

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

So far, approximately 75 new hand-dug wells have been built and 36 rehabilitated by Inter Aide. If the common standards recommend a well for 250 persons, smaller communities of 120 people and above have been also targeted.

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

Wells construction / Rehabilitation



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

HHWT



As a matter of consequence that these small communities are more often excluded of interventions of any actors 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 contribution and community work (collecting local materials, assisting masons...)
- the cost of maintenance of a hand pump might be expensive as less people could contribute.

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 of training a water committee among which specific persons have the responsibility to chlorinate the water for each household in the village. In **2015**, it is a total of **52 communities and almost 3 400 persons** who have been targeted and who successfully continue to drink treated water from their local source.

water points maintenance



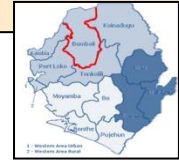
This document is a review of the approach and try to highlight the reasons of adoption of chlorination.

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

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

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.

The district of Bombali occupies a total area of 7,985(3,083) and comprises thirteen chiefdoms.



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

The average size of the villages targeted are in general of 50 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 answers proposed have to write an official request.

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

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

Then sensitization meetings and workshops will be organised to diffuse good hygiene practices: explaining the contamination chain, 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 (CLTS approach).



Hygiene sensitization and explanation of the contamination chain.

If the villagers are able to fulfil objectives related to good hygiene and sanitation that will be agreed with Inter Aide, then a **Water Committee** will be created with a chairman, chairlady, secretary, treasurer and trainees. Two trainees 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.



Among the objectives targeted with the families, one condition to continue the collaboration is the equipment of each household with a latrine constructed by the villagers.

The role of the trainees

A specific session is organised for the trainees (although everybody can follow) where they learn to:

1. start first by washing hands before processing,
2. filter the water that has been fetched in order to remove particles,
3. use the correct amount of chlorine (1 syringe = 1 ml),
4. shake to mix and wait 30 min. before drinking, the time for the chlorine to react.



Each household will get a 5 gallons* Jerrycan and a cup at a subsidized price by Inter Aide, the water committee will be in charge of kits - 1 kit for 50 persons - composed of **1 syringe, a bucket with cover and a white cloth**, they will organize themselves to buy the bottles of chlorine (details next page...).

- A kit for 50 persons = 30 000 Le
- The sets of 'rubbers' and cups per household (> 5people) = 13 000 Le

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

Ex. : for a community of 10 HH, 50 persons, the initial cost (before refill) is **40 000 Le.**

around 10 USD or 8.75 €

The trainees organized themselves to make sure all households have treated water at least for two days: either people drop-off their jerrycans after fetching early in the morning at the trainees' houses, either the trainees are going house by house.

* 1 Imperial gallon ≈ 4.55 liters, 1 Jerrycan ≈ 22.5 L.

Household Water Treatment : the communities' training

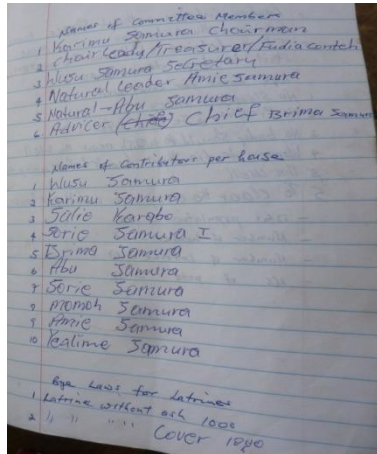
money contribution and chlorine purchase

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 buying and 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 movements of money in and out are clearly registered and the amount in hands can be known by everyone



MONTHLY CONTRIBUTION

YEAR: 2012

NAME	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
1. Kansuru Samura												
2. Kansuru Samura												
3. Kansuru Samura												
4. Kansuru Samura												
5. Kansuru Samura												
6. Kansuru Samura												
7. Kansuru Samura												
8. Kansuru Samura												
9. Kansuru Samura												
10. Kansuru Samura												
TOTAL												

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 is to buy the bleach, 3 000 Le are kept each contribution as security and can allow them to skip when more difficult period arrives.

BUDGET FOLLOW-UP

NAME	CONTRIBUTION	AMOUNT	DATE	REMARKS
1. Kansuru Samura				
2. Kansuru Samura				
3. Kansuru Samura				
4. Kansuru Samura				
5. Kansuru Samura				
6. Kansuru Samura				
7. Kansuru Samura				
8. Kansuru Samura				
9. Kansuru Samura				
10. Kansuru Samura				
TOTAL				

Budget follow-up

They organise a meeting before buying the chlorine to count the money in front of everyone.

List of contributors

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



1 bottle of bleach costs **7 000 Le** (price in 2015).

In average observations made shown that one bottle of 250 ml last 40 days for a village of 50 people. Which 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 52 communities with whom Inter Aide is working in 2015 can supply at 8 shops* disseminated in the corresponding chiefdoms. Each water committee has a card with the details of the seller(s) in their area.

BLEACH STORE KEEPERS CONTACT

CHIEFDOM	SECTION	NAME	ADDRESS	PHONE NUMBER
Sella Limba	Kamakwie	Mrs. Teresa Saccob	Kamakwie I	088-195-025
Sanda Loko	Kamalo	Mr. Abass Conteh	Kamalo Court Barry	077-336-348
Gbanti Kamaranka	Kamaranka	Mr. Umaro Shall	Kamaranka Town	077-463-634
Gbanti Kamaranka	Makomray	Mrs. Kadiatu Councillor	Makomray Town	
Sanda Tendaren	Rogbin	Mrs. Aminata Koroma	Madina (Talmu Bangura)	077-580-687
Sanda Tendaren	Rogbureh	Mrs. Kadi A. Conteh	Rokulan Town	077-248-631
Sanda Tendaren	Rogbureh	Rugiatu Jaloh	Four Road Loko Town	088-229-365
Tambaka	Simibuye	Fatou Turay	Samaya	079-147589
Magbaimba Ndowahun	Kagbere	Morris Sesay	Kagbere Town	077-762-287

* 9 shops were initially identified. One has been replaced because its general business went down. One get out of the strategy, it was supplying 2 communities that later have been equipped with a well. 2 new more shops should join the strategy soon.

Household Water Treatment : the supply chain



9 shops at chiefdom level
(some of them in pictures)
in link with a main supplier in
Bombali capital district (Makeni)

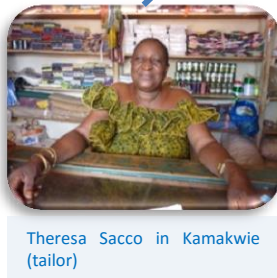


Umaro's shop in Kamaranka
(grocery)



Kadia A. Coneth shop in Rokulan
(grocery)

Buy 5 000 Le
Sell 7 000 Le.



Theresa Sacco in Kamakwie
(tailor)

These local shops buy to Munu enterprises in Makeni,
in link with the factory in Freetown.

Buy 50 000 Le a pack of 12
Sell 5 000 Le a bottle.

Shops' owners have also been
trained to explain to their
customers how to use the bleach
to treat water.



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

Although the main commercial purpose of the 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).

Hudroge Enterprise
2 pilgring Road Kissy Douck Yard
Freetown



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 Munu in Makeni and two
factories in Freetown, one of them – MADAR – disappeared from
the market in 2012.

Shops are supplying from 4 up to 10 villages (in 2015).
The selection has been made so that a villager has not to walk more than 20 km to reach a supplier.

Household Water Treatment : the monitoring

To summarize, the initial collaboration of Inter Aide and the community last about a month.

Then the team comes back 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 trainees, the recording for the secretaries, 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 will re-explain any steps. The team comes back then twice or at least once a year to monitor progress and to confirm good practices.

Steps	Description	Time Frame
Preliminary	Strategy explanation and health/sanitation sensitization	1 week
Community preparation	Money contribution follow up, formation and training of Water Committee, latrine improvements or construction	2 weeks
Training	Distribution of HHWT materials, training on water treatment procedure	1 week
Follow up	Following on treatment and use of water, and users reactions to the treatment	2 weeks after training, then 1 to 2 a year

N.B. : It is important to sensitize the communities not to use Clorax® past its expiration date, as the concentration of bleach in the solution decreases rapidly after the date.

The monitoring focus on:

	Visit date =								
Village	population	Amount of bleach (ml) for 22 litres H2O	Qty of bottles purchased	Last refill	refill of before	Time range between refill (Days)	Individual average water consumption/day	FRC (mg/L)	Money balance
	examples :								
village a	56	1	1	22/05/2015	15/03/2015	68	1,44	0,80	3000
village b	83	2	2	30/05/2015	10/03/2015	81	0,82	1,2	0

- respect of dosage
- chlorine consumption and therefore safe water consumption
- Money contribution and organization for refill

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 indicates 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. Therefore, in order to know the correct dose and before sensitizing the communities, the free residual chlorine concentration is tested with the community source water (at least for a group of communities among the same basin or catchment) by applying different volume of chloral on different batches. The concentration is measured using a DPD tester 30 minutes after treatment and the day after. The free chlorine residual 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 chlorine residual between 0.5 mg/L and 1.0 mg/L. Typically, a dose of 1.0 mL of Clorax for a 5 gallon rubber results in an appropriate free chlorine residual that will protect the water for the maximum two days of storage.

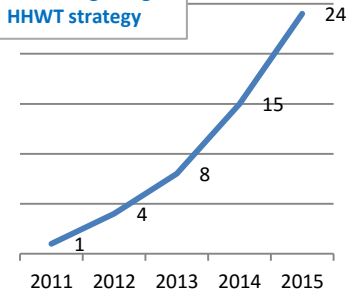
Household Water Treatment : Results

In 2015:

- **52 communities** in total – almost **3 400 people** in the following chiefdoms of the north of the district : Gbanti Kamaranka (10), Magabaimba Nduhahun (11), Sanda Tandaren (9), Tambaka (1), Sella Limba (22) *only two villages left, but because they have been equipped with a well they are sharing*
- Approximately 77 kits provided
- 8 shops and a main supplier in Makeni clearly identified as chlorine provider

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

Number of villages which integrating HHWT strategy



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	
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%	81%
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%	89%

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 keep going 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 options for safe water 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 : Results and way forward

What are the challenges => Actions ?

- **Secretary is a key position = need to know how to read and write**
it is generally young persons who could possibly move from the village in the future (?) => *to monitor*
- **Chlorine dosage for treatment:**
each water has its own chlorine demand but at the same time we need a standard method easy to explain and to remember,
although most trainees shown that they were very conscientious and serious, mistakes can happened (during monitoring we observed that in his absence, one trainee did a hand-over to one of his student but it was not done properly)
⇒ *Getting official approval of Ministry of Health, eventually also Ministry of Water and Resources □ labelling,*
⇒ *Indications on bottles like simple drawings to illustrate the procedure,*
- **Initial chlorine concentration and decrease:**
for now there is no way to certify the quality and standards in production,
moreover, there is no guarantee of the conditions of storage at shops and if bottles sold are not expired / even less at household level, whereas the strength of chlorine in a bottle can decrease quite quickly and then the volume added could become not sufficient,
⇒ *Control by the Inter Aide team and ideally progressively by the Ministry of Health,*
⇒ *Increase in demand and then on production should obliged chlorine producers to invest on more quality control protocols and means,*
⇒ *Scaling up the approach to increase the demand that will means injecting more means. This implies linking with other partners to disseminate the approach (combined rural and urban settings and needs).*

Effects => Actions ?

- All communities mentioned automatically a **real decrease of diarrhoea cases** (near to 0) compare to the situation when they were drinking not treated water from their local source.
⇒ *Continuing collecting health data to confirm,*
- **Improvement of quantity and quality of the water consumed:**
 - as the water point is nearby, people can refill regularly and safe water consumption is increasing,
 - they can bring treated water to the farm,
 - water quality last long as the chlorination has a remanent effect: most of the time the contamination increased with conditions of water storage, the long lasting effect of chlorine allows to overcome that,
 - there is no risk of shortage and breakdown,
 ⇒ *Officialising these results from analysis by Water Directorate*
- **The costs compare with hand pumps for such small communities make this option more interesting:**
Hand pump preventive maintenance: spare parts to replace annually, labour costs ≈ 100 000 le a year ~ 17 € or 23 USD for the community*
HHWT ≈ 35 000 le a year for the community (≈ 7.5 € or 8.5 USD)
- People are proud of their option ⇔ **Self supply**
⇒ *Light local water point improvement*

* See also www.interaide.org/pratiques/sites/default/files/howmuchitcost_march_2014.pdf .

Which represents 400 Le per person considering 250 p. for a water point but would be 5 times more for a 50 people community

Household Water Treatment : traditional well improvement

With some communities with whom Inter Aide started first (2011-2012) and who proved their dedication with the time, it has been decided to do some light local source improvement , in order to make the fetching easier and increase protection against contamination.



In Small Katherie , 28 people, the first community where the collaboration started in 2011, the community dug 4 meters , 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 :

- The 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 , Inter Aide did the casing and the platform. It was a 2 weeks work.

The community provided :

- Gravel,
 - sand,
 - Labour force,
- A blacksmith, friend of the community offered the metallic cover.

Inter Aide provided :

- The site foreman for 10 days
 - 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 also 4 meters, Inter Aide did the casing and the platform. It was a 2 weeks work.

The community provided :

- Gravel,
- sand,
- Labour force,

Inter Aide provided :

- The site foreman for 10 days
 - 300 000 Le
 - 10 bags of cement,
 - 15 iron bars,
 - 30 m mesh wire
- Equivalent to 2 000 000 le \approx 400 € \approx 500 \$