WATER IN INDIA: NEW VALUE CHAINS & OPPORTUNITIES

Stanford University US-Asia Technology Management Centre School of Engineering

Presented by: Ravi Mariwala, PhD Scientific Precision Pvt. Ltd., Mumbai, India

November 21, 2013

Outline

- The story behind the opportunity
- Some Quick Facts & Trends
- Ground Realities
- Addressing the Pain Points
- Scientific Precision Brief Introduction
 - Approach
 - Supply Chain
 - Products
 - Markets Currently Served
- Summary

The Story - Beginning





Water in India - Reality

- India Consumes 1.7 trillion lit of Water per day
- 83% is used for Agriculture, 10 % for industry 4 % for Domestic use, 3% power sector
- Water is replenished by a fairly regular 4-5 months of monsoon
- Ground water resources are fairly developed but
 - consumed at a far greater rate than it is being replenished.
 - In essence it is mined
- Investment in Water Sector is at a dismal rate than what is needed mainly due to
 - Poor Vision & Planning
 - Involvement of Multiple Agencies
 - Poor Execution

Infrastructure for Domestic Water

- No city in India has 24 x 7 Piped Water
- 43.5% of 330 million homes have piped water
- 58% of homes have bathing facilities
- 47% of Homes have latrine facilities
- Only 30% of domestic waste water is treated and discharged – Extremely inadequate Sewage Treatment Infrastructure
- More than 600,000 children below the age of 5 yrs. die due to water related illnesses
 - Second largest cause of death for infants
- Source : Indian Census Report 2011

Ground Reality



Water Theft



Extremely Poor Infrastructure



Water Supply Through Tankers

Growth & Investments in Water Sector

For domestic use & industrial use, per capita water consumption to grow at 250% over the next 12 years

Investments Estimated at US\$ 3.6 Billion About 9% Private in 2010

> Government encouraging Public Private Partnership but not successful

Legislation is not effective because of Multiple Agencies involved

Water Supply & Sanitation are interrelated. 12 th 5 year plan has addressed the issue

Current Socio-economic Scenario in India



Reasonable technical skills but basic skills masons, plumbers electricians etc. getting scarce Aspiration to have an office job

Growing and educated young Population Exposed to the world through internet



Increasing income, willing to spend





Great enterprenual drive

Young Population, highly aspirational Wants a better life than their parents



Increasing cost of labor in urban & semi urban areas

Deep penetration of Mobile telephone

Opportunities to Make a Difference

- Address the MASSIVE gaps in the basic Economic & Social Development
 - Water & Sanitation
 - Power
 - Health Care
- Provide
 - A sustainable free market solution
 - Address the evolving needs & trends
 - Empower People Provide a rational choice
 - Create meaningful jobs

How are the issues for water & sanitation addressed currently?

- Poorly engineered at best rule of thumb solutions.
- Through 'Unorganized' sector
 - by providing make-shift 'Jugaad' solutions
- This leads to
 - High cost
 - Poor efficiencies
 - Wastage
 - Excess consumption
 - Undersized and leaky pipe networks
 - Contamination
 - Frequent maintenance
 - Indiscriminant water mining from Bore wells without replenishment!

Addressing the Pain Point

- Can drinkable water be provided in every tap at a comparable or lower than reasonable government charges?
- Can this be a sustainable initiative from economical and environmental point of view?
- Can the local stake holders be involved to create meaningful ecosystem providing skills & livelihoods?

Our Strategic Intent

- Provide
 - Drinkable water in every tap
 - With local participation
 - In a sustainable manner

Offer an alternative where consumer has a choice to use, replenish and control water without depending on the government

Where are the opportunities to meet the intent?



Key is to Understand each step Execute each step well

Solutions through Services and Products



How do we do it?

Check Water Quality and Power avaibility Develop Water Budget & Consumption Profiles Provide Sustainable Solutions through appropriately designed products and systems

Assess Needs

Strategy to Scale

- Provide Solutions Through Products or Combination of Products
- Develop Supply Chain Which
 - Works Across Geographies
 - Requires Simple Training in
 - Customer Orientation
 - Multiple Skills viz. Electrician, Mechanical Assembly
 - Involves Low Cost Assembly and QA Stations
- Involve Local Talent and People
 - They are our best ambassadors
 - Create Local and Meaningful Jobs
- Be Nimble Respond Fast



Supply Chain Attributes

Supply Chain	Source	Skills	Successfactors
Design	In-house	Science & Engineering	Passion Ability to work with hands and mind
Procurement & Manf.	Outsourced	Fabrication Metal Work Basic Electronics & Electrical	Eye for detail Customer Orientation
Assembly & QA	In-house	Aptitude for Technical Work Eye for Detail	Source from Field Services Customer Orientation
Marketing & Sales	Mostly in-house	Young Multi diciplinary Communication Skills	Ability to clearly show the benefits of Our Products
Field Services	Outsourced	Technical Skills	Last Mile Ecosystem Local Stake Holderes

Seek Constant Feedback

Be nimble, move fast

Innovate Constantly – not just in design and products but more importantly in

- Customer Interaction & Communication
- Field Services & Product Delivery
- Understanding hidden needs and concerns

Product Profile



AquaHome

A Fully Automated Water Purification & Supply Systems – Drinkable Water in Every Tap

- Ideal for 2 to 10 room homes and small resorts
- Fully Automated
- Low Power Consumptions
- Compact Foot Print & Robust Operations
- Easy Installation & Start up Plug & Play
- Solar Power Back up Option
- No Overhead Tanks !
- Saves Time & Money!

AquaHome – 3000

- 3800 L/hr. (1000 GPH)
- 1 HP Power Full Solar Energy Integration Possible
- Provides Water on Demand
- Provides Filtered & Drinkable Water
- Installation time 30 min.



AquaSoft

- Water Softener for small and large volume
 - from few thousand liters to million liters per day
- Filters and Softens water
 - No more white spots or scales !
 - Great bathing experience with soft water!
- Environmentally Friendly
- Required because of Detoriating Ground Water Quality

AquaGarden

Automated Water supply system for irrigation

- Enough pressure for drip irrigation
- Provision for fertigation
- Low power consumption
 - Solar Power Operation possible
- Option of automated and intelligent watering schedules
- No overhead Tanks !
 - Cost & water savings

AquaRecycle

A Fully Automated Water Purification & Recycling System for car wash and Auto garages

- Fully Automated
- Removes grease, oil suspended solids and bacteria
- Recycles detergents and additives
- Low Power Consumptions
- Compact Foot Print & Robust Operations
- Easy Installation & Start up Plug & Play
- Solar Power Back up Option
- No Overhead Tanks !
- Saves Time & Money!

*Power*Solar

- Fully Integrated Solar PV based Electrical System
- Ideal for single phase motors and home applications
- Robust
- Compact
- Easy to install
- Low Maintenance
- Can be integrated with AquaHome & AquaGarden

Key Milestones

- Reduction in Power consumption
 - from 3 phase 5 HP motor to single phase 1 HP motor
- Reduction in Foot Print Size Reduction
 - from 3 m x 4 m installation on a foundation to 1.2 m x 1.7 m Chassis
- Installation Time 4 months to 0.5 hr.
 - Target 5 min.
- All weather module
 - Do away with Special Rooms
- Full integration with Solar Energy

Success Factors

- Practical down to earth approach
- Go to Gemba !
- Constantly Innovate
 - In all aspects
- Involve Local Stake Holders
 - Train and work with local talent
 - The last mile eco-system is your face with the customer
- Internalize learning and feedback across the supply chain
- Strong emphasis on systems, processes and quality assurance
 - No compromise on quality
- Ability to work with semi-organized sector and fragmented market

Businesses Served

- Semi Urban Homes & Institutions
 - \$30-50 million Market growing at 18-22% per year
- Automobile Segment
 - Recycle of Car Wash Water
- Hospitality Sector & Small Townships
 - Sectors being actively considered

Summary

- A massive supply-demand (S-D) gap exists in essential services and infrastructure in many segments in India. Some of these segments are.
 - Water & Sanitation
 - Power
 - Health Care
- Water & Sanitation are basic necessities for Social & Economic growth of a country. its mismanagement can have a deep and irreversible impact on the health and development of individuals, communities and the country
- The challenge is to bridge S-D gap fast with
 - Sustainable solutions
 - Evolving a last mile eco-system
 - · Partnering with local communities
- This is the new paradigm of supply chain and distribution for
 - Fragmented & unorganized sectors in India
 - It provides sustainable and affordable solutions across geographies
 - · Creates meaningful choices
 - · Empowers people with a choice
 - Provides a channel to quickly deliver appropriate technology for the problem at hand

Thank You !