UNICEF PRINCIPLES FOR DESIGN

"Empowering communities to combat water inequality" is one of the key aims stated by WaterScope. For this reason, it was very important for us to design around the user and community. Our main focus was for them to be able to take the initial product and use it independently, effectively and sustainably. Designing around the Unicef 'Principles for Development' was an effective way to ensure that we fulfilled this criteria.

ONE: DESIGN WITH THE USER

- We developed a solution with the user in mind from the start, considering the whole user experience from beginning to end. The design is compact and easy for transportation. It is simple to take apart for cleaning, and the modular design means that parts can easily be repaired, or disposed and replaced.

- We integrated into the existing workflow, by ensuring that the current syringe filtering method can be directly replaced with our own solution. We also simplified the current process by integrating a water collection vessel into our solution.

- We improved access to the filtering process by designing a system which requires minimal physical exertion, unlike the previous syringe method.

- Additionally, the system does not need any training to use; as can be seen by our short picture instructions.

FOUR: BUILD FOR SUSTAINABILITY

In this design we have aimed for sustainability in multiple ways:

- Environmental sustainability: Utilising cold water sterilisation to minimise any disposable parts, particularly large plastic items.

- Price sustainability: Minimising cost of total system, by keeping the number of parts to a minimum, and keeping those parts basic. Minimising cost per use, by minimising disposable parts. The cold water sterilisation would cost less than 5p per use.

- Product sustainability: Our modular system composed of simple items enables easy repairs. The community can use their own initiative to adapt our system to work for them, giving them control.

SEVEN: REUSE AND IMPROVE

- We have utilised the Luer lock system already in place at WaterScope, but improving the speed at which water is filtered through it.

- Several of the items in our system come from WaterScope, using as much as possible of their own inventory to solve the problem.

NINE: BE COLLABORATIVE

- Our product has been designed with a diverse team, from mechanical to information and bio-engineering backgrounds. Our work has been very collaborative, with everyone in the team sharing and documenting their results and processes.

- Additionally, the product was developed incrementally and in continual discussion with WaterScope, to ensure that all their requirements were being met. Each prototype was demonstrated and developed based on the feedback given to us.

Written by Katie Archibald

TWO: UNDERSTAND THE ECOSYSTEM

- Whilst there was not enough time to fully understand the ecosystem our product would be placed into, as mentioned above, we designed it to integrate as smoothly as possible into the current process, which has been field tested and successful in Tanzania.

- After discovering the filter may be used in refugee camps, which have hundreds of water sources, we created a product that could be adapted to filter multiple sources at once.

THREE: DESIGN FOR SCALE

- Our modular design means that it is incredibly simple to incrementally scale up the product. Each part can be taken individually and improved, whilst still having a fully functioning filter.

- Our modular design also enables the product to be adaptable to any country or context. Parts can easily be replaced with those available in country.

- By our integration of the Luer lock system, which is currently used by WaterScope, in our final solution it is possible to utilise their existing suppliers to minimise cost.

FIVE: BE DATA DRIVEN

- We have undertaken experiments to demonstrate the improvement in the new system, by testing and comparison of flow rates and turbidites.

SIX: USE OPEN DATA, OPEN STANDARDS, OPEN SOURCE, OPEN INNOVATION

- Throughout the whole design and development process, all our work has been uploaded and logged on GitHub, so that is possible to track our progress AND prototypes.
.
- Additionally, all relevant information, blueprints and test results will be available to the public on our website.

EIGHT: ADDRESS PRIVACY AND SECURITY

- As our system is mechanical and not digital, this principle is not as relevant to our project at this time.