



# Safe Water Project

*Partnerships for Commercialization of Household  
Water Treatment and Storage Products*

**UW Water Center  
Presentation**

*February 2007*



Oxfam



**PATH**

A catalyst for global health

# Presentation Overview

- PATH Overview
- Safe Water Context
- Household Treatment
- Project Approach
- Water Stories: India and Africa



# Who is PATH?



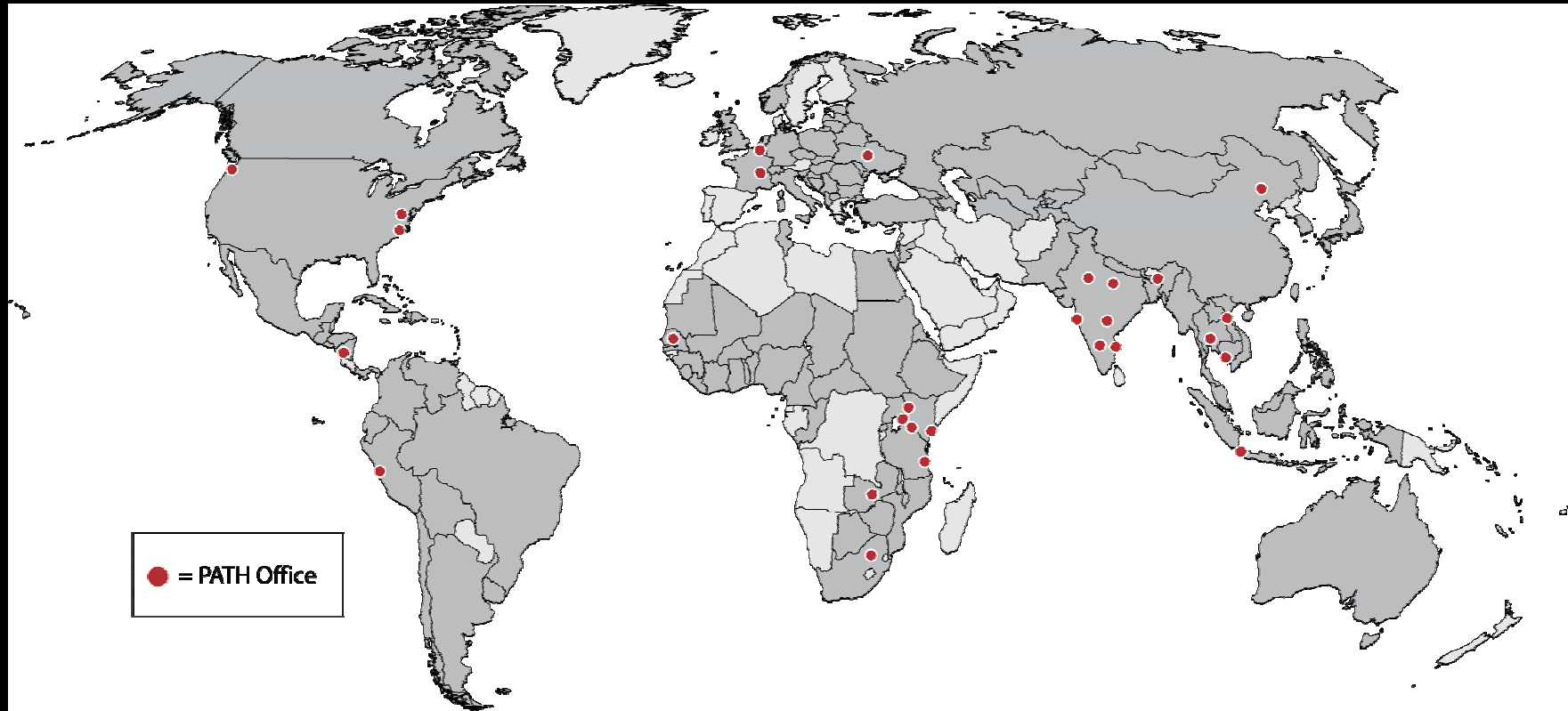
# PATH Facts

- PATH is an international, nonprofit NGO that is 100% donor supported
- PATH has a 30-year history of partnerships
  - Private corporations
  - Local NGOs
  - UN organizations (UNICEF, UNFPA, WHO)
  - Alliances (GAVI, ACCP)
  - Ministries of health



# PATH Projects and Offices

28 Offices in 18 Countries; 539 Staff



# PATH's Mission

To improve the health of people around the world by advancing technologies, strengthening systems, and encouraging healthy behaviors.



# PATH's Proven Track Record

- PATH works in health technologies, maternal and child health, reproductive health, vaccines and immunization, and emerging and epidemic diseases.
- History of technology and program innovation
- We develop and introduce health technologies with partners
- 26 technologies commercialized



# Safe Water Context



# Water, Sanitation, Hygiene Issues

- Policy, property and human rights
- Environment, climate, development
- Behaviors, poverty, competing needs
- Public sector efforts now underway
- Water distribution, quantity, quality



# Water Contaminants

- Bacteria
- Viruses
- Parasites
- Industrial by-products
- Heavy metals
- Excess turbidity



# Health Impact of Diarrheal Diseases

- 1.8 million people die every year from diarrheal diseases
- 88% of diarrheal disease is attributed to unsafe water supply, inadequate sanitation, and hygiene.
- Improving the quality of household drinking water can lead to a reduction of diarrheal episodes by 35-39%.



# Water Supply, Hauling and Storage



# Point-of-Use Water Treatment

- Physical Removal
- Chemical Treatment
- Heat Disinfection



# Locally Made Ceramic Filter (Nepal)



**सफा फिल्टर प्रयोग गर्दा ध्यान दिनुपर्ने कुराहरू**

१. फिल्टर क्यान्डल पानीले राम्रोसँग सफा गर्नुहोस् ।
२. फिल्टर क्यान्डलको वासर, नट राम्रोसँग कस्नुहोस् ।
३. फिल्टर राम्रो समथल स्थानमा राख्नुहोस् ।
४. सूर्यको प्रकाश सिधै सफा फिल्टरमा नपार्नुहोस् ।
५. फिल्टरको धारा राम्रोसँग कस्नुहोस् ।
६. फिल्टरको क्यान्डल सफा गर्दा साबुन प्रयोग नगर्नुहोस् ।
७. फिल्टरको धाराको पानी आउने मुखमा फोहोर हातले नछुनुहोस् ।
८. फिल्टर क्यान्डल सफा गर्दा दौत माफ्नुने नरझ ब्रसले राम्रोसँग मिलाएर सफा गर्नुहोस् ।

सफा फिल्टर सम्बन्धी बग जानकारीका लागि आई. डी. ई. नेपाल केन्द्रीय कार्यालय काठमाडौं तथा क्षेत्रीय कार्यालय पोखरामा सम्पर्क गर्नुहोला ।

## चाँदी लेपन गरिएको किटाणु रहीत


# सफा फिल्टर




क्षेत्रीय कार्यालय: कोन्दिय कार्यालय: त्रिभुवा कार्यालय: सन्तु रमौली,  
पोखरा, फोन: (०६१) ४३२४२२२२ सन्तिसपुर, फोन: (०१) ४३२०९४३३ फोन: (०६४) ४३०६०२



# Kenya “Healthful Waters” Filter



 **MajiAfya**

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Reid Harvey  
[purifier@localnet.com](mailto:purifier@localnet.com)



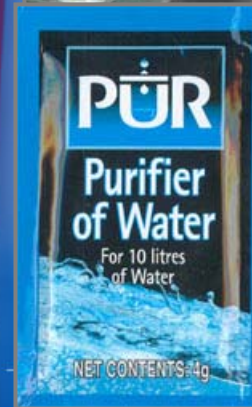
# Chemical Treatment: WaterGuard

- Dilute sodium hypochlorite solution in bottle
- Best suited for clear water
- One bottle treats 1000 litres of water
- Over 900,000 households currently using the product  
(source; PSI Trac survey)



# Point-of-Use Water Treatment cont'd

- UV
- Combination



# SODIS Application

**1** Wash the bottle well the first time you use it



**Clean  
PET Bottles**

**2**

Fill the bottle  
3/4 full with  
water



**Fill Bottles  
partly to 3/4**

**3** Shake the bottle for  
20 seconds



**Aerate the Water  
through Shaking**

**4**

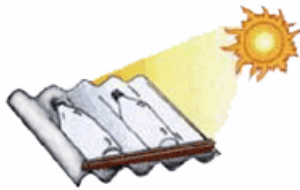


Now fill up the bottle  
fully and close the lid

**Fill Bottles  
completely**

**5**

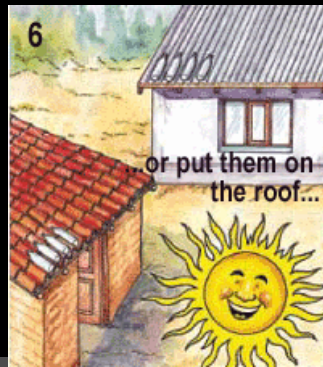
Place the bottles on a  
corrugated iron sheet



**Expose Bottles  
to Sunlight**

**6**

or put them on  
the roof...



**Exposure on Roofs  
are adequate**

**7**



Expose the bottle to the  
sun from morning until  
evening for at least six  
hours

**Expose the Bottles  
for 6 Hours**

**8**

The water is now  
ready for  
consumption

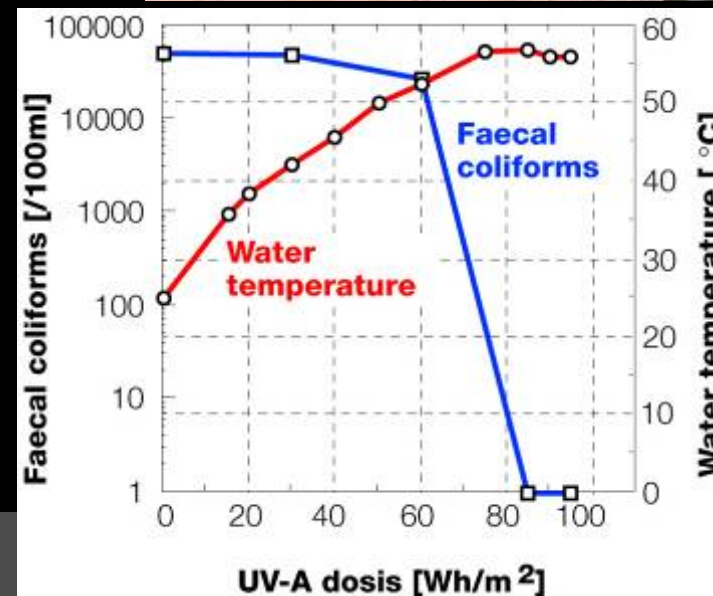


**Drink the Water  
from the Bottles**



# How does SODIS work ?

- plastic bottles are filled with contaminated water and exposed to sunlight for 6 hours
- sunlight disinfects the water through two effects:
  - radiation in the UV-A spectrum
  - increase of water temperature
- **water temperature can rise to 50 °C and more**
- **Faecal coliforms are reduced by 3 - 4 log (99.9 % reduction)**



# Biosand Filter

A slow sand filter adapted for household use:

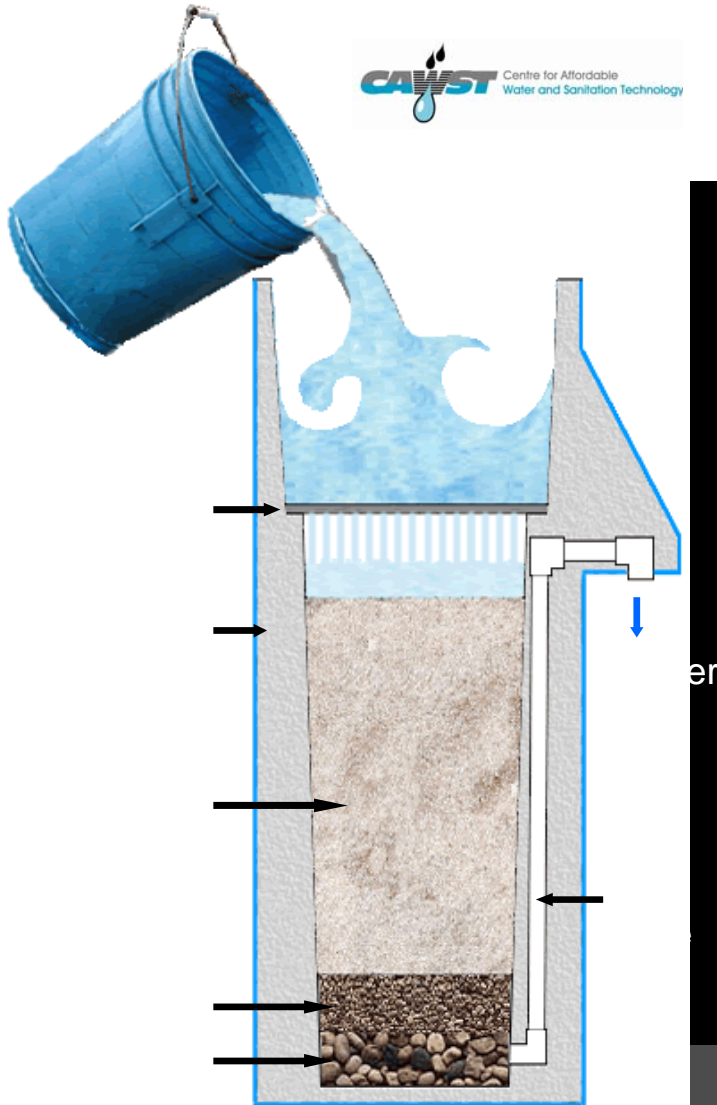
1. Height of the water above the sand is 5 cm
  - This allows oxygen to reach the biofilm layer that forms near the top of the sand
2. Sand removal is not required
  - A clean-in-place technique, called 'swirl and dump', allows the impurities to be removed without removing the sand

Flow Rate: ~ 30 litres per hour

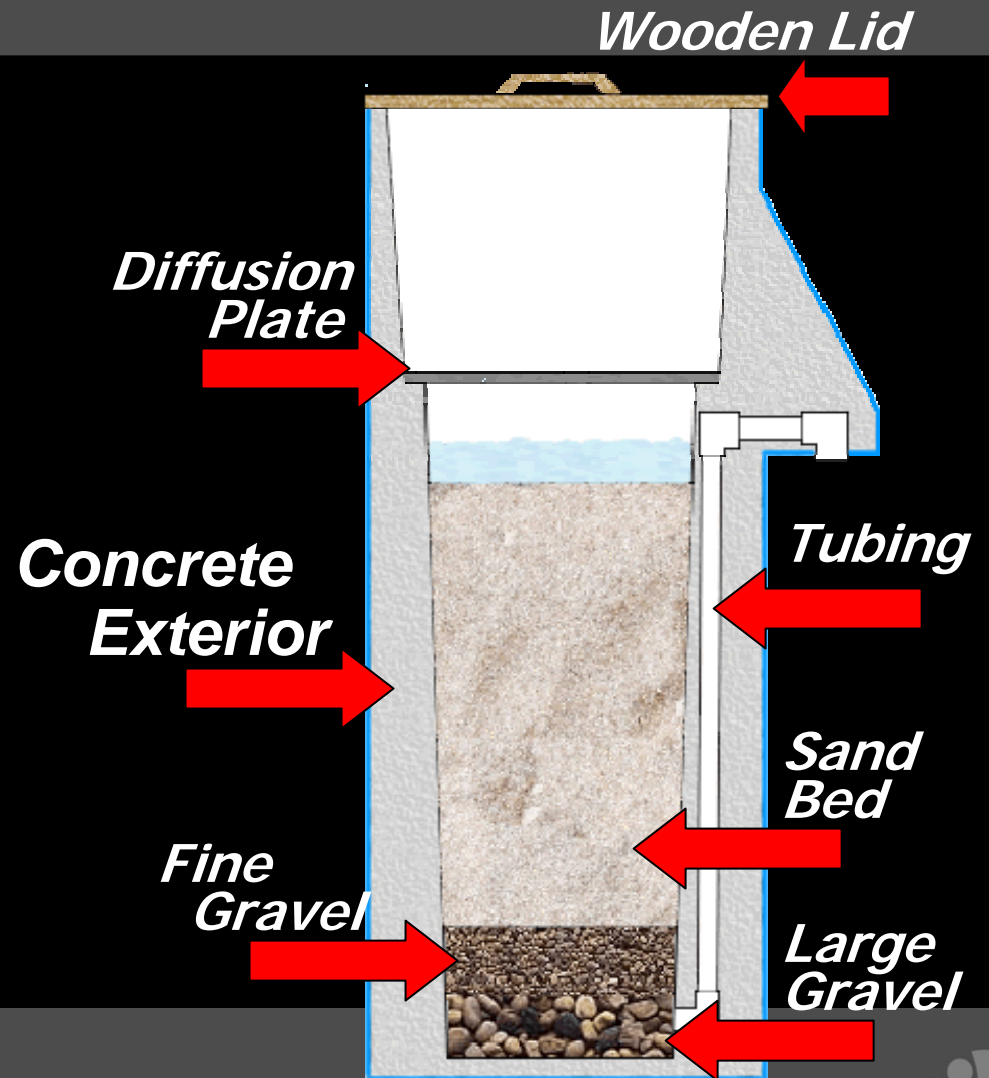
Cost to Produce: 12 – 40 US\$

Filters installed: Over 100,000 in 43 countries

Purpose: To help provide clean water for the 1.1 billion people without this basic need.

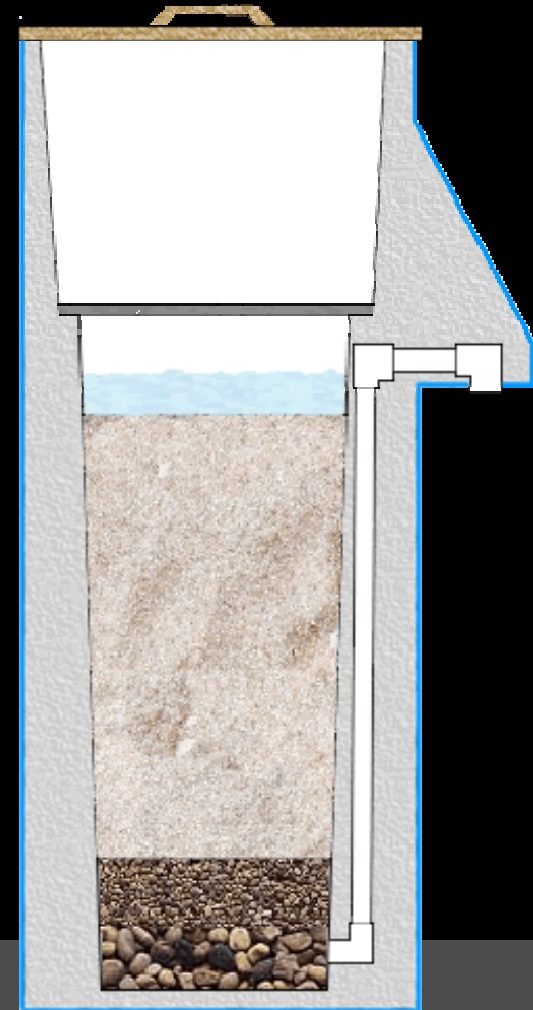


# Bio-Sand Materials and Features



# Processes of Filtration

- 1. Mechanical Trapping*
- 2. Predation*
- 3. Adsorption*
- 4. Natural Death*



# Technology Comparison

|                   | Turbidity | Heavy Metals | Viruses | Bacteria | Parasites | Pesticides |
|-------------------|-----------|--------------|---------|----------|-----------|------------|
| Boiled            | Red       | Red          | Green   | Green    | Green     | Red        |
| Filtered          | Yellow    | Red          | Yellow  | Yellow   | Yellow    | Red        |
| Chemical          | Red       | Red          | Green   | Green    | Yellow    | Red        |
| Combined Chemical | Green     | Green        | Green   | Green    | Green     | Yellow     |
| UV                | Red       | Red          | Green   | Green    | Green     | Red        |
| SODIS             | Red       | Red          | Green   | Green    | Green     | Red        |

- Indicates solution addresses well or consistently
- Indicates solutions addresses moderately well and/or sometimes
- Indicates the solution does not address or does not address well



# Our Approach

Facilitate private sector  
resources to meet public  
health needs



# Our Guiding Principles

## PATH's Guiding Principles for Private Sector Collaboration

### INTRODUCTION

PATH's mission is to improve health, especially the health of women and children. To achieve its mission, PATH identifies, develops, and applies appropriate and innovative solutions to public health problems, particularly in low-resource settings. Collaboration—including collaboration with the private sector—is a key element in PATH's approach.

PATH's goal for private sector collaboration is to achieve maximum sustainable benefit for public health through engaging private sector collaborators to apply their development, manufacturing, and distribution strengths toward innovative technologies that, in the absence of PATH involvement, would not be a private sector priority.

### PURPOSE AND SCOPE

PATH developed these Principles for Private Sector Collaboration to:

- Articulate key institutional policies and positions regarding PATH collaborations with private sector companies.
- Provide PATH staff with guidance in managing private sector collaborations.
- Provide current and potential private sector collaborators with an overview of PATH's perspectives and expectations for collaboration.

PATH's Board of Directors and President fully endorse these principles. The principles convey both the broad direction and the specific actions that they expect of all PATH teams that form collaborations with private sector companies.

These principles primarily address the following types of collaborations:

**Transfer of a Technology Developed or Owned by PATH.** PATH develops a technology in-house and transfers the intellectual property to a private sector collaborator for further development, manufacturing, and distribution.

**Support by PATH for Development of a Collaborator's Product.** PATH provides significant resources or expertise (such as funding, management, co-development, and assistance with clinical studies) to a private sector collaborator to support the collaborator's development of a product.

**Support by PATH for Introduction of a Collaborator's Product.** PATH supports and/or undertakes significant programmatic activities (such as field trials, epidemiological studies, and advocacy programs) that demonstrate and communicate the public health value of a product produced by a private sector collaborator.

## Clear link to mission

PATH's collaborations with private-sector companies must lead to positive impact on availability, accessibility, and affordability of important health products for public health programs in developing countries.

## Recognition of private-sector needs

In collaborating with a private-sector company, PATH must recognize the company's need for commercial benefit in order to ensure a sustainable commitment to the collaboration.



# What PATH has to Offer

- Facilitating/brokering partnerships among:
  - Manufacturers, distributors, potential credit facilities
- Management of Intellectual Property
- Product improvement- testing, adaptation
- Investing in advertising and promotion
- Facilitating research and behavior change
- National and international policy evolution



# Project Description



# Gates Foundation Learning Initiative

The Bill & Melinda Gates Foundation is making limited and focused grants to contribute to water, sanitation and hygiene in the developing world and to understand more about sustainable and scalable opportunities to reduce water-related diseases.



# Project Approach through Partners

- Provide a portfolio of household water treatment and storage (HWTS) products that meet the needs of middle- and low-income consumers.
- Catalyze an independent, sustainable private commercial market that provides choice.
- Facilitate a market that services a range of market segments – allowing possible cross-subsidization.
- Introduce new market campaigns, behavior change approaches, supply chains using best practices.



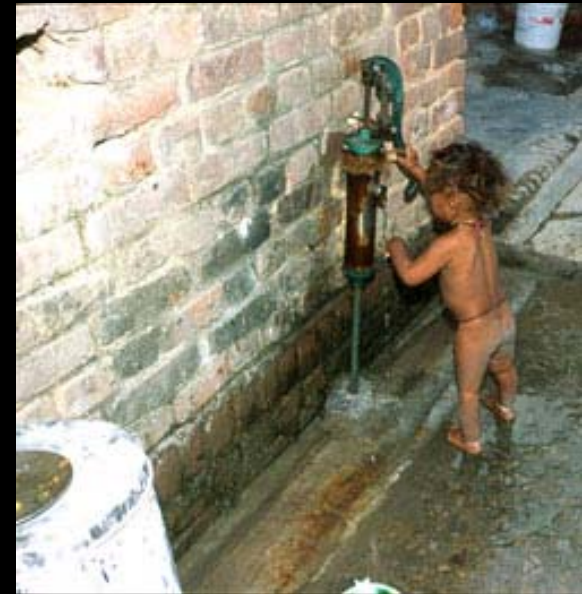
# Project Approach through Partners cont'd

- Eliminate a steady infusion of public-sector funding for this market to exist or expand.
- Work with public-sector entities to ensure supportive policies, incentives, and public messages.
- Identify gaps in a commercial model where public sector provision may meet the need.
- Develop a model market within a pilot country.



# India as the Pilot Country

- The World Bank estimates 21% of communicable diseases in India are water related.
- Established industrial base
- Robust consumer economy
- Additional countries will be selected for parallel research to determine applicability of model



# Project Structure

## Five-year project

- 1 year foundational research
- 1 year development
- ½ year scale-up, final pre-test, and roll-out
- 1 ½ year “run time” for pilot market
- 1 year assessment, analysis, adjustment, and development of “road map” for expansion



# Challenges and Opportunities

- Removing diarrhea pathogens may not be enough
  - The best solution(s) may not be affordable for target consumers
  - Consumers may not perceive a need or purchase products
  - Commercial parties may not see benefit or provide products
  - The solutions could be location-specific and not replicable
- 
- 10 years of R&D in low cost POU options validated technologies
  - Robust market in middle and upper income POU products in India
  - Base of the Pyramid approaches are reaching very poor consumers
  - Cost effectiveness data and evidence shows value of POU
  - Public health messages and programs have sensitized many consumers



# Project Vision

Households with unreliable and/or unsafe sources of water will have access to, purchase, and consistently use affordable and effective products to treat and store water in the home.



# India Story

Real need, real opportunity



















# Hindustan Lever





HINDUSTAN LEVER  
pureit

കുടിയ്ക്കാനുള്ള ശുദ്ധമായ വെള്ളം







# Africa Stories

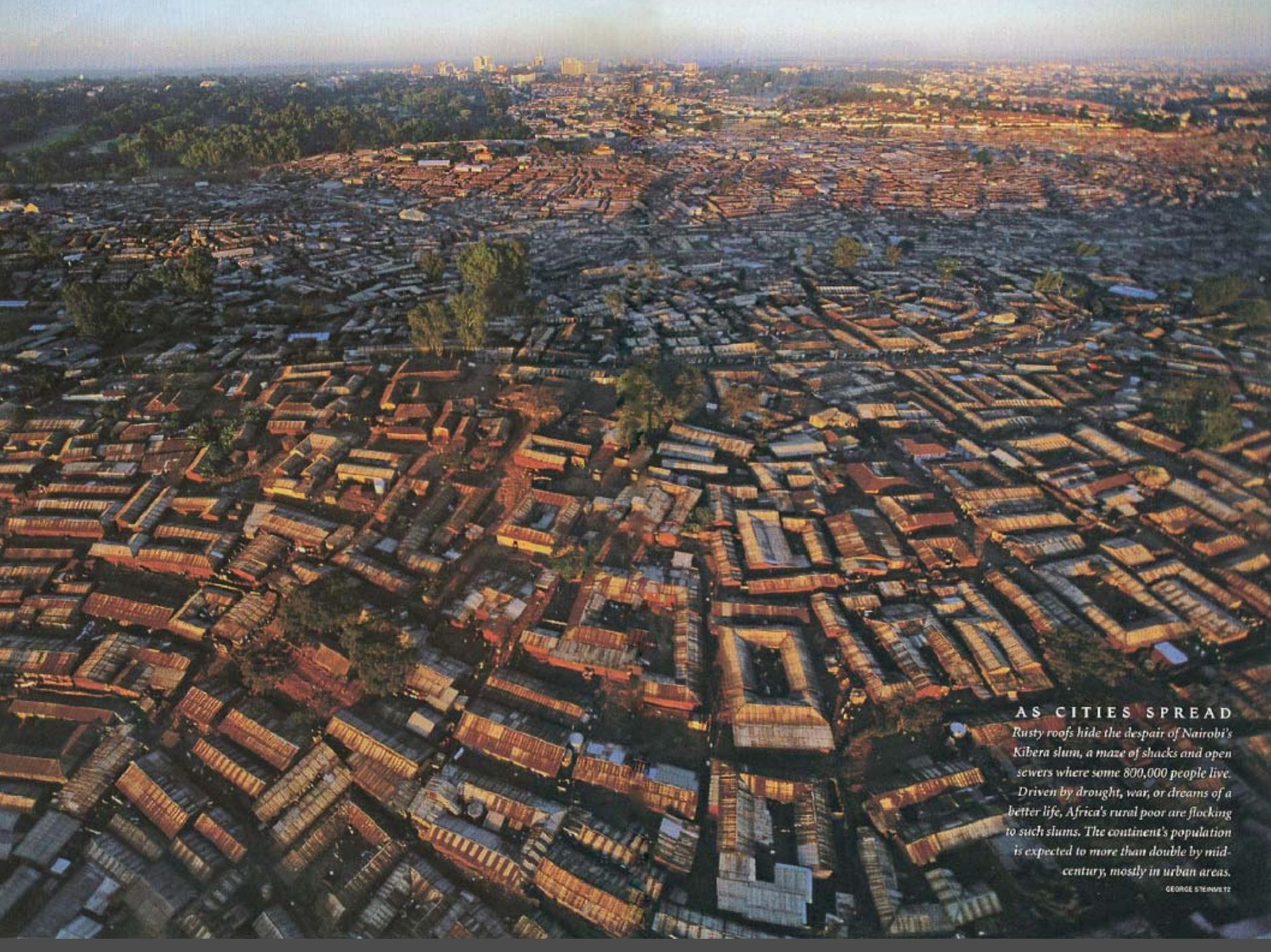
Shades of Poverty, Entrepreneurs



# Nairobi's Kibera Slum

- Over 700,000 residents
- Multiple NGO projects for water, sanitation, and hygiene
- Vigilante police ensure security
- Robust entrepreneurial activity





#### AS CITIES SPREAD

*Rusty roofs hide the despair of Nairobi's Kibera slum, a maze of shacks and open sewers where some 800,000 people live. Driven by drought, war, or dreams of a better life, Africa's rural poor are flocking to such slums. The continent's population is expected to more than double by mid-century, mostly in urban areas.*

GEORGE STERNWITZ



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# Korogoco Slum

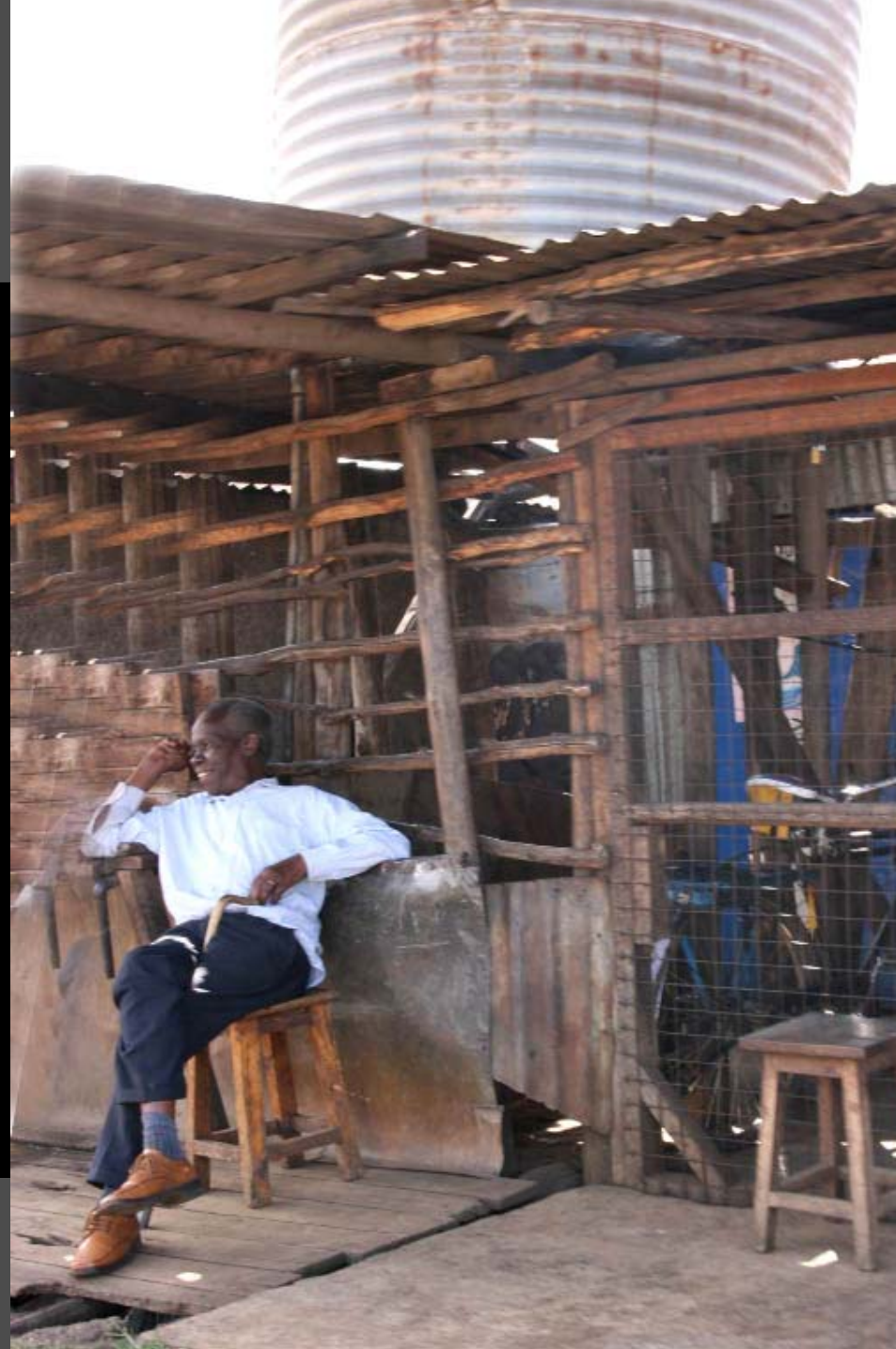
- Many TB/HIV positive residents
- Water supply intermittent
- Security problems prevent aid agency access
- Lackluster economic activity



























# Tanzania Rural Setting

- Dry regions require network of water haulers
- Water sources server large catchment areas
- Transport becomes major issue



















Thank you



# Outside of Project Scope

- New product development
- Provisioning of NGOs in providing HWTS products
- Hygiene, sanitation, and source improvement



# Typical Stages of Market Adoption

