

The Importance of communication in the process of management of drinking water distribution systems by local authorities in Burkina Faso: Case of the direct management of AEPS in the Commune of Dapélogo, province of Oubritenga , Region of Central Plateau.

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Abstract:

This study focused on the problem of the conjunction of the actions of the various actors involved in the management of simplified drinking water supply systems (AEPS) in Burkina Faso. By emphasizing the specific case of the Municipality of Dapélogo, in the province of Oubritenga, this study aims to show that the establishment of water management and sanitation mechanisms contributes to the use of a system of very effective communication tools which can contribute to making the various actors more effective in the execution of the missions of development of the service of the drinking water in the various Communes which are entrusted to them. From the results of this study, we mainly note that the clear definition of the roles and responsibilities of each actor, the absence of formal communication or management tools and the administrative burden are the main problems that negatively impact the effective management of the systems (AEPS) managed directly in Burkina Faso. Solutions ranging from the implementation of communication tools to the proposal of a financial management guide have been proposed to deal with the problem of this study.

Keywords: Communication, Behavior Change, Drinking water, Dapélogo, management, direct control, Development.

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1. Introduction

Since 2006, full communalization and the transfer of powers devolved to local authorities have been a reality in Burkina Faso. Drinking water supply and sanitation (AEPA) are now the responsibility of local authorities. Each municipality, relying on the axes of the national repository in terms of DWSS, designs its policy and can provide the means for its implementation. This is how the Commune of Dapélogo, within the framework of the implementation of its Communal Sectoral Development Plan for Water and Sanitation (PCD-AEPA) benefited from the support of its Luxembourg partners, for the realization of a project called "Drinking Water Supply and Sanitation Project in the Commune of Dapélogo". seven (07) Simplified Drinking Water Supply systems (AEPS) in seven (07) centers. In early 2017, the municipality commissioned and operated its seven (07) networks, and to this end, opted for the direct management of its works. The network is well functional and supplied by standpipes to the delight of the inhabitants; confers photo n° 1 of an example of a standpipe in the city of Dapélogo. This mode of management, most often discouraged by the services of the Ministry of Water and Sanitation (MEA), makes Dapélogo the only municipality in the Central Plateau region to experiment with it

Photo n° 1: *Fountain terminal n° 4 in the city of Dapélogo*



Sources: *Field survey March 2022*

To do this, the AEPS and their management systems deserve more attention, especially since the successful experience of Dapélogo could be beneficial to several municipalities wishing to better assert themselves in their field of competence, which is DWSS. Indeed, it is observed that the AEPS have become, since their commissioning, not Only an important source of revenue for the Commune but above all the main source of drinking water supply for the populations of the centers hosting them. However, beyond the technical aspects, the viability of a DWS network depends on of managerial capacity. In addition, the direct management of AEPS has not yet been subject to capitalization in Burkina Faso. Consequently, there are few communication and operational management mechanisms from which a rural municipality such as Dapélogo can draw inspiration. Since 2006, full communalization and the transfer of powers devolved to local authorities have been a reality in Burkina Faso. Drinking water supply and sanitation (AEPA) are now the responsibility of local authorities. Each municipality, relying on the axes of the national repository in terms of DWSS, designs its policy and can provide the means for its implementation. This is how the Commune of Dapélogo, within the framework of the implementation of its Communal Sectoral Development Plan for Water and Sanitation (PCD-AEPA) benefited from the support of its Luxembourg partners, for the realization of a project called "Drinking Water Supply and Sanitation Project in the Commune of Dapélogo". of seven (07) Simplified Drinking Water Supply Systems (AEPS) in seven (07) centers, confers below photo n° 2 of Dapélogo water tower.

Photo n°2: *One of the Seven (07) Photo of Dapélogo City Water*



Sources: *Field survey, March 2022*

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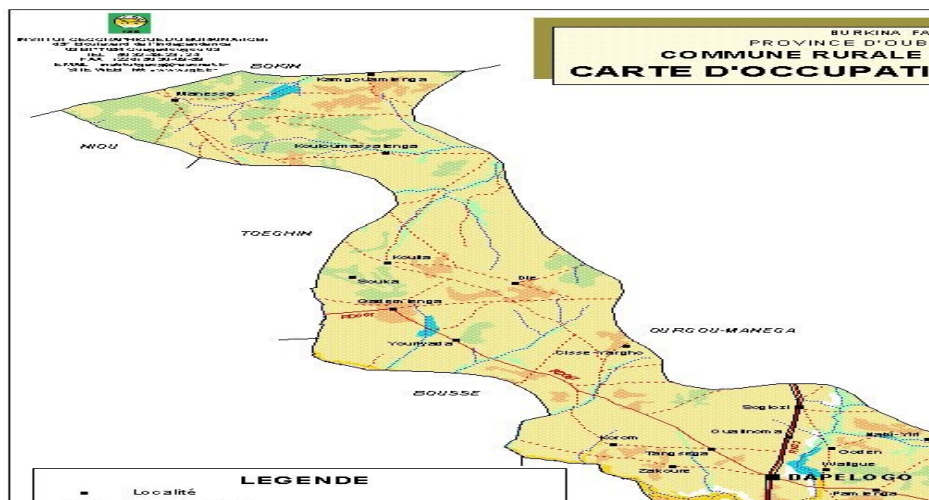
experiment with it. To do this, the AEPS and their management systems deserve more attention, especially since the successful experience of Dapélogo could be beneficial to several municipalities wishing to better assert themselves in their field of competence, which is DWSS. In fact, the AEPS have become, since their commissioning, not only an important source of revenue for the Municipality but above all the main source of drinking water supply for the populations of the centers housing them. However, beyond the technical aspects, the viability of a DWS network depends on the managerial capacity. In addition, the direct management of AEPS has not yet been subject to capitalization in Burkina Faso. Consequently, there are few communication and operational management mechanisms from which a rural municipality such as Dapélogo can draw inspiration. Therefore, the overall objective of this study is to show that a set of management tools participating in a communication system can contribute to the viability of AEPS managed directly in local authorities in Burkina Faso. Specifically, this involved:

- Make a diagnosis of the management of the current management system of the AEPS in the Commune of Dapélogo;
- Propose an effective communication system via management tools directly managed by the AEPS of Dapélogo

2. Study site:

The rural commune of Dapélogo is located in the northwest of the province and covers an area of approximately 548,326 km² (INSD, 2006). It is located 29 km from Ziniaré, capital of the province of Ouhritenga and 35 km from Ouagadougou, the administrative capital of Burkina Faso. It is accessible in all seasons either by national road 22 (RN22) which connects Ouagadougou to Kongoussi or by departmental road 148 (RD148) which is the Dapélogo-Ziniaré axis. The population of the rural commune of Dapélogo, like the other communes of the province of Ouhritenga is young with nearly 59% of the population. There is real social cohesion between the different social groups in the municipality. This social cohesion is manifested through the ease of social mobilization, the population always listening to their authorities. Social cohesion is a great potential for the development of the municipality of Dapélogo. (IDP of Dapélogo, 2018-2021). Physically, the Municipality of Dapélogo is part of a vast penneplain that occupies the entire central part of Burkina Faso.

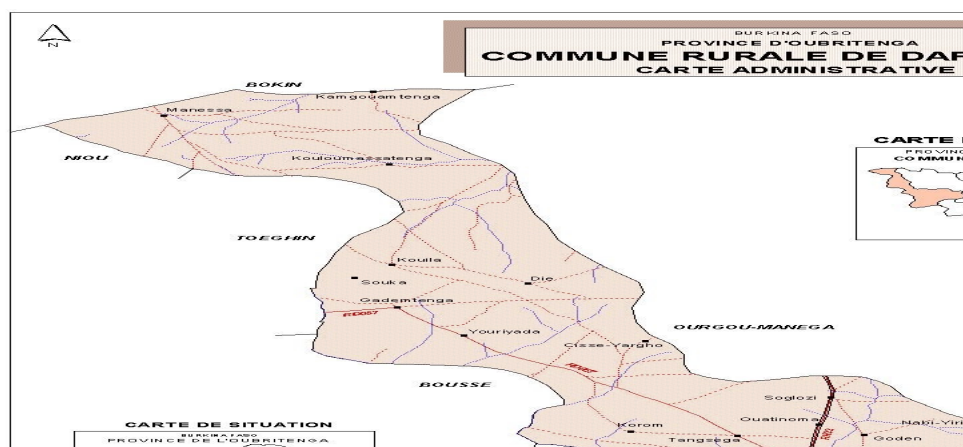
Figure n°1: Land use plan for the municipality of Dapélogo



Sources: Field surveys, March 2022

The commune of Dapélogo, like the entire region of the central plateau, is subject to a climate of the North-Sudanian type. This climate is characterized by an alternation of 2 distinct seasons. In terms of rainfall, the rains experience a strong spatio-temporal variation from one year to another. The average rainfall established over 3 years is 605 mm spread over 38 days. The temporary watercourses that cross the rural commune of Dapélogo belong to the Nakambé watershed. These are dry regime rivers and are tributaries of the Massili and have lowlands that have allowed the construction of dams.

FIGURE N° 2: THE MUNICIPALITY OF DAPELOGO IN THE GEOGRAPHICAL AREA



SOURCES: INSD, 2006

2.1 Tools and methodology used

This study was conducted between June and October 2018, then revisited for additional surveys from January to February 2022 in the commune of Dapélogo, province of Oubritenga in the Central Plateau region of Burkina Faso. The choice of this study area is justified by the fact that it houses seven (07) AEPS systems consisting of two systems powered by the National Electricity Company (SONABEL) and five others operating with photovoltaic solar fields. This is due to the fact that these five villages of Manessa, Gademetenga, Guiè, Voaga and Garpéné do not yet have access to the SONABEL network. According to the report on the studies that led to the construction of the works, these two types of energy sources are recommended because the generators generate enormous management difficulties (Socio-economic report on the drinking water supply project in the Municipality of Dapélogo, 2014). This same report revealed that the affermage management of AEPS in the Central Plateau Region has many limitations. These two elements combined meant that Dapélogo is not part of ONEA's field of intervention and led the municipal authorities in 2016 to opt for simple management of the said works. Hence the interest of this study.

2.1.2. A Two-Phase Study Methodology

A theoretical phase which consisted of bibliographic research on the management of hydraulic structures in Burkina Faso and a practical phase which consisted of a series of interviews in:) Administering a maintenance guide to the decentralized technical service in charge of water and sanitation in the central plateau region;) Administering a guide to the municipal authorities of Dapélogo;) Administering a maintenance guide to the technicians of the Town Hall of Dapélogo in charge of the management of the AEPS;) Administering a maintenance guide to the fountain workers, responsible for the sale of water and to the guards responsible for the safety of the AEPS;) Interviews with the Red Cross which finances the project.

Discussions and Results:

2.2. Issues related to the institutional context for the financial management of the water service:

Decentralization in Burkina Faso has changed the institutional landscape. Until 2006, the State ensured the project management, and even the role of contractor. If very often there is a disengagement from the entrepreneurial function, the delegation of project management to autonomous and responsible communities is not yet a reality (even in large urban centers). The National Water and Sanitation Office (ONEA), in its growth policy, is encountering enormous difficulties with secondary centers whose low profitability weighs on its financial autonomy. As a result, reflections are underway to think of a new strategy for the development of secondary centers with the experimentation of new management methods in relation to the laws on

decentralization which transfer project management responsibilities to local authorities. These important responsibilities cannot be properly ensured without an appropriate development of the capacities (technical, financial, human and organizational) of the municipalities.

2.3 sale of water

It is done only at the standpipes; the Municipality of Dapélogo does not first have private connections. A project of the cross is being carried out for high-speed drilling to strengthen the supply of demand. The period chosen for the water service at the standpipe, with the exception of public holidays, is from 6:30 a.m. to 7:30 p.m. each day of the week. The price per m³ governed by the deliberation of the municipal council adopting the price of water at the standpipe, is 500 CFA francs. And according to the Mayor of the Commune of Dapélogo, this is explained according to the municipal authorities by the fact that the reform provides that the price per m³ does not exceed 500 CFA francs. In accordance with the same deliberation, the standpipe manager called a fountain manager is paid in proportion to his sale at the rate of 25% of his sale at the end of each month. But there is no well-defined invoicing system with a frequency of issuance and payment of invoices. In fact, according to Mr. Raphael OUEDRAOGO, fountain operator in the center of Gademtenga, "we do not know in advance, like in Ouagadougou, how much we have to pay, we have to go to the Town Hall and find out the amount of our bill, the very day of the payment of his bill" And Mr. Ousmane KIEMTORE from the center of Garpéné added "it happened to me twice to discover that the amount I had taken with me to the Town Hall was drastically lower than the amount of my bill. We are still uncertain about the amount of the invoice.

2.4. The maintenance of the facilities not very enviable

Initially, there was no formal preventive and curative maintenance contract signed with a service provider responsible for making rounds a year to ensure the proper functioning of the networks. Also, in the event of a breakdown, it was difficult for the managers to find a maintenance person within a reasonable time to carry out corrective maintenance. These facts corroborate the assertions of Mr. Marc GANSONRE, Head of the Municipal Technical Service of Dapélogo: "when there is a breakdown, thanks to my personal relations with the Head of the ONEA center in Pabré, the latter puts me in contact with an electrical technician or a plumber he knows. And if the service provider is not available, we are under pressure from the population throughout the outage period"

2.5 Water quality management

Like any simplified drinking water supply system (AEPS), the monitoring of the water quality of the AEPS of the Commune of Dapélogo requires that one is interested in the different sources of water (boreholes) and their potential for pollution. The methods and frequencies of disinfection as well as the quantities of disinfectant and the risks they may entail. According to the WHO, drinking water is water that does not contain dangerous quantities of chemicals or germs that are harmful to health and is as pleasant to drink as circumstances allow, depending on its sanitary quality and its approval for consumption. (Soussou, 2016). And in terms of the quality approach, the first agent who approves the quality of the water is the consumer (Soussou, 2016). In the specific case of Dapélogo, complaints were only recorded in Garpéné by users about the taste of the water. And for water chlorination, calcium hypochlorite being easy to find and is the chlorine generator used for water disinfection. It is supplied in the form of pellets and contained in 40kg barrels. The cask of each site contains a basket of 1 L in volume, the base of which has an orifice allowing the dissemination of Ca (ClO)₂. But for all the guards, who are the agents in charge of chlorination, no protocol for this operation exists.

3.1. A communication system via the use of AEPS management tools.

The management of AEPS directly requires the establishment of a mechanism that takes into account all its aspects. It is mainly about the potability of water, the functionality of the networks and the financial behavior of the AEPS. For these different links in the chain to function normally, the following tools can be used for effective management. These are guides for setting up the AEPS monitoring system for the Dapélogo management. This document has therefore been designed in a participatory manner. Also, it should be noted from the outset that monitoring is primarily aimed at decision-making in a dynamic of information, awareness and communication strategies. It will address monitoring tools, monitoring, processing and analysis indicators. Four (4) objectives are assigned to it:

1. monitor production, continuity of service and the various intervention methods;
2. meet the water demand of beneficiary populations;

3. monitor the profitability and relevance of the price of water;
4. monitor the fluidity of the money circuit generated by the operation of the networks.
5. Manage water quality.

3.1.1. Monitoring of production, continuity of service and interventions

3.1.2. Production monitoring

It will be a question of knowing what is produced by the various boreholes of the network. The indexes of the counters of the drilling heads will be recorded and monitored to make it possible to know the volumes of water taken from each drilling. In terms of tools, a drilling counter monitoring book must be opened and kept up to date, see Table 1 below

Table n°1: Typical example of monitoring indexes of drilling head counters

Janv-19						Volume Total pompé Janvier -19
Forages	Index au 31/12	Index 15/01	au Volume pompé	Index 31/01	au Volume pompé	
F						
Ch						
Total						

Source: Field surveys March 2022

By keeping this type of table on a regular monthly basis, the technical department will be able to accurately determine the quantity of water produced per day, then per month and per year in order to compare them with the volumes consumed during the same periods of time.

3.13. A guaranteed service continuity offer :

A guaranteed service continuity offer: For a continuous service any network needs curative and preventive maintenance. These two types of maintenance are subject to contracts with private service providers. He needs to follow their work in the field, in particular the regular keeping of a notebook for monitoring maintenance with all the precise information for successful curative maintenance.

Tableau n°2 : Type de cahier tenue pour la maintenance curative

N°	Date Interruption du Service	Date Information du STMEA	Objet de l'intervention	Date intervention de réparation	Date remise en Service	Durées des pannes	ObseA guaranteed service continuity offer: For a continuous service any network needs curative and preventive maintenance. These two types of maintenance are subject to contracts with private service providers. He needs to follow their work in the field, in particular the regular keeping of a notebook for monitoring maintenance with all the precise information for successful curative maintenance.rvations

Sources: *Field surveys March 2022.*

through this table to be kept by network, it is easy to follow the interruptions of services and their duration to allow the project owner to work to reduce the number and especially the duration. This same approach is observed both on Curative maintenance and on preventive maintenance through the various AEPS centers.

a) Réponses à la demande d'eau des populations

It will be a question of entering the demand satisfied in terms of consumption through this table to be kept by network, it is easy to follow the interruptions of services and their duration to allow the project owner to work to reduce the number and especially the duration. This same approach is observed both on Curative maintenance and on preventive maintenance through the various daily, monthly and annual AEPS centers of the populations served. To compare it with the maximum production to consider urgent or necessary actions if necessary. For this, it is essential to open and keep up-to-date information collection tools, to set up analysis tools in order to help the project owner in his decision-making

3.1.4. Suivi de la rentabilité / pertinence du prix de l'eau

The monitoring of profitability should make it possible to fix and revise the price of water, to play on the charging stations, to prioritize the investments to be made (private connections) with a view to improving the result of the operation and identify suggestions for improvement. The appropriate tool to allow this profitability to be read is the operating account drawn up at the end of the financial year.

3.1.5. Le choix de comptes d'exploitation par réseau et consolidé par la suite

For the purposes of analysis, it is first necessary to make an operating account by bucket and then a consolidated operating account for all the 7 networks confers below the example of operating account document by AEPS.

Table n°3: *Operating account by AEPS AEPS of:2019*

Charges	Montant	Produits	Montant
- Salaires			
o STM-EA (mutualisation des 7 AEPS)		- vente de l'eau	
o Gardiens		- Ristourne AUE	
o Fontainiers			
- Approvisionnement			
o Produit de désinfection			
o Stock de pièces de rechanges			
- Amortissement			
o Calculer			
- Energie			
o Facture			
- Maintenance			
o Facture			
o Matériel de nettoyage des plaques			
- Fonctionnement (mutualisation des 7 AEPS)			
o Moto			
o Mission			
o Communication			
	500000		1.000.000
Résultat brut :			500.000

Sources: *Field surveys March 2022*

The operating account has two types of expense: - the common costs for the water service, such as salaries and the operation of the STM which will be distributed between the 7 networks according to a distribution key to be defined, which can be The number of m3 produced, The number of BF and BP , The number of inhabitants or users, The charges specific to each network, preventive and curative maintenance and Energy consumption. The STM will have a central role in assigning the charges to the various networks, in connection with the municipality's financial services, namely the analytical assignment of each invoice, the management of a stock of spare parts (pipes, meters, etc.) for the 7 networks and monitoring its use by each network so as to allocate the cost to the network concerned. This follow-up of the turnover will make it possible to analyze the situation of each network, to know the operating result (positive, balanced or negative) and to propose actions to improve the profitability of the network (improvement of the yield, reduction in charges, etc.) and actions to improve water consumption, namely awareness-raising actions, network extension, strengthening of distribution (extensions, new BFs, BP campaigns, etc.) and a change in the price of water. water to cover the charges.

3.2. An acceptable fluidity of management

Seven AEPS networks scattered across a vast municipality raise concerns about the circulation of money and operating income. Thus, the fluidity of the circulation of operating revenue is a very important aspect of governance. The main question is to know who in the village will collect the money from the fountain workers? How will the funds collected be sent to the head office? A priori, the fountain manager remains the delegate in all the villages. They sell the water and transport the products to the management. For this, we can set up a system in relation to Orange money for example. This system could consist of setting up an Orange money account of the management, held by the manager to which the standpipe operators will transfer the money collected. Depending on the distances, it would also be possible for the manager to move. In all cases, the receipt of any amount will give rise to the delivery of a receipt by the management. At this level, one of the tools is the invoice which materializes the payments of the sums between the delegate, here the manager of the BF and the management. It looks like this. But tracking billing is not enough. The aim here is to monitor the effectiveness of invoicing and therefore the revenues of the networks, by being able to monitor the difference between the actual revenues and the potential revenues. This monitoring can then allow real management of the AEPS.

WATER
 CONSUMPTION
 INVOICING
 MUNICIPALITY OF
 DAPELOGO

Village : Branchement : Numérotation :
 Nom du gérant (BF) ou de l'abonné :

Tableau n°4 : *Typical example of water consumption in the Municipality of Dapélogo*

INDEX (m3)	DATE	CONS. FACTUREE (m3)	DUREE (Jours)	PRIX UNITAIRE (F.CFA)	MONTANT TOTAL (F.CFA)	
Nouvel	420	30/09/2018	165	31	500	82 500
Ancien	255	31/08/2018				
Consommation facturée (a)					82 500	
Arriérés ou impayés (b)					0	
Commission fontainier (25% Montant total) (c) = (a + b) x 25%					20 625	
Redevance (d)					0	
Taxes d'assainissement (e)					0	
Autres taxes (f)					0	
Totaux Taxes (d + e + f)= T					0	
NET A PAYER A LA REGIE (a + b – c +T)					61 875	
AVANT LE					Le 10/10/2018	

Sources: Field surveys March 2022

Payment must be made to the Municipal Revenue Authority the first weeks of the month from 8 a.m. to 12 p.m. at the Town Hall of Dapélogo in cash or by electronic payment. For any payment, a receipt in the name of the municipality will be drawn up and given to the manager. Electronic payments will be regularized by a receipt. It is essential to establish a table for monitoring BF invoicing, similar to table 5 below.

Table n°5: Monitoring of payments from standpipes

	Consommation janvier (m ³)	Montant facturé janvier	Evolution (Janvier / décembre)	Consommation février	Montant facturé février Evolution (Février / janvier)
BF 1	233	87 375	9 375	252	7 125
BF 2	223	83 625	34 875	234	4 125
BF 3	82	30 750	1 500	126	16 500
BF 4	-	-	-	-	-
Total	538	201 750	45 750	612	27 750

SOURCES : Field survey March 2022

Tableau n°6 : follow-up of the payments of the terminals

Bornes fontaines	Montant facturé janvier	Reste à payer du mois	Solde du mois	Reste à payer cumulé sur mois	Montant facturé février	Montant versé en février	Solde du mois	Solde cumulé sur deux mois	Montant facturé mars
BF 1	39 000	39 000	-	-	39 000	39 000	-	-	56 250
BF 2	40 875	-	- 40 875	- 40 875	52 875	52 875	-	- 40 875	87 375
BF3	52 875	52 875	-	-	58 500	-	- 58 500	- 58 500	97 125
BF 4	0	0	-	-				-	
Total	132 750	91 875	- 40 875	- 40 875				- 99 375	240 750

Sources: Field survey March 2022

he exploitation of tables n° 5 and n° 6 can also be done on Excel by opening a page for a better visibility of each center and this by the STM.

3.3. Water quality management :

This notebook, made available to the site caretaker, trained in chlorination operations, will provide exact information on the dose of chlorine administered every seventy-two hours. It will not only make it possible to realize whether or not the customer is satisfied with the taste of the water after each chlorination operation, but also any other complaint can be recorded. The STM, through its periodic monitoring, will therefore be able to realize whether or not it is necessary to take action in order to continue to build the loyalty of standpipe users.

Conclusion:

The objective of this study, which is to show that the implementation of management mechanisms contributes to the use of a communication system for the development and change of very effective behaviors which will contribute to bringing well-being to profits. of the different actors and to bring them more knowledge and efficiency in order to encourage them in achieving many convincing results for the benefit of the populations of the entire population of the Commune of Dapélogo. Indeed, the problem of the disadvantages presented by the management of AEPS directly is explained by the absence of formal management tools from the electromechanical, financial and water quality management points of view. Also, we presented the current management system that prevails in the Commune of Dapélogo with collaborative links between the different actors involved in the process. Finally, we demonstrated through a proposal of management tools, how communication constitutes a real force of proposal which could contribute to improve knowledge in the management in direct control, of the AEPS in the communes concerned, like that of the Municipality of Dapélogo. It is also the place to indicate that the whole process of Communication as well as for the Development as for the change of behaviors was of a manifest interest, for the benefit of the actors of the Commune of Dapélogo, our zone of study in particular and that of the entire national territory in general, for their betterment in terms of management, service and distribution of drinking water in Burkina Faso.

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