the rope pumps,
- Oxfam signed a partnership contract with the Regional Water Department to cover monitoring of the water points and rope pumps. Local technicians will make regular monitoring visits, focusing on water quality, cleanliness and other aspects of water point management. They will liaise with and advise the water point management committees,
- as well as providing clean drinking water and toilet facilities in schools, the project carried out public health campaigns in the villages around each school, to raise people's awareness about the importance of good hygiene in reducing rates of illness. These campaigns went alongside the campaigns to promote positive attitudes to girls attending school.

'I'm now a change agent on good hygiene practices'

Bintou Adama, 12-year-old girl, 6th grade

'I am a member of the of Hygiene Club of Kermachoué school, in Bamba, Bourem district, which has 17 members, including six girls. We are responsible for ensuring the cleanliness of our school, and we are helped by four teachers and one member of the school management committee.

'Members of our hygiene club have acquired knowledge and skills on school hygiene and sanitation. The local education advisors of Bourem district, in collaboration with Oxfam, have trained us through workshops on good hygiene and sanitation.

'We clean and maintain the school halls and classrooms according to a rota, (the classrooms are cleaned every day, the schoolyard once a week). We make sure that all children wash their hands after using the toilet.

'After two years, we have noticed that the study conditions are better and many pupils are becoming more diligent in school because they are healthy.'

Challenges for the future

- Until the government includes the rope pump in its National Water Development Strategy, the technology cannot be marketed and scaled up. At present, people are only allowed to install the pumps for private use.
- Increasing the number of intervention schools will become more difficult as the selection criteria include soil quality. It is possible that these criteria will exclude some schools that are most in need of a water supply if their soil quality is insufficient for rope pump implementation.
- As well as funding low-cost technologies for water supply, donors need to fund complementary activities such as hygiene promotion and improved school governance to maximise the impact and sustainability of WASH components in schools.
- Donor preference for projects using low-cost technologies must be balanced with Oxfam's rights-based approach to working with communities. Many children live in areas where low-cost technologies cannot be implemented, and efforts must be made to ensure that they also have the right to safe drinking water.
- The security situation in the north of the country is becoming the biggest challenge, as it is restricting access to some of the more remote villages where people are most in need.
- One constraint of the technology used is that it is only suitable for easily reachable ground water levels, as is the case in the alluvial zones of the Niger river. Other drilling techniques are likely to be necessary to provide water points to more remote areas.

'I now have enough time to attend school...'

Aminatou Mohamedine, pupil at Djin Here, Temera, Bourem

'My name is Aminatou. I am 8 years old and a school pupil. I come to draw water at the pump every morning before going to school with my sisters.

'I first draw the water in a bucket and bring it outside the perimeter of the pump to fill our water container. It's not tiring, because before Oxfam installed the pump, my sisters and I walked up to 2km, often with our mother, to get water from the river. Now, I'm only 50m away from the pump.

'I am very proud of this project because it has brought us good-quality water. I never get sick anymore because the water does not give me stomach aches or diarrhoea. It does not contain worms or insects like river water.

'I go to school in time, my mother prepares us to eat very early in the morning and we can also take a bath/ bucket shower at least twice a day in our shower. Before, everyone took a shower in the river. Thanks to the people of the project, which allowed us to have the pump.

'Now, with the water point inside our schoolyard and the second one in the village, we don't have to waste time to get water. We can attend school every morning on time. We don't have to drink water from the river. The rope pump provides us with safe water to drink.'

Appendix 1: Key components of the rope pump

The guide



Pulley wheel



Pump lock



The rope and pistons



The water check valve



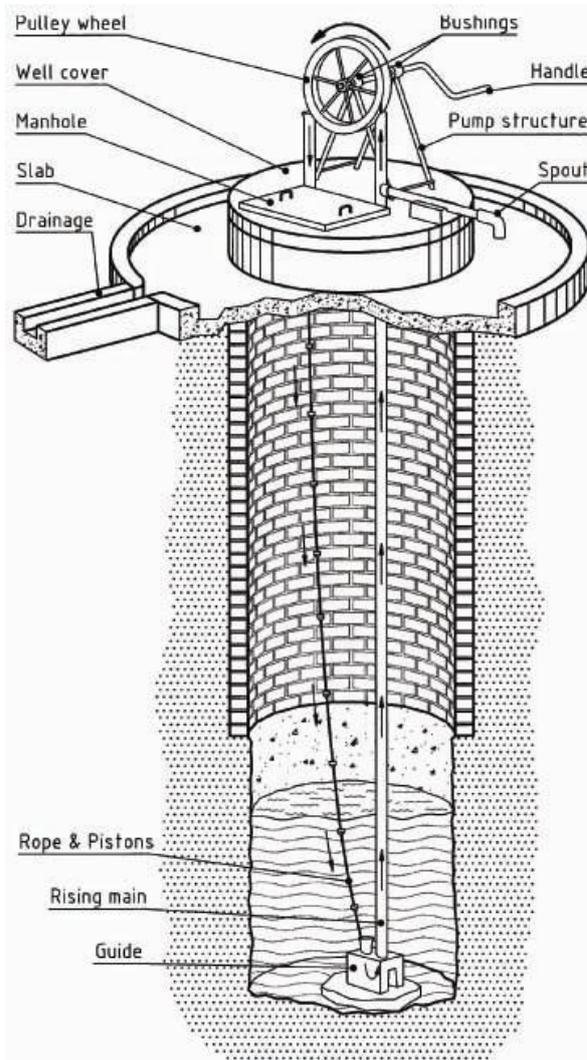
The handle



The clapet anti-retour



The rope pump scheme



¹ Oxfam is an international confederation of 15 organisations of which Oxfam GB is one. The work in this paper is that of Oxfam GB which will be referred to as Oxfam hereafter.

² See UNDP (2010) Human Development Report 2010, 'The Real Wealth of Nations: Pathways to Human Development', <http://hdr.undp.org/en/reports/global/hdr2010/> (accessed 12 May 2011).

³ EFA Global Monitoring Report 2010, p. 6.

⁴ UNICEF 2009, The State of the World's Children, Special Edition, www.unicef.org/sowc/ (accessed 12 May 2011).

⁵ Education for All (EFA) Global Monitoring Report 2010, Sub-Saharan Africa Regional Overview, p.3, <http://unesdoc.unesco.org/images/0018/001865/186526E.pdf> (accessed 12 May 2011).

⁶ *Ibid.* p. 13.

⁷ C. Pearce, S. Fourmy and H. Kovach (2009) 'Delivering Education For All in Mali', Oxfam International Research Report.

⁸ Articles 25 and 26 of the Universal Declaration of Human Rights.

⁹ EFA Global Monitoring Report 2010, p. 11.

¹⁰ J. Adams, J. Bartram, Y. Chartier, J. Sims (eds) (2009), 'Water, Sanitation and Hygiene Standards for Schools in Low-Cost Settings', WHO, www.unicef.org/wash/schools/files/rch_who_standards_2010.pdf (accessed 12 May 2011).

¹¹ The coverage rate for Temera was around 46 per cent and for Bamba, was around 32 per cent, before Oxfam started working in that commune (currently, it is around 55 per cent). Source: base de données Systeme d'information Géographique du Mali (SIGMA) and Gao Direction Regionale de l'hydraulique (DRHE).

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