

Three water filters interchange the rules:

Working together to increase access to safe water for low-income families

Problem: Existing household water treatment and safe storage (HWTS) devices are not well suited for users in low-resource settings. Some of the challenges are:

- **Cost**—too expensive
- **Complexity**—too difficult to assemble and use correctly
- **Durability**—too easy to break in challenging settings
- **Desirability**—product aesthetics must be designed for low-income settings

Solution: Development and introduction of new products that were designed with and for low-income families. These products are:

- **Affordable** to low- and middle-income households
- **Appropriate** for challenging conditions
- **Adaptable** such that filters and devices from different manufacturers can be interchanged

Designing with users for users

Low-income consumers in developing countries live and work under challenging conditions. Yet these consumers are not often engaged in the product design process, resulting in products that do not address their unique needs. We engaged with low- and middle-income families in Andhra Pradesh, India, to identify existing product shortcomings and help design more appropriate HWTS devices.

Working together to create a common interface

Through an iterative user-centered design process, product developers worked together to create a common interface to connect the filter element to the device that we call the C1 Common Interface.

This new feature will benefit low-income consumers long term with:

- **Choice and competition:** With a non-proprietary interface, consumers and distributors will not be locked in to having to purchase filter elements from only one company.
- **Ease of use:** The new C1 Common Interface controls the orientation of the filter element and reduces the risk of accidental contamination of the treated water.

Iterative user-centered design process



1 Extended user testing

- Tested 5 existing HWTS devices
- Observed 20 families over 5 months
- Gained insights on usability, durability, and desirability challenges
- Synthesized insights into design guidelines (see PATH's online HWTS Design Guidelines)



2 Design workshops with users

- Collected user suggestions on HWTS device characteristics
- Let users design their ideal solutions
- Demonstrated working prototypes and appearance models
- Synthesized feedback for prototype designs



3 Prototype development

- Developed the "Reference Design" prototype in partnership with Quicksand and Cascade Designs, Inc.
- Tested iterations of the prototype in user workshops in India

4 Prototype testing with users

- Tested the Reference Design in 13 rural and semi-urban households in India
- Observed families for 3 months
- Validated correct assembly, usability, and desirability with users

5 Production designs

- Developed three new device designs based on prototype testing
- Worked with manufacturers to optimize product and shipping costs
- Created tooling for high-volume manufacturing to support scale

Going beyond product design

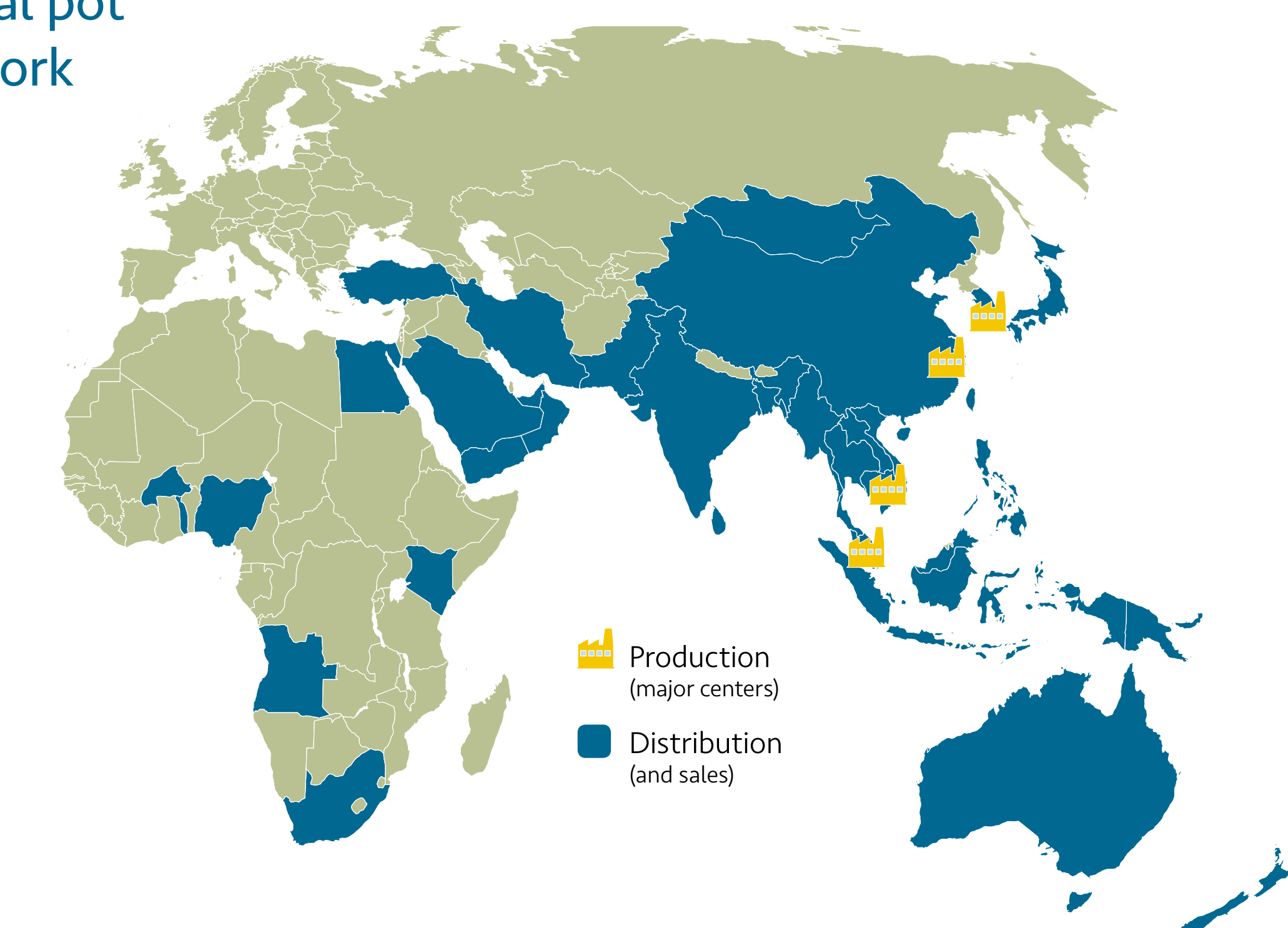
PATH is partnering with three mineral pot water treatment device manufacturers in China to create three different HWTS devices based on PATH's Reference Design. We are also working with filter element producers to create effective filters. Both the devices and the filter elements will incorporate the C1 Common Interface.

This partnership will improve:

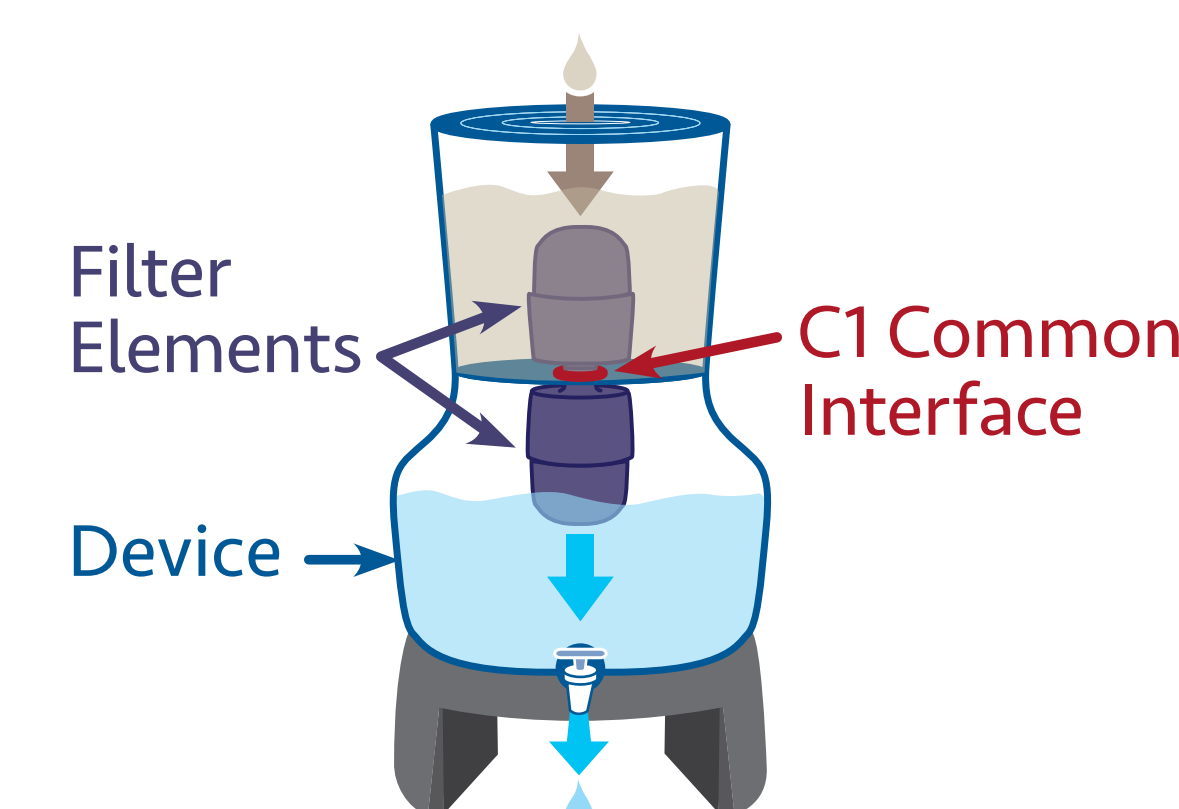
- **Choice**—ensuring that devices and filters from multiple producers work together so that customers will benefit from being able to choose among more solutions that meet their needs.
- **Scale**—building on success by partnering with manufacturers that can export efficiently, scale manufacturing capacity to meet demand, and provide competitive and affordable prices.
- **Sustainability**—achieving increased uptake and consistent use by designing and implementing a supply strategy that leverages a decentralized manufacturing and distribution network at scale.

The new products will be available for export from China in early 2012.

Leveraging mineral pot distribution network



PATH's Reference Design



Alternatively, the terms Household Water Treatment and Safe Storage (HWTS) and Treatment Elements may be used for Water Filters and Filter Elements, respectively. Device refers to a Water Filter without its Filter Elements.

Filter element



Cascade Designs, Inc.

Devices based on Reference Design



Dukang

Ningbo Clean

PureEasy

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PATH's Safe Water Project is a five-year learning initiative funded by the Global Development division of the Bill & Melinda Gates Foundation. Its primary focus is to test market approaches for improving access to effective household water treatment and safe storage products for low-income households.