2 with 8

Safe drinking water for 2 billion people with $8 billion

A bold Idea

The objective of this paper is to stimulate discussion and action for a wide scale dissemination of effective, attractive and affordable Household Water Treatment and Safe storage (HWTS) options. Point of Use treatment seems by far the most cost-effective option to reach the goal of safe drinking water for all. In 2007 a WHO report indicated that HWTS could reduce water borne diseases by 50%, and more if combined with improved hygiene. Also that HWTS can lead to a benefits of up to $60 for every $1 invested (WHO, 2007). Many studies and projects with HWTS followed, many lessons learned but still billions of the world poorest do not yet have safe drinking water while the rich widely use inline or gravity water filters which has become a multi-billion business.

Why is it so hard to get safe water to the poor- and so profitable to sell it to the rich?

After the call for "action now!" at the 2022 Stockholm Water Week a group of people guided by John Cherry (recipient of the 2020 Stockholm water prize), formulated a game changing idea to provide safe drinking water to 2 billion people with grants totalling $8 billion, so an average of $4/capita.

Context

Over 2 billion people use water sources that are contaminated with faeces (WHO, 2022). Reasons vary from leaking water pipes in urban water schemes to contaminated wells in rural settings. Even if a water point provides safe water, it often becomes re-contaminated during transport or storage in the house. Safe drinking water with options like water kiosks or piped in systems cost at least $25 per capita for CapEx. Serving 2 billion people therefore would cost at least $50 billion. A much cheaper, be it intermediate, solution is HWTS.

HWTS

It is an open door but people who do not have a safely managed water source at premises still drink water. The challenge is to make that water clean and safe. A solution is to treat it at the point of use with options like boiling, chlorine, UV or household water filters. Over 80 HWTS products are documented by the organisation CAWST (CAWST, 2021). Many were tested by the WHO testing scheme and over 30 products comply with the WHO performance criteria for removal of turbidity and pathogens (WHO, 2022). Each option has its limitations. For instance, Chlorine is effective in eliminating bacteria and viruses but not in cryptosporidium, a significant cause of child mortality. It also has a taste if not dosed exactly right. Options with only UV do not function with turbidity. Boiling requires fuel. Filters in general are expensive but in many countries the filter market is booming for both inline filters mounted on the water pipe and standalone gravity filters. There is a range of table top filters that are attractive, effective and affordable with prices of $20 to $60. Options with ceramic or diatom filter elements can treat 30 - 60 ltrs/day and membrane filters can treat over 100 ltrs/day. Some models also remove viruses. If a HWTS product complies with the 3 Cs, (Correct, Consistent, Continuous use), and if combined with improved hygiene, they are very effective in reducing water borne diseases (Wolf. 2018)

Failures, lessons and success

The 2with8 idea was formulated using decades of experience with HWTS including failures. For instance, in a project in East Africa 900.000 filters were given away for free but after some time most filters were not in use anymore (IRC, 2011). Reasons include complicated cleaning and as a free gift there was limited ownership by the users. However increasingly there are successes. (Clasen, 2015; Brown, 2008). An example is Ethiopia where local assembly of several filter models started. High quality filter elements are imported and the plastic parts are produced locally. By 2021 over 350.000 were sold and cost of a complete filter starts at $22. The cost to start up local assembly was around $2 mln. which was partly funded with aid money. Interesting is that increasingly water utilities admit that they cannot always deliver safe water for reasons like intermittent power supply.

So families have to store water. As an additional service over 100 utilities now sell water filters and that number is increasing fast (Foppen, 2019; Aqua for All, 2023). The example of Ethiopia can be scaled up, adapted to local situations and replicated in other countries.
Local production or assembling of filters can reduce the need of foreign currency and create employment. At present, main clients of the filter companies in Ethiopia are NGOs who give filters to poor families but increasingly also families buy filters.
The proof that household water filters are market-based (a product that families are willing to pay for), is the fact that an estimated 600 million families worldwide paid their filter. Where there is a piped water system 'inline filters' are popular. In other situations and especially in Asia and South America gravity water filters, or so called Table top filters, are popular. Africa remains a challenge.

2 with 8
The goal of the "2 with 8" idea is to stimulate action! Show that with an investment (grant) of (on average) $4 per person, 2 billion people can have point of use treatment that provides water that is free from biological contamination and protozoa. In case of chemicals like Arsenic or fluor an option is rainwater. Even in areas with 200mm rain/year, 4000 liters of rainwater can be collected from a roof of 20 square meters on a yearly basis. With a HWTS product this water can be made safe to drink. A question is what products can reach the scale needed to serve 2 billion people. An answer is; use a market based approach. Let people choose what option they prefer. Use the 5 P's for marketing (Product, Price, Place, Promotion, People). This approach and answers to the question "Why is it so hard to get safe water to the poor- and so profitable to sell it to the rich?" are described in publications like "Marketing safe water systems" (Heierli, 2007). Actions to reach the yet unserved include;

Action 1.Increase awareness
Awareness that clear water can still be contaminated, but also awareness on the economic benefits of HWTS like reduction of health related costs or increased productivity. E.g. a visit to the hospital may already cost more than a filter. A good quality water filter can be paid at the cost of 3 to 6 months of bottled or sachet water. Awareness is needed on low-cost options and training in use and maintenance. This awareness needs to be nationwide and for 2 to 5 years on radio, television, social media. An example of such a campaign has been executed in Cambodia (IDE, 2018)

Action 2. Build Supply chains including payment systems
Build up commercial supply chains of effective, attractive and affordable HWTS products. In each city and town there should be shops or outlets that sell 3 or more options with different prices, so people have a choice. HWTS products should be approved by the national government. Options should also comply with the 3Cs and be market-based meaning that families are willing to pay for a product and that, after projects stop, the supply chain will proceed on a commercial base without NGO or other support. To reach the target group payment options are needed like micro credit, pay as you use, group credit. An example can be the Grameen bank

Action 3. Subsidize the poor
Of the 2 billion people an estimated 50% are too poor to buy an option like a filter. Families with incomes of $1/day can or will not pay a month worth of income for a filter. This group needs a subsidy.
To avoid for subsidies to distort the market, a voucher system can be applied similar to what was used for bed nets. With a voucher of for instance $20 a family goes to the local shop, pay for instance $2 and gets a filter worth $22. If they want a filter that cost $32, they pay $12.
Households can be divided in: A. Those who can afford upfront payment, B. Those who need payment in instalments, C. Those who cannot pay the full price.
By subsidizing households of group C with vouchers, a commercial supply chain of products can be created for new products and spare parts for all groups.

Cost

The investment (multiple grants) to reach 2 billion people is an estimated $8 billion. A very rough indication to use this is:

- 30% for awareness.
  Large scale, long term on social media communicating reasons for point of use treatment;
- 10% for building supply chains and payment systems.
  Selecting, training the private sector, supporting governments, monitoring and evaluation, payment options;
- 60% for vouchers (200 mln. filters @ $25/filter).
  Vouchers go to target groups like new mothers and those who do not yet have "basic service" so an improved water source within 30 minutes walking from home.

Organisation and financial resources

Realising this approach will require a coordinating organisation and the cooperation of all stake holders including, Governments, Private sector, NGOs and the Finance sector. The dissemination of vouchers could be realized by NGOs, faith organisations, health workers, etc. Funds could come from Governments, organizations and donors interested in reaching SDG6.1 and / or SDGs for health (eg. stunting). Another promising (partial) funding option is carbon credits which requires pre-financing. Filter projects can receive carbon credits since they reduce the use of fuel to boil water. Even if people do not boil water they can be eligible with so called "supressed demand".
Income from carbon credits can be used to build supply chains and reduce the cost of products. Generating carbon credits requires a stringent monitoring including tools to track the filter location, usage and treatment performance. The producers of HWTS products could form a coalition similar to the solar light or cookstoves industry and so create a market based supply chain. Actions can start small with a village, later a region and eventually country level. The $8 billion could, should come from all who want to help in reaching the human right to safe drinking water for all.

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References

- Brown. J. 2008. https://www.researchgate.net/publication/23249863_Local_Drinking_Water_Filters_Reduce_Diarrheal_Disease_in_Cambodia
- CAWST 2021. https://www.hwts.info/products-technologies).
- Clasen. T. 2015. Cochrane study https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD004794.pub3/full
- Foppen. H. https://www.ircwash.org/sites/default/files/084-201906foppenholtslagchekoltheutilityappr_002.pdf
- Heierli. U. 2010; "Marketing safe water systems". www.poverty.ch
- IRC. 2011 https://www.ircwash.org/news/kenya-western-province-lifestraws-carbon-water-program-bogus-says-kevin-starr
- IDE Cambodia 2018. https://www.ideglobal.org/story/clean-water
- WHO. 2007 https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/water-safety-and-quality/publications#householdwatertreatment
- WHO. 2022 https://www.who.int/news-room/fact-sheets/detail/drinking-water
- WHO testing scheme.https://www.who.int/tools/international-scheme-to-evaluate-household-water-treatment-technologies
- Wolf. J, Clasen,T, Bartram.J et al. 2018: Impact of drinking water, sanitation and handwashing with soap on childhood diarrhoeal disease: updated meta-analysis and meta-regression. https://pubmed.ncbi.nlm.nih.gov/29537671/