Presentation Overview

1. How AQUA-BRIDGE (A-B) initiated
2. What we do: Appropriate Technology + ICT platform
3. A-B at work
4. Web-based ICT platform

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More than 10% of world population do not have safe **drinking water**

Two most promising low-cost drinking water filters are based on porous media flow:

TABLE 3. Scoring of POU Treatment Technologies Based on Sustainability Criteria

technology	quantity	quality	ease of use	cost	supply chain	overall score
free chlorine	3	1	3	3 (liquid) 2(tablets)	1	11 10
coagulation/chlorination	2	3	1	1	1	8
SODIS	1	1	1	3	3	9
ceramic filters	2	3	2	3	2	12
biosand filters	3	3	2	2	3	13

Sobsey et al., Environ. Sci. Technol. 2008

Biosand filter

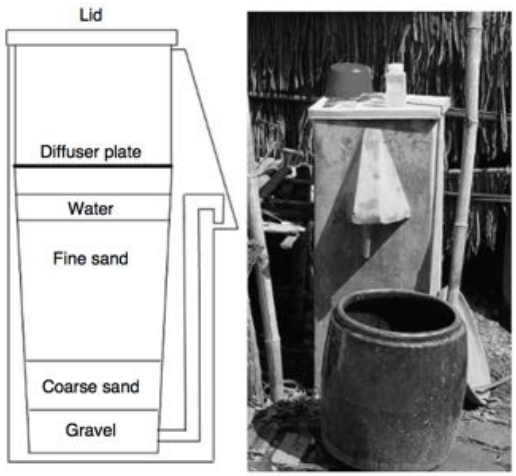

Figure 1 | BioSand filter.

Murphy et al., J. Water and Health, 2010

- Biosand filter: 90% ~ 99.9 % harmful bacteria removal

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Who we are

ICT expert

Youjin Shin

Microbiologist

Pratik Shah

Environmental Scientist

Peter K. Kang

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3. **What** does **AQUA-BRIDGE** do?

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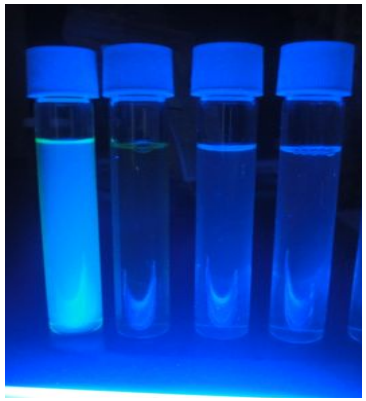
We bring
clean water

Using appropriate
technology



Integrated with
web-based **ICT platform**

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What is appropriate technology?

Appropriate technology is small-scale, decentralized, labor-intensive, energy-efficient, environmentally sound, and locally controlled.

Biosand filter

Water-quality test

Service Model

Water filtration technology

Bio-sand Filter

- Cleans water to drinkable level at low cost
- Built by/with the resource at the local community
- No energy required
- Superior flow rate
- Easy to scale-up

* Very effective for microbiologically contaminated water
* Not very effective for desalination and removing heavy metals

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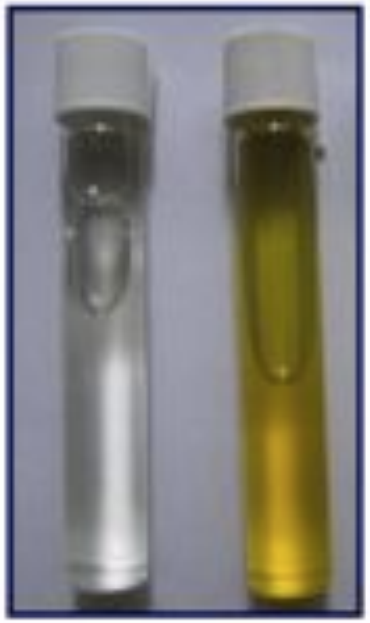
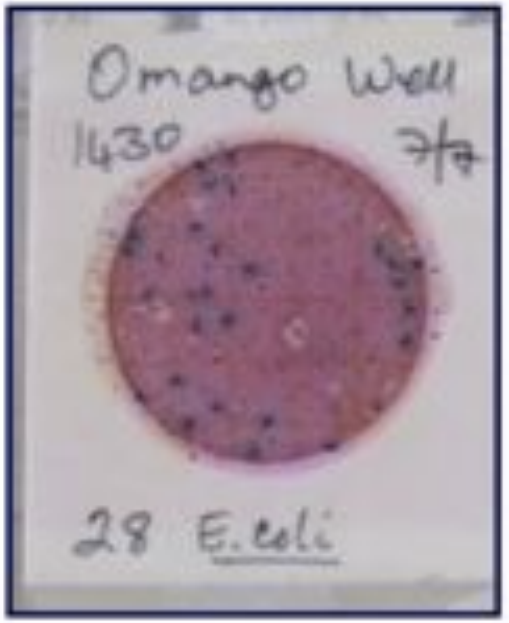
Low-cost Water Quality Test

2 EC-Kit Tests



Colilert Test (10 ml pre-dispensed tube)



Petrifilm

Source: 1.815J Week 4 lecture presentation by Susan Murcott

Our Service Model: Hybrid model

Neighborhood-level

+

Household-level

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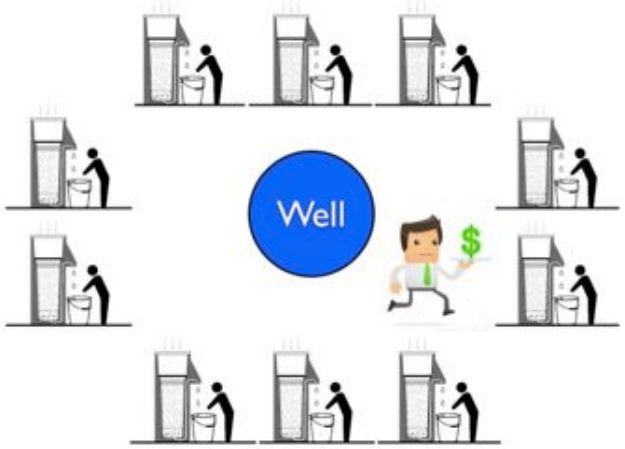
Neighborhood level Model



Pros

- Larger impact
- Easier quality control

Cons

- Support from community people and local government is necessary
- Larger initial cost
- Devoted local manager is essential

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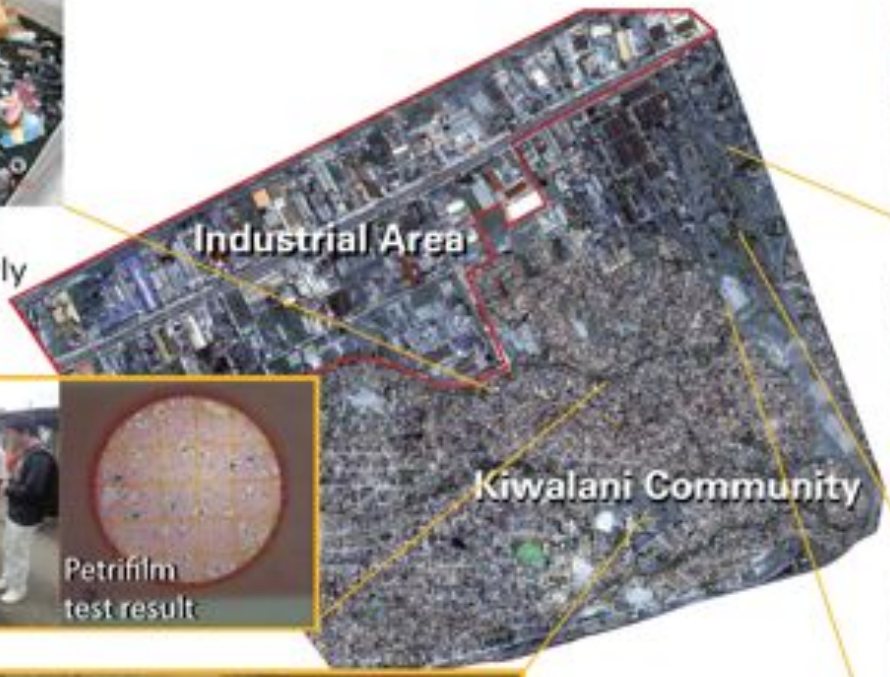
Our First Visit: March, 2011

- Understanding the problem and community
- Water quality test
- Build trust with the community

Situation

Nearby factories contaminate nearly all water sources

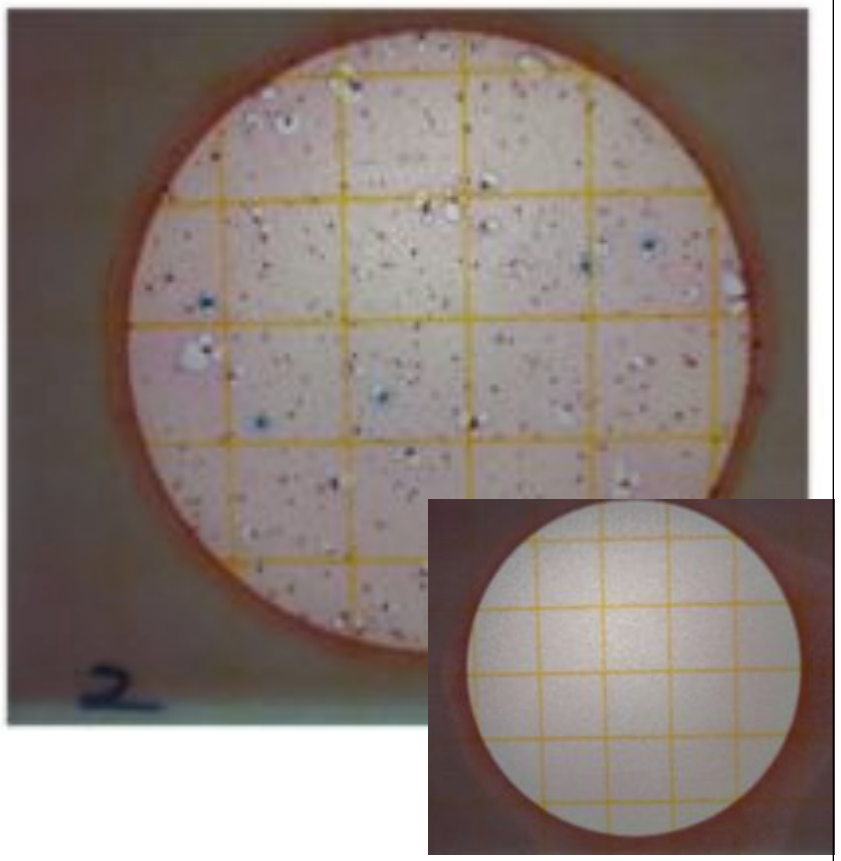


Due to the lack of any drainage systems, rain causes flooding in these communities. People routinely discard their feces in these flooding waters, contributing to the spread of diseases.

Water situation in Kiwalani - Water quality is bigger issue

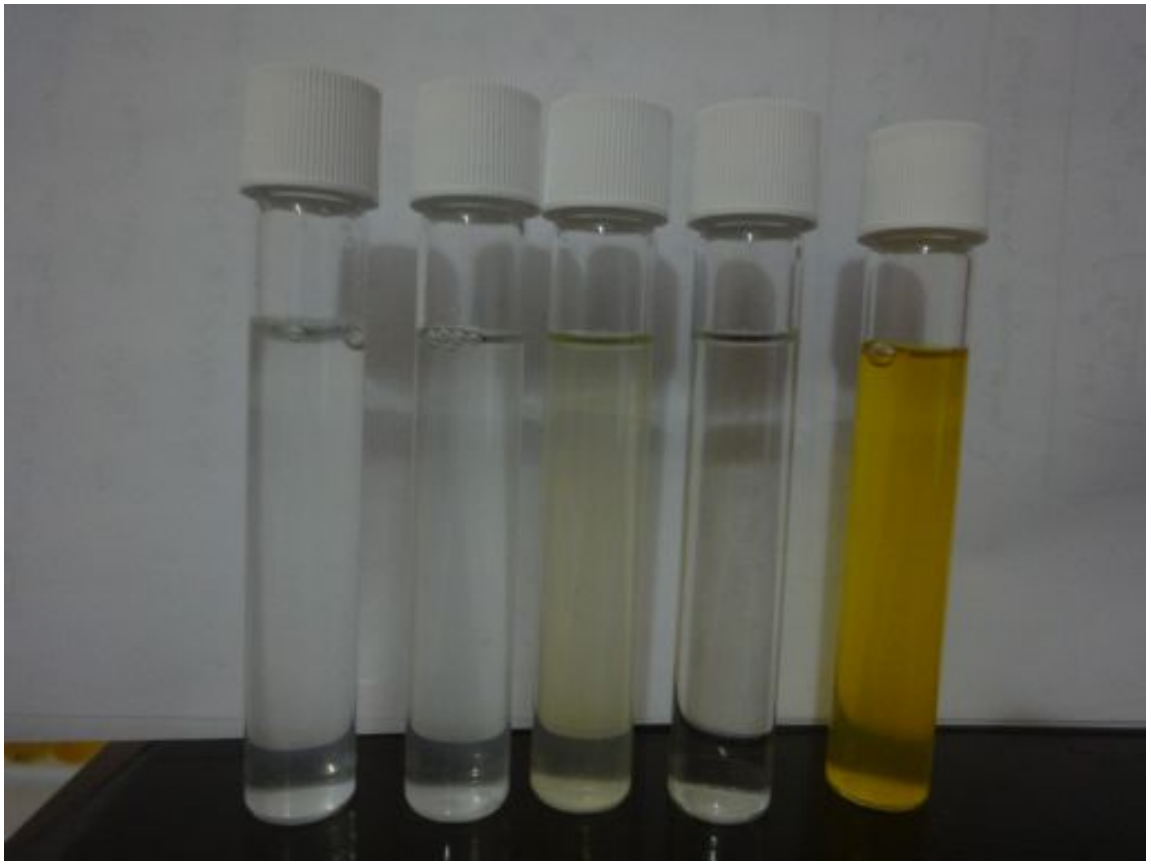
- Roads are flooded even with one day of rain. Sources of mosquitoes.
- People dump out feces during rain, which is source of many diseases.

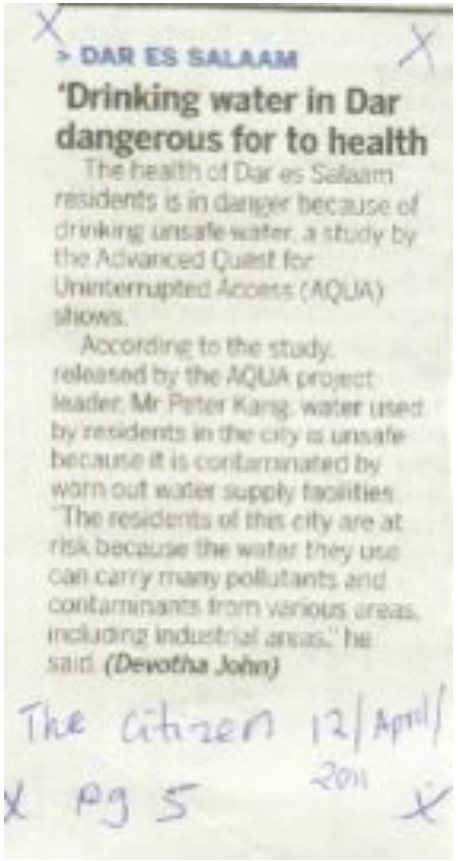
Water situation in Kiwalani - Water Quality Test



- We sampled 10+ water points; most shallow wells are microbiologically contaminated

Raised awareness





> DAR ES SALAAM

'Drinking water in Dar dangerous for to health

The health of Dar es Salaam residents is in danger because of drinking unsafe water, a study by the Advanced Quest for Uninterrupted Access (AQUA) shows.

According to the study released by the AQUA project leader, Mr Peter Kang, water used by residents in the city is unsafe because it is contaminated by worn out water supply facilities. "The residents of this city are at risk because the water they use can carry many pollutants and contaminants from various areas, including industrial areas," he said. *(Devotha John)*

The Citizen 12/April/2011

pg 5

- Four deep wells yielded relatively safe results.
- Published in local newspaper (*The Citizen*, April 12, 2011)

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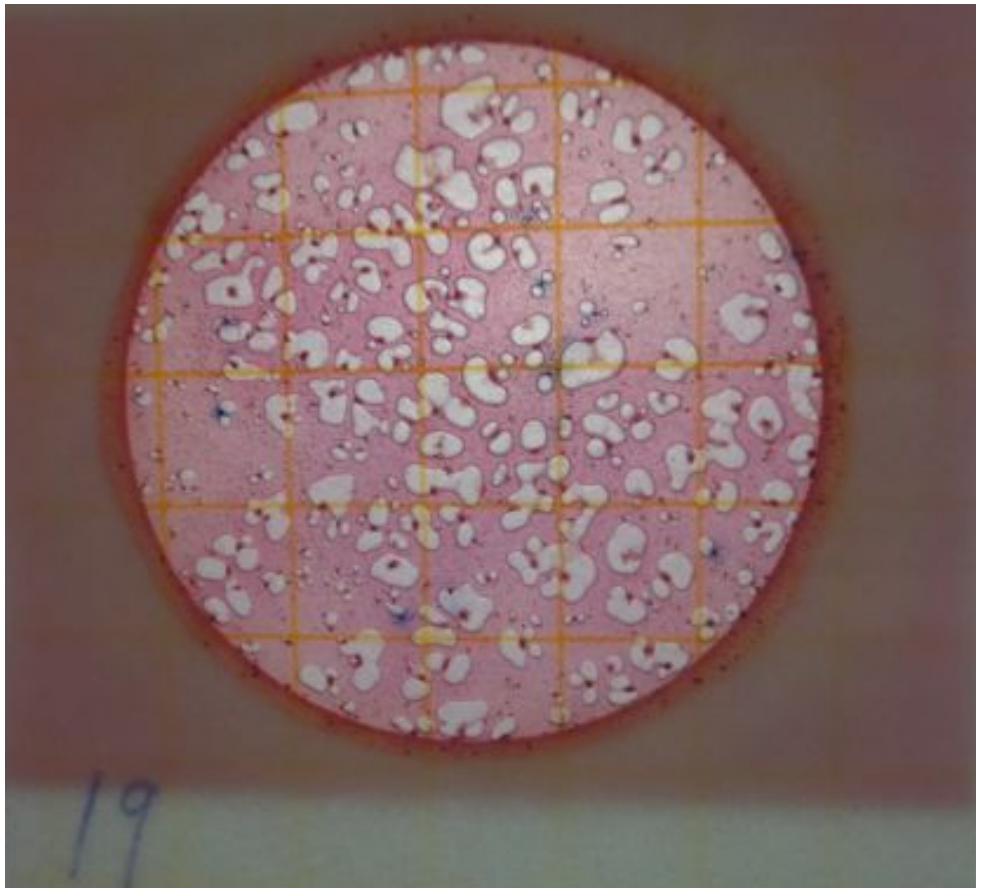
Quiz!

Our Hotel !!!



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Trust Relationship with TAKIWOYA

• TAKIWOYA - a local grass roots organization in Kiwalani - was formed in 2007 to meet the demand of improved living conditions in their community.

• Our local partner

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Second visit: January 2012

- Revisit with our solution: biosand filter with neighborhood level service
- We always start with long discussion with local women: ALWAYS WORKS!!
- Most of the time, solution suggested by local women.
- Way to build up a trust relationship

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Water Quality Test

Building a Gate for Security

Building and Installing Biosand Filter

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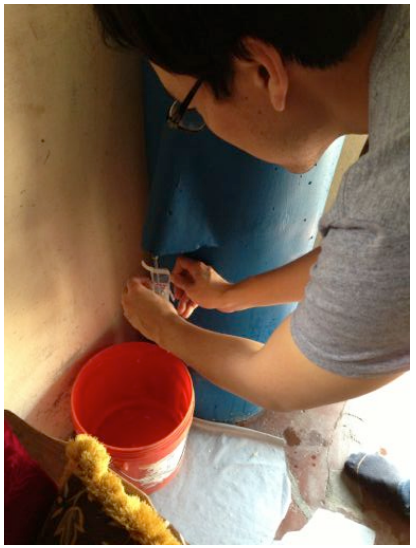
Open house

Third visit: Data collection with mobile application



- Household survey
- Water quality testing with GPS location
- Reference system

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Filter distribution with GPS location

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Support from local government: Large demand

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5. Web-based ICT Platform

Why web-based ICT platform?

The ICT platform will allow us to make **data-driven decisions** based on the sufficient information collected from our community.

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Web-based ICT platform

Goal

1. Real-time data collection
2. Transfer data into information
3. Raising awareness in developed countries
4. Fundraising from general public

Target

1. For Project management
2. People in developed countries

Delivering Strategy

1 Community based map
2 Data visualization

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How we collect data

1. Community **survey** with mobile application

By Modi Research Group at Columbia Univ. Photo: Formhub

- Gather survey data with GPS information.
- Understand community situation and project acceptance.
- Automatically uploaded to our web-based platform

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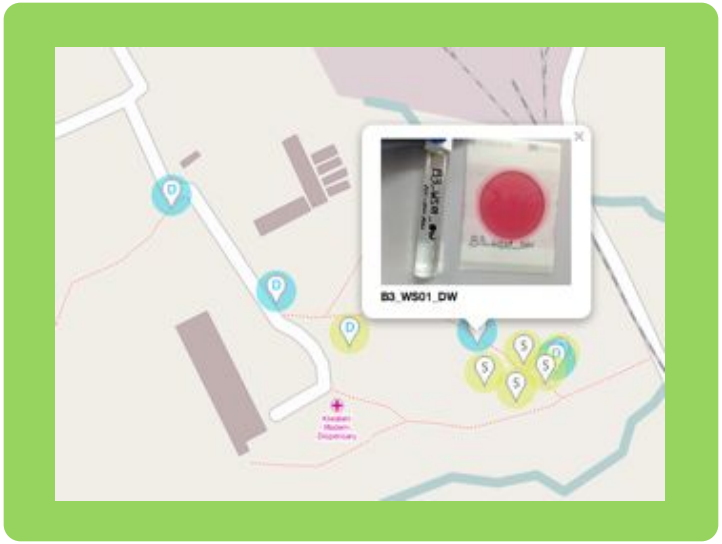
How we collect data

2. **Water quality** information



Water quality test +

GPS location

Water status map

- Collect water quality data with GPS information
- Monitoring filter performance, water situation
- Automatically uploaded to our web-based platform

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How we collect data

3. Crowd sourcing from the community members (twilio)

Texting (Kiwalani)

ICT Platform (A-B)

- Filter users and community members can text us.
- Texted message are automatically uploaded, analyzed on our platform
- We can respond to the disease outbreak (“boil water”)

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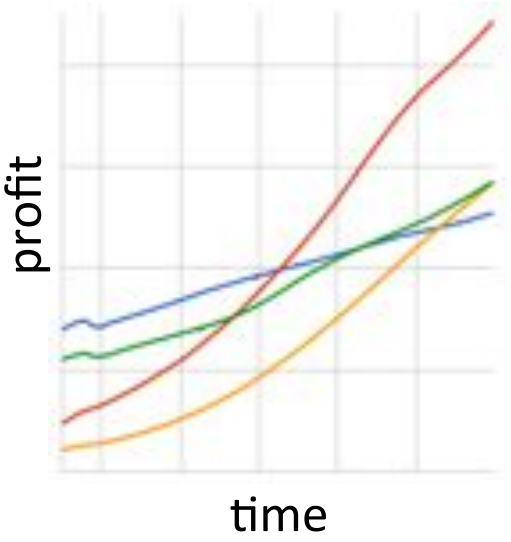
How we collect data

4. Rent fee collection (M-pesa)

Texting (Kiwalani)

ICT Platform (A-B)



- Filter renters can pay using their cellphone via M-pesa system
- Rent fee collection status will be automatically uploaded on our platform
- We can respond to payers (“why”)

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How we collect data

5. Project activity: GPS tracking with photo info (runtastic)

http://blog.runtastic.com

- Project manager records his GPS location & photos
- GPS tracking will be uploaded on our platform
- We can analyze working history and also can be used for story telling

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One day journey (July 18th, 2013)

visualization by Youjin Shin

We **bridge the gap** between the developed and developing countries through our web-based platform

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Fundraising

- Through ICT platform, users in developed countries can learn about the Kiwalani community's current water situation and make donations to support the water filtration network.

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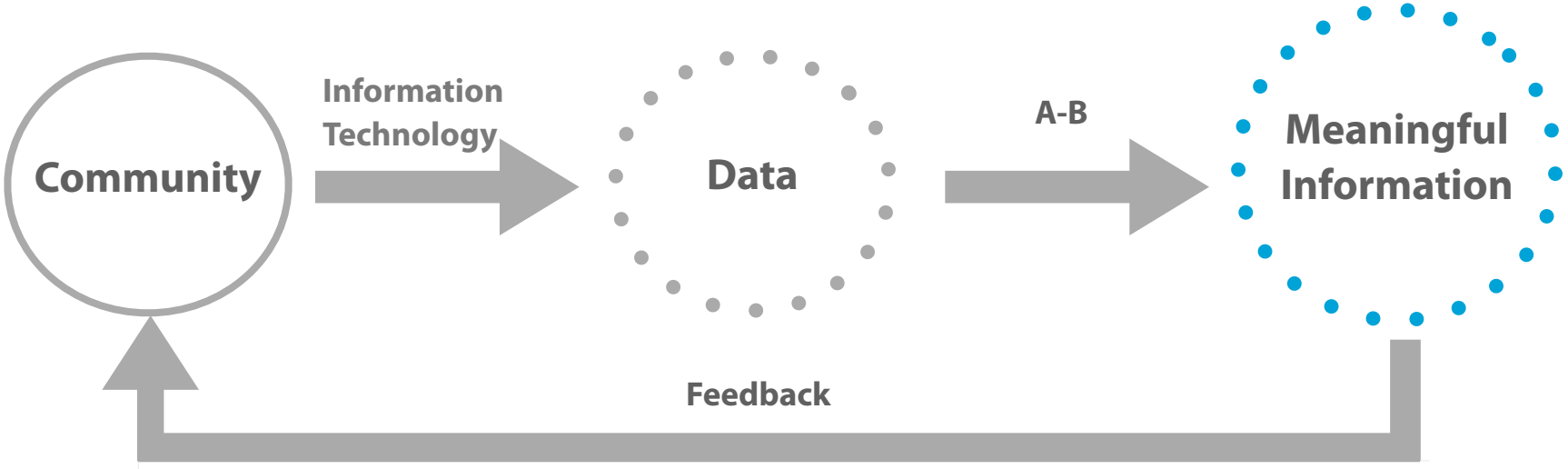
Summary: ICT Platform

Data into Information



1 Collect community information (ex. survey, water quality, crowd sourcing, rent fee, GPS tracking)

2. Designing data informed strategy (ex. where to distribute next set of filters, how to improve filter design)

3. Feedback to community (implementation)

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Current status of our ICT platform

http://itp.nyu.edu/~ys1438/sinatra/waterQuality

- We use openstreet map for updating community information
- Deep well vs Shallow well
- Biosand filter (two filters that are not working..)
- New filters: where to install next?
- Key locations

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