

Inter Aide is doing rural WaSH activities in Sierra Leone and in Bombali district since 2007.

So far, approximately 133 new hand-dug wells have been built and 20 rehabilitated by Inter Aide. If common standards recommend a well for 250 persons, smaller communities of 150 people and above have been also targeted.

Indeed in Bombali District, the population is dense but also scattered: there is an important ratio of people living in small communities.

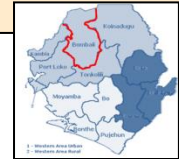
## HHWT



As a matter of consequence, these small communities are often excluded from intervention of any actor for the construction of new water points because:

- it requires too much investment to target less beneficiaries than an improved water point can serve,
- the construction by itself would be difficult as few people would be available for community work (collecting local material, digging, assisting masons...)
- the cost of construction and maintenance of a hand pump might be expensive as less people could contribute.

Bombali District is a district in the Northern Province of Sierra Leone. Its capital and largest city is Makeni. The population of Bombali district as of 2012 is 483,674 and it comprises 13 chiefdoms.



## Wells construction / Rehabilitation



**To tackle this issue and to avoid leaving people in needs aside, Inter Aide launched in 2011 a pilot approach of household water treatment.**

It consists in training a water committee among which specific persons have the responsibility to chlorinate water for each household in the village. In **2016**, it is a total of **107 communities and more than 7 000 persons** who have been targeted and who successfully continue to drink treated water from their local source.

**This document is a review of the approach and tries to highlight the reasons of adoption of chlorination.**

## Water points maintenance



In parallel, Inter Aide is piloting a maintenance program that consists in developing a network of professional technicians able to provide support to villagers in case of breakdown of their well's hand pump. These technicians are also promoting their services for an annual preventive diagnosis of the hand pump in order to avoid major breakdowns.

These combined options are a possible way to reach **100 %** of water coverage and sustainable access.

See also [www.interaide.org/watsan/sl](http://www.interaide.org/watsan/sl) and different notes on *"Pratiques"* [Inter Aide website](http://www.interaide.org).

# Household Water Treatment : the communities' training – the filtration-chlorination

The average size of the targeted villages is in general **60 people or 10 houses** .

An intervention of Inter Aide is conditioned by an **official request** of communities : after the team explained the program and the way it is implemented, a village which thinks that its needs can be addressed by the answer proposed has to write an official request letter.

*One example among others is the village of Kayumbay in Sella Limba which wrote a letter to Inter Aide office in Kamakwie after hearing the radio broadcasting organized by the team.*

The first step induces a **house to house survey** by the team to assess exact data concerning population but also health, hygiene situation and habits, as well as conditions of access to water.

Then a **Water Committee** will be created with a chairman, a chairlady, a secretary and chlorinators. Two chlorinators for 50 persons – a male and a female, are in charge of the chlorination. The town chief is always appointed to be the Advisor of this committee. The role of each member is explained and all villagers are informed of the advantages of chlorine.



Hygiene sensitization and explanation of the water contamination cycle.

A **hygiene and sanitation sensitization** meeting will be organised to diffuse good practices: explain the water contamination cycle, the importance of washing hands, drinking safe water, storing food and water properly, as well as fighting against open defecation through promotion of construction of latrines.



Posters of diarrhea causes and prevention measures are paste in the community



The sensitization meeting insists on the importance of latrines to avoid water contamination

## The role of the chlorinators

A **specific training** is organised for the chlorinators (although everybody is invited to witness) where they learn to:

1. wash hands with soap or ashes before processing,
2. filter the water that has been fetched with the white cloth in order to remove solid particles,
3. use the syringe to pull correct amount of chlorine,
4. shake to mix and wait 30 min before drinking (time for the chlorine to kill germs present in the water).



During the **supply distribution**, each household will get a 5 gallons\* container and a drinking cup at a subsidized price by Inter Aide and the water committee will be in charge of chlorination kits - 1 kit for 50 persons - composed of a **bucket with cover, 2 syringes, a white cloth and a funnel**. They will organize themselves to buy the bottles of chlorine (details next page).



Each household receives a container and a cup



The chlorinators organize themselves to make sure all households have treated water at least for two days: either people drop-off their containers after fetching early in the morning at the chlorinators' houses, either the chlorinators go house to house.

- A kit for 50 persons = **45 000 Le**
- Set rubber + cup per household (< 8 people) = **13 000 Le**

Inter Aide takes in charge 75% of the costs, **communities pay the 25% remaining**.

Ex. : for a community of 10 households (50 persons), the initial cost (before refill) is **40 000 Le: around 10 USD or 8.75 €**

→ **Initial cost** for 1 family: about **4 000 Le** (~ 0.50 €)

→ **Yearly cost** for 1 family (refill): about **3 000 Le** (~ 0.40 €)

\* 1 Imperial gallon ≈ 4.55 liters, 1 container ≈ 22.5 L.



# Household Water Treatment : the communities' training

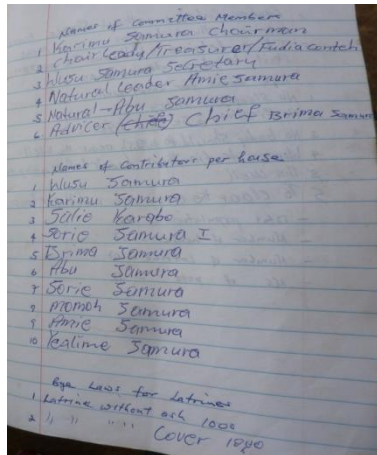
money contribution and chlorine purchase

Another key member among the committee is the **secretary**.

She/he will be in charge of organizing the money contribution and monitoring the budget for refilling the chlorine.

Therefore her or his specific training will have the following objectives:

- A list of contributors is clearly established in order to
  - make the house to house collection easier and transparent,
  - define how much every contributor will have to pay to reach the required amount to buy chlorine,
- The collection of money is planned by a calendar,
- Every movement of money in and out is clearly registered and the amount in hands can be known by everyone



**MONTHLY CONTRIBUTION**

YEAR: 2012

NAME	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
1. Karamu Samura												
2. Karamu Samura												
3. Karamu Samura												
4. Karamu Samura												
5. Karamu Samura												
6. Karamu Samura												
7. Karamu Samura												
8. Karamu Samura												
9. Karamu Samura												
10. Karamu Samura												
<b>Total</b>												

## Contribution calendar

In Kansuron they collect 10 000 Le every 2 or 3 months (1 000 Le per household), depending on the chlorine consumption. 7 000 Le are used to buy bleach, 3 000 Le are kept at each contribution as security and can allow them to skip when a more difficult period arrives.

1 bottle of bleach costs **6 000 to 7 000 Le** (price in 2016).

Observations made show that one bottle of 250 mL lasts in average 2 months for a village of 50 people. This represents a bit less than 1.5 Litre of safe water per person per day only for drinking purpose.

It costs roughly 3 500 Le a year for a family to treat the water ( $\approx 0,75$  € or 0,85 USD).

The 107 communities with whom Inter Aide is working in 2016 supply in 14 shops disseminated in the whole district. Each water committee has a card with the details of the seller(s) in their area.

**BLEACH STORE KEYPERS CONTACT**

Chiefdom	Storekeeper's name	Store Location	Contact numbers
Free town	Mohamed Mughis	Free town, 3 Upper East Street	030-550-450 / 077-524-450 / 079-223-224
Makeni	Foday F. Cord	Makeni, 2 Sylvanus Junction	088-401-737 / 076-844-225
	Theresa Sarrali	Karamanki	030-414-424
Sella Limba	Mabinty Dumbuya	Kathanta	030-367-411
	Foday Koroma	Kabba Ferry	099-894-470
Sand Loko	Mr. Kalangbary	Laminaya	077-441-033
Gbanti Karamanka	Umaro Shali	Karamanka	077-463-634
	Kadia A. Conteh	Rokulan	088-280-024
	Serie T. Timbo	Riyanka Lal	077-088-181
Sands Tendaren	Nandema Fullah	Rosos	030-571-423
	Mohamed Bandy	Masactaba junction	088-230-907
	Morris Sany	Kaglers	077-762-387
Magbainba Nduhalun	Hana Koroma	Handon	076-712-873
Thambaka	Fatu Turay	Samaya	079-147-589
Gbendembu Ngwarun	Papamane Sany	Gbendembu	078-776-879
	Umaro Timbo	Kalanga (Open Eye)	078-804-199

## List of contributors

In the village of Kansuron, there is 1 contributor per house (10). In this first page are also listed names of the water committees' members, as well as part of by laws concerning sanitation in the village.



# Household Water Treatment : the chlorine supply chain

Clorol® is produced locally in Freetown. It has no additives, perfumes or products other than calcium hypochlorite and Soda which makes it suitable for water treatment.

Although the main commercial purpose of bleach was so far for washing clothes.

The demand for now is not so important to justify more investments of the factory in a more sophisticated production process...(less than 3 000 bottles a month).



Inter Aide did market surveys in Makeni and Freetown to identify chlorine providers: the entry point was first Theresa in Kamakwie who was already selling bleach really punctually for washing clothes, from that the team identified a first reseller in Makeni (Munu enterprise) and two factories in Freetown, one of them – MADAR – disappeared from the market in 2012.



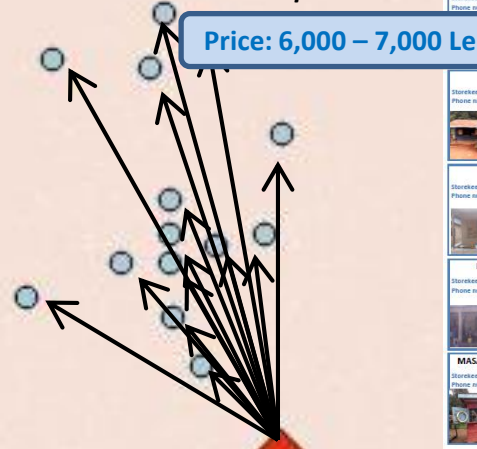
**Freetown**  
*Factory / Gross reseller*

**Hudroge Enterprise**  
# 2 pilgring Road Kissy Douck Yard  
Freetown  
**Price: 3,200 Le**

**M. Mohamed Mughnie**  
# 3 Upper East Street  
Freetown  
**Price: 3,500 Le**

**14 shops at chiefdom level**  
Shops' owners trained to explain to their customers how to use bleach to treat water.

**Bombali district**  
*Bleach storekeepers*



**Makeni**  
*Gross reseller*

**Foday & Fofanah enterprise**  
# 2 Sylvanus junction  
Makeni  
**Price: 5,000 Le**

**Bleach storekeepers**  
**Bombali district**

Location	Storekeeper	Phone number
KAMAKWIE	Theresa Jacob	020-464-434
SAMAYA	Peta Turay	079-147-559
KAMARANKA	Umaru Sall	079-489-434
ROSOS	Nandema Patah	080-971-423
ROYANKA LOL	Sanki Timbo	077-888-181
MASACTABA JUNCTION	Mohamed Bundo	068-230-907
GBENDEMBU	Papante Sany	078-776-979
KALANGBA (OPEN EYE)	Umaru Timbo	078-804-199
ROKULAN	Kadi A. Conteh	068-238-034
KABBA FERRY	Foday Koroma	088-984-470
KATHANTA	Mazaly Dunbaya	088-987-743
LAMINAYA	M. Kiangaly	078-441-933
HUNDUNWA	Hama Koroma	078-712-973
KAGBERE	Monic Conteh	077-762-287



# Household Water Treatment : the monitoring

To summarize, initial collaboration between Inter Aide and the community lasts about two months.

Then the team comes back after three days and after two weeks to see if the approach is convenient for the families, if it is accepted and practiced, if the families are convinced about the benefits. They also control if everything has been clearly understood especially by the committees' members (the protocol for the chlorinators, the recording for the secretary, etc.) but also if the importance of drinking safe water and other hygiene messages delivered have been clearly understood by any villager. They verify by random visits in a sample of households if the water has been treated and what is the residual concentration of chlorine thanks to a DPD tester. If necessary, they re-explain any step. The team comes back then punctually during one year to monitor progress and to confirm good practices – the frequency of visits depends on the level of acceptance of each community.

#	Step	Description	Time Frame
1	Preliminary	First contact, survey and strategy explanation	3 weeks
2	Community preparation	Formation and training of Water Committee, hygiene sanitation sensitization, money contribution follow-up, supply distribution and first purchase of chlorine	1 month
3	Training	Training on water treatment procedure	1 day
4	Short and medium term follow-up	Following on treatment and use of water, and users reactions to the treatment	3 days, 2 weeks after training + punctual visits over 6 months
5	Long term follow-up	Following on treatment and use of water	Punctual visits over 6 months

The monitoring focuses on:

- respect of treatment procedure (esp. dosage)
- chlorine consumption and supply
- money contribution and organization for refill
- secretary's notebook
- community work
- local water source conditions
- hygiene and sanitation practises

Frequent visits are also done to the shops to monitor their sales and stocks and to verify if there are able to explain properly use of bleach for water treatment.



*DPD test is a colorimetric test consisting of adding a DPD 1 pill to the sample. The reaction will create a reddish tint that has to be compared to the different levels of the scale that indicate the free chlorine residual concentration.*

*The free residual chlorine should be between 0.5 and 1 mg/L (30 minutes after treatment) .*

## The chlorine dosage:

Every water source has a different chlorine demand. The concentration of chlorine remaining in the water after treatment is measured using a DPD tester 30 minutes after treatment. The free residual chlorine should be above 0.2 mg/L in order to fight further contamination but no more than 2.0 mg/L to avoid taste and odor issues. Because the water will be stored in the house for a few days, it is recommended to have a free residual chlorine between 0.5 mg/L and 1.0 mg/L. Typically, a dose of 2.0 mL of Cloral for 5 gallons of water (22 liters) results in an appropriate free residual chlorine that will protect the water for the maximum two days of storage.

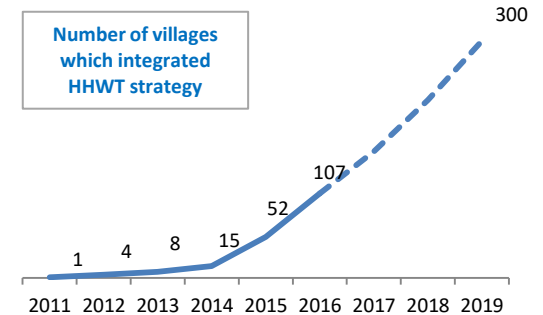
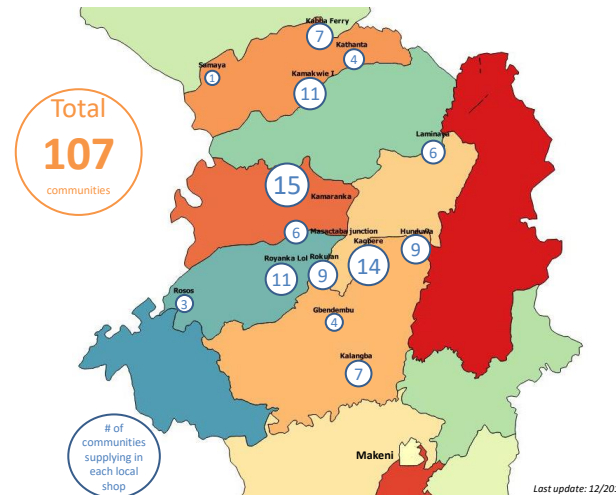


## Household Water Treatment : Results

## In 2016:

- **107 communities** in total – more than **7,000 people** in **7 chiefdoms**
- More than 150 chlorination kits provided
- 14 shops and a main supplier in Makeni clearly identified as chlorine providers

**Objective 2019:** 300 communities in Bombali district



For the specific chiefdom of Sella Limba, which is the chiefdom where Inter Aide began initially the construction and rehabilitation campaigns before expanding to the neighbouring chiefdoms, data collected about the situation in the villages allows to picture the following situation:

Sections	Sella Limba water point coverage							Total
	Kamakwie	Kayimbon	Magbonkonie 1	Magbonkonie 2	Mamankoh	Manonkon	Samiya	
total number of villages	39	29	25	20	33	17	23	<div>81%</div> <div>↓</div> <div>89%</div>
total number of villages with improved water point(s)	28	20	21	19	30	16	15	
<i>but villages among those whose WP is out of use</i>	2	1	1	0	1	1	0	
Water coverage	67%	66%	80%	95%	88%	88%	65%	
villages without water points except than traditionnal ones	11	9	4	1	3	1	8	
HHWT Villages	4	4	2	0	0	1	8	
Improved water point coverage including HHWT	77%	79%	88%	95%	88%	94%	100%	

In 2015 the water coverage has improved in Sella Limba comparing to the situation when Inter Aide started in 2007. The water coverage was around 40% in 2007, to double in 2015 thanks to repairs and new constructions. The combined efforts of providing services that allowed to maintain these water points and access to safe water, plus the integration of smaller communities through HHWT even allows to get closer to a 90% coverage.

Sella Limba is the chiefdom that presents the best results as Inter Aide started earlier but same efforts are ongoing in Sella Limba and the other chiefdoms, extension is planned to the South of the district to be able to propose a full package of safe water options for the whole district.

# Household Water Treatment : Results

## Strengths / What makes the differences:

- **The water committee...**

mobilizes others villagers (comparing with individual practices)

*Different modes of organization:*

*fetching in the morning and disposing at trainee's house,  
trainees are going house to house (clusters or rotation)...*

these members feel responsible and know that it is helpful for everybody: before if someone was sick it can contaminated everyone.

- **Working in small communities...**

makes easier getting the attention of everybody, during training by Inter Aide and after for the committee itself,

apart from Water Committee, others people are also learning (and can assist, replace committee's members...),

organizing the contribution, controlling the money, solving problems are easier to manage among few people : it is less difficult for secretaries, treasurers, as well as town chiefs to explain and apply the by laws, organising meetings and spraying information to everyone is more simple...

- **Simple record keeping and transparency**

organisation and contribution system in order to always have the just necessary funds

⇒ listing contributors, knowing total amount required make the determination of contribution easy = **importance of the role of the secretary,**

⇒ Transparency: Everybody is informed about money in and out

## What could be problematic but is not

- **Turbidity and filtration effectiveness ?**

the communities are generally identifying and using local sources of water that are not so turbid,

the white cloth is very useful and effective, trainees use it and clean it each time, buy new ones when damaged,

- **Taste of chlorine ?**

although, the difference in taste is a change at the beginning, people accept it as they clearly see the health impact (they refer to the chlorine as medicine)

- **Trainees who eventually wouldn't want to treat each other house or who are obliged to leave the village ?**

through the water committee, people are taking this responsibility seriously: global problem = global solution,  
people identified others persons in their absence,

- **For the community to get funds for the refill ?**

the money it represents is affordable: 7 000 Le (1.3 € or 1.75 \$) every two months for a whole small community,

it is easier to organise money contribution among few households (and to solve problems)

- **Access to chlorine ?**

the shops never experienced shortage (*one get out of the strategy but more as regard to its business that get down*). During Ebola crisis some sold the bleach at the price they bought it to support their community, the grocery in Makeni is going once a week to Freetown.

# Household Water Treatment : review of the strengths and weaknesses

## Strengths

### • **Reliable approach to get safe water\***

80% of positive Free Residual Chlorine in the containers

Treatment directly at the point of use in safe containers: very low risk of recontamination Almost 0% prevalence of diarrhoea by under 5 years old children after introduction of HHWT

### • **Communities convinced by the importance of HHWT\***

100% of acceptant communities

80% of households with chlorinated water at any time

People convinced by the importance of filtration (see the solid particles) and chlorine input (experience strong positive impact on health)

Reputation of chlorine as a “medicine” reinforced by its smell and taste

### • **Effective approach to reach 100% safe water coverage**

Solution that could be proposed to any type of community (population, location, topography)

### • **Efficient bleach resellers’ network and strong product availability**

Chlorine and syringes available in very remote rural areas

Distance between one community and its bleach shop of 4.2 km in average

Shops turned into bleach resellers already known by most communities

No major access hurdles due to water side crossing during rainy season

### • **Ease of implementation / Rapidity of spread**

Simple steps of HHWT accessible to any uneducated person

Standardized dosage at district level : 2 mL of chlorine / 5 gallons container

Possibility to replace easily the chlorinators in their absence

Only 2 months necessary to make a community autonomous with HHWT

34 communities trained and monitored by 1 field facilitator in 1 year

## Weaknesses

### • **The quantity of bottles sold for now does not allow a strong partnership with the bleach factory**

Small scale project: the interest of the factory in the project is limited and they will not invest for now in a new design of Bleach bottles (labelling, cap)

No quality control in production

→ *Possibility of scale-up in other areas through partnerships with other actors*

### • **Difficult data recordings for monitoring**

Recorded data by water communities or shops owners on chlorine consumption poorly reliable for monitoring:

- Low level of education in the communities
- Low incentive to record data for resellers

→ *Focus on data recording from the resellers’ notebooks and emphasize on the importance of data recording for IA (additional responsibility for the reseller mentioned in the MOU)*

### • **Spread completely relying on Inter Aide’s intervention**

Inter Aide assistance is always necessary to introduce HHWT in communities Programme not ripe enough to make autonomous spread of HHWT possible

→ *Promotion tools available in the bleach shops, radio promotion*

→ *Promotion through the Primary Health Units and Community Health Workers – promotion tools available in the PHUs*

→ *During all preparation phase, emphasize on communities’ self-sufficiency after training*

### • **Solution for water quality but not always for quantity**

Even some local wells or sources can get dry in dry season

→ *Plan when necessary local source improvements:*



# Household Water Treatment : Results and way forward



## Opportunities



- **Promotion of HHWT in bleach shops**

Promotion tools available in all bleach shops

- **Introduction of HHWT in schools through partnership with Street Child**

Pilot project targeting 12 schools in Tambakha chieftdom

Increase of the demand for bleach and consolidation of the supply chain

Promotion tools available in schools

Advocacy of School Management Committees in their villages and involvement of children in the promotion

- **Promotion of HHWT in PHUs**

Medical staff trained on HHWT and HHWT used in PHUs with no access to safe water

Promotion tools available in the PHUs

Promotion of HHWT through meetings of CHWs (as a support during the first contact phase)

- **Promotion of HHWT through a radio campaign**

Media largely used and trust all over the country

Possible intervention of bleach resellers

- **Bleach communities potential in other districts**

## Threats

- **Break in the supply chain due to slow rhythm of the bleach business**

Small business for resellers (small profit and low frequency of purchase) – difficulty to afford transportation costs

→ *Keep a strong growth rhythm to reach a significant scale and retain incentives for all supply chain stakeholders to continue their business*

- **Break in the supply chain due to unpredictable events**

Fragile accessibility of products (bleach and syringes) in rural areas: any unpredictable event can lead to the closure of one bleach shop and difficulties for communities to supply

→ *Back-up solutions for each stakeholder of the supply chain*

# Household Water Treatment : traditional well improvement

With some communities who proved their dedication with the time and face big water shortage constraints during dry season, it has been decided to do some light local source improvement, in order to stop seasonality of water point, reduce turbidity, make the fetching easier and increase protection against contamination.



In **Small Katherie** (28 people), first community where the collaboration started in 2011, the community dug 4 meters in 2013, Inter Aide did one meter casing and a cover to protect from erosion, infiltration and contamination.

The community provided :

- gravel,
- stones,
- sand,
- labour force,

Inter Aide provided :

- a site foreman for 5 days,
- 6 bags of cement,
- 7 iron bars,

Equivalent to 600 000 Le  $\approx$  115 €  $\approx$  150 \$



Original traditional source



Newly improved local well

In **Kansuron** (46 people), where the collaboration started in 2012, the community dug 4 meters in 2014, Inter Aide did the casing and the platform (2 weeks work).

The community provided :

- gravel,
- sand,
- labour force,

A blacksmith, friend of the community offered the metallic cover.

Inter Aide provided :

- a site foreman for 10 days  $\sim$  300 000 Le,
- 13 bags of cement,
- 17 iron bars,
- 30 m mesh wire,

Equivalent to 2 220 000 le  $\approx$  430 €  $\approx$  520 \$



Original traditional source



Newly improved local well

In **Masunkarie** (39 people), where the collaboration started in 2012, the community dug 4 meters in 2014, Inter Aide did the casing and the platform (2 weeks work).

The community provided :

- gravel,
- sand,
- labour force,

Inter Aide provided :

- a site foreman for 10 days  $\sim$  300 000 Le,
- 10 bags of cement,
- 15 iron bars,
- 30 m mesh wire,

Equivalent to 2 000 000 le  $\approx$  400 €  $\approx$  500 \$

# Household Water Treatment : traditional well improvement



## Mangay Line

43 people, 2012-2013 campaign  
Improvement in 2014



## Rosumbu

93 people, 2013-2014 campaign  
Improvement in 2016



265 people, 2014-2015 campaign  
Improvement in 2016



## Lower H Plan

114 people, new construction but seasonal well using bleach during dry season  
Local well improved in 2016



## Masongbo

Improvement: Local sources made with concrete 5 m special casing, head wall, cover slab & apron

The community provides :

- 10 big piles of **gravel** for backfilling
- 80 head pans of **granite stones**
- 100 head pans of **sand**
- 8 **men power** per day
- the **cover**.

Inter Aide provides :

- A **site foreman** for 10 days ~ 520 000 Le,
  - 19 bags of **cement** ~ 1 045 000 Le,
  - 20 lengths of **iron rods** ~ 540 000 Le,
  - 10 kg of **mesh wire** ~ 60 000 Le,
- Equivalent to 2 165 000 le ≈ **285 €**