













### TODAY'S SESSION

1. ABOUT IMAGINE H2O ASIA

2. FOUR STARTUP PITCHES + Q&A

- . AQUAFFIRM
- . DRINKWELL
- . SMARTTERRA
- . LIQUINEX





### SOLVING WATER WILL REQUIRE IMAGINATION

Our mission is to empower people to develop and deploy innovation to solve water challenges globally

### 150+ STARTUPS SINCE 2009

#### **500+ APPLICANTS ANNUALLY**































































# OUR ENTREPRENEURS ARE TACKLING ISSUES ACROSS SDG 6

SUSTAINABLE GUALS

Indra (UWC '19)

### **ACCESS**

- » WATER QUALITY TESTING & DETECTION
- » ENVIRONMENTAL REMEDIATION
- » WASTEWATER TREATMENT & REUSE

#### **EFFICIENCY**

- » NETWORK MANAGEMENT & LEAK DETECTION
- » AGRICULTURAL TECHNOLOGY
- » WATER-ENERGY NEXUS

#### SAFETY

- » DRINKING WATER TREATMENT & DELIVERY
- » DIGITAL SOLUTIONS
- » STORMWATER & FLOOD CONTROL

# OUR ACCELERATOR PROGRAMS HELP STARTUPS CREATE A PATH TO MARKET

#### STARTUP MENTORSHIP

Virtual accelerator programs and in-person water startup bootcamps

#### **INDUSTRY VISIBILITY**

Global showcase events and marketing support

### **INVESTOR & CUSTOMER INTRODUCTIONS**

Direct introductions to a global partner network

### PILOT FUNDING & IN-COUNTRY SUPPORT

Targeted awards to co-fund high-impact pilot projects

SENTRY (IH2O '18, IH2O Asia '20)

## A TRACK RECORD THAT EXTENDS TO SOUTH & SOUTHEAST ASIA

### **SINCE 2009**

deployed 100+ solutions in 50+ countries

provided **\$1** million+ in award funding to scale solutions

helped alumni raise \$550 million+ in early-stage investment

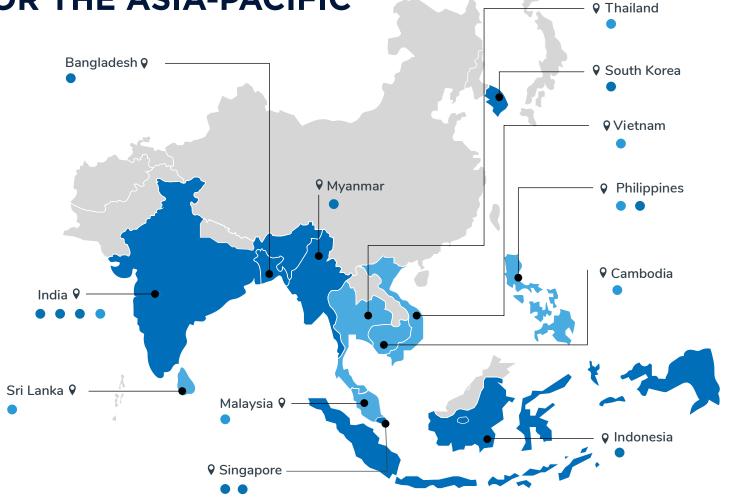
created customer network of **70+** end-users

launched Imagine H2O Asia as Asia-Pacific hub



## A CUSTOMER VALIDATION PLATFORM FOR THE ASIA-PACIFIC

- Active Deployments
- Active Customer Discussions with IH2O Asia Partners



### THE ECOSYSTEM PARTNERS NETWORK

### A COMMUNITY OF END-USERS COMMITTED TO WATER INNOVATION

#### SELECT ECOSYSTEM PARTNERS

























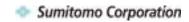
















#### OTHER GLOBAL CUSTOMER PARTNERS











# ENGAGE OUR INNOVATORS & PARTNER WITH US

SILITED

SINGLE CONTROL OF THE CONTR

**SWITCH Singapore 2019** 

**PARTNER BENEFITS** 

TECH INSIGHTS,
ACCESS & LEARNING

INNOVATION PROJECTS

INDUSTRY COLLABORATION & VISIBILITY

ECOSYSTEM BUILDING

Receive early access to startup applicants, innovation insights and promote learning among members Receive ongoing introductions to relevant solutions for pilot and commercial opportunities

Advance organization's innovation leadership profile globally and unlock new partnership/networking opportunities

Foster the development of local entrepreneurial ecosystems across the region

### **INTRODUCING TODAY'S SPEAKERS**



David Sarphie CEO





Giridharan Sengaiah VP of Product





Minhaj Chowdhury CEO





Bashir Ahmad CEO

LIQUINEX

**IMPROVING WATER QUALITY TESTING** THROUGH REAL-TIME **DETECTION OF ARSENIC** AND FLUORIDE



### **DAVID SARPHIE**

**CEO** 



**SENSOR & DIAGNOSTICS** 



# AQUAFFIRM Dr David Sarphie, CEO

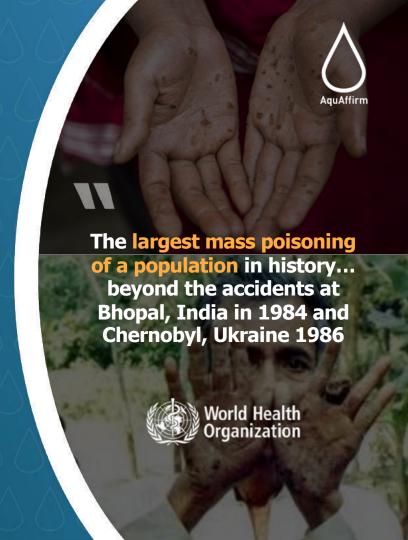


### ARSENIC CONTAMINATION: A GLOBAL TRAGEDY THAT REMAINS UNRESOLVED



Arsenic kills over 45k
Bangladeshis each year,
affects millions more

Lack of visibility into full scope of contamination



UNCHECKED GROUNDWATER
USE POSES NEW
CONTAMINATION RISKS IN
SOUTHEAST ASIA

>50mln

in Bangladesh

3.75 - 7MLN

in Vietnam Red River delta

>3.4 MLN

in Myanmar Irrawaddy delta 320 000

in Cambodia Mekong delta



# ARSENIC MITIGATION HAMPERED BY INADEQUATE TESTING ALTERNATIVES







Complex

Poor accuracy

Slow Slow

- No digital sensors
- No web connectivity



### AQUAFFIRM-AS™: RAPID DIGITAL TEST FOR ARSENIC

A patented test strip-based biosensor using proprietary enzyme



**RAPID** 

Results in 3 min



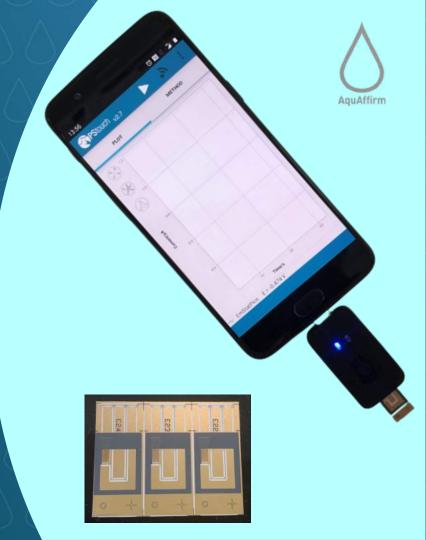
**EASY-TO-USE** 

Little training / No on-site supervision



**WEB-ENABLED** 

Instant data upload



### OUR PROPRIETARY AQUAFORM™ SOFTWARE PLATFORM UNDERPINS THE SENSORS





- Acts as backbone for system
- Mapping & optimisation
- Results validated in Brazil
- Real-time mapping and data analysis will transform arsenic mitigation in SE Asia

### **CASE STUDY: BANGLADESH**

### Initial field trials conducted in Haizadi & Araihazar in 2019

- Tested arsenic contaminated wells with support of local community leaders
- Demonstrated clear benefits (time, usability, precision) over incumbent tests
- Discussed future collaborations with UNICEF (Dhaka WaSH team)
- Recorded & filmed by BBC for podcast & short documentary

Validation trials underway now



### INITIAL MARKET OPPORTUNITY: BANGLADESH / VIETNAM

This has immediate commercial applications:

### **BANGLADESH**

### **FOUNDATION-SUPPORTED**

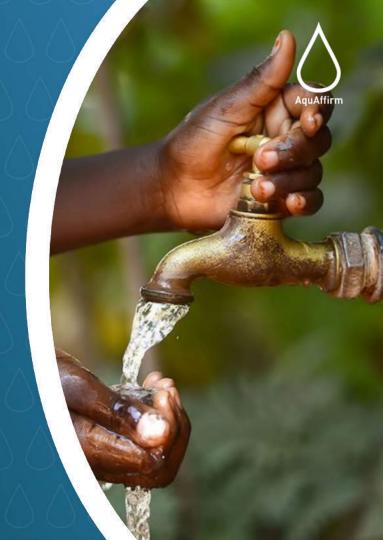
Tube well test program 10M wells

#### **VIETNAM**

### **B2B SALES: PARTNERS**

Partner with solutions providers Clients:

- Beverage industry
- Test labs



### **AQUAFFIRM TEAM**

### Multidisciplinary team that has built this technology





DR DAVID SARPHIE CEO





PROF JOHN WOOD CBE, FRENG Chairman





**DR ROB MERRIFIELD**Dir. of S/W Dev

Imperial College London



PROF GABRIEL AEPPLI FRS, NAS Non-Exec Dir





PROF TONY CASS FRSC Non-Exec Director

Imperial College London

### **HOW CAN AQUAFFIRM WORK WITH YOU?**





Facilitate introductions to distributors, esp. in Vietnam



Looking to partner with institutions for R&D / pilot projects



Support consultancy projects to demonstrate technology in the field



### DR DAVID SARPHIE, CEO

david.sarphie@aquaffirm.com

www.aquaffirm.com



**PROVIDING SAFE DRINKING WATER** TO LOW-INCOME **COMMUNITIES VIA PATENTED RESIN-BASED NANOTECHNOLOGY** 



### **MINHAJ CHOWDHURY**

CEO



DRINKING WATER





### **Drinkwell operates & maintains Water Infrastructure "as a Service"**

### **BEFORE**



#### **AFTER**



"Build, Decay, Rebuild"	Capex Financing	Cost Share with Service Provider
Tk 1.0	Price Per Liter	Tk 0.4
30-50%	System Loss	1%
×	Water Quality	WHO/National Standards
Uncertain	Availability	6a – 10p



### Drinkwell's patented HIX-Nano technology removes heavy metals while recovering 90% of water



Lower lifecycle cost vs. Reverse Osmosis\*



Simple operation by local unskilled labor with low service requirement vs. complex operation requiring continuous skilled labor



Water Recovery vs. 40-50% for Reverse Osmosis



lifetime\*, via periodic regeneration every 6 months to 1 yr, vs. only 1 yr for competing one time use resins



6x lower energy costs vs. Reverse Osmosis translating to high reliability in rural areas with power outages



8.5x

Longer runtime per cycle (each batch of resin lasts for 5 cycles) vs. alum-based resins that must be thrown away after only 1-2 cycles

<sup>\*</sup> For a 1,000 Liter Per Hour System in instances where TDS is below 1,200 ppm

### Drinkwell has executed 412 deployments delivering safe water to 504k people via 41 partners across Bangladesh & India.



### Drinkwell has executed 412 deployments delivering safe water to 504k people via 41 partners across Bangladesh & India.

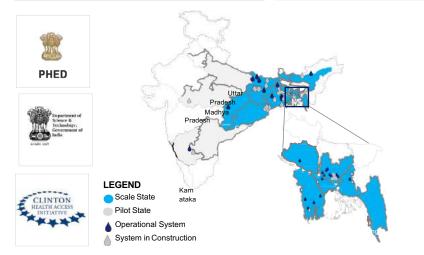
Selected Customers (India & Bangladesh)

Order Growth

### **TATA TRUSTS**



Dhaka Water Supply & Sewerage Authority











Bihar PHED (India): 1→90



Assam PHED (India): 1→175



Dhaka WASA (Bangladesh): 1→300

### **Drinkwell has a 4-stage operating model**

# Design

- Water Testing
- PPP Contract





## Build

- 3 93 m<sup>3</sup>/hr capacity
- Patented resins







- 40-60 paisa per liter
- Onsite Registration







- Control Room
- Onsite Servicing



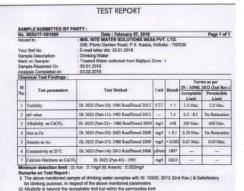




### West Bengal PHED Case Study: Bazitpur –AIRP, N 24 Parganas



Capacity – 91.5 m³/hr Execution – RiteWater HIX- Nano Technology Technology provider – Drinkwell



January 2018

Treated Water As<10 ppb



RawWater As-63 ppb Treated Water As<10 ppb

\* It is noted that this plant passed through all evaluation tests independently done by PHE/ATF

### West Bengal Community System Case Study: Gaighata Panchayat Samiti – Water ATM



#### **Drinkwell AIRP – Water ATM (Jan 2018)**

Location Gaighata Panchayat Samiti/ Office of BDO

Inauguration January 2018

Capex provider Gaighata Panchayat Samiti

Plant Capacity 5000 LPD

**Operating Partner Self-help Group** 

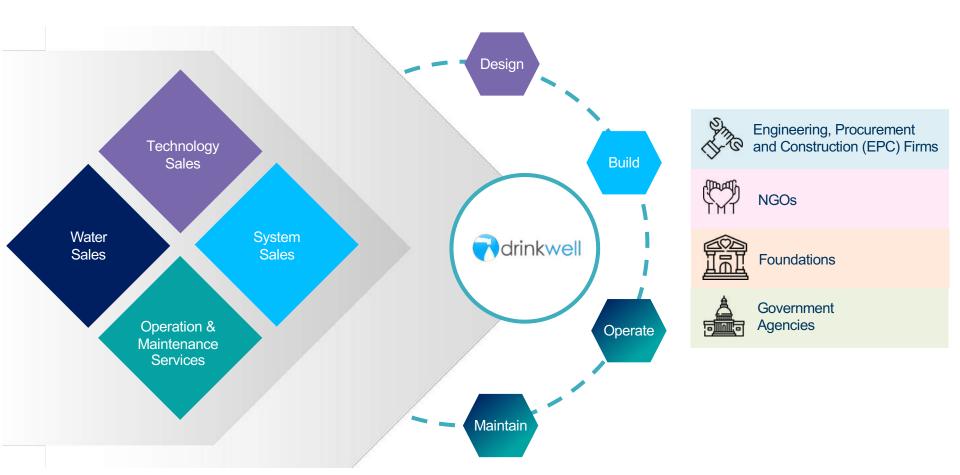
TW quality As -0.002 ppm, Iron < 0.1ppm

Daily Average sale 2500 L

Features ATM dispensing system

\* Following successful run of AIRP- Water ATM in Gaighata BDO, 5 more orders for similar unit in Gaighata Pachayat samiti & 2 orders in Krishnanagar Pachayat Samiti have been awarded to DRINKWELL

### Drinkwell's end-to-end water solutions ensures full accountability through the project lifecycle



### MANAGING NON-REVENUE WATER BY REDUCING APPARENT AND REAL LOSSES



### GIRIDHARAN SENGAIAH

VP, PRODUCT



SMART NETWORK MANAGEMENT



## Challenges in rural water supply



### **Current trends in rural water supply (SA & SEA)**

- 1. Transition to piped water supply to households
- 2. Transition to large multi village water supply schemes
- 3. Smart Water Management (STWM) systems

### What are the challenges?

- Large networks with geographically dispersed customers
  - Difficult to manually locate sources of water loss
  - Response time to complaints/ loss events is longer
- Lack of water management expertise at village level









## Our value proposition



Augment rural operator's capability to reduce water losses

### By providing AI powered analytic tools, that

- Use data already collected by utilities
- Are affordable with no additional capex
- Are cloud-hosted and easy to deploy/ scale
- Provide task management and workflow integrations

### **MeterCity**

#### Reduce water loss at connection

- Analyse consumption patterns
- Forecast water demand
- Identify faulty meters

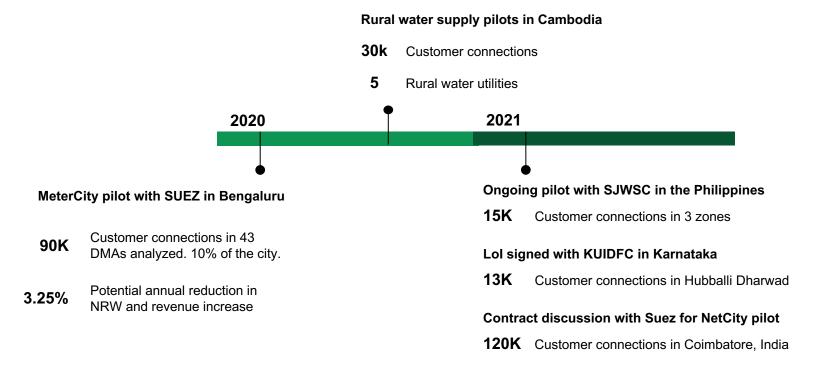
### **NetCity**

Reduce water loss at supply network

- Assess pipe network condition
- Monitor supply operations
- Identify leaky/ vulnerable pipes

## Our traction







## Team SmartTerra

### Incubated by







**GOKUL K GOVINDU** 

CEO

Ex: Apple & Nvidia.

Computer Engineer from NIT-K

& USC, Los Angeles.



**NAVANEETHANS** 

VP, DATA SCIENCE

Ex: Machine Learning Lead at Freshworks MS, Johns Hopkins University BS, University of Illinois, UC



**GIRIDHARAN SENGAIAH** 

VP, PRODUCT

Ex: Manager, PwC, Urban Utilities and Governance MPA, NUS Singapore BTech, Anna University



**SUDHIR BARU** 

VP, ENGINEERING

Ex: IIoT Backend Software Lead at Lantronics. BTech, BITS-Pilani (GC)



ANAND JALAKAM

Stategic Advisor

Founder, Jalakam Solutions, 28 years in water hydraulics, utility design & operations

www.smartterra.io

**ENSURING ACCESS** TO SAFE DRINKING **WATER IN REMOTE COMMUNITIES VIA COMPACT TREATMENT SYSTEM** 



### **BASHIR AHMAD**

CEO

LIQUINEX



### CLEAN WATER ANYWHERE FROM A SUITCASE

www.liquinex.com

5 Soon Lee St, #03-42 Pioneer Point, Singapore 627607

## GLOBALLY, COMMUNITIES ARE FACING AN UNPRECEDENTED RISE IN EXTREME WEATHER AND CLIMATE-RELATED EVENTS



## Water-related disasters make up a majority of all natural disasters

Up to 90% of natural disasters over past 10 years are from floods, droughts and severe storms affecting more than 1.7 billion people worldwide

## Flooding and other climate risks are increasing in frequency and severity

10 out of the top 15 countries most threatened by and vulnerable to climate change are in the Asia-Pacific

## Water quality challenges threaten immediate relief and long-term recovery

Debris, wreckage, and agricultural runoff enter and contaminate the water supply



# CONVENTIONAL SOLUTIONS FOR IMMEDIATE DISASTER RESPONSE ARE INSUFFICIENT, EXPENSIVE, OR UNRELIABLE



# PORTABLE FILTRATION SOLUTIONS

- Time-consuming, labor-intensive manual pumping
- Expensive membrane replacement
- Frequent cleaning and upkeep
- Limited disinfection capability



### PACKAGE WATER

- Expensive due to transportation costs
- Unsustainable medium-term solution
- Generates large amounts of plastic waste



WATER TANKERS

- Uncertain water quality
- High threat of recontamination
- Unable to reach remote locations



A COMPACT WATER PURIFICATION SOLUTION DELIVERING

500L /HOUR

- \$0.03 per 100L
- Zero Maintenance
- Fully Automated
- Portable
- Consistent, Complete Treatment



### **DESIGNED & DEVELOPED IN SINGAPORE**



\*1 unit can serve up to 2000 people/day

### High Flowrate

Up to 500L/hour\*

### O Portability

Check-in baggage (30kg), fits on motorcycles for ease of transportation to remote areas Size: 63 x 50 x 30cm

### O Versatility

Deployable in various water sources of unknown quality including floodwaters, only 12V car battery required and/or solar pack

### Built-in Backwash

Automated backwashing to remove build-up contaminants, failproof operations

### O Contaminant Removal

Long-lasting ultrafiltration ceramic membrane delivers drinking water that meets WHO Guidelines:

- Bacteria and pathogen removal
- Odor and color-free
- Additional modules available to target specific contaminants (e.g. arsenic)



## LOCALLY SOURCED PARTS

- 1. Filter Pump
- 2. Hoses and Fittings
- 3. Feed Pump
- 4. Y-Strainer



## PROPRIETARY TECH

- 5. UV Sterilizer
- 6. Ultra-Filter Housing with Ceramic Membrane
- 7. Activated Carbon Housing
- 8. Control Box In-Built Backwashing Function

# EXPANDING PRODUCT PORTFOLIO

### Ready to deploy in Q3 2021



### **Standard**

Compact Water Purification System

### **Dimension**

63 x 50 x 30cm

#### Flow Rate

up to 500 liters/hour

Weight

30 kg



### Mini

Compact Water Purification System

### Dimension

52 x 40 x 22cm

### Flow Rate

up to 150 liters/hour

Weight

12 kg



### **Brackish Water**

**Reverse Osmosis** 

### **Dimension**

53 x 43 x 22cm

### Flow Rate

up to 150 liters/hour

Weight

12 kg



### Seawater

**Reverse Osmosis** 

Dimension 82 x 52 x 41cm

Flow Rate up to 700 liters/day

Weight 60 kg



### TARGETING DISASTER RELIEF AGENCIES

### **IMMEDIATE AND MEDIUM-TERM RELIEF**





Flooding Disaster - Jakarta, Indonesia

Treated river and floodwaters >100,000 litres over two years
System deployed within 36 hours
1000+ people served

Flooding Disaster – Kerala, India

DEPLOYED IN 5
COMMUNITIES ACROSS
3 COUNTRIES

(Indonesia, Thailand, Malaysia)

### **COMMUNITY AND RURAL SOLUTIONS**

### **DRINKING WATER SUPPLY IN TEMPLE**





Off-Grid Supply (Temple, Singapore)

Untreated Well Water
Up to **1000 litres/day 200+** people/day served

### **RURAL SCHOOL WATER PROVISION**



Rural School (Mt. Merapi, Indonesia)

Untreated Surface Water >100,000 litres treated 200 people/day served for 2 years

# OUR INDUSTRIAL BUSINESS PROVIDES THE EXPERTISE AND TRACK RECORD TO DEVELOP QUALITY SOLUTIONS FOR DISASTER RELIEF



Drinking Water Treatment System for Lembaga Air Perak

Installation of 30m3/hr river water treatment system (Malaysia)



REC Solar: Design, Build, Own and Operate Project

Recycling of REC's cooling tower blowdown wastewater and RO reject water (Singapore)













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### **FOUNDERS**

### **BASHIR AHMAD**

CEO, Co-Founder

Over 18 years of experience in engineering design, construction and maintenance of water/wastewater treatment plants

### **RIAZ DEEN**

CTO, Co-Founder

Over 10 years of experience in industrial and marine engineering, fabrication and manufacturing



### RECOGNITION



















## **THANK YOU**



**Bashir Ahmad** 

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IMAGINE H<sub>2</sub>O ASIA

# THANK YOU

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Enterprise Singapore











