AQUAFIL

Protein-based Water Filter

> 1 Billion People

Lack Access to

Potable Water Today

Rhoda’s Story

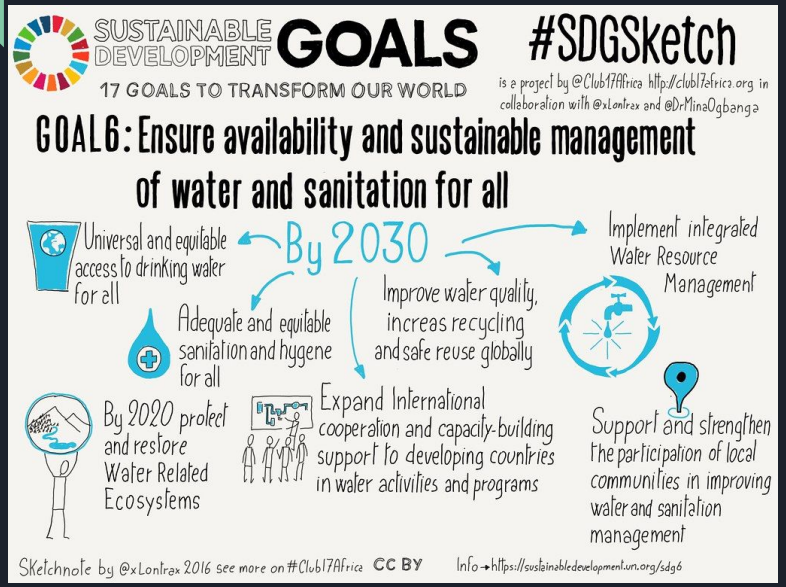
“Sometimes, you could see the **germs** with your own eyes.
We were supposed to add chemicals to clean it, but we were so **poor**, we couldn’t afford them.
People were getting **diarrhea**, **dysentery**, and even **cholera**.”

- Rhoda

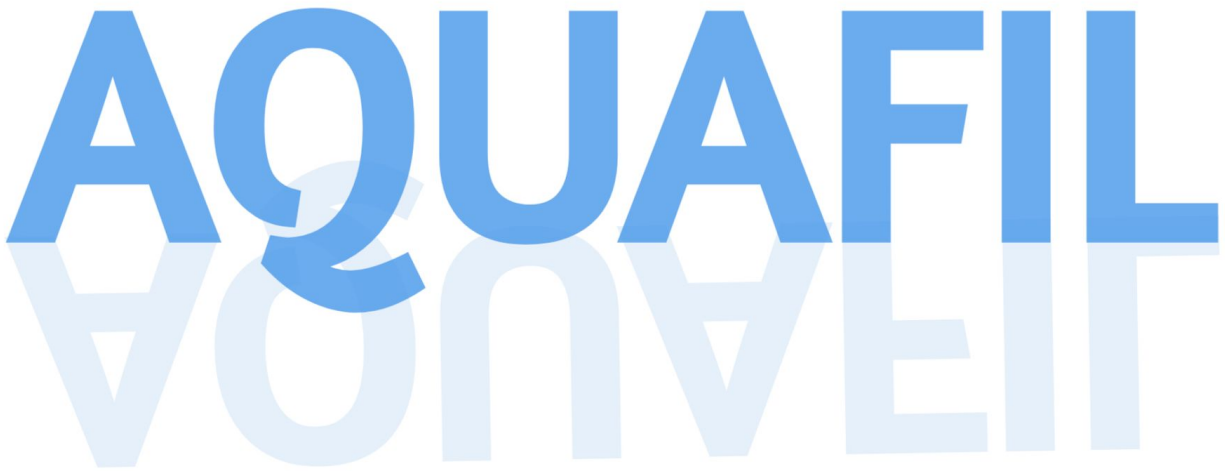
Problems

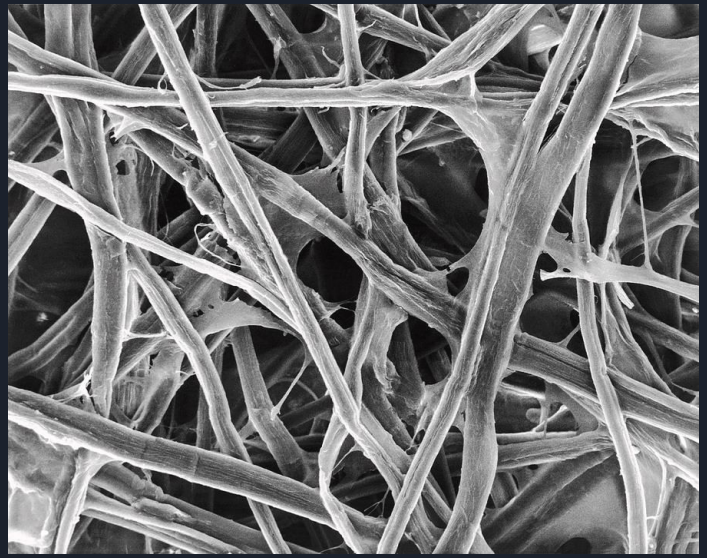
Typhoid Fever
Trachoma
Schistosomiasis
Malaria
Intestinal worms
HIV/AIDS Infection
Guinea worm disease
Fluorosis
Cholera
Arsenicosis
Diarrhoea
Cryptosporidium
Cyclosporiasis
Dysentery
Gastroenteritis
Giardiasis
Hepatitis E Infection
Salmonellosis
Escherichia coli 0157:H7 (E. coli) Infection
Hepatitis A Infection
Campylobacteriosis
Acanthamoeba keratitis
Amoebiasis
Microsporidiosis
Botulism
Legionellosis
Leptospirosis
Otitis Externa
Vibrio Illness
SARS
Acute gastrointestinal illness
Poliomyelitis
Polyomavirus infection
Desmodesmus infection
M. marinum infection
Naegleriasis

Relevance to Global Health



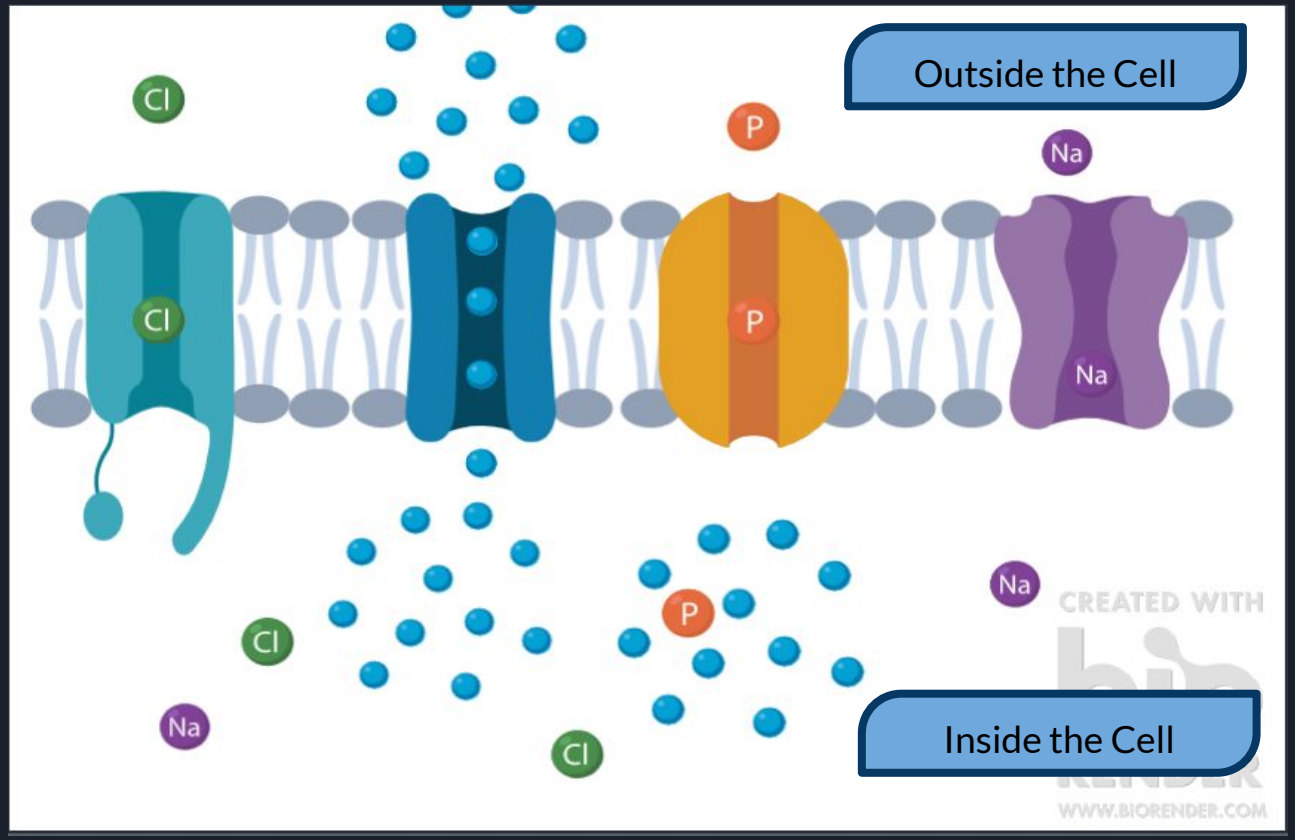
Target: Achieve universal and equitable access to safe and affordable drinking water for all, by 2030.


AQUAFIL

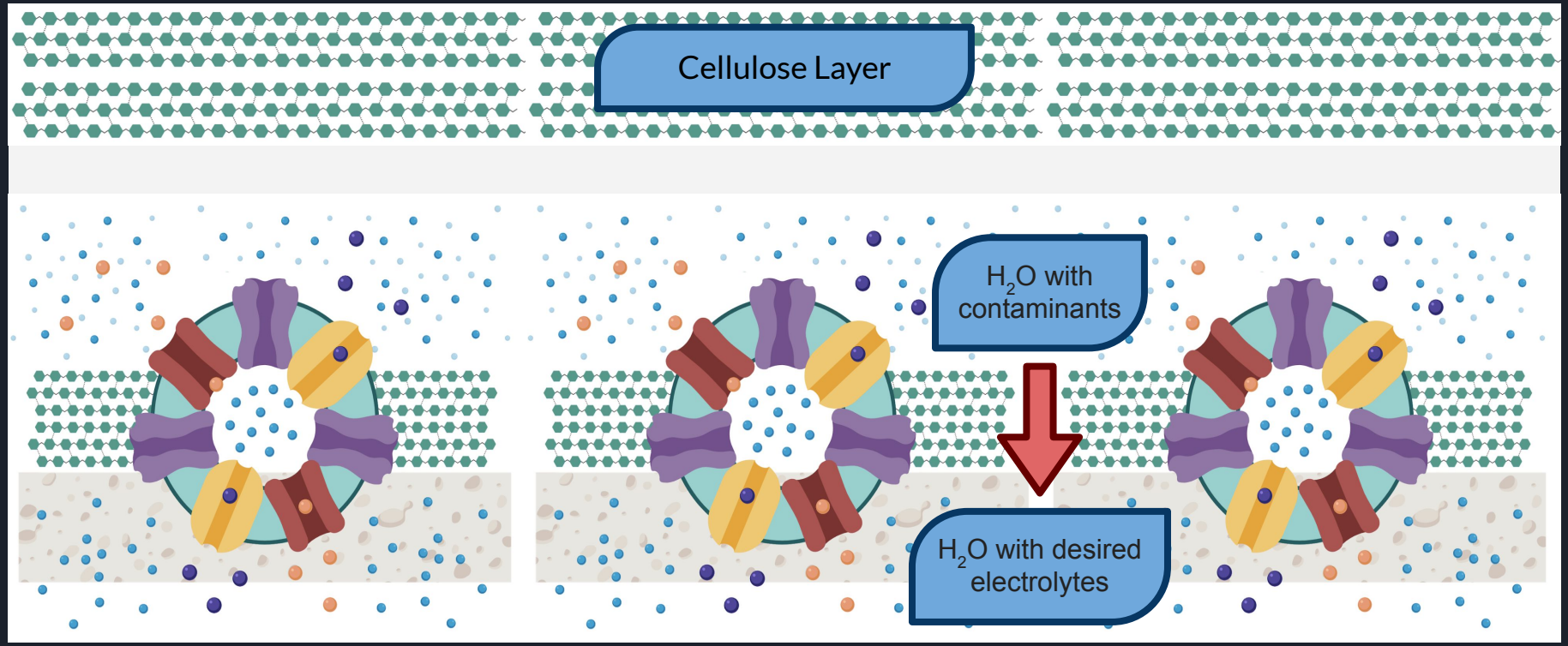


- A cellulose encrusted with E. Coli membrane
- Drinkable water! Only lets pure water and and electrolytes through.
- Filtratration at an Angstrom scale!
- Safe, only the membrane of the E. Coli is used
- Product is organic and biodegradable

E. Coli Membrane

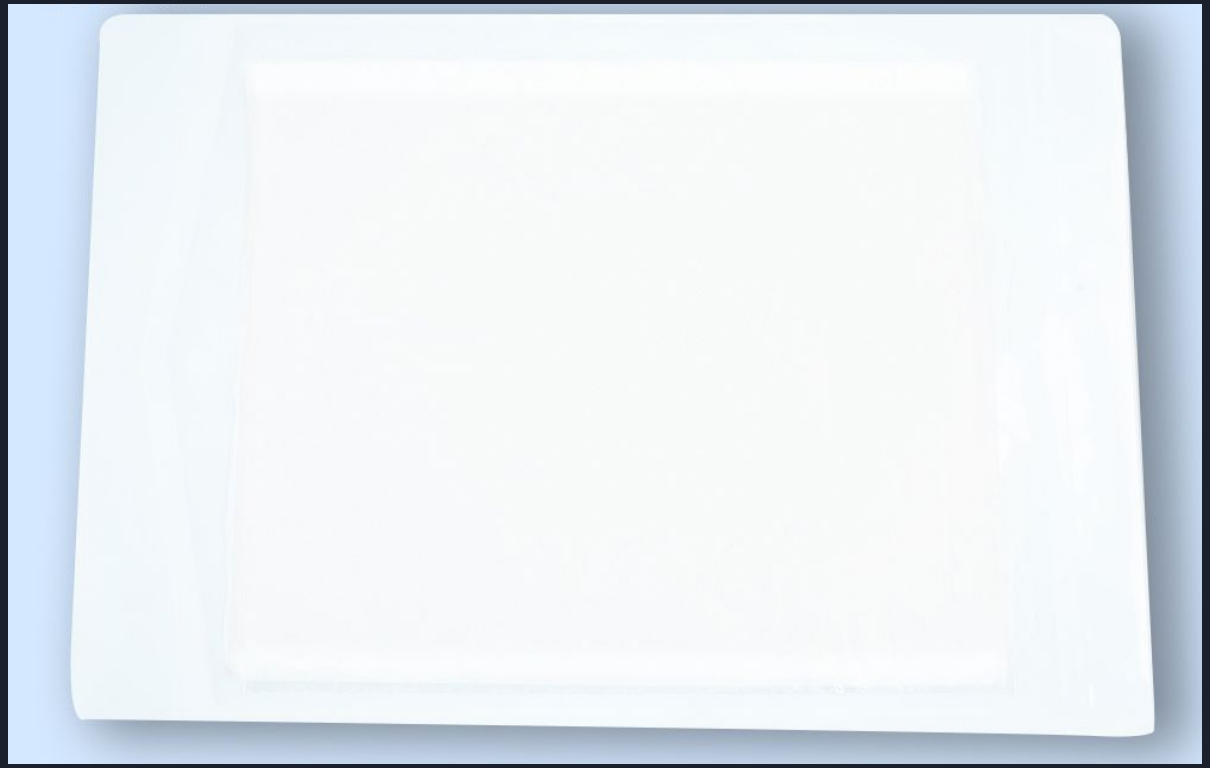


Composition of Filter



Models built using BioRender

Membrane Protein Filter



Tackling the Issue

Rural Communities

First World Consumers

United Nations

First World Retailers

United Nations Basic Level Contract

First World Retailers

United Nations Level 1 and 2 Contract & First World Retailers

Sustainable Way to Empower Rural Communities Without the Access to Clean Water

Manufacturing Cost

2.62 GBP

Per Meter Squared (Filter)

Product Prototypes

3D Models built using Blender 2.80

Tap Water Filter

Jug Water Filter

1st World Retailer: 0.5 GBP Retail

1st World Retailer: 5 GBP Retail

UN: 2 GBP Retail

1st World Retailer: 10 GBP Retail

Competition

LifeStraw

- Only a one-step filtration
- Cost of product is high

NXFiltration

- Filters out electrolytes and only pure water is left


AQUAFIL

References

-https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4544834/
-https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3140680/
-https://www.sciencedirect.com/science/article/pii/S0376738819305290
-https://uknowledge.uky.edu/cgi/viewcontent.cgi?article=1096&context=cme_etds
-https://www.embl.de/pepcore/pepcore_services/protein_purification/extraction_clarification/lysis_buffer_additives/
-https://bitesizebio.com/9107/how-to-lyse-cells-for-protein-extraction/
-https://www.nxfiltration.com/products/nanofiltration/
-https://www.elisagenie.com/blog/ripa-recipe-cell-lysis-buffer/
-https://app.biorender.com/gallery/illustrations
-https://www.nature.com/articles/srep45089
-https://www.nature.com/articles/srep19893
-https://www.sciencedirect.com/book/9780128139264/nanoscale-materials-in-water-purification
-https://www.energy.gov/science/bes/articles/filtering-water-better-nature
-https://www.unicefusa.org/three-stories-about-how-clean-water-saves-kids-lives
-https://www.nxfiltration.com/products/
-http://news.bbc.co.uk/media/images/46424000/jpg/_46424101_dirty_water766.jpg
https://www.happinessishomemade.net/wp-content/uploads/2015/07/Drink-Water.jpg
https://alivenewspaper.com/wp-content/uploads/2018/04/Cases-of-Unsafe-Drinking-Water-in-the-US-Already-in-2018.jpg