Multiple-use Water Services

Close-out Report

12/15/2010
Winrock International

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Submitted by Winrock International on 31 March, 2011.

I. Overall Summary

Project Name	Multiple-Use Water Services
Project Country	Niger • Communities in the Zinder Region, Departments of Kantché and Magaria, Communes of Matameye, Doungou, Ichirnawa, Bandé and Magaria
Duration	**2 Years:** November 15, 2008 - December 3, 2010
Activities Summary –	The project improved the access of rural communities to water for drinking and productive uses through the installation water services (rope pumps, treadle pumps and the rehabilitation of traditional wells) and capacity building. The project also promoted hygiene and productive use livelihood activities such as gardens and fisheries.
Total Project Funding	• Total: $1,174,069 • WAWI: $736,032 - cash • WADA: $434,797 - cash • MUS Group: $3240 – in-kind
Implementing Partners -	**Cellule de Recherche Action Concertée – Gestion des Ressources Naturelles (CRAC-GRN)** • NGO • $45,791 • Coordinated logistics of project start-up. Managed human resources (including health care and payment of salaries) of the field agents. Facilitated the "capitalization" process (an end-of-project constructive critical analysis of project activities shared with partners and others who could benefit from the lessons learned), including writing 2 capitalization reports. • [redacted] **Développement pour un Mieux – Etre (ONG DEMI-E)** • NGO • $10,522 • Implemented both phases of baseline study (including development of questionnaires, hiring and management of interviewers, data entry and report writing). • [redacted] **PRACTICA Foundation** • Foundation • $15,830 • Collaborated on translation of Rope Pump Manual into French. Winrock revised, edited, assisted with lay-out, and translated to French. Practica updated drawings to match the current model in Niger, changed drawings to be 3-D, and created drawings for welding jigs. • [redacted]
Coca-Cola and USAID Partners	**USAID**

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	• A 1-day field visit was made to the project by a USAID representative based in Niamey (Gary Cramer) at the start of the project in February 2009. • Provided funding for project activities, assisted in project design process, and reviewed reports and notes from team calls. • Four field visits made by staff of ARD, the prime for WAWI. **The Coca-Cola Africa Foundation** • Provided funding for project activities, provided a representative to attend the MUS Open Doors day, and reviewed notes from team calls.
External Partners and Roles	**Direction Départementale d'Hydraulique (Departmental Rural Water Departments) (Kantché and Magaria)** • Government agency • Helped with identifying communities, organizing trainings for water point management committees and approving final water points • [redacted] **Direction Départementale de Développement de l'Agriculture (Departmental Agriculture Extension Office) (Kantché and Magaria)** • Government Agency • Trained a total of 86 garden producers at 4 different sites. Provided weekly follow-up visits for 10 months for the trained producers and women's gardens. • [redacted] **Communes (C.U. Matameye, Doungou, Ichirnawa, Bandé, C.U. Magaria)** • Local government • Helped with identifying communities, attended trainings for water point management committees and approved final water points • [redacted]

II. Project Achievements/Issues & Resolutions

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Provide reliable access to multiple-use water services that are designed and implemented to sustainably meet	*Achievements* ▪ Identification of communities: 51 communities (pop. 19,292) identified through the WAWI-WADA project for MUS activities and an additional 10 communities (pop. 2,705) identified through another,

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domestic and productive water needs
 	
▪ Identify and mobilize at least 30 communities for MUS.
▪ Facilitate community selection of supply option, financing, and private business for installation.
  o 30 communities will have access to water for domestic and priority productive uses.
▪ Support establishment of 30 Water Users Associations (WUAs) and provide training.
	short-term, Winrock WAWI project for hygiene and follow-up activities. Identification of the 61 communities (total pop. 21,997) was done in 5 waves (counting the other Winrock WAWI project as "wave 3"): wave 1 (February '09) wave 2 (March-April '09), wave 3 (June '09), wave 4 (Jan '10), and wave 5 (June '10). Identification was done in 4 steps: 1. Sharing criteria with local government officials, rural water department agents and other knowledgeable parties (drilling consultant etc.) 2. Collecting of pre-lists made by officials and water department. 3. Visiting villages to complete identification sheet 4. Comparison of MUS potential (potable water plus gardening) in different villages. See attached Excel Document "Community List – Final Report – Dec 2010" for selected villages, populations and infrastructure.
	
	▪ <u>Selection of supply options:</u> Communities were given the choice between rope pumps and Canzee pumps. Only two communities chose the Canzee pump.
	
	▪ <u>Access to water:</u> Out of the 51 communities identified by the MUS project, 47 communities (pop. 17,370) were provided with access to potable water through the MUS project. However, of the total population of 17,370 people, only 15,704 can be considered to have access to potable water as a direct result of the MUS project because in 6 villages existing pumps (India, Vergnet and rope pumps) cover a portion of the population. 62 rope pumps and 2 Canzee pumps were installed at the community level.
	  o 38 communities (pop. 13,910 or 1,987 households) out of the 47 received enough water for their domestic needs (25 litre per capita per day (lpcd)) *and* for their small livestock (5 lpcd).
	  o 41 communities (pop. 15,020) out of the 47 received enough water for their domestic needs (25 lpcd) but not for their small livestock.
	
	▪ <u>Water point management committees:</u> 58 water point management committees were trained to manage 64 water points in 47 villages. In some villages with more than one pump, a water point committee was established for each pump. In other villages with multiple pumps, a single committee managed all pumps. The village selected their own management model. As part of the capitalization process, a study of 15 (50%) of the first and second wave water point management committees was conducted 16 months after the pump installation. Based on the results, management committees report meeting an average of once every 2 months. The average amount of funds held for O&M was 7,095 XOF (~$15.77) in their pump funds, which is reasonable given that the average cost of maintaining the pumps for the first 16 months was found to be 10,114 XOF (~$22.48).

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	• Cluster repairmen (rope pumps): All 62 MUS community rope pumps, 2 market rope pumps and 6 Winrock WAWI 2009 rope pumps were divided into 21 clusters in which each village is <2km from another village in the cluster. From each cluster, the best and/or most central village repair person (decision made with input from communities) was invited to a 3-day, in-depth training on how to repair pumps. The cluster repairmen may be paid for their services if the water point management committee chooses to pay them, but they were not paid for attending the training. The training took place in two centers, one for residents of Kantché and the other for residents of Magaria. All village repairmen know the name and location of their cluster repairman. All cluster repairmen know the name and location of their zone repairman/installer. • Translation of Rope Pump Manual: Project staff translated the PRACTICA Foundation's Rope Pump Manual into French and provided information for updated drawings of the pump and its welding jigs. PRACTICA edited the French translation, updated the drawings in 3-D and did the final lay-out. The manual will soon be available on their website: http://www.practica.org/services/publications/manuals/ • Traditional wells: 5 traditional wells were rehabilitated for use in watering large livestock. 19 traditional wells were diagnosed and 16 were given plans for rehabilitation by a well expert. The goals of rehabilitation were: 1) Adequate water -- to assure that enough water was available to satisfy needs of large ruminants 2) Structural integrity of the well -- to assure the longevity of the well 3) Enhance user safety – to improve the safety of those pulling water. Of the 16 wells with rehabilitation plans, 6 wells were prioritized and 5 were completed[1]. In each village it was explained that the wells were being rehabilitated to serve livestock, not human, needs. An evaluation mission of the 5 rehabilitated traditional wells found: 1) Adequate water is available in all wells. In 4 of 5 wells, the amount of water was increased and now satisfies demand (the 5th well - Garin Djibdji - already had sufficient water) 2) Structural integrity enhanced in 4 of 5 wells (in the 5th well – Garin Farou - longevity was already good) 3) Safety of users enhanced in 4 of 5 wells by constructing a cement edge around the well to help prevent people from falling in (the 5th well – Garin Farou - already had an edge). Watering troughs were built at all wells except Garin Farou. No watering trough was built at Garin Farou because, since their borehole was unsuccessful, they still use their traditional well as their primary drinking water source. As such, it is not recommended to encourage animals to come to the well as they are possible sources of contamination.

[1] Rehabilitated wells: Garin Djibdji (6.8m), Guidan Gouley (from 16.2m to 16.7m), Garin Farou (from 17.3m to 18m), Kereni (from 12.2 to 12.9m), Kereni 2 (from 15.7m to 17.4m).

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	Major Issues/Resolutions ▪ "Irrigation only"/ "Potable only": At the beginning of the project, there was some confusion as to whether communities needed to have potential for all MUS activities or whether those having enough potable water could be brought on as "irrigation only" and those having enough irrigation water could be brought on as "potable only". As a result, 2 communities in the 1st wave were identified as "irrigation only". Since, in this context, irrigation was mostly done through privately financed systems, the "irrigation only" communities appeared less involved and had a lower level of participation in other parts of the project (such as hygiene). Also, while no villages were chosen specifically as "potable only", and the project tried to make sure that water was available for small livestock in all villages, the project provided support for water-based income generating activities (e.g. gardening and aquaculture) in only approximately 65% of 1st and 2nd wave villages and none in subsequent wave villages. In the case of the 1st and 2nd wave villages, this was due to lack of suitable terrain for gardening and in the case of 3rd-5th wave villages, this was due to time constraints. ▪ Unserved Communities: The project was unable to serve 2 communities with potable water. Of the 51 communities selected, 47 received potable water points. Two villages, as mentioned above, were designated from the beginning "irrigation only". In the 2 villages left unserved, Garin Farou and Houdel, the project was unable to supply potable water despite repeated attempts due to hydrological constraints. Initially, attempts to drill boreholes using low-cost technology were unsuccessful. In the case of Garin Farou, the rock was extremely hard and could not be reached, and in the case of Houdel, the water table was not productive because of high clay content. In both cases, the situation was explained to the community by project staff and letters were written to the mayor's office and the rural water department. (Please see Annex 1 for more details on abandoned boreholes). ▪ Underserved Communities: Of the 47 communities provided with improved water access, 6 communities did not get enough for their domestic needs, (25 lpcd under Nigerien law) as determined by the output of the pump when operated by actual users at 90% capacity for 8 hours per day. [Note: when the international norm of 20 lpcd is the benchmark, only 2 communities-- Dogon Gao and Izeykan—fall short]. In two communities (Magarami Peulh and Guidan Gouley), the amount of water available is less than 1% under the quantity required. 2 others (Tandjawa and Guidan Dodo) were 13% under the quantity required and 2 more (Izeykan and Dogon Gao) were between 30 and 33% under the quantity required. 5 out of these 6 villages are

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	in rocky areas where drilling was difficult. The 6th village (Dogon Gao) is in sandy terrain. The borehole was more productive initially (1.3 m3/h) but during cold season production decreased. In June 2010, the borehole was deepened by 2.75 meters but this still did not result in a significant increase in the productivity. The current output is just 0.6 m3/h. It is interesting to note, however, that the Vergnet pump installed on a mechanized borehole in Dogon Gao has an output of just 0.7 m3/h. This suggests that the problem is with the unproductive water table and not with the drilling technology. All of these communities continue to use their pumps. ▪ Rehabilitation of Boreholes: The productivity of 10 boreholes[2] was insufficient after the pump was installed. This is due to the fact that for the first 4 waves of villages, no pumping tests were done prior to pump installation because this was not part of the protocol during the last Winrock project in 2007. During the 5th wave, pumping tests were done because they are being advocated as part of the professionalization of the sector promoted by UNICEF. Pumps were not installed on boreholes judged to be unproductive during the pumping test. Pumping tests are useful because they allow one to know whether the borehole can support a pump and whether there is sand in the borehole. The downside of borehole testing is the cost—it is expensive (~300 USD/borehole if done as part of a group of boreholes). In some cases, they can be almost as expensive as the borehole itself. It's possible that pumping tests could be used most cost-effectively by targeting only certain at risk boreholes (e.g. those with water columns under 3m or in clay soils). Currently, Relief International and UNICEF are in the process of establishing norms and standards for low-cost boreholes in Niger and these norms include pumping tests. In the future, Winrock plans to require drillers to adhere to these standards. In 4 cases (Kabori, Garin Djibdji, Houdel and Baaja), the boreholes were re-sited and re-drilled and 3 have outputs of ≥ 1m3/h. The other, Houdel, was not equipped with a pump as it failed the pumping tests. In 7 cases (Houdel was "rehabbed" before being re-drilled) the boreholes were "rehabilitated" by removing the cement plug, drilling deeper and re-equipping the borehole with a smaller 110mm pipe. In addition, 1 borehole (Makeira Tsangaya) had termites (possibly through improperly joined pipes) and another (Garin Lassane) brought sand. Both were re-equipped to the satisfaction of the community and WHO standards. ▪ Rehabilitation of Pumps: Several months after the first two waves of pumps were installed, widespread problems with the pump base (where the pump attaches to the cement pad) became evident. Also, the pump covers began to rust and certain problems with the pump bodies and handles were noted. In October 2009, the project

[2] Garin Mahalba, Dogon Gao Est, Garin Djibdji 1, Kabori 1, Kereni 3, Tandjawa, Guidan Mourtala, Guidan Dodo, Houdel, Baaja

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	facilitated a meeting of pump manufacturers and installers to discuss these problems. In two cases, manufacturers were advised to adhere more strictly to the standards they were taught and in three cases small changes were made. In July 2010, it was decided to update all pumps installed before October 2009 to meet new specifications[3]. ▪ Water point management committees: As part of the capitalization process, a study of 50% of 1st and 2nd wave water point management committees was conducted. Certain difficulties in management came to light: o Out of 15 committees interviewed, 12 had stopped collecting money according to the established schedule in at least one period during the 16 months of operation. A 13th committee had never stopped collecting, but changed their collection schedule from weekly to annually. Of the 12 cases, 11 were due to the difficulties in collection (though in 2 of those cases the committee noted that they also had plenty of money in the pump fund) and one was due to difficulties with the borehole (which was subsequently re-drilled). A tendency to go from weekly contributions to annual contributions (including annual contributions in the form of cereals) was noted. In the current project trainings, multiple ways of collecting money for the pump fund are discussed. To address the difficulties of collection in future projects, new methods could be added to the training (E.g. setting a fixed amount to be kept in the fund which would then be replenished following repairs, for example) and the pros and cons of an annual system could be better explained. o During the committee trainings, committees were taught how to keep 5 registers: contributions, expenditures, repairs, meetings and a visitor log. Out of 15 committees interviewed, none kept all 5 registers. The most commonly kept register was the record of contributions to the pump fund and that was only kept by 6 of 15 communities. The reasons given were a lack of training, a lack of time to complete the documents and the fact that the registers were not useful. Another factor noted by project staff was that the villages least likely to keep their registers were disproportionately those villages made up of small hamlets. This is likely because of the time it takes to walk between houses and the difficulty of regrouping the committee members. In upcoming projects, a reduced set of registers that are appropriate to villages with hamlets should be developed and field agents should monitor and assist secretaries in completing the registers for a few

[3] The new specifications are: Base bolts for 19 mm spanner instead of 17 mm spanner, base angle iron of 5mm instead of 3mm and galvanized pump covers.

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	months. o In two villages (Goberéré and Kourouka), women do not actively participate either in village meetings or in the pump committee meetings for religious reasons. In the future, different structures could be proposed to ensure female participation without necessitating mixed-gender meetings. o 4 of 15 committees didn't currently have enough money in their pump fund to purchase one quality rope. ▪ <u>Ownership of traditional wells:</u> One traditional well was prioritized for rehabilitation, but the rehabilitation wasn't completed. This was due to an ownership issue with the well. This well was the property of an individual who allowed the community have access. The well owner didn't want to increase the quantity of water because he didn't want to attract more users.
Improve health for poor rural households by providing access to safe drinking water and promoting improved hygiene practices at the household level ▪ Identify 6 target communes for self-supply in Magaria and Matameye ▪ Promote technologies to households and link with suppliers. o 15 radio broadcasts, five functional demonstration wells in priority markets, and a stream of at least 50 orders for household pumps/wells. ▪ Provide quality control. o 50 functioning household water self-supply systems that provide potable water. ▪ Water quality testing and training for water users (households and communities).	*Achievements* ▪ <u>Self-supply:</u> o 5 communes were identified in Kantché and Magaria. o Developed a lower-cost (around 50,000 XOF or ~$111), locally-made "Private Canzee Pump" (PCP) in partnership with Richard Cansdale, a consultant who developed the Canzee pump, and Sani Rabo, a local pump maker. o Installation of 9 examples of the PCP at the household level. o 4 functional demonstration pumps (2 rope pumps and 2 Canzee pumps) were available in markets. Pumps were partially funded and managed by the mayor's offices. ▪ <u>Water quality testing:</u> Chemical and biological tests were performed by government laboratories on all community and market pumps and on all successful self-supply pumps. Chemical tests were carried out immediately after the installation of the borehole. Bacteriological tests were carried out just after the rainy season (both in Oct. 2009 and Oct. 2010) because this is the time when contamination is most likely to occur. ▪ <u>Training in basic hygiene practices:</u> o All field agents were given a 2-day Participatory Hygiene and Sanitation Training (PHAST) refresher course at the beginning of the project and a manual of PHAST modules. All agents had previous experience with PHAST. o A set of 27 PHAST images was developed to facilitate discussion of disease transmission and how to prevent it through hand-washing and proper handling of water.

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○ Chemical and biological tests to be performed on wells installed. Training will be provided to 30 communities and 50 self-supply households in proper well/pump maintenance and hygienic practices. ▪ Training 30 communities in basic hygiene practices. ○ 25% of compounds in those communities will establish a hand washing station.	○ Village hygienists in all villages received training in utilization of PHAST images to facilitate discussion. ○ A hygiene theater tour took place, with popular radio personalities and was seen by 8244 people (41% of the population of the first 4 waves) in 50 villages. The main message was: "Wash your hands with soap at the two critical moments"—after elimination and before eating. ▪ <u>Hand washing stations:</u> After discussing many options, a low-cost hand washing station was chosen. The hand washing station consists of a can with holes, a vessel for pouring water, soap and a soap holder. The station was chosen because of the availability of low cost materials as well as the potential to be a visual reminder of the need to wash hands. Approximately 940 stations were purchased and installed by 800 households, 25.6% of the total number of households in the project area. The rate of installation at the community level varied from 0% (9 communities) to ≥50% (9 communities) with a maximum of 89% of households installing a station. An outside interviewer visited 35 households, 14 months after the installation of the first stations and conducted a randomized study, which showed that: ○ 100% of the stations reported by the field agents were actually installed. ○ After an average of 9 months of use, 46% of stations were still functioning. ○ 77% of stations were installed by the users themselves. ○ According to users, installation of the station resulted in an increase in the number of times they washed their hands *with soap* (an average of 3.5 times per day for adults and 2.5 times per day for children). ○ There is a link between knowledge and use. Of those who knew the 2 critical moments for hand washing, 56% were still using their stations, of those who could not cite the 2 critical moments, only 37% were still using their stations. More information about the hand-washing stations is available in the "capitalization" report. *Major Issues/Resolutions* ▪ <u>Self-supply:</u> ○ 5 communes were identified and not 6 because there was a sufficient market available in the 5 communes and keeping the project area small meant that the field agents spent more time working with beneficiaries instead of more time travelling. ○ The decision to attempt major modifications to a pump in order to reduce its cost and allow its local production (rather than promoting a pump already on the market) caused serious delays in the self-supply strategy. This is because any new product must be tested and modified and

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	re-tested before being promoted. o Additionally, it is difficult to ask people to pay 100% of product cost for a product still in the testing phase. For this reason, the project asked people to use the pump for a period of several weeks and then start making installments. Of the 9 households who agreed to test the pump, 3 made installments of up to 40% of the purchase price, but none paid completely. o Based on field test results, the PCP with 40mm valves seems to have a technical limit of 7m. Of the 9 installed, 3 were removed after just a few weeks of use. Users preferred the PVC dipper they had been using previously. A 4th PCP was removed after a few months of use and replaced by the SDR (treadle pump). o Even the existing PCPs were determined by users to be too heavy to lift resulting in a 32mm valve being created and re-installed as 32/40. Other changes to the initial design were made, including: attaching the "t" handle with screws; using pressure pipe for the spout, and doubling the pipe above the metal joint and where the interior pipe is perforated. o Of the 5 PCPs being used, 3 (Jigayi, Angoual Lassane 1, and Ghana) passed both bacteriological and chemical tests and were still being used to meet household needs. The remaining 2 were deemed unpotable (Sara Sara, Angoual Lassane 2) based on water quality tests revealing high levels of nitrates (see below). Users were informed and these pumps were left to meet only livestock needs (which was already the case). o Because of the problems listed above that were encountered during the pilot phase of the household pumps and the time it took to address them, the technology was not considered ready for either market demonstration pumps or radio broadcasts during the lifetime of this project. ▪ <u>Water Quality Testing:</u> o Four community boreholes and 2 PCP boreholes were determined to be contaminated chemically with nitrates. The 2 PCP boreholes were designated as "livestock only". Two community boreholes were abandoned and successfully re-drilled elsewhere. At the suggestion of the regional water department's technician, the other remaining community boreholes were treated by pumping for 8 hours using a motorized pump to remove the initial reserve of contaminated water. After the pumping, the water was re-tested and found to be within World Health Organization standards. o In 2009, 1 borehole out of 35 was found to be biologically contaminated. The evacuation pipe of this pump (in the

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	village of Katché Katché) was broken and infiltrated through fissures in the cement pad. These issues were resolved and in 2010 the borehole was re-tested and found to be no longer contaminated. o In 2010, 16 out of 42 boreholes were found to be biologically contaminated. In one case, the PCP borehole was designated "livestock only". A study of the 15 other boreholes showed that in each one there were problems with evacuation pipe and/or cement pad (like Katché Katché) or there were animals tied near the pump. All of these issues were resolved and the boreholes were treated with chlorine. Re-testing showed that all 15 were potable. In the future, the evacuation pipes will need to be re-designed to prevent them from cracking and the infiltration pit will need to be at least 10 meters away from the pump. ▪ Training in Basic Hygiene Practices: Prior to the training of the 4th wave of hygienists, concerns were raised by project staff as to whether the hygienists of the first 3 waves were continuing to regularly discuss hygiene. A sample of hygienists in 16 villages was interviewed and the results showed that while 66% had shown the images to others within the last two months, only 17% had led discussions where they posed questions. When asked to explain the images, only 28% correctly cited all the hygiene themes. As a result, it was decided that a 4-session training with each hygienist in his/her village be done over the course of several weeks in addition to the hygiene training done during the water point management committee training. This process was followed for the 4th and 5th wave villages and was appreciated by the hygienists and the field agents. ▪ Hand washing stations: o While tin cans are always available in local markets, when the first 3 waves of villages (43 villages in total) were all asked to purchase tin cans at the same time, they became difficult to find. In the future, staged roll-outs of stations could be done to avoid this problem. o Smaller communities of <200 people had an installation rate of 38%, whereas larger communities of >200 people had an installation rate of 23%. In the future, subdividing communities into smaller neighborhood groups and having one person in each neighborhood responsible for encouraging people to install hand washing stations could increase the installation rate. o The majority of households who stopped using their stations did so after moving. While they all expressed the intention to reinstall the station, it took them several months to do so. In the future, having a person in each neighborhood who was responsible for encouraging

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	people to install stations he/she could also remind people to re-install their stations after moving.
Increase annual incomes and diversify livelihoods of poor rural households through locally appropriate strategies that support and sustain incomes from productive water use activities, focusing on livestock and horticulture. ▪ Identify, select, and provide training to pump manufacturers and drillers to produce and install low-cost technologies for domestic and productive activities. o Training for at least four enterprises that manufacture and sell low-cost potable water pumps and at least four private drilling/installation teams. ▪ Agricultural markets sub-sector analysis. o High-value horticultural crops and livestock products for which smallholders have a competitive advantage will be identified. o Smallholder needs to produce and compete in identified high-value markets will be identified. o Baseline information and direction for developing specific extension training activities will be	*Achievements* ▪ <u>Training of pump manufacturers:</u> o Trained (21 days) 1 new rope pump manufacturer in Matameye. o Refresher training (7 days) to 1 existing rope pump manufacturer in Zinder. o Group training (7 days) for all 3 rope pump manufacturers in Maradi and Zinder to agree on construction norms. o Trained (14 days) and refresher training (10 days) to 1 new Sauki da Riba (SDR) treadle pump manufacturer in Magaria. o Trained (10 days) 1 new SDR treadle pump manufacturer in Matameye. This manufacturer had previously worked in a workshop producing SDRs. o Trained 1 new SDR treadle pump manufacturer in Maradi. This manufacturer already produced Niyya da Kokari treadle pumps but had demand for the SDR model. o 423 SDR pumps sold by Winrock trained manufacturers during the project period ('09-'10) but not all sold in project area (many sold in Mirriah department). It was difficult to measure what percentage of these sales was the direct result of the project's promotion activities. Seventy-nine SDR pumps were sold by manufacturers trained by the MUS project. o Winrock trained manufacturers sold 132 rope pumps during the project period ('09-'10). Sixty-eight rope pumps sold by manufacturer trained by the MUS project. ▪ <u>Training of drillers / installers:</u> o Trained (5 days) 3 new zone rope pump installers/repairers in Matameye, Magaria and Zinder. Subsidized percussion drilling equipment for 2 drilling teams (Matameye and Bandé) and trained (7 days) drilling teams on the use of their equipment. Training would have been longer but members of each team already had experience doing percussion drilling. o 5 potable water drilling teams had 2 days of training on how to calculate costs for potable wells. Marketing materials, including a publicity flyer for each team, were produced to help the teams promote themselves. ▪ <u>Agricultural markets sub-sector analysis:</u> After meetings with experts in the livestock and agriculture sectors, it was decided that incomes in the area could best be increased through improved vegetable

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identified. ▪ Strengthen human capacity for income generation. o At least 30% of households in target areas will have the knowledge and skills needed to undertake high-value horticultural or livestock income generating activities.	production and aquaculture. The latter was on an action-research basis. For each sector, a consultant was recruited and completed a study on the potential. ▪ <u>Improved vegetable production:</u> The study, completed in April 2009, concluded vegetable production could be improved by: training producers on production techniques, improving irrigation systems, and improving access to intrants (seeds, pesticides and fertilizers). As a result, the following activities were undertaken: o 48 demonstrations of the SDR pump in 4 communes with the participation of 1,396 farmers (including 77 women). o 36 SDR pumps were provided on credit to volunteers from 21 MUS villages. o Gardening training. 86 producers with underdeveloped gardens attended one of four, 4-day gardening trainings that stressed hands-on learning, including use of pedal pumps, canalization, soil and bed preparation, selection of best varieties, nursery creation and spacing. As a result, the producers planted an average of 300m² in new crops (mostly onions, lettuce and cabbage). o Rainy season production: In 2009, 56 producers tried rainy season production of tomatoes, only 20 of whom were able to harvest. For those 20 producers, the harvest was quite small (average of approximately 17 USD profit). This profit included the value of consumed tomatoes. On average, 44% of production was sold. In 2010, 36 producers tried rainy season production of tomatoes, cabbage and moringa. While moringa flourished, tomatoes reached flowering stage in only 15 sites. Production was not measured as it was delayed by flooding and hence, coincided with the end of field activities. o Women's gardens. 48 women from the villages of Kereni, Ayraye and Garin Sarkin Noma Idi approached the project asking to be taught how to garden. They fenced in sites of approximately 2000m². During their first cold season (Nov 2009 – April 2010**)** the women sold a total of 2,225 kg of produce for $677 USD and consumed another 950 kg. ▪ <u>Aquaculture Action Research:</u> The sub-sector study proposed that aquaculture be carried out in cement tanks and in areas with clay soils in man-made ponds. o 3 tanks and 4 ponds were constructed and stocked with catfish during two periods of production. o Throughout the two periods of fish production each site was visited twice per month by a local consultant. o Local fish food recipe (blood, bran and peanuts) was

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	developed and improved throughout the two production seasons. o After each production season, a workshop was held for all producers, the aquaculture consultants, local environmental agents, and 3 private aquaculture producers in the area. o Results of the second season were better than those of the first, but still extremely far from what would be needed for economic viability. The 2009 overall survival rate was 6% and the 2010 survival rate was 10% (with the maximum rate of 57%). According to our fisheries consultant, economically viable fish farms need to have survival rates of >90%. o All aquaculture producers intend to purchase a small quantity of catfish and continue with the activity. o Despite the low level of "success" in the project area, the fisheries have received great interest and a number of entrepreneurs, who are more strategically located near roads, have undertaken fish production. *Major Issues/Resolutions* ▪ <u>Training of drillers / installers:</u> o 3 installers were trained rather than 4 as Winrock was working with 3 pump makers. Each pump maker chose 1 apprentice to be trained in installation. o Initially, the strategy was to train one rope pump installer per rope pump manufacturer (a young apprentice of the manufacturer) plus one installer from the workshop of the SDR manufacturer in Magaria (as there is no rope pump manufacturer there). After several months of project activities, it was determined that it would be better to train one member of each the drilling team because they are the ones who are in the field and in contact with the population (whereas manufacturers are more based in town in their workshops). Time constraints prevented the project from implementing this change in strategy. o Of the 3 new zone rope pump installers / repairers, only 1 (Magaria) is currently active. The two others were not as skilled in installing pumps and were subsequently not used or promoted by the project. This didn't prove to be a problem, as there was already a zone repair person in Matameye and there are few rope pumps in the area of Zinder. o Continuing complaints about the quality of garden boreholes (insufficient water columns and aspiration of sand) from producers and local agriculture agents led the project to search for possible solutions. Drillers said that

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	the lack of thick (7mm) short (1.5m) drilling pipes led drillers to fear both falling from the pipes while drilling and not being able to get back their pipes if they drilled too deep. The project subsidized thicker pipes for 6 active teams and in return, each drilling team re-drilled 2 boreholes in their area that had been identified as substandard. Quality control of the new boreholes was insured by the project through pumping tests with a motorized pump. ▪ Reinforcement of pump spare parts supply chain: A few months after installation of the rope pumps it was clear that communities wanted a higher-quality rope. A nylon-cotton blend which is stronger than the nylon rope found in Zinder markets is available in Niamey. The project successfully encouraged two hardware stores (in Zinder and Magaria) to sell the rope and sold a few rolls at cost to communities so they could test the difference in quality. A year after the installation of the pumps, it became clear that a better supply chain was necessary for pistons (and could be useful for pipes and other pump parts). The project identified 3 retailers in markets (Matameye, Doungou and Bandé) who had business contacts in Zinder, Maradi and Kano and could reasonably purchase all the necessary parts. A small initial stock of spare pump parts was given to the retailers and they set common prices which were heavily advertised on local radio stations. After 2 months, 2 of the 3 sellers had sold approximately 200 USD of parts (mostly rope and pistons) and 2 of 3 sellers had already purchased more rope. The parts sellers are also able to direct pump users to the nearest zone repairman or pump manufacturer. ▪ 30% of households have skills needed to undertake high-value horticultural production: Due to time constraints and the seasonal nature of agricultural activities, agricultural support activities were only undertaken in 1st and 2nd wave villages, a total of 2,099 households. Of these households, 86 were reached through gardening training and follow-up and 48 were reached through participation in women's gardens. Nearly all the participants in rope pump, rainy season tomato and aquaculture activities were also participants in gardening training. This means that 134 of 2099 households were reached or 6.4%. The reasons that the project didn't attain the 30% knowledge standard in 1st and 2nd wave villages are as follows: o As stated above, only 65% of 1st and 2nd wave villages were suitable for horticulture. Niger's geology is such that only villages with nearby oases can practice horticulture. The project reached 10% of households in villages that were able to practice horticulture. o One reason the project only reached 10% of households in villages that were able to practice horticulture was the limited amount of time field agents had to provide extension services. For example, in the first year of rainy

Objectives and Milestones	Final Report
	season tomato production, one of the reasons for attrition was the lack of intense follow-up. As a result, the second year it was decided to enroll a smaller group of producers, 36 instead of 56, so that each producer could receive an extension visit every 2 weeks. o Another reason the project reached only 10% of households was that the aquaculture pilot had such difficulties in its first season of production, that a second pilot season was needed to test new feeding regimens, rather than scaling up to new households. o The project researched, but did not pursue, livestock support activities (other than making sure that livestock water needs were provided for) which could have been pursued in the other 35% of villages not suitable for horticulture because it seemed that most livestock support activities undertaken by other NGOs in the area did not continue after the project lifetime. ▪ <u>Improved Vegetable Production:</u> o Credit for SDR pumps: The strategy of giving credit to demonstrators for SDR pumps and boreholes proved difficult, particularly because of the timing. As the project's initial time-frame in the field was from Feb-Dec 2009, project staff didn't think they could wait to start demonstrations until the ideal time for both purchases and for starting gardening activities in Niger, which is just after harvest (Oct-Nov). Therefore the initial demonstrators were chosen in Feb-March. While the demonstrators appreciated the pump, this was not a good time to collect money because people were getting ready for the farming season. Out of 36 demonstrators, 19 paid an average of 36 USD or 30% of the cost of the pumps (with payments ranging from 15-100% of the full cost). o Rainy season production: In 2009, lack of time, soil problems, and lack of rain were major causes of attrition among demonstrators. Also in 2009 there was a lack of training and follow-up for producers as the training was assigned to a part-time consultant who was often unavailable. In 2010, this was remedied through agreements with local agriculture extension agents who made weekly visits to demonstrators. In 2010, flooding caused by excessive rain and insect problems were the major causes of attrition. These increased risks to crops during the rainy season are what lead to the premium prices paid to those who were able to produce. o Women's gardens: The numbers of women active in the gardens decreased in Ayraye from 14 members to 11, in Kereni from 14 members to 10 and in Garin Sarkin Noma

Objectives and Milestones	Final Report
	Idi from 20 members to 7. The attrition is largely due to women having realized that they don't have time to garden, particularly during the rainy season. Despite this, the remaining members of Kereni and GSNI have already purchased onion seeds for the upcoming season (without any project support) and the remaining members of Ayraye have prepared the soil and plan to purchase transplants. ▪ Aquaculture Action-Research: The major known difficulties in aquaculture were: o Feed: Initially the producers gave the food in powdered form which is difficult for catfish to grab and eat. During the second production season producers made the food into granules (and some of them steamed or boiled it). Still, even with this improvement, it is unclear whether the local fish food formula is appropriate. In addition, the producers tended to give too much food to the fish in hopes that this would make them eat more. Instead, the oxygen used by the decomposition of the extra food added to the oxygen problems in the ponds. o Water: During the first season, the ponds were chronically short of water. It proved difficult to keep the ponds filled by using the SDR. During the second season 3 of 4 pond producers switched to motor pumps. Even so, the quantity of water was often insufficient and the water often showed signs of lacking oxygen. o Predators: During the first season many fingerlings in ponds were eaten by frogs. During the second production season all ponds were surrounded by chicken-wire. This kept the frogs out, but large lizards were still able to enter and birds continued to pose problems.
Catalyze a supportive environment for MUS learning, replication, and scale-up through outreach, education, and establishment of a multi-stakeholder MUS Learning Alliance ▪ Conduct outreach and education on MUS to Ministries, NGOs, and sector professionals. o A MUS briefing packet will be developed. Key ministries, WAWI	*Achievements* ▪ 3 workshops and 1 Open Doors Day were held. Key technical agencies (Water, Agriculture, Environment, Health and Community Development), NGO representatives and local government officials were invited to participate. o Zinder workshop, June 2009: 20 attendees o Niamey workshop, June 2009: 15 attendees o Zinder Open Doors Day, May 2010: 30 attendees o Zinder workshop, November 2010: 20 attendees ▪ A MUS powerpoint was shown to attendees of the first two workshops and MUS briefing packets were developed and given to those attending the Open Doors Day. ▪ MUS Open Doors Day was the subject of a newspaper article, a radio broadcast and television broadcast. ▪ A solution story video on a family of MUS project beneficiaries was

Objectives and Milestones	Final Report
partners, NGOs, and sector professionals understand MUS, receive MUS briefing packets, and have been invited to participate in the MUS Learning Alliance. All project staff trained on key "MUS messages." ▪ Establish a MUS Learning Alliance with a total of four workshops: two in Zinder and two in Niamey.	produced. http://www.youtube.com/watch?v=7SgdV8lI6xs ▪ Background training on MUS was given to all field agents ▪ Quarterly reports on MUS activities were produced in French and shared with 30 institutions each quarter (government authorities, communes and interested NGO's). Reports were personally handed over by senior project staff in order to facilitate discussion about the MUS project. ▪ 3 Peace Corps volunteers put pumps in their communities with technical advice from the MUS project. The communities reached by Peace Corps were Koré Haoussa, Commune of Doungou, Department of Kantché; Garin Galadima, Commune of Gouna, Department of Mirriah; and Baouré Ali, Commune of Guidimouni, Department of Mirriah. *Major Issues/Resolutions* ▪ Workshops were organized by project staff where MUS was discussed by actors in water and other key sectors, but an independent MUS Learning Alliance was not established. While such an alliance would certainly be helpful to refine MUS practice and theory, given the busy schedules of sector professionals it is hard to expect them to maintain an active alliance when none of them are currently working on MUS projects.

III. Monitoring and Evaluation

WADA Global Indicators		Outputs or Outcomes (current Fiscal Year)	Measurement Methodology
#	Indicator		
1	Number of people in target areas with access to improved drinking water supply as a result of program assistance	15,704	See note 1
2	Number of people in target areas with access to an improved sanitation facility as a result of program assistance	0	
3	Number of school children in target areas with access to an improved sanitation facility as a result of program assistance	0	
4	Liters of drinking water treated with program-supported methods for point-of-use application as a result of program assistance	0	
5	Percentage of compounds with absence of visible feces in program target communities as a result of program assistance	0	
6	Percentage of compounds in program target communities with a handwashing station as a result of program assistance	25.6%	See note 2
7	Number of hectares under improved water resource, watershed, or basin resource management as a result of program assistance	0	
8	Number of watershed/basin stakeholder governance groups supported with program assistance	0	
9	Number of policies, laws, agreements, or regulations promoting sustainable water resources, watershed, or basin resource management and conservation that are implemented as a result of program assistance	0	
10	Percent of operations and maintenance costs for water supply and sanitation services covered through customer charges in program -assisted target areas	100%	See note 3
11	Number of community water and sanitation committees established and trained with program assistance	58	See note 4
12	Number of policies, laws, agreements, regulations, or investment agreements promoting sustainable water supply and sanitation that are implemented as a result of program assistance	2	See note 5
13	Funds leveraged for program-supported projects	24,607	See note 6
14	Number of positive external media publications, awards, or public recognition involving the Alliances' activities	3	

1. Project staff estimated the population of each village at the beginning of the project. As villages were served the population of each village was added to the number of people served. In a few villages where there were existing pumps, the population was divided between the pumps and only a fraction was counted towards project results. (See community list for more details.)
2. Each field agent had a sheet for every village on which they recorded the names of heads of household who installed handwashing stations, the number of stations installed, and the number of users for each station. On two separate occasions random households were selected for verification. 100% of verified households had installed stations.
3. 100% of O&M costs were covered through customer charges as the project did not provide any O&M support other than technical advice and follow-up. All pumps were functioning at the end of the project, so costs were being covered by communities. The current average

holdings of committees was ~15 USD while the average O&M over 16 months was ~22USD so the average collected over the past 16 months was ~37 USD.

4. The number of communities trained is based on training reports provided by trainers at the end of each training. Each training is attended in its entirety by field agents, who are responsible for the logistics and either the Technical Director, Coordinator or Project Director visits for the opening of each training.
5. We have 2 agreements with two different commune governments about having potable water in the marketplace for people who come to market. Winrock furnished most of the cost of installing the pumps and the communes maintain them.

Submitted by Winrock International on 31 March, 2011.

6. Funds leveraged as a result of the project

XOF conversion rate	450			
Designation	cost per unit	#of units	cost XOF	cost USD
village rope pump contributions	25000	41	1,025,000	2,278
visit of richard cansdale	1541237	1	1,541,237	3,425
investment in aquaculture : 2 earth ponds + fish	400000	2	800,000	1,778
estimation of total cost of SDRs and boreholes sold	65000	100	6,500,000	14,444
total fiscal year '08-'09				21,925
commune contribution to market water points	36000	2	72,000	160
village rope pump contributions	25000	13	325,000	722
boreholes sold through december promotion	30000	27	810,000	1,800
total fiscal year '09-10				2,682
grand total				24,607

IV. Water Quality Testing

See attached documents.

V. Direct Beneficiaries

Total Direct Beneficiaries and Explanation	Estimated Overlap and Explanation	Net Direct Beneficiaries
15,704 people benefitted from potable water • Access to potable water achieved through the installation of 64 low-cost water points 35 people (5 households) benefitted from additional water from household pumps for either livestock or human use 5600 people (800 households) benefitted from hand-washing stations 86 male and 48 female gardeners benefitted from training and follow-up • Four 4-day trainings and weekly follow up extension services 7 aquaculture producers benefitted from investment in aquaculture infrastructure, training and follow-up 20 metalworkers benefitted from pump manufacturing training (5 workshops with approximately 4 workers in each) 36 drillers (6 teams with approximately 6 members each) benefitted from training and investment in materials.	All potable water, hand-washing station, gardeners, 6 aquaculture producers and 28 household pump users overlap with those benefitting from hygiene training activities.	15,768

Submitted by Winrock International on 31 March, 2011.

VI. Telling Our Story[4]

Cluster repairmen given in-depth rope pump repair course

November 23, 2010

"Before, I knew how to change the cord and put on grease, but now I even know how to bend the pipe that takes in the rope," said Mourtala Ousseini, the cluster repairman from the village of Zougoubi in the region of Zinder, Niger. Mourtala and 20 other cluster repairmen had just finished a three-day in-depth course in how to maintain and fix rope pumps. The training, as well as the installation of the rope pumps themselves, is part of the activities of the Multiple-use Water Services (MUS) Project, financed by WAWI and WADA and implemented by Winrock International.

Mourtala was chosen by the other village repairmen in his cluster because of his skill in caring for the two rope pumps in Zougoubi, which, in the 19 months since the installation of the first pump, have never been broken for more than a day. The Zougoubi cluster has 4 villages and 6 pumps. There are a total of 21 clusters that contain 64 rope pumps put in by the MUS project and 6 rope pumps put in by Winrock with the support of a different WAWI project in 2009. The maximum distance between villages in a cluster is 2 kilometers. This means that cluster repairmen can walk from one village to another and that all the repairmen in a cluster already know each other, which facilitates communication.

In all villages where the MUS project installed rope pumps, the villages chose a repairman to install the pump with project staff and also received one-day training on pump repair that covered the essential maintenance and repairs: changing the cord, taking out the pipes, tightening screws and greasing ball-bearings. In order to make sure that most repairs can be carried out locally, without the expense of having a zone repairman come from 30 kilometers on a motorcycle, the cluster repairmen were given extra training. The training included both exercises in diagnosing the cause of certain problems (for example, what are all the possible reasons a pump no longer brings as much water as it did when first installed) and hands-on exercises in molding plastic and taking out pipes.

Since his training, Mourtala recently was called to help repair a pump in the village of Karaye, about 2 kilometers away. The pump had mysteriously stopped turning. Mourtala took the pipes out and saw that the cord had become wound around the pipe at the bottom of the borehole. He unwound it, reduced the amount of cord and carefully returned the pipes to the borehole. Then he walked back home, proud.

Cluster repairmen practice making pump parts during their 3-day intensive training in Doungou, Niger.

[4] High-definition images will be sent by mail on a DVD.

Submitted by Winrock International on 31 March, 2011.

Hand washing stations please parents

November 23, 2010

"The station is helpful to me because it means my children can wash their hands by themselves without my help," said Moussa Abdou, a farmer in the village of Sara Sara, Region of Zinder, Niger. Moussa bought and installed the station himself over 14 months ago after field agents from the Multiple-use Water Services (MUS) project came to his village and taught about the importance of hand washing with soap as a way to better health. The MUS project is financed by WAWI and WADA and implemented by Winrock International.

The MUS project had already brought 2 pumps to Moussa's village (a hardware cost of approximately $2,000 USD) but stressed that his own investment in a tin can and plastic teapot (approximately 71 cents) for use as a hand washing station could be just as important in improving his health. Washing hands with soap at the two critical moments (before eating and after using the toilet) can reduce the incidence of diarrhea by 44% without any other intervention. In comparison, just improving water sources, through pumps etc, reduces the incidence of diarrhea by 25%.[5] Together, improved water sources and hand washing can have a real impact on health.

MUS field agents used hygiene images and theater to teach men, women and children about the two critical moments for hand washing. As a result, 800 households (25% of the total number of households) in 61 villages have bought and installed hand washing stations between May 2009 and October 2010. The MUS project chose the design of a tin can with holes as the station because it is very cheap and can be purchased by the users and because it serves as a visual reminder to wash one's hands. Surprise randomized visits by evaluators 2 months and 9 months after installation showed that, respectively, 86% and 46% of households continue to use the stations.

The station is not only for children. Adults use it as well. Of those still using the station after 9 months, 100% said they washed their hands with soap more frequently than before they got the station, an average of 3.5 times per day. Children, like Moussa's son Chazali, use the station with soap an average of 2.5 times per day.

Moussa Abdou (l) and Chazali Moussa (r) wash their hands at the station Moussa installed 14 months earlier.

[5] 5 Lorna Fewtrell, Kaufmann R.B., Kay D., Enanoria W., Haller L., and Colford, J.M.C., Jr. 2005. "Water, sanitation, and hygiene interventions to reduce diarrhea in less developed countries: A systematic review and meta-analysis." The Lancet Infectious Diseases, Vol. 5, Issue 1: 42-52. As quoted in Guide de planification du Journée Mondial du Lavage des mains, deuxième édition.

Submitted by Winrock International on 31 March, 2011.

A Kabori Story: Multiple-use Water Services in Niger

December 7, 2010

Ali Maman is a farmer and gardener. He lives with his three wives, Hadiza, Habiba and Nanuwa, five children and six grandchildren in the village of Kabori, Zinder.

"Me, before the project came, you can see the work that I used to do. It's just some sugarcane and some squash and a couple of tiny tomatoes … That's what I put because watering the plants is really hard. That's why we did those plants. Sugarcane is only harvested once a year so I won't get any money from this crop until next year. A crop that we can only harvest once a year, that is hard on us. The difficulty of watering the plants is what keeps us from growing other crops."

Winrock International's Multiple-use Water Services (or MUS) Project, which is financed by WAWI and WADA, helped to turn Ali's limited garden into a year-round steady source of income.

In March 2009, Ali volunteered to demonstrate a manually drilled borehole and a low-cost treadle pump. His borehole was drilled by a drilling team based in Matameye, a town just 30 km from Kabori. The pump was made by a metalworker also based in Matameye and trained by Winrock. The proximity of the pump's manufacturer is important when Ali's pump needs repairs. This suction pump can lift 4-6 m3 of water per hour from a depth of 10 meters.

Project staff showed Ali how to set up and maintain the pump, and how to build a network of irrigation canals. Before learning how to build irrigation canals, Ali had carried water from his traditional well to each individual plant. This laborious method of irrigation severely limited the area that Ali could cultivate. Since he got the treadle pump, Ali has doubled the size of his garden.

In August 2009, during the rainy season, Ali harvested his first ever crop of peppers. In Niger, the rainy season is traditionally reserved for field crops, like millet and beans. The months of July and August, in particular, are known to local farmers as "the hungry season," because they must wait for these crops to mature .

In December 2010, after attending a training the MUS project gave on high-value crops, Ali planted 500 m2 (a quarter of his garden) in cabbage, lettuce and onions, three crops he had never grown before. Ali also planted his first moringa trees. Moringa is a small tree that produces leaves high in vitamin A all year round.

In January 2010, Ali bought himself a small motor pump so that he could more quickly irrigate his growing garden and keep up with the demand for water of his fish pond. He still uses his treadle pump when the motor pump is broken or when he has no money for petrol.

With technical advice from Winrock, Ali and his sons had dug a 100m2 fish pond next to his garden. Winrock provided 6000 improved catfish and a local fish food made of bran, blood and peanuts as part of the MUS project's small pilot project (only 7 producers were chosen) on rural fish production. Though the

pilot project did not give the results that were hoped for, 90% of the fish died before harvest, all 7 producers, including Ali, plan to purchase a small number of fish themselves and continue with the activity.

While Ali had problems getting enough water to irrigate his garden, his wife Hadiza had problems getting enough water for their family to drink, cook, bathe, wash clothes, and water their sheep and goats.

Kabori's traditional well is a sandy 10-minute walk from the village. Hadiza often found herself rushing to bring home enough water in the evening. While water from Kabori's traditional well is plentiful, it also carries a risk for diarrheal diseases. The ropes used to pull up water drag mud into the well, and the excreta of livestock, watered just meters away, drain into it.

In the Zinder Region, where Ali and Hadiza live, diarrheal diseases and malaria are the major reasons why over 20% of children do not live to see their 5th birthday.

The same local metalworker who made Ali's treadle pump also made two low-cost rope pumps that were installed in Kabori by the MUS project. The pumps sit on top of two manually-drilled boreholes, 18 and 11 meters deep. Now, Hadiza can get clean, safe water for drinking, washing and cooking any time of day just 100 meters from her house. Like all the other married women in the village, she contributes about 5 cents per week to the upkeep of the pump.

At first glance, the water problems of Ali and Hadiza, and the solutions brought by the MUS project, seem separate. In fact, they are closely related in at least two ways. First, if the treadle pump were the only source of pumped water in the village, it is likely that Ali and Hadiza would prefer to carry this clear water home than to drink the tan water that comes from the traditional well. Despite the water's clarity, it could be contaminated by the fertilizers and pesticides used in the garden or by the garden-well water that Ali uses to prime the pump. Secondly, the solutions are related because the extra money that Ali and other gardeners like him earn with their treadle pumps will help maintain and improve village infrastructure, including the rope pump. Winrock hopes that in the future, Kabori, and other villages like it, will invest in rope pumps and boreholes, a total cost of around 500000 FCFA, without project assistance.

"We can improve our lives, that's why we like this project. You help us at first and we can continue to improve. That makes us happy," said Ali.

Submitted by Winrock International on 31 March, 2011.

Nanuwa, Ali's wife, pumps water from a locally-made rope pump just 100 m from her home.

Hadiza Ali pumps water from a locally made rope pump just 100m from her home.

Ali Maman with his first crop of peppers (several months before harvest).

Submitted by Winrock International on 31 March, 2011.

VII. Partner Participation

USAID Mission engagement

A 1-day field visit was made to the project by a USAID representative based in Niamey (Gary Cramer) at the start of the project in February 2009.

Coca-Cola Bottler/PAC engagement

In May 2009, MUS project staff met with 2 representatives of Braniger (the local Coca-Cola bottler) and the senior operations manager for Coca-Cola Africa. Potential for collaboration was discussed, but no concrete steps towards collaboration were taken.
In May 2010, representatives from The Coca-Cola Africa Foundation and from Braniger attended the Open Doors Day event which showcased the project to a range of local officials and NGOs.

VIII. Media/Awards

1. Best Practices & Innovations Award from InterAction

In November 2010, "Water for Health and Wealth: Multiple-use Water Services" was presented with a Best Practices & Innovations (BPI) Award from InterAction. While the prize was not specifically for the MUS Niger project, the experience gained during the project and the project results were important in the application.

2. Global Waters

In September 2010, MUS was featured in the State Department's new "Global Waters" newsletter. The article is attached (see Annex 2) and can also be found on the web at:
http://www.usaid.gov/our_work/cross-cutting_programs/water/globalwaters/p10_multiple100905.html.

3. State Department book

In March 2010, an essay about the MUS project in Zinder was published as part of the State Department book: Global Water Issues.
http://www.america.gov/publications/books-content/global-water-issues.html

4. Sahel Quotidienne article

In May 2010, the national state-run newspaper published an article, attached below (Annex 2), about the Open Doors Day that the project organized.

5. ORTN television spot

In May 2010, the national state-run television chain showed the Open Doors Day. A DVD was sent to GETF immediately after the broadcast and so is not attached here.

Submitted by Winrock International on 31 March, 2011.

IX. Sustainability

Community Level

The water points financed by WADA and WAWI continue to be managed by the village-level community water point management committees. In a random sample of 15 villages done after 16 months of operation, all 15 pumps were still working. All, except one[6] had repaired their pump, spending an average of 10.114 XOF (approximately $20 USD) per pump over the 16 month period. The average amount in the savings boxes on the day of the interviews was 7000 XOF (approximately 14 USD) per pump.

Because of the close collaboration between the MUS project and the District Agriculture Office, the District Agriculture Agent has said that he will try to get the 3 women's gardens included in the FAO women's gardens program. He will also make sure that they get a portion of the annual FAO seed distribution.

Project Level

Because of the results achieved during the WAWI/WADA project, USAID has decided to finance another MUS project in Zinder through WA-WASH. While the intervention villages will be different, some follow-up of old villages will be included in order to monitor the maintenance costs over time. The WA-WASH project will continue to work with the same drillers and pump manufacturers and thus will continue to support the supply-chain for low-cost water points.

X. Overall Lessons Learned/Feedback

The monthly phone calls were sometimes difficult to arrange given all the partners (not just GETF and 2 representatives from ARD, but also GTZ, Animas, World Chlorine Council, etc.) and their travel schedules. Also, since the two Niger projects didn't have much space for overlap (either geographically or content-wise) it seemed a bit odd to try to manage them as a group. Still, this caused no significant difficulty.

Reporting was fairly straightforward and well explained in the reporting guidelines.

[6] This is likely an error of the interviewer as in a subsequent discussion the repairperson said that he'd changed the cord several times.

Annex 1: Unsuccessful Boreholes

MAGARIA CEG-5

Background:

- Demonstration borehole is located at a middle school in an area where the watertable is relatively deep (25m);
- Drilling was done using jetting method;
- Planned to install an India Mark 2 pump on a low-cost borehole.

Result of drilling:

- Borehole reached a total depth of 27,3 m and 1,94 m water column in sandy soil. Drilling was stopped because the team had reached the limit of its equipment. It is possible that a team with better equipment of the same type, could drill a productive borehole in this area;
- The pumping tests showed that the borehole could not support a pump.

Current status:

- The site was declared unsuitable for the current range of low-cost technologies because a drilling team with access to all current manual drilling methods (auguring, percussion and jetting) could not drill a borehole;
- A letter explaining the reasons for the closing of the site was sent to the school director, the water department and the mayor;
- The borehole was removed.

Possible solutions:

- Drill a borehole using a Nigerian team and the jetting technique (a team has been said to have recently drilled a borehole of 63 meters in similar conditions) and invite Nigerien drilling teams to watch;
- Drill a borehole using a motorized drilling machine.

HOUDEL

Background:

- MUS intervention village (4th wave);

Result of drilling:

- The drilling and re-drilling of a borehole used the augering and percussion methods in thick clay. A rope pump was installed but the water cut out frequently and the population was unsatisfied with the quantity (this pump was left, however, and continues to be used);

- A second borehole of depth 27m61 with a water column of 2m70 was drilled using the jetting technique. Drilling was stopped because the team had reached the limit of its equipment. It is possible that a team with better equipment of the same type could drill a productive borehole in this area;
- Pumping tests showed that the borehole could not support a pump;

Current status:

- The borehole was left to the village to use with a PVC dipper to water livestock. A meeting between residents, the water department and project staff established, in writing, that the borehole is left to the village for the purpose of watering livestock;

Possible Solutions:

- Drill a borehole using a Nigerian team and the jetting technique (a team has been said to have recently drilled a borehole of 63 meters in similar conditions – clay and sand) and invite Nigerien drilling teams to watch;
- Drill a borehole using a motorized drilling machine;
- Place an India Mark 2 pump.

<u>GARIN FAROU</u>

Background:

- MUS intervention village (1st wave);

Result of drilling:

- There were three unsuccessful attempts to drill the borehole using the percussion technique. All 3 boreholes were stopped by a layer of very hard rock that continually broke the drilling equipment;
- There was a visit by a well expert and a decision to traverse the hard layer by using well digging techniques followed by continued use of percussion techniques ;
- The well digging team was unable to traverse the same hard layer (at approximately 14,5 meters) after 2 months;
- A second, more experienced well digging team was also unable to dig through the rock;

Current status:

- A meeting was held with second well digging team, village leaders and project staff to explain the reasons for stopping work;
- The village asked for the well to be left so that they could continue themselves;
- A letter explaining the reasons for stopping work and the assumption of responsibility for the work site by the village was written to the village chief, the mayor and the water department;

- Traditional well was rehabilitated

Possible solutions:

- Conduct a geological study to see whether there are better sites for drilling in the area;
- Use a motorized drilling machine;
- Install a rope pump or an India Pump depending on the depth needed to reach water.

Submitted by Winrock International on 31 March, 2011.

Annex 2: Media

Global Waters - September 2010

News from the Field: Multiple-Use Water Approach Brings Multiple Benefits in West Africa

In many cases around the world, government officials and others have taken a top-down approach in introducing new water systems, including erroneously assuming—or even mandating—that people use water for only a single purpose. For example, only for domestic use in the home or for productive uses such as crop irrigation and livestock.

A better approach, the U.S. Agency for International Development (USAID) and its partners have found in recent years, is to develop "multiple-use" water services or systems (MUS). With a MUS approach, planners presume that people need water—and will use it—for a range of purposes, from drinking and cooking in the home to generating income from farming and other economic activities.

In the West African country of Niger, that MUS approach has certainly made a difference to Hadiza Ali and her husband, Ali Mohammed. The two of them and other family members live in the village of Kabori, in the administrative region of Zinder, in southern Niger.

In the past, Hadiza used to walk six times a day to collect water from a traditional well. That well provided drinking water for both humans and livestock. The well opening is at ground level and so any spilled water and rain water could carry dirt and animal waste back into the well. That increased the chances that diarrhea-causing waterborne illnesses would be spread, especially to the village's children.

Now, with a new water supply developed with support from USAID and Coca Cola, Hadiza no longer walks to the traditional well. Instead, she uses a rope pump that is much closer to her home and that provides cleaner, safer water.

Her husband has also benefitted from an improved water supply. Before, Ali used to draw water from a well and then carry it to each plant individually. "The difficulty of watering plants kept us from growing other crops," he says.

Ali now waters his garden using a new treadle pump and a series of irrigation canals. Ali has doubled the size of the garden and added new crops, including onions, cabbages, and lettuce. The garden now provides the family a year-round source of nutrition and increased income.

The project serving Kabori and other Zinder communities has been implemented for USAID by Winrock International, a U.S.-based nonprofit organization, since late 2008. Called Water for Health and Wealth: Multiple-Use Water Services in Niger, the Winrock program has so far improved water access for more than 13,500 people, helped over 80 gardeners increase their crop yields, provided hygiene training for more than 17,000 persons, and installed and provided training for seven experimental aquaculture ponds.

Besides improving health conditions, the MUS project has generated new employment in the Zinder region. Both the rope pumps and the treadle pumps are manufactured locally, using completely local materials.

The locally manufactured pumps have proved to be much more reliable than hand pumps that some other organizations have installed elsewhere in Niger. Hand pumps provide safe water but can be difficult and expensive to maintain. Some replacement parts for the hand pumps that are common in Niger cost over $500. That is far beyond the resources of most villagers, many of whom survive on less than $2 per day, earned from farming and raising livestock. In contrast, repairs to the new Zinder pumps can be made by local metalworkers, with spare parts costing under $25.

Winrock's multiple-use strategy in Niger was based on a systematic cost-benefit assessment of single-use versus multiple-use water services and their potential suitability for South Asia and sub-Saharan Africa. Winrock completed that study in 2007, with financing from the Bill & Melinda Gates Foundation. The results of that evaluation indicated that while multiple-use services can initially cost more than single-use systems, they offer significant advantages over the long term.

Hadiza and Ali have certainly seen the benefits for their village. "We like the project," says Ali, "because we can improve our lives. You help us at first, and we can continue to improve."

Submitted by Winrock International on 31 March, 2011.

Sensibilisation des populations sur les multiples usages des services de l'eau dans la région de Zinder

Accroître l'accès à l'eau potable des communautés

Dans une région comme celle de Zinder où les populations sont confrontées à des problèmes récurrents de l'eau, les actions de sensibilisation dans le domaine sont toujours d'une grande pertinence. C'est ainsi que le 11 mai dernier, les responsables du projet pilote sur les multiples usages des services de l'eau (MUS) dans la région de Zinder, ont organisé une journée porte ouverte.

Les populations des départements de Kantché et Magaria se sont massivement mobilisées pour découvrir et apprécier les réalisations de ce projet pilote à travers les actions de terrain organisées dans le cadre de cette journée portes ouvertes. La première étape de la série de visites a été la commune urbaine de Matameye. Dans cette localité, la délégation s'est intéressée à un atelier de fabrication de pompe de maraîchage, un modèle modifié de « Niya da Kokari ». Ici elle s'appelle « Sawki da riba ». Selon le responsable de l'atelier, un des trois que le projet a installé dans la région, cinq pompes sont fabriquées quotidiennement.

En réalité, c'est sur le terrain qu'ils trouveront les réponses à la plupart des questions qu'ils ont posées lors de l'étape de Matameye. Le déplacement en valait la peine, puisque les invités ont été plus qu'impressionnés. Installées dans une zone où la nappe phréatique n'est pas profonde (entre 8 et 12 mètres), ces pompes délivrent d'importantes quantités d'eau, à la grande satisfaction des consommateurs. C'est le cas notamment de la commune rurale de Doungou où ils ont découvert deux modèles de pompes : la pompe Kanze et la pompe à corde. Poursuivant leur visite, les participants à la journée portes ouvertes se sont également rendus dans le village de Ayrayé où ils ont visité la pompe à corde du village, le jardin maraîcher des femmes et la station de lave main. Le plus impressionnant est sans doute la station de lave main. En effet, les villageois se sont rendus compte que la plupart des maladies sont transmises par les mains sales. Aussi, grâce à l'installation de cette station, en fait une pompe, ils peuvent désormais se laver les mains. Quant au jardin maraîcher des femmes, il a été créé en 2009 par l'ONG Win rock international. Il a une superficie de 0,25 hectares et est équipé par deux forages financés par la même ONG.

La dernière étape de cette série de visites a été le village de Kaborl, où est expérimenté un site de pisciculture. L'étang est empoissonné avec des silures. Cette activité, selon son promoteur, est très rentable, puisque l'espèce qui est empoissonnée est très appréciée pour sa viande. C'est par la seconde pompe à corde du village que la visite de terrain a pris fin. Son installation a été jugée nécessaire pour répondre aux besoins en eau de la population, la première étant insuffisante. A ce jour, 67 pompes, tout système confondu sont installées dans 14 communes des départements de Kantché et Magaria. Elles sont facilement réparables selon les techniciens, ce qui fait que les populations ont manifesté leur intérêt pour celles-ci. Leur technologie est maîtrisée par les artisans. Car l'approvisionnement en eau du milieu rural a comme défi principal, la durabilité des systèmes. Mieux, les multiples usages des services de l'eau sont conçus en fonction des besoins multiples que rencontrent les ménages vulnérables. Il s'agit ici d'une approche pragmatique des initiateurs, qui, dans leur démarche, veulent faire comprendre aux populations de la zone où se trouvent les pompes, que l'eau ne sert pas uniquement à boire, à se laver, faire la lessive etc. L'eau a d'autres multiples usages tels que dans les domaines de l'hygiène et de l'assainissement, les activités génératrices de revenus.

Contrairement à l'approche actuelle qui se focalise surtout sur la fourniture de l'eau pour un usage unique, notamment pour la boisson et la production. C'est d'ailleurs pourquoi, l'un des objectifs des multiples usages des services de l'eau, est d'introduire des services de l'eau à usages multiples, techniquement et économiquement viables, qui permettent aux ménages ruraux pauvres d'améliorer de façon durable et équitable leur accès à l'eau, aux revenus, à la santé, à l'hygiène et à la sécurité alimentaire.

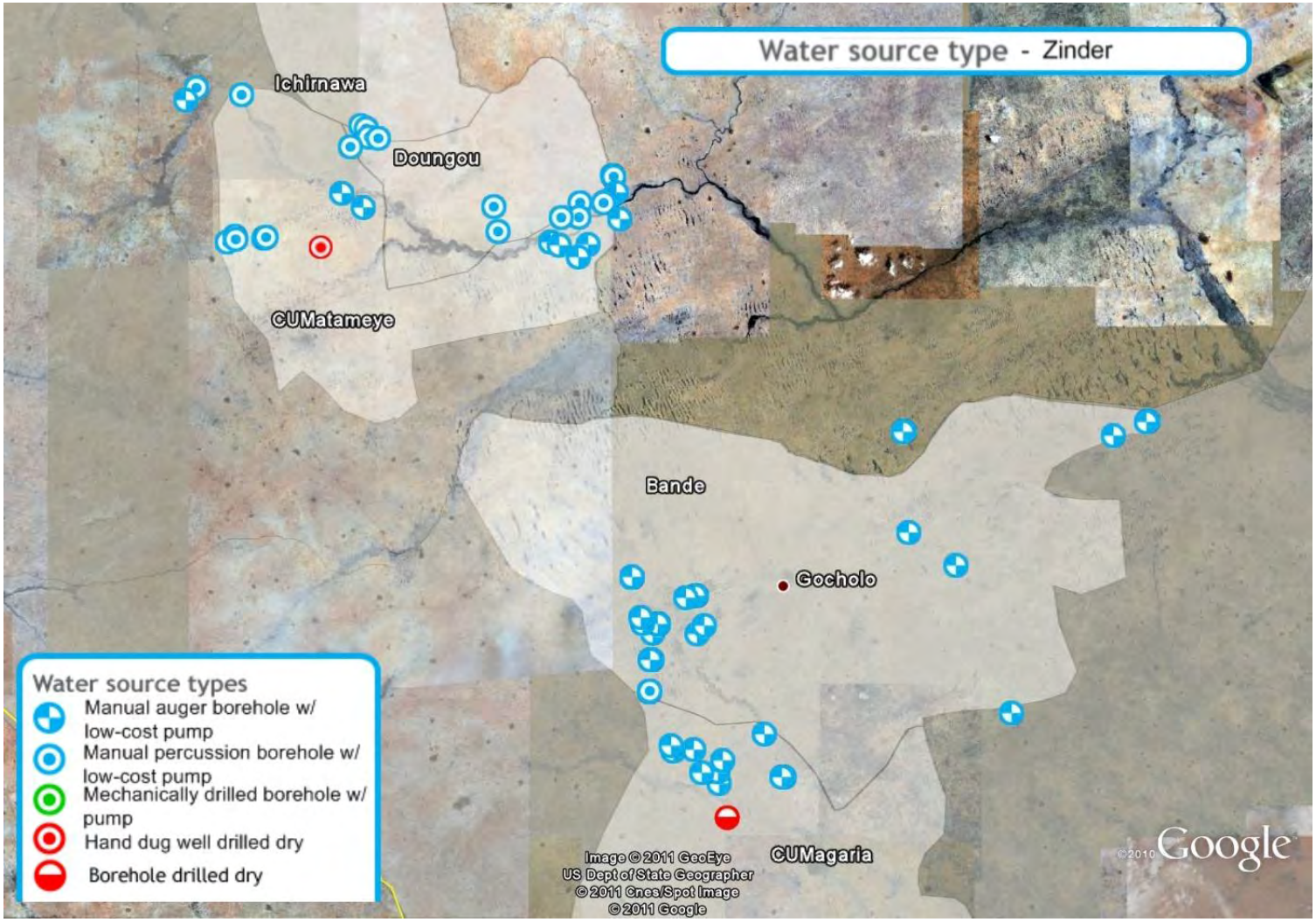
La fin de la journée a été surtout marquée par les interventions des différents partenaires qui ont financés l'installation de ces pompes. Il s'agit de la fondation de l'USAID. Leurs représentants ont salué cette initiative qui ne manquera certainement pas de faire école. Ils se sont dits impressionnés par les réalisations sur le terrain, avant de féliciter et d'encourager les responsables du projet. Aujourd'hui, c'est une population de 16.000 personnes, réparties dans les départements de Kantché et Magaria, qui bénéficie de ces réalisations.

*** Abdou Saïdou**
ONEP Zinder / Diffa

2010 Le Sahel

* Saïdou Daoura, envoyé spécial

Annex 3: Maps


Water source type - Zinder
Ichirnawa
Doungou
CUMatameye
Bande
Gocholo
CUMagaria
Water source types
Manual auger borehole w/ low-cost pump
Manual percussion borehole w/ low-cost pump
Mechanically drilled borehole w/ pump
Hand dug well drilled dry
Borehole drilled dry
Image © 2011 GeoEye
US Dept of State Geographer
© 2011 Cnes/Spot Image
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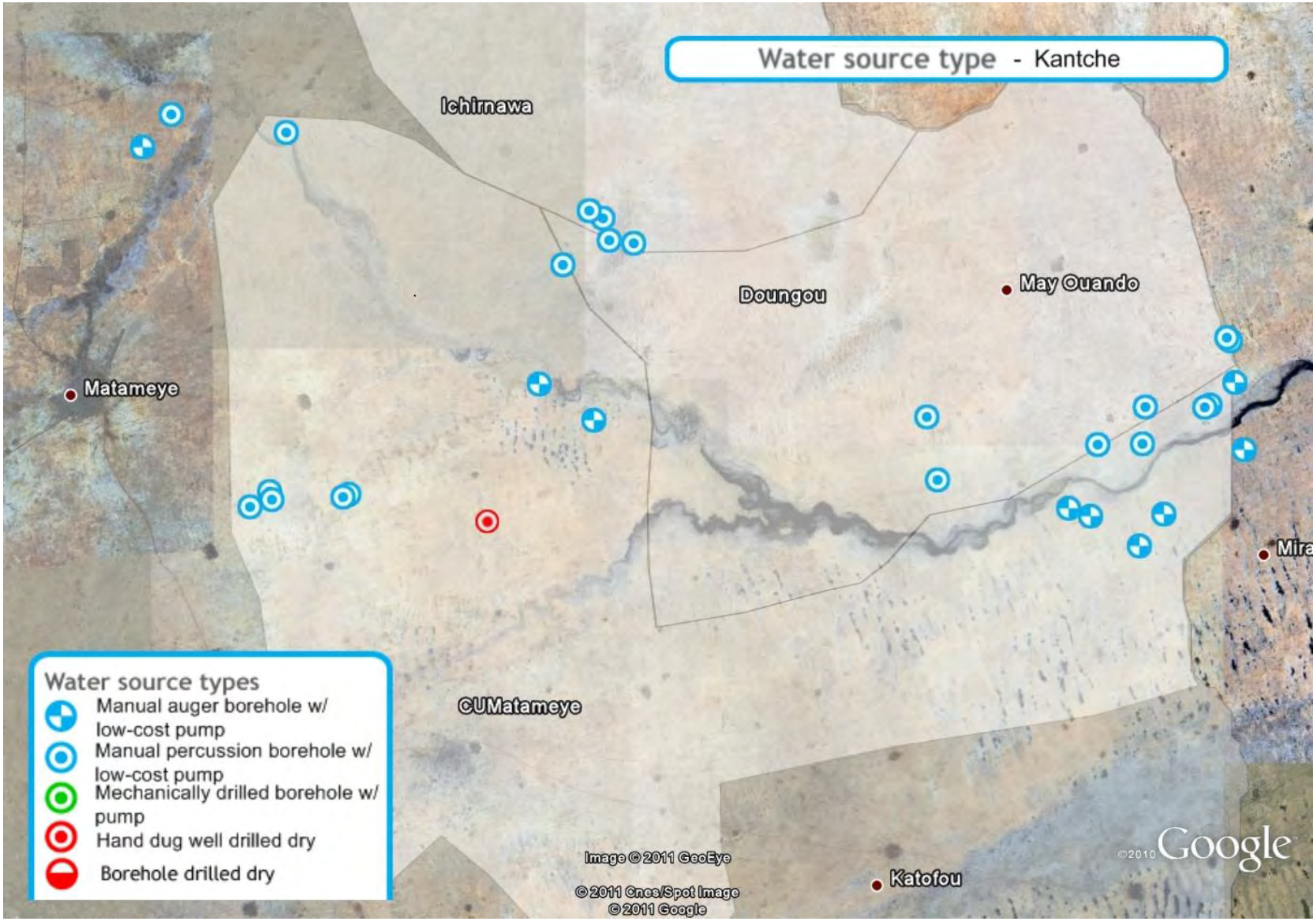
Google


Water source type - Kantche
Ichirnawa
Doungou
May Ouando
Matameye
CUMatameye
Katofou
Mira
Water source types
Manual auger borehole w/ low-cost pump
Manual percussion borehole w/ low-cost pump
Mechanically drilled borehole w/ pump
Hand dug well drilled dry
Borehole drilled dry
Image © 2011 GeoEye
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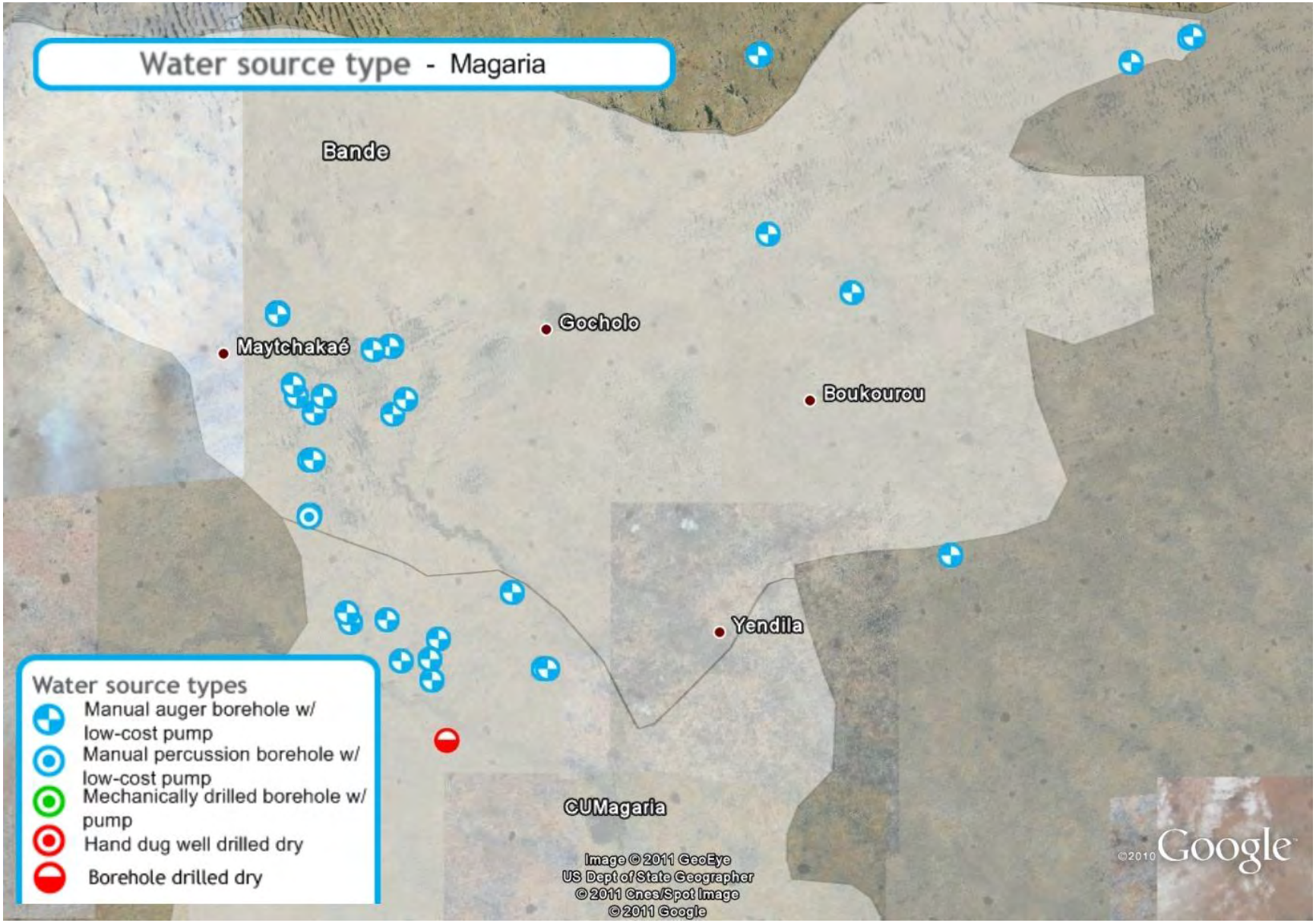
Water source type - Magaria
Bande
Gocholo
Maytchakaé
Boukourou
Yendila
CUMagaria
Water source types
Manual auger borehole w/ low-cost pump
Manual percussion borehole w/ low-cost pump
Mechanically drilled borehole w/ pump
Hand dug well drilled dry
Borehole drilled dry
Image © 2011 GeoEye
US Dept of State Geographer
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