

## **SUPPORTING INFORMATION (SI)**

# Does the implementation of hardware need software? A longitudinal study on fluoride-removal filter use in Ethiopia.

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### **Details of the assessment of filter use**

Participants were first asked how many times a day the filter was filled. This number was then multiplied by 8 liters (the standard filling volume that fits into the filter) to give the total number of liters filtered per household-day. Since some beneficiaries reported using other sources of fluoride-free water (they would use rainwater, or buy water from a reverse osmosis plant or at a community filter), the amount of water (in liters) obtained from these sources was added as well. Finally, the amount of fluoride-free water consumed per household-day was divided by the number of people living in each household, resulting in the dependent variable – filter use measured in liters per person-day in a given household.

### **Details of the assessment of the total consumption of water per person-day**

Participants were asked to show the cups they used for drinking and cooking and estimate how many of those cups would be used in a day. Using the interviewer's estimation of the cup size, the total amount of water

used for drinking and cooking can be calculated. By dividing this number by the number of people living in a household, a measure for total (raw and fluoride-free) water consumption per person-day in each household was obtained.

### **Details of the educational workshop with pledging**

An influential and well-regarded woman from the village of Weyo Gabriel, where the workshop was held, was trained for two days to be the workshop leader. She was informed of the purpose of the workshop and trained in depth on the content. Detailed scripts were given to her for the first part of the workshop, the persuasive and informational session, and for the pledging, translated into Amharic and Oromic. The women who would be attending were approached three days prior to the workshop. They were also informed that there would be an allowance of approximately US\$1.5 for attending the workshop. This is approximately a worker's average daily income. Paying an allowance for the attendance of workshops or meetings is common practice in Ethiopia. During the workshop, the

workshop leader was assisted by our OSHO social worker.

The workshop was scheduled to last three hours and consisted of an initial greeting, followed by a persuasive and informational session, an open discussion, an interactive group game, and, finally, the participants' pledges to change their behavior. During the greeting, the attendees were invited to actively participate and to feel free to ask questions at any point. The workshop leader then began with the persuasive and informational section. She first informed participants of the characteristics of fluoride by saying that it was an extremely microscopic chemical, too small to be seen by the naked eye, and that it is tasteless so that filtered and unfiltered water tastes the same. The next part of the workshop was about fluorosis. She described the illness and showed pictures of affected people. She talked about the incurable nature of fluorosis, which led her into a discussion of the importance of prevention. In the next part, she instructed them about what filtered water should be used for (drinking and preparation of food) and what unfiltered water could still be used for (e.g. washing, cleaning, and

giving to cattle). Next, she discussed how to prevent fluorosis – namely by always using filtered water for drinking and cooking – and she explained why cooked water still contains fluoride. She explained how, unlike bacteriologically unsafe water, cooking or heating does not help. She explained that bacteriologically unsafe water turns into safe water after it has been heated because the bacteria die. The example of salty water, which does not lose salt as a result of cooking it, was given.

When discussions among the participants started, they were not stopped but encouraged. Examples of the topics discussed included whether injera (the Ethiopian flat bread) tasted better if cooked with filtered or unfiltered water, and whether or not it would be good for your skin if you washed yourself with filtered water from time to time. In the open discussion, participants were invited to ask questions about the informational part.

Next, there was an interactive group game; a quiz to repeat and consolidate the new knowledge. Participants were divided into five groups, each with four or five women. The task derived

from six different multiple choice questions on fluoride, fluorosis, and prevention. The questions were written on large posters in Amharic as well as in Oromic, and participants had to decide whether laminated pictures that symbolized the possible answers belonged to the right or wrong side of the poster. Figure S3 shows a correctly solved task. Before participants were divided into groups, one question had been solved by the whole group as an exercise example. Each group was visited to ensure that they had got their question right and that they understood the meaning of each picture. Afterwards each group presented their answer in front of the whole group and which was corrected if necessary.

In the final pledging portion of the workshop (Figure S5), the leader asked the participants whether they wanted to commit themselves to always using filtered water for cooking and drinking. All women raised their hands for approval. Subsequently, each woman got up and pledged in front of the group as a whole.

Finally, the workshop leader thanked the women for their participation and they all received financial compensation for their attendance.

**Personal filter filling sheet**

How many family members are living in your household? \_\_\_\_\_ people  
 How many children of yours are under 13 years? \_\_\_\_\_ children

	How many cups does one child drink per day?	How many cups does one adult drink per day?	How many jugs do you use for cooking per day (including food, coffee, shai)?
cups/jugs			
liters	0.2	0.2	1
Total liters			
Total per day	Sum of total drinking and cooking: _____ liters		
Total times filling per day	Above divided by 8 liters: _____ times per day		

So if you want that your family only consumes filtered water you have to fill your filter: \_\_\_\_\_ times per day. But this means, you have to fill it with water when it is entirely empty. Then you can produce enough filtered water for your whole family.

Now that you know that you have to fill the filter \_\_\_\_\_ times per day, let's find out when it would fit in your daily routine to do the filling.

When do you and your family normally drink a lot of water? At which time of the day?  
 \_\_\_\_\_

So we know that when you fill the filter, it takes around 30 minutes for the water to run through the filter.

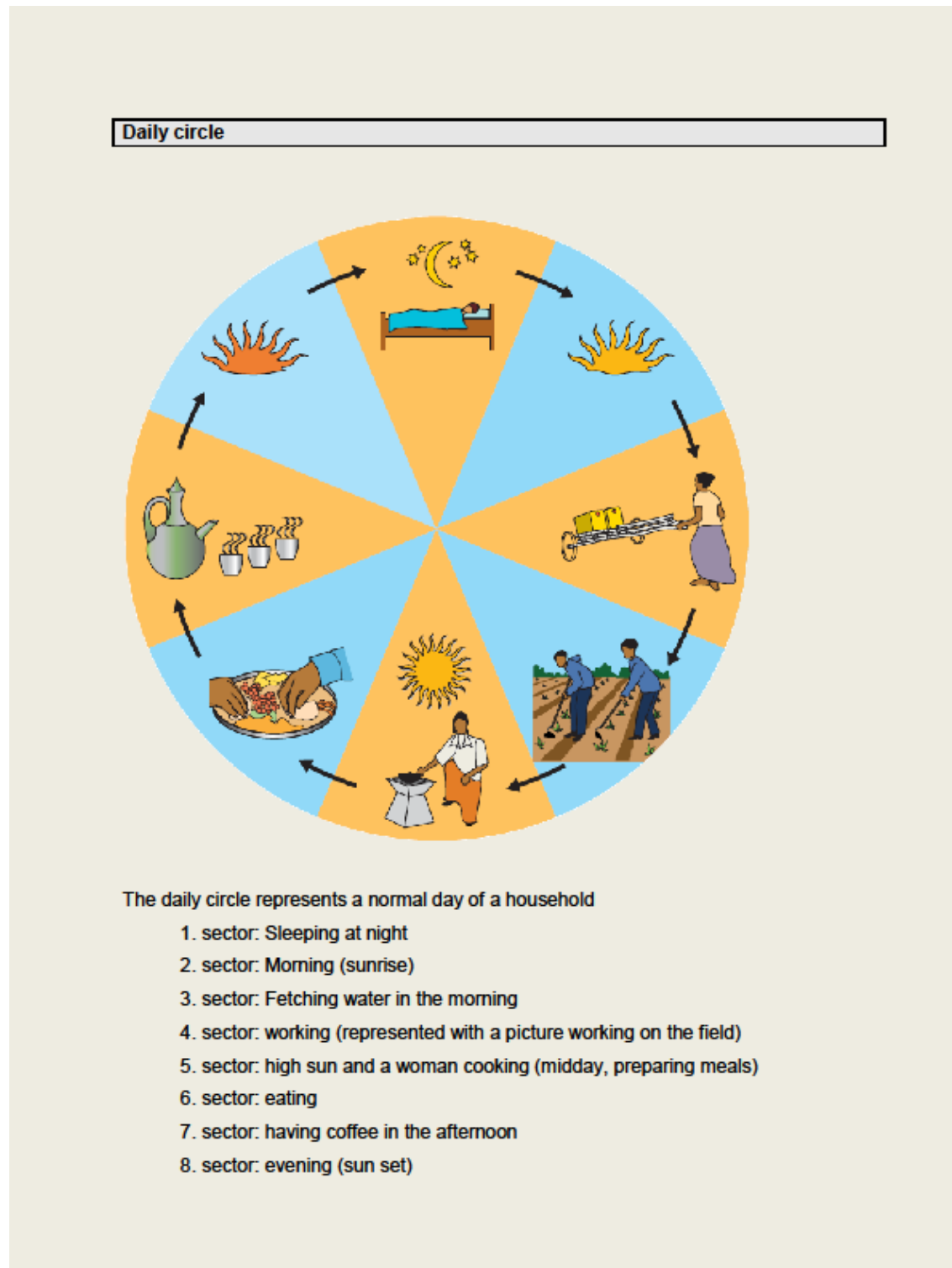
In order to have enough water during \_\_\_\_\_  
 you have to fill the filter:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

}

fill these moments  
into the daily circle!

**Figure S1.** Personal filling sheet for the planning and social prompt intervention.



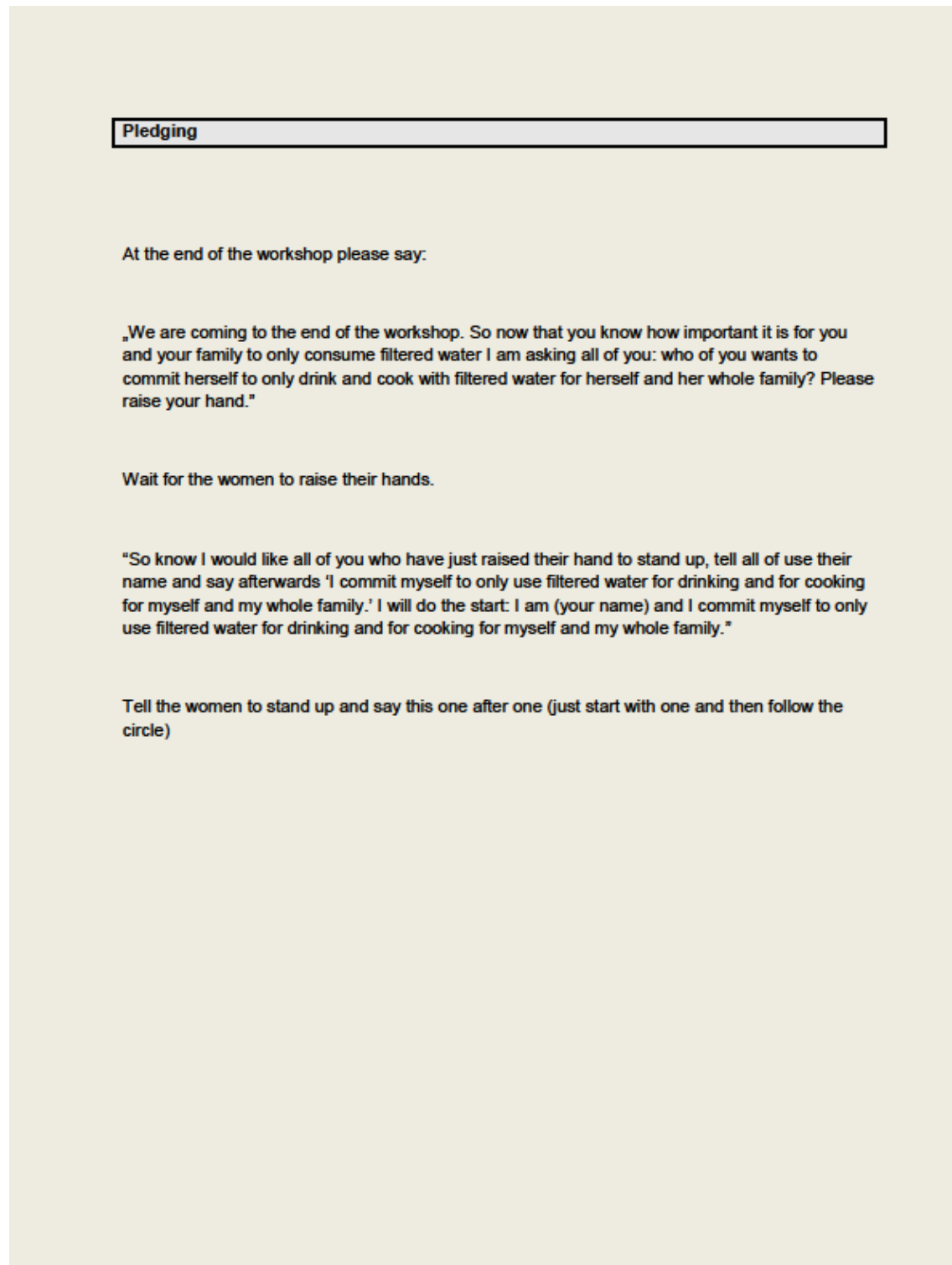
**Figure S2.** Daily circle for the planning and social prompt intervention.



**Figure S3.** Example of a solved task from the group quiz (question: “How can fluorosis be prevented?”) Image by Ina Sonego, EAWAG.



**Figure S4.** Workshop leader explaining the group game. Image by Ina Sonego, EAWAG.



**Figure S5.** Instruction for workshop leader for the pledging section of the workshop.