

Code of Practice for Cost-Effective Boreholes

Burkina Faso: Summary of Findings of 2009 Study and Draft National Code of Conduct



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Abbreviations (in French, and then English)

ANP-SEPAB	Association Nationale des Professionnels du Secteur de l'Eau et de l'Assainissement au Burkina Faso - National association of professional contractors in the water and sanitation sector.
CASPEA	Composante "Appui au Secteur Privé intervenant dans le domaine l'Eau et de l'Assainissement" - Capacity building program for the private sector in the water and sanitation sector
CdC	Code de conduit – Code of Conduct
PAGIRE	Plan d'Action pour la Gestion Intégrée des Ressources en Eau - Integrated water resource management action plan
PN-AEPA	Plan National Alimentation en Eau Potable et Assainissement - National water supply and sanitation program up to 2015.
PAR	Programme d'Application de la Réforme du système de gestion des infrastructures hydrauliques d'approvisionnement en eau potable en milieu rural et semi-urbain au Burkina Faso - Implementation program of the reform for the management of water supply and sanitation infrastructures in rural areas and small towns in Burkina Faso
PNGT	Plan National de Gestion des Terroirs - World Bank Program that supports municipalities
DGRE	Directon Générale des Ressources en Eau - National Directorate for Water Resources
PCD-AEPA	Pln Communal de Développement pour l'Alimentation en Eau Potable et Assainissement - Municipal Plan for water supply and sanitation

Exchange rate of US\$ 1= FCFA 450

1 Introduction

Under the umbrella of the Rural Water Supply Network (RWSN), SKAT has been commissioned by USAID / UNICEF to study how to optimize the costs of boreholes construction in the three countries of Zambia, Ghana and Burkina Faso. The main output of the studies is the definition of a national protocol/code of conduct for the construction of boreholes specific to each country.

The Burkina Faso mission described in this report was done in November 2009 by a team of two experts Bruno Duffau (water engineer) and Inoussa Ouedraogo (hydrogeologist).

In terms of context, in Burkina Faso, the dialogue in the water sector has been fruitful and has allowed for a) the establishment of a Sector Wide Approach supported by three donors (DANIDA, ASDI and the European Commission); b) the establishment of a common fund for technical assistance and c) the definition of a national strategic plan (PN-AEPA).

The Code of Conduct fits into the national strategies and can be used as a tool for the implementation of the national plan (PN-AEPA). A first draft of the Code of Conduct was discussed during the mission. There was relatively little involvement of the donors but strong ownership by the Government. Donors comments are expected at the beginning of 2010.

This report provides a summary (in English) of the mission report and of the Code of Conduct, which are both in French.

2 National context

2.1 Organization of the Water sector

In Burkina Faso, most boreholes are constructed for human consumption, though they are often equipped with a trough to enable livestock watering. Borehole drilling for domestic use falls under the responsibility of the Ministry of Agriculture and Water Affairs and its National Directorate for Water Resources (DGRE). The Ministry of Education and the Ministry of Health manage the water supply of schools and health posts respectively. The on-going decentralization process gives a lot of responsibilities to the municipalities that are the owners of the assets for water supply.

So far most of the boreholes have been constructed through donor-funded programmes. The share of NGOs, varies from one year to the next and is estimated to be less than 5% of the boreholes constructed every year while Government provides less than 10% of the total funding for borehole construction (2008 Joint Review). However, this situation will change drastically from 2010 with sector budget support funded by the European Commission, the Danish Cooperation (DANIDA) and the Swedish Cooperation (ASDI). Around €38 million of financial support it planned over the the next 5 years. This includes a specific fund for technical assistance for water and sanitation. It is estimated that about 1,500 to 2,000 new boreholes are drilled annually in the country.

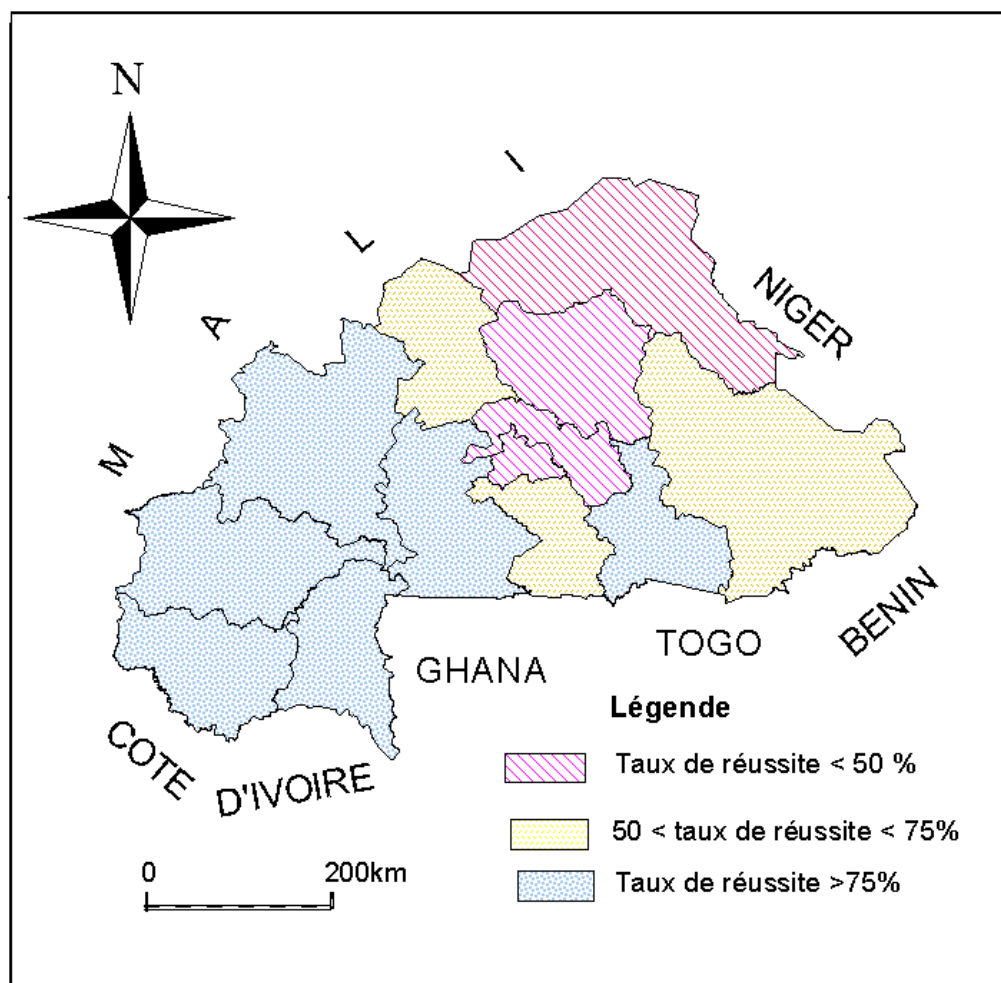
The DGRE has developed recently a number of tools at national level:

- an **Integrated water resource management action plan** (PAGIRE) for the management of water resources,
- a **national strategic plan for the water sector** up to 2015 known as the PN-AEPA,
- a **strategy and set of tools for the management of water assets in the rural** areas known as the PAR.

2.2 Physical environment

The general context is favourable to the construction of boreholes equipped with handpumps due to the following:

- 1) Underground water is usually not very deep. The static water level is often less than 30 metres from the ground. However yields are limited, with most of the aquifers in granite or hard consolidated rocks. The available water depends on the level of fracturing.
- 2) The rural population lives in open and scattered settlements.

Figure 1 Drilling Success Rates in Burkina Faso

For the purpose of the study, the Burkinabé territory has been split into three categories according to their potential for boreholes construction (Figure 1).

- Easy drilling area: the success rate is above 75%
- Difficult drilling area: the success rate is between 50 and 75%
- Very difficult area: the success rate is below 50%

2.3 Access to a Protected Water Source Water

According to the national monitoring system in DGRE an estimated 54% of the rural population in Burkina Faso has access to an improved water supply. Burkina Faso is on track to meet the Millenium Development Goals but faces challenges with respect to small piped systems where the level of failure is very high (Public Expenditure Review, May 2008). However there are disparities within the country and some regions have low coverage rates due to the difficulty of finding water. The Sahel region is a case in point with the access rate to a protected water sources estimated at 36%.

Around 30,000 rural water points have been listed by the Government, most which are boreholes. DGRE's figures of 2008 indicate that 83% of the rural population with access to protected water depends on boreholes with handpumps while 12% are supplied through protected wells and the remaining through small distribution systems.

In most situations, the extraction of water depends on cracks in hard rocks. Therefore in many areas, the best locations for boreholes have been equipped and the sitting of new boreholes is becoming more and more difficult.

2.4 Handpumps

In Burkina Faso, a total of 95% of the handpumps comprise six models. However, three of them are going to disappear soon because they are no longer produced. Spare parts, however, are still produced. The percentage of non-functional boreholes is about 21% and it is estimated that around 8% are abandoned (ANTEA, diagnosis of 13,000 waterpoints). World Bank (2006) found that the maintenance issue in Burkina Faso is not too serious. Maintenance is good compared to other countries; maybe the main success factor is that there is no alternative for water supply. Other favorable factors are:

- there is a one year guaranty of the pumps (usual condition in all tender documents) which are often installed by the dealer;
- the DGRE has guided the introduction of handpumps in Burkina Faso allowing for a proper balance between the needs for competition and for spare parts distribution. Thus spare parts are within easy reach of most local communities.

2.5 Decentralization

A new legislative framework is in place and gives to the 351 municipalities of the country (which cover all of the territory of Burkina Faso) the ownership of the assets for water supply. The national programme that supports the decentralization process is managed by the Ministry of Finance. It is important to note that DGRE has little or no control on the WASH component of this programme.

Practically, municipalities have very limited funds and internal capacity to implement works and activities. At the time of the study, many of them were busy developing local plans of development for water and sanitation (PCD-AEPA). Some municipalities have started the construction of waterpoints with the support of a World Bank water program (PNGT) that allocates around €2 million per year for the water sector for a five year period.

Some municipalities have launched the construction of boreholes but the general opinion of stakeholders interviewed is that has not been successful because the contracts were too small (less than 5 boreholes) to attract skilled contractors.

2.6 Management of water points and maintenance

As mentioned in section 1.3, maintenance is not a major issue compared to other countries. However the decentralization process will introduce a new organization for the management of waterpoints by giving a role to the municipality for the control and the preventive maintenance of handpumps.

Unlike other activities related to the construction and the management of the waterpoints, there is no overarching framework for the social component. So far each program has developed its own approach. Given that more works will be implemented through the Government procedures (due to sector budget support), the changes resulting from decentralization and lack of a comprehensive approach to dealing with the social aspects of water supply, the current high level of functionality is at risk of dropping in the future.

The new strategy defined by the AR and PN-AEPA foresee some changes in the management of the waterpoints. Considering the weaknesses of the municipalities, there is a risk that in some cases the maintenance is not at the expected level and that users stop to pay for the water. Also the introduction of the private sector in the management of some waterpoints may result in a lower quality of the service, in particular for the poorest who cannot afford to pay for water.

3 Costs of boreholes

The range of costs of a borehole in Burkina Faso is set out in table 1. This data is based on recent contracts and other data collected during the mission.

Table 1 Cost Structure of Drilled Water Wells in Burkina Faso

Item	US\$ Price (01-01-2009 with exchange rate of US\$ 1= FCFA 450)
Social component	US\$ 1600 to 2200
Borehole siting	US\$ 400 to 1100
Supervision of works	US\$ 200 to 700
Drilling	US\$ 6700 to 13300
Handpump	US\$ 2200 to 3600
Apron	US\$ 900 to 1300
Total	US\$ 10000 to 20000

Note: these costs do not include the cost of negative boreholes. The average costs including negative boreholes depend on the drilling area and vary from FCFA 6,500,000 (US\$ 14,400) to FCFA 8,500,000 (US\$ 18 800).

4 Code of Conduct (CdC)

This chapter sets out the objectives and main commitments of the draft Code of Conduct for Burkina Faso.

4.1 Planning

Planning of infrastructures for water and sanitation has been identified as a main weakness in the Public Expenditure Review of May 2008. A new strategy linked to the decentralisation and harmonization processes is in place and its implementation is just in its starting phase.

The overall objective of the CdC is to improve the coordination of water construction works. Commitments of the Code of Conduct are as follows:

- The priorities defined in the Municipal Plans for Water and Sanitation (PCD-AEPA) are to be respected when they exist. In cases where PCD-AEPA have not been developed, the municipalities and regions will be strengthened and supported to implement the planning.
- Donors must inform the Administration (DGRE, municipalities) and the other funding partners about the planning of investments from the identification stage up to the funding decision;
- The Municipality should set up a workplan and agenda before the tender process in order to coordinate the social component (sensitisation, mobilisation and training), the borehole siting and construction works. Potential bidders must be informed of the workplan and agenda.
- Define homogeneous lots of works that focus on the same geographical area and incorporate the plans of the other sectors such as Education and Health.

4.2 Community involvement

The objective of the CdC is to a) ensure that the communities have sufficient finance for the maintenance and management of the water points and b) ensure that the very poor have access to improved water supplies. This is broken down into the following commitments:

- All agencies and organisations should support the national approach defined in the PN-AEPA and PAR for the management of the waterpoints;
- Strengthen the communities in areas where alternative water resources exist and where the risks of poor maintenance of waterpoints is higher;
- In the case of communities who do not fulfil their obligations in term of maintenance, then rehabilitation works and improvement of the maintenance system should be undertaken rather than the construction of new boreholes;
- Monitoring Systems should include an indicator for access to water for the poorest. The new management of the waterpoints relies on the private sector hence a risk in term of access to water for the poorest and most vulnerable people.

4.3 Groundwater resources

The PAGIRE report considers that the ground resource of the Nakambé river basin is the most vulnerable water resource in Burkina Faso. Arsenic and nitrates have been found in excess in some waterpoints and fluoride is suspected though rarely measured (fluoride has been identified in neighbouring countries Niger and Ghana).

The objective of the CdC is to protect the groundwater resources against over exploitation and check water quality. This is broken down into the following commitments:

- Support the activities planned under the PAGIRE for the follow-up of the most vulnerable aquifers. Storage of data, studies and project information should be improved;
- Ensure that the information on water resources which are not suitable for human consumption is communicated to DGRE with an accurate siting of the identified waterpoints;
- Make sure that the waterpoints not suitable for human consumption are clearly identified in the field and that the potential users are aware of the risks;

4.4 Handpumps

UNICEF imports handpumps directly from recognized factories in India in order to benefit of better prices and to avoid the poor quality of some Indiamark II on the market. This option keeps prices down. However it does not help the development of after-sales services because resellers are usually not interested in selling the spare parts without selling the pumps. In practice, it is very difficult to verify the quality of imported pumps and it is easier to control the factory of origin. The system of one-year guarantee widely developed in Burkina Faso seems to provide good results.

The objective of the CdC is to maximise handpump durability through the following commitments:

- Take measures to ensure that the new handpumps are of good quality, e.g. by promoting the installation of the pumps by the dealer who provides the guarantee and after-sales service;
- Make sure that the possible introduction of new pumps in the country considers the after-sales service.

4.5 Monitoring and Evaluation

The objective of the CdC is to develop good knowledge of the drilled wells in the country in order to facilitate planning of construction and rehabilitation of water points. The commitments are:

- Utilize and strengthen if necessary the M&E system of the Government rather than develop a parallel system.
- Respect the procedures for M&E as defined in the PN-AEPA and make sure that the information about construction and rehabilitation of waterpoints is communicated to the regional directions (DRAHRH).

4.6 Who drills?

In general, water well drilling in Burkina Faso is undertaken by the private sector. There are at least 40 drilling enterprises in Burkina Faso that have been listed by the recently created Association of Contractors

in the water sector (ANP-SEBAP). Comparing this potential with the number of boreholes constructed every year (less than 2000) suggests that the supply considerably outweighs the demand. However it should also be noted that most of the works are delayed because of the poor maintenance of the machines and the poor management of the companies. In addition, some “*drilling companies*” are simply intermediaries who subcontract the works to professionals and get their commission.



The CASPEA program is supporting the private sector regarding water activities. In response to the demand of the professionals a number of training sessions and other supports have been organized. This program will end in 2010 and there is a need to perpetuate this type of support for the private sector as it exists in many countries and to set up a funding mechanism.

In this context it is necessary to professionalize drilling activities and to maintain an acceptable level of competition.

For this purpose, DGRE and the ANP-SEBAP have already started a dialogue in particular around the definition of technical agreements. The commitments of the CdC are as follows:

- Support the Government and the association of contractors of the water sector (ANP-SEPAB) for the development of accreditation of enterprises which construct boreholes;
- Do not subsidize drilling companies and promote a fair competition (avoid the creation of a drilling company by an NGO for example);
- Make sure that the contracted drillers have the proper accreditation;
- Inform in writing the agreement commission of severe failures of a contractor;
- Support the independence of the accreditation commission (already formed but not fully functional) in order to ensure that the accreditation is managed in a fair manner. Support could be through an independent review of the results achieved by the commission.
- Support the capacity building of the drillers in technical and management issues, i.e. drilling techniques, maintenance of equipments, accounts, costing, etc.

4.7 Procurement

The objective of the CdC is to augment the scale of contracts and concentrate drilling works in a reasonable geographically specified area with similar hydrogeology; b) respect the harmonisation of procurement procedures and create the capacity for the management of tenders by Government and c) integrate the activities of the water sector with that of education and health. The detailed commitments are:

- Propose a minimum of 30 boreholes for tenders except for manual drilling and force majeure such as a flood crisis for example that needs an urgent response;
- Do not launch tenders with all-inclusive prices in difficult and very difficult areas as defined in Chapter 1.2 and pay to the driller the negative boreholes in these locations;
- Set a specific contract for the construction of the apron, the supply and installation of the handpump;
- Where manual drilling is possible, set specific contracts for hand drilling;
- Tender documents should include recommendations and norms defined by the Government;

- According to the available capacities, favour tendering processes through the Government structures and support with technical assistance;
- When the tender process is under the municipality control, ensure that the civil servants have adequate skills in the planning, management and execution of the tender process (e.g. through training and supervision).

4.8 Contract management, supervision, payment

As the private sector is poorly capitalized, when the payments are delayed, which often happens, the implementation of contracts is also often delayed. When the supervisor is paid for the time on site, this can be a constraint for contractors who want to rapidly terminate their contracts. However contract delays are normal and sometimes the supervisor has difficulties to be paid for additional time on site even when he is not responsible for the delays.

There is a need to professionalize the supervision; too often the supervisor is a young technician with a very limited knowledge and experience and who is dependant on the contractor for his logistics (transport and housing). This makes almost impossible for him to go against the interests of the contractor. In addition, the community mobilization, siting and construction phases are not always well coordinated.

Given the above, objective of the CdC is to minimize the administrative constraints and poor techniques which inhibit effective drilling and supervision. The recommendations of the Code of Conduct are:

- Respect the contracts and payments, and ensure that payment is made in a timely manner.
- Pay the supervisor on a lumpsum basis for the expected duration of the works and on a time basis for additional time when the supervisor is not responsible for the delays.

4.9 Borehole siting

The cost of borehole siting has been drastically reduced in 10 years (from more than US\$ 3,000 to around US\$ 350 per borehole). However, the quality of the siting has also reduced drastically, and when the drilling conditions are difficult, the boreholes are often constructed far from the population to ensure success.

The objective of the CdC is to professionalise the siting of water wells in difficult and very difficult areas (section 2.2). The detailed recommendations of the CdC are as follows:

- In “difficult” or “very difficult” areas (see definition in section 2.2), consultants must be contracted for boreholes siting. All-inclusive works, where the contractor is responsible of boreholes siting should be possible only in easy drilling areas.
- It should be a requirement that a hydrogeologist undertakes borehole siting, including field work, and he should be controlled.
- Promote the use of complementary methods for borehole siting (electromagnetic, gravimetric or seismic) in very difficult areas in order to improve the success rate of drilling.

4.10 Borehole design and construction

In general, boreholes for handpumps are standardized with uPVC 125 mm (external). For small piped systems the most common casing is uPVC 160 mm (external). There is a tendency to upgrade from handpump supplies to small piped water systems in areas with sufficiently high population density. Thus it is important to carefully consider which diameter of well to install, even if a borehole is initially intended to be used for a handpump supply. The national standards set by DGRE are not always adhered to and the supervision is often sub-standard. The Government will soon commission a study that will aim at further defining technical specifications for the construction of boreholes.

The issue of water quality is a hot one whereby international experience could feed national dialogue. Currently, a newly constructed borehole considered not suitable for drinking water is decommissioned and cannot be used by the population. This is not the official policy of UNICEF but practically it happens in Burkina Faso as the Government is quite sensitive regarding this very political issue (nobody wants to be accused of poisoning the population). In situ testing allows for stopping some works at the first inflow of water when contamination is observed and can avoid having to condemn fully equipped boreholes.

However, proper dialogue with the communities would enable some of these boreholes to be kept for other uses than drinking; it would bring a definite benefit on health (hygiene).

The objective of the CdD is to guarantee that the defined standards with respect to design and construction of boreholes are adhered to. This has been broken down into the following commitments:

- Respect the technical specifications defined by DGRE,
- Support the capacity building for drilling companies and supervisors in particular for the use of drilling norms and recommendations;
- Test in situ the level of arsenic in areas where risks have been identified, develop water analyses in situ in particular for fluor and nitrates.
- Support the improvement of the technical dispositions, the conception of boreholes for small piped systems and the use of hydro-fracturing are two issues that require further investigations;

It should also be noted that hydro-fracturing has been tested in Burkina Faso. Though the technical results were interesting, this option has been abandoned for cost reasons. However as boreholes sitting is increasingly difficult in some areas, this technology (used widely in Togo) could be reintroduced. At least two drillers, whose head office is in Burkina Faso, have the proper equipment.

4.11 Drilling technology

UNICEF in coordination with the Government intends to support a study on hand-drilling potential in Burkina Faso. This study will produce a map that will locate the areas with a good potential for hand-drilling. Though the equipments are often old, their modernization is not a priority of the contractors because the machines are underused.

The objective of the CdC is to optimise the cost of drilling with respect to the drilling techniques deployed. The one key commitment in this regard is to promote the use of hand-drilling technologies wherever it is possible.

4.12 Data

Within the PN-AEPA, the drilling record format has been developed with the supervisor in charge of transmitting the information to the client. However, in practice, some reports are either missing or not of the expected quality because of the poor supervision of the works.

The objective of the CdC is to ensure that the data with respect to borehole drilling is collected upon completion of the work, and to clarify who is responsible for managing the data flow. The key commitment is for the tender documents to specify the data to communicate to the administration and make sure the Regional Directions (DRAHRH) receive the information on borehole drilling.

4.13 Borehole development

Once a well has been declared successful, the well development is usually for less than two hours (cleaning until the water no longer contains suspended particles). Subsequently a CIEH pump test is carried out, comprising three stages: two hours at one pump rate, two hours at another and then two hours for recovery. In practice, certain wells are declared successful even though the yield is insufficient.

The objective of the CdC is to ensure that the specifications for development and pump test are harmonised across the sector. The key commitment is to clearly specify a standard procedure fore borehole development and pump test in Burkina Faso.

4.14 Record keeping

A national database, incorporating a Geographic Information System can incorporate data from all boreholes (including their geographical coordinates). However, the knowledge of the hydrogeology of Burkina is very weak and fragmented. Under the PAGIRE, studies are planned in order to improve the knowledge of the main aquifers.

The objective of the CdC is to constitute a database on borehole drilling in Burkina Faso with a view to improving the knowledge of hydrogeology and ultimately facilitate drilling works. The commitments in this regard are:

Comply with the procedures defined by the manual for monitoring and evaluation of the PN-AEPA;

- Support the installation of a database for boreholes used for water extraction.

4.15 Reporting

A website with the main information on the water sector is partially operational:

<http://www.reforme-aep.org/actualite.htm>

The objective of the CdC is to ensure that information with respect to drilling is made available to the public through the following commitment: Support DGRE for the production of annual monitoring and evaluation reports.

5 Conclusion and Recommendations

The main problem in Burkina Faso with boreholes construction concerns the quality of the construction works. In addition, boreholes construction is becoming increasingly difficult in some areas with limited underground water resources and water found only in the fractures. The latter is one of the causes of the lower performances in drilling contracts. An increasing number of unsuccessful boreholes are being registered and there are difficulties in finding water near the population in some areas. The second problem identified consists of the poor performance of the private sector. This results in particular from the selection of contractors and the superior. The selection criteria give little weight to the technical side and the technical side is poorly controlled during the contract implementation.

The findings of this study indicate that priority should be given to the following recommendations:

- Where drilling conditions are considered difficult or very difficult, the selection of the contractors and their supervision should be improved. The planned accreditation system should help to professionalize the sector, but it is also important to control the involvement of skilled technicians such as hydrogeologists in the field.
- The introduction of new sitting and drilling methods (hydro-fracturing) in areas where drilling success rates are low. In these areas the consultant in charge of the sitting should be different from the driller; if the consultant is responsible for selecting a site which is subsequently not successful, the driller should be paid for this work. Note that this is not the current practice in Burkina Faso.
- On the administrative side, lots of works should contempt a minimum number of boreholes with a strong geographical focus.
- Capacity building is a serious issue for both the public and the private sectors, in particular when considering the decentralization process and the lack of capacity in the municipalities

The private sector lacks technical and management skills; most contractors and consultants do not have enough financial resources and are vulnerable to unforeseen situations. The CASPEA program will end in 2010, options should be considered to continue with the same type of activities.

The public sector also needs more support. For borehole construction purposes, the main targets should be:

- The regional directorate (DRAHRH), with support focusing on the management of large contracts (finance and procurement) and the follow-up of the projects (technical and logistics).
- The municipalities with respect to planning investments and he management of the waterpoints (finances and technical).

Further, with the implementation of a budget support for the water sector, there will be the need to clarify the flow of funds.

The next step after this mission will consist of the follow-up on the code of conduct. It should be a tool for the Government and its funding partners. The definition of the strategies and the decentralization process being recent, it will be interesting to monitor how useful will be the code of conduct and possibly amend it according to the experience of the field.

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Annex 1 Stakeholders met

Prénoms	Nom	Structure	Poste	
Jean Mathieu	BINGBOURE	DGRE	DAEP	Administration
Boureïma R.	COMPAORE	Burkina Promafor	Directeur	Entreprise de forage
Laurent	DIPAMA	DIACFA MATERIAUX		Fournisseur de pompes
Roger Adama	WANDAOGO	BERA	DG	Bureau d'Etudes
Yacouba Saly	TRAORE	BERA	Hydrogéologue	Bureau d'Etudes
K N	VENKATESH	SAIRA INTERNATIONAL	DG	Fournisseur de pompes
Stephan A.	NEU	KFW		Chef de fil des PTF
Anicet	OUEDRAOGO	PRS II		Administration
Mahamadi	ZOUNGRANA	DGRE/ PAR		Administration
Patrice	MOLIERE	ANTEA/PAR	Chef de Mission	Maître d'Œuvre PAR
Ousseini	THANOU	DGRE	DGRE	Administration
Mathieu	BADOLO	Commission Européenne		PTF
Raoul Paul I.C.	ADJALLA	Plan Burkina		ONG
Aboubacar	ZOUGOURI	DANIDA		PTF
Peter	JØRGENSEN	DANIDA		PTF
Zakari	BOURAIMA	WASHCOST	Sociologue	Recherche
Pascal	DABOUE	WASHCOST	Chargé de communication	Recherche
Séni Macaire	NARE	FORAFRIQUE/FORACO	Directeur	Entreprise de forage
Evariste Auguste	KAFANDO	FORAFRIQUE/FORACO		Entreprise de forage
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Mikaël	DUPUIS	VERGNET HYDRO	Chargé de projets	Fourniture de pompe
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Seydou	TRAORE	Banque Mondiale		PTF
Karim	TRAORE	PRS II		Administration
Stanislas	BONKOUNGOU	DGRE	DLSO/ CASPEA	Administration
Ousmane	BONKOUNGOU	DGRE		Administration
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Lansana	KABA	SAHELCONSULT	Chef de service	Bureau d'Etudes
Soungalo	TOGOLA	UNICEF-Burkina		PTF
Jean Paul	OUEDRAOGO	UNICEF-Burkina		PTF
Mariam	TRAORE	UNICEF-Burkina		PTF
Alain Sévérin	KY	ONEA	DDPI	EPA
Christophe	BARAT	AFD	Chargé de mission	PTF
	SERME	BESER	Hydrogéologue	Bureau d'Etudes/Entreprise
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