



Education Water and Sanitation  
Health



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Awarded Innovations

Agriculture Climate Change  
Food Security Clean Energy

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# Table of Contents

<b>INTRODUCTION</b>	01
<b>Round 4 Awardees</b>	
<b>AGRICULTURE</b>	05
Value added millet products based rural enterprise	06
Bhagalpur banana fibre project	08
Community owned initiative for food security in tribal area	09
E-DeWeeder: Smart weed sensors based e-weed control	10
Facilitation to market access to default organic farmers	11
Mobile apps for farmers in regional language	12
Study on stored grain quality in hot and cold storage system	13
Original Indian Table (OIT)	15
<b>CLEAN ENERGY</b>	31
Smart nanopower for socioeconomic development of villages	32
Women entrepreneurs for energy efficient slum homes	44
<b>EDUCATION</b>	45
Invisible Visible: A screening tool for identifying children with dyslexia	46
Making elementary education culturally compatible	47
School Transformation Program (STP)	48
Smart Madrasa	49
Kala Samavesh: Education of 3000 children with disabilities using Arts Based Therapy (ABT)	50
<b>HEALTHCARE</b>	61
Smart and portable intensive care unit	62
FlapCut technology for cost effective Mycobacterium Tuberculosis (MTB) diagnosis	63
"MozziQuit" to make the world free of mosquito menace	64
A rapidly deployable device for wound care	69
MiraCradle™ to fill void in birth asphyxia treatment	70
<b>WATER &amp; SANITATION</b>	85
Solid waste resource management and environmental sanitation	86
<b>OTHERS</b>	101
Wireless communication infrastructure for rural settings	102
Entrepreneurship program for youth: Self-employment opportunities for marginalized youth in semi-urban and rural areas	103
Dhakka brake: A regenerative brake device to store the momentum needed for pushing the brake	106

# Table of Contents

## Round 3 Awardees

<b>AGRICULTURE</b>	05
BioAvert I: Biological program of disease aversion for horticulture crops	18
Popularising bamboo polyhouses among small farmers	19
Revolutionizing agri business in north east India	20
Low cost innovative and smart irrigation controller	21
Low cost manual milking machine	22
Pilot demonstration and transfer of Solar Conduction Dryer (SCD) from India to Nepal	23
CassavaTech: A high-tech equipment for processing cassava	24
Portable solar cotton picking machine	25
<b>CLEAN ENERGY</b>	31
Expanding solar as a service to lower income households & micro-enterprises in rural India	35
Biogas based cooking grid	36
Piloting of a novel table top solar panel laminator in rural locations for decentralized manufacturing and sales of solar panels by rural youth and women	37
Development of Integrated Energy and Revenue Management System for Mini-grids	38
Harnessing the destructive energy in pine needles for rural development	39
Pre-paid mobile payment based solar micro grids	40
Scaling Prakti multi-fuel clean cook stoves in India, Bangladesh and Nepal	40
<b>EDUCATION</b>	45
Kakshaa: An innovative teaching method to engross students and enrich classroom environment	51
Art in education	52
RIVER Multi-Grid Multi-Level (MGML) dissemination	53
<b>HEALTHCARE</b>	61
Nurse centres electronically linked with city doctors to provide gynaecological and reproductive health services in rural Kenya	72
Empowering women through menstrual hygiene solutions	73
Mobile partograph mLabour	74

# Table of Contents

Device for lab diagnostics at the doorsteps	75
An automated and affordable point of sample collection screening tool for cervical cancer	76
“Saans” - A device to keep, lungs of neonates with RDS (Respiratory Distress Syndrome) open while transferring them from a low resource setting to an NICU (Neonatal Intensive Care Unit)	77
Affordable smartphone integrated non invasive fetal electrocardiogram monitor	78
<b>WATER &amp; SANITATION</b>	88
Desolenator: Solar empowered drinking water system	87
Samagra: Providing access to clean, safe and reliable community toilets for the urban slum-dwelling poor	88
Creating green jobs turning trash to treasure for farmers	89
Solar powered water purification centers for urban and rural regions with poor grid access and water quality	90
Waste picker franchise model	91
The women for WASH initiative	92
Water for all	93
Community drinking water systems from India to Rwanda	94

# Table of Contents

## Round 2 Awardees

<b>Agriculture</b>	<b>05</b>
Producing more with less: Promoting Sustainable Sugarcane Initiative (SSI)	26
Portable digital copra moisture meter	27
To achieve higher farm productivity and reduce losses using web and mobile technology in Kenya using the model from India	28
Improving farmers' livelihood through end to end agri services in Nepal	29
Ensuring food security and income generation for poor farmers of Bangladesh through innovative water management technology named "BHUNGROO"	30
<b>Clean Energy</b>	<b>31</b>
Pico hydro home lighting in hilly areas	42
Clean energy and women empowerment through women led enterprise	44
<b>Education</b>	<b>45</b>
The classroom library	54
Hamari Paathshala: Collective action for education	56
Angel Xpress Foundation (AXF) free learning centers that connect educated adults with slum children	58
Community led solutions for girls' education	59
<b>Healthcare</b>	<b>61</b>
A cost efficient and portable point of care complete blood count (CBC) device from capillary or venous blood based on patented lab on a chip platform technologies	79
Adapting and piloting MIRA (Women Mobile Lifeline Channel) project from India to Uganda and Afghanistan	81
Building an evidence based scalable & sustainable eye care model for Ethiopia	82
<b>Water &amp; Sanitation</b>	<b>85</b>
Jeevandhara handpumps with filtration system for rural areas	95
Installation of pressurized recharge wells for creating fresh water pockets to make water available for drinking and sanitation purposes in water scarce schools of Mewat, Haryana	96
JALDOOT: Safe drinking water delivery model	97
Low cost odour trap for waterless urinals	99

# Table of Contents

<b>Others</b>	<b>101</b>
Financial deepening and economic inclusion @ tapping the unbanked billions	107
Low cost technology to distribute financial services across the country	108
<b>Round 1 Awardees</b>	
HaldiTech: A high-tech turmeric processing unit	110
On demand electricity generation using waste heat generated during cooking for rural households using thermoelectric generators	111
CLT e-Patashale: Low-cost innovative e-content for STEM K-12	112
I Love Reading (ILR)	113
Technology based solution, with a strong educational core, in improving reading levels of primary school students in Hindi language in India	114
Mobile technology driven family planning model: An ecosystem to achieve high contraceptive prevalence rates among rural and tribal communities – Project Vikalp (“Options”)	115
MIRA: Mobile Channel on Rmnch+A for rural women	117
Waterlife: Community drinking water system	118
Rang de: Making microcredit affordable for the poor	119







**Introduction**



## About the Program

The Millennium Alliance (MA) is an inclusive platform to leverage Indian creativity, expertise and resources to identify, support and scale innovative solutions being developed and tested in India to address development challenges that will benefit base of the pyramid populations across India and developing countries.

The MA is a network that brings together various actors within India's social innovation ecosystem including, but not limited to, social innovators, philanthropy organizations, social venture capitalists, angel investors, donors, service providers, and corporate foundations, to stimulate and facilitate financial and non-financial contributions from the private and public sectors in support of development innovation.

The Alliance provides innovators with a range of services such as seed funding, grants, incubation and accelerator services, networking opportunities, business support services, knowledge exchange, technical assistance and facilitates access to equity, debt and other capital. 84 social enterprises have been supported so far under the programme with a funding support of Rs. 63 crores. To foster trilateral cooperation, 12 of these social enterprises are being supported for replication of their projects now in Kenya, Nepal, Ethiopia, Bangladesh, Uganda and Afghanistan. The program will support around 350-400 enterprises over the next three years.

## MA Objectives

**Provide a platform to leverage Indian creativity, expertise and resources to:**

### 1. Identify game changing innovations

The Alliance intends to identify breakthrough innovations that achieve development outcomes for BoP populations more effectively, more cheaply, more broadly (that reach more beneficiaries) and in a shorter period of time

### 2. Rigorously test, share and appropriately adapt promising solutions

The Alliance encourages innovators to rigorously test and evaluate their innovative solutions to confirm that they are achieving a concrete development outcome in the most effective manner.

The Alliance will support solutions that are based on effective and sustainable business models.

### 3. Scale innovations that work

The Alliance aims to support innovations that exhibit the potential to be replicated or scaled broadly to maximize their impact.

## Focus Sectors

Although the Millennium Alliance will consider supporting innovations across all development sectors, it will prioritize the following sectors:

1. **Basic Education** (with priority on innovations in early grade reading/early literacy)
2. **Water and Sanitation**
3. **Health** (with a priority on innovations in service delivery and commodities technology in Family Planning, Reproductive Health, Maternal and Child Health and Communicable diseases sub-sectors)

4. **Agriculture/Food Security** (with focus on production, access and uptake, storage and processing services and innovative agri-technologies)
5. **Clean Energy/Climate Change** (Pro-poor mitigation and adaptation projects, access to markets and finance)

For innovations from a sector not included in the above list, to be considered under the MA, it must either benefit BoP populations directly or indirectly by creating or improving the environment that supports improvements in the lives of BoP populations.

## MA Awards

Millennium Alliance offers three types of grants: Stage 1, Stage 2, and for replication in developing countries. Funding amount for Stages 1 is fixed and for Stage 2, it is upto Rs. 1 Crore. For replication in developing countries, the grant size is determined on a case by case basis. Applicants are required to apply for one of these three grant stages. An applicant who desires to scale the model in India as well as in another developing country (besides India), should apply to stage 2 and developing countries category separately. MA evaluators will review the stage selection made by the applicant. If the evaluator determines the applicant has applied for a more advanced stage than is suitable, the application will be considered for the revised stage.

### Stage 1: Piloting or testing an innovation.

Stage 1 funding is intended to support product development and to test the real-world viability of an innovation. Projects may conduct a pilot or other validation of the innovation. Projects should demonstrate a departure from current practices as well as cost-effectiveness. Projects must have already established a proof-of-concept for their project. Idea stage projects are not eligible for an MA award.

All Stage 1 awardees receive a Rs. 30 Lakh grant, Rs 10 Lakh of which is strictly earmarked only for capacity building.

### Stage 2: Scaling or replicating an innovation which has been successfully piloted.

Stage 2 funding provides solutions that have demonstrated success at a pilot or small-scale stage with support to implement at a larger scale. Enterprises should be able to demonstrate the proven success of their innovation through credible and rigorous evidence. Stage 2 projects should transition successful innovations from the current areas of intervention to a substantially broader scale.

Stage 2 projects should strategically leverage MA funding to access funding/resources from other project partners, government programs, or funders.

Stage 2 awardees will receive a maximum of Rs. 1 Crore grant depending on the project stage, merit and needs, Rs. 10 Lakh of which is earmarked for capacity building.

### Stage 3: Innovation for developing countries

Grants for innovations for developing countries are intended to test the real-world viability of a proven Indian innovation in another developing country. Projects should have already gone to scale in India. These innovations should exhibit a strong proof of concept with evidence based data. The projects should demonstrate a departure from current practices and be more cost-effective than alternatives. Applications for global projects are accepted for Health, Agriculture and WASH sectors only under MA Round 5. Global applications in other sectors will not be considered for funding. Funding can be used for the following activities: to scope demand for the innovation in the developing countries, to adapt the innovation based on the requirements of the new context, to build local partnerships for implementation (with NGOs, businesses, or the government), and to run a small-scale pilot. In the application, the enterprise should be able to demonstrate demand for their innovation in the country of replication. Replication to countries in South Asia and Africa are eligible for Stage 3 funding.





## **Awardee Portfolio: Agriculture**

## Value added millet products based rural enterprise

**Organisation:** Centre for Technology and Development (Society for Economic and Social Studies)

*Round 4*

### Challenge

Millets are the highly nutritious, small-seeded hardy crops belonging to gramineae family which usually grow well in hot and dry rain-fed areas under marginal conditions of soil fertility and moisture. Due to their short growing season, they develop from seeds to ready-to-harvest crops in about 65 days. If stored properly, Millets can keep well for two years or beyond. These highly beneficial characteristic of Millets are of vital importance for food security and climate resilience. Regular consumption can also help in overcome malnutrition.

However, the popularity of these so-called 'coarse' grains as foods, and hence as crops, has severely eroded over the past few decades in India in preference to the so-called 'fine' grains or 'major' cereals such as rice and wheat. Cultivation of Millets has been decreasing steadily in the major producing states of Tamil Nadu, Karnataka, Uttarakhand, Maharashtra and AP/Telangana.

Uttarakhand ranks 3rd in India in terms of area and production of millets, and the state is also home to large number of local pulses and other grains which unfortunately is declining despite its benefits for nutrition, food security and resilience to drought.

Efforts have been made by many Research Institutions and other agencies to revive the popularity of Millets among both farmers and consumers. Yet these efforts are inadequate and have a long way to go before reversing the unfortunate declining trend noted earlier. Importance of doing so given climate change and its likely impact on paddy and wheat in India, and adverse trends noted in nutritional status noted throughout the country and especially in Uttarakhand, are undoubtedly major considerations.

### Solution

Millet based VAPs have not been seriously attempted commercially in India (bar a very few exceptions limited to cookies only). Despite being exceptionally nutritious, their consumption has declined for want of standardized processing techniques to compete with fine cereals. Hence an effort is made to process and increase the utilization of small millets in popular foods types by the tag 'SUPERHEALTH FOODS'. The present project seeks to

introduce a novel millet based FSSAI compliant packaged product range, such as breakfast cereals, flakes, pops, instant food mixes, etc. into the market not only improve the food and nutritional security but also open a new market for farmers in urban areas to improve their income and development of highly improved products.

This project will improve livelihood opportunities, income generation and ensure household food security on a sustainable and equitable basis. The programme will provide:

- Viable enterprise with feeder 'satellite' operation at cluster of village level.
- Sufficient scale of marketing off take to ensure viability/replicability of enterprise.
- Jobs and income for farmers and motivate them to restore and scale up millet cultivation.

The project will also improve nutritional status among consumers through access to natural, nutritious and healthy snacks and other food items.

### Impact

Improved cultivation of the millets, leading to climate resilient agriculture.

Approximately 100-150 direct beneficiaries will get employment in the envisaged Enterprise as decided by the beneficiary organization.

An additional 100-150 Small Farmers would also benefit directly from the Project by supplying raw produce to the Enterprise and receiving better and fair price.

Small grocery and provision stores, petty stalls and street vendors would also benefit by adding a new product range to their product profile.

Since the product range would focus on nutrient enriched value added products it will help women, children in the area and the general population to prevent malnutrition.

Also, the packaging and marketing of the products to the high end urban market, provides the economical stability to the beneficiaries that will make enterprise sustainable.



**Potential to Scale**

It is intended to organize the proposed Rural Enterprise in 2 Clusters of 3 Villages and 2 villages respectively act as 'satellite units' for primary processing operations, all networked with a Nodal or 'Mother' Unit in a replicable 'hub and spoke model' with potential for future expansion. The semi-processing activities like cleaning, dehulling, grinding, etc. will be done at Satellite units and final processing and packaging will be done at Mother unit. The branding, sales and marketing will be

done by their already well established "Farmers" brand in Uttarakhand.

Beneficiaries in each village would be organized in Self Help Groups of around 10-15 Women, thus making around 30-45 Women in each Cluster and around 100-150 Women in all including the Mother Unit. More villages and clusters will be added to the satellite units as the enterprise scaled up.



*Millet Dehuller Machine (fabricated by CTD)*



*Millet cookies*

## Bhagalpur banana fibre project

**Organisation:** Naugachiya Jan Lok Karyakram (NauJanLok)

Round 4

### Challenge

Bhagalpur district is famous for its banana plantations. Banana plantations are a profitable agricultural activity for the plantation owners; whereas it provides only seasonal employment to the labour families which are also dependent on the banana cultivation. There is huge distress migration taking place in this area due to unemployment during the off and lean seasons. Mostly women hailing from the BOP are unemployed most of the times year round.

The banana plantation in large scale also generates banana trunks in large quantities which are left in the open to decay. This is a severe problem for environment and health. There is no waste management practices with regard to decaying banana trunks which also is a reason for hugely increasing mosquito problem in the area.

### Solution

Bhagalpur Banana Fibre Project is offering a very effective single solution for the twin problems listed in the above section. The wasted banana trunks could be collected at the source and transported to small work sheds set up for extraction of high quality Banana Fibres from the banana trunks. This would provide direct employment to especially the women (men also). The bio waste after the extraction of the fibre is highly suitable for composting and could be turned in to organic manure as a by product. There is practically no waste left after these two processing steps and thereby solves completely and constructively the waste management and health issues caused by open decaying of the banana trunks in large quantities.



### Impact

- Huge reduction in mosquitoes in the region
- Employment generation on sustainable manner to the otherwise unemployed women hailing from the BOP
- The project shall directly impact in the quality of life of at least 10000 persons
- Increased income levels of the families engaged in the banana fibre production and its marketing
- A new and sustainable business enterprise and livelihood option added to the region
- Production and sale of organic manure
- Increase in the income levels of families engaged in organic manure production and its marketing

### Potential to Scale

- Raw material availability is huge and sufficient for large scale operation of the project.
- The project is already tested and the success has been very encouraging.
- The project is economically viable and socially useful.
- They already have good links with many outlets for the fibre they have been extracting. The high demand existing in the sector is a pulling factor that shall help the potential to scale.
- The organization has the experience and expertise in all aspects of the banana fibre extraction, product diversification, value addition and marketing.





## Community owned initiative for food security in tribal area

**Organisation:** Deepak Foundation

Round 4

### Challenge

Today, agriculture alone as a sustainable livelihood option is almost impossible for the rural poor in India. Increasing cost of agriculture inputs, poor access to technology and lack of transport and storage facilities traps the marginal farmers into vicious cycle of poverty, drudgery, and poor nourishment. The situation is worst in remote tribal areas where despite production of pulses and millets throughout the year. These locally produced foods do not reach the local communities through public distribution system. Women's engagement into agriculture largely remains as unpaid family work. In absence of any processing facilities, most of the agri produce is sold without value addition and at a low price, further depriving the poor households to fulfill the economic and nutritional needs. The nutrition intervention programmes of the govt (icds, mdm etc. ) are focused on only the select target population group and does not reach the entire family. Hence there is a need to make available nutrition supplement not only for the under nourished but for the entire family without increasing the drudgery of the women at the household level. Opportunity for wage employment is scarce, and women have to face drudgery throughout the year. The situation is compounded with lack of marketing linkage. The challenge is to develop collective engagement of women farmers into business model to improve their livelihood and food and nutrition security.

### Solution

The innovative solution is to provide opportunity for processing pulses so that these pulses are packaged and sold locally and marketed through e-retail channels. The by-product, that is, the broken pulses and indigenously grown rice could be processed and packaged as instant khichdi mix and sold as a cost effective meal throughout the year. The culturally accepted instant khichdi mix would not only address the nutrition needs of the entire family and under nourished population groups but could also be sold to reduce drudgery of women.

### Input

Skills will be provided to women farmers (SHGs members) to process locally grown pulses, sort, grade, package, label and market it as dal, which fetches 80% more

income than whole unprocessed pulses. 6000 women farmers grouped into 300 SHGs in two blocks of a tribal district are already trained for producing chemical free food grains and pulses and vegetables. Facilitation for availing seed money /loan will be done to SHGs for purchase of processing units comprising pulse mills, solar driers, de-hydrators, and grading, sorting as well as packaging tools. Market linkages will be established for sale of graded and packaged dal through various channels. By-product broken dal with locally grown rice, solar dried vegetables, fortified oil and spice mix will be sold locally as ready to cook mix (khichadi) with high nutrition value.

### Impact

Sale of processed pulses will yield at least 50% higher income than baseline values. Demand for setting up more units in the area will also increase. Cultivable area under pulse & vegetable will increase, enhancing food security. Use of solar drying will attract farmers to package solar dried vegetables. Sales of ready to cook supplement will increase at least 25% from baseline values. Drudgery reduction and increased consumption is expected to improve nutritional status among households regularly purchasing the premix. Access to market through e-retailing will increase income from sales. Dependency on PDS will reduce and women's collectives as farmer producing company will strengthen. The women growing vegetables will get incremental income from surplus vegetables, and the large scale wastage will be curbed. Women running pulse mills will get income for their by-product, which is sold at meagre price. Landless women will get employment opportunity. Large number of change making entrepreneurs will be created.

### Potential to Scale

At the end of the fourth year, 3000 women are estimated to use the meals service. This will bring about change in eating pattern in 3000 households, thus reaching out to nearly 15000 -18000 people, who will start to consume atleast one wholesome meal per day.

Similar programme can be implemented in other tribal areas where pulses, cereals and vegetables are grown yet malnutrition remain a persistent problem.

## E-DeWeeder: Smart weed sensors based e-weed control

**Organisation:** Chitkara University Research and Innovation Network

Round 4

### Challenge

- i. Crop yield loss due to weeds when farmers are already suffering with losses due to climate change
- ii. Health challenges with existing chemical weedicide solutions

### Weedicide sprays have their challenges as:

- i. Costly weedicide sprays (INR 3200 per hectare including manpower for spray)
- ii. Farmer's inability to apply chemicals efficiently or get the manpower to spray it properly
- iii. Increasing herbicide resistances
- iv. New weed species emergence

### Mechanical DeWeeder has following challenges

- i. Costly solution
- ii. Causes seed dispersal in the farms making the weed denser in next cropping cycle

### Solution

- i. An Irreversible cell necrosis of weeds selectively by using radio frequency irradiation. The novel process is implemented using directive applicator
- ii. Automatic weed detection enable selective processing of weed only
- iii. E-DeWeeder traverse the farms without disturbing the crops, detects the weeds and causes irreversible cell necrosis to weed plant

### Impact

- i. RF based weed control costs (INR 400-700 per hectare depending on crop and density of weeds) and health effective alternate to chemical weedicide and hence value of money to bottom of pyramid i.e. farmers
- ii. No effect of increasing weedicide resistance of weeds and hence precise solution to every level of farmer
- iii. Weed management solution to small farmers at 40 % prices resulting in crop yield enhancement up-to 37 % is observed in wheat field

- iv. Less weeds in the next year and hence increase in efficiency of farming

### Potential to Scale

With increasing demand of solution to weed problem farmers are looking forward to alternate solutions to chemical and mechanical deweeding. Hence E-DeWeeder as a product has got high potential for scaling up the services to different states and countries

**Phase I:** Current targets : State: Punjab and Haryana

**Districts:** Patiala, Ambala, Mohali and Ludhiana

**Research Funding:** University and partially funded by government funding and inventory/production/capacity building funding: Millennium Alliance Funding, Community reach : IEEE SIGHT/EPICS or government funding

**Phase 2:** After 3 years: Punjab, Haryana, Himachal Pradesh and Chandigarh (U.T.)

Targeting at-least 20 selective districts

Scale-up with money back from sales and offering the equity to VC

**Phase 3:** After 4 years: PAN India

Scale-up with sales and profits back to company

**Phase 4:** After 4.5 years: Global reach

Partnerships in different country



## Facilitation to market access to default organic farmers

**Organisation:** Banyan Roots Organics Pvt. Ltd.

Round 4

### Challenge

By default organic farmers in Rajasthan are not getting market for their organic produce and are forced to leave their sustainable and ecological practices and are migrating to cities.

### Solution

- 1.) Collection of by default organic and tribal farmers produces locally at village level collection centre by efficient way and using technologies like ERP.
- 2.) Setting up monitoring system and PGS certify them.
- 3.) To fetch good price and increase shelf life of their produce, an innovative food processing unit which can efficiently run in remote area like solar base processing has been developed, which also help to increase employment in villages.
- 4.) Create own brand of trusted organic products to sell either offline or online for assured market.

### Impact

- Biodiversity
  - Farmers Income
  - Health (Farmers and Consumer)

- Output
  - 2000 Farmers
  - 14400 Customers (2000 Members)

#### Outcome

Present :-

- 25% Increase in Farmers Income
- 70% Input Cost reduced
- 14 Forgotten crops diversity and 6 crops in a Farm

Projected:-

- 50% Increase in Farmers Income and 90% input cost deduction
- 30+ Forgotten crops diversity and 14 crops in a Farm

### Potential to Scale

- A) Near about 20 million farmers are dependent on rainfed agriculture in Rajasthan. They are targeting by default organic farmers in that rainfed farming where most of rainfed farming is by default organic. They will generate their income by providing market and food processing solution.
- B) Organic market is huge and now day by day market size is increasing by awareness. Current players are not able to fulfill existing demand. In their pilot they proved that they can tap this market by their affordable pricing through their own supply chain.



Training of food processing



Innovative Products

## Mobile apps for farmers in regional language

**Organisation:** Jayalaxmi agrotech Pvt Ltd

Round 4

### Challenge

Due to information gap, agriculture become input intensive and less profitable. Illiteracy and diversity further complicated this problem.

As a result, youths in villages are not showing interest in farming and they are migrating to urban areas in search of new jobs (As a per some published results, every minute 30 farmers leaving agriculture in India).

Farmers are not aware of new innovations in agriculture, not aware of new varieties which can withstand drought or specific disease, not able to identify disease and hence there is huge dependency on pesticide dealers. However, they always prescribe products where they have more margins.

90% of farmers are not aware of recommended package of practices for specific crop.

India has around 120 million agriculture families. Even if they have one government agriculture field staff for every 1000 agriculture families, India needs at least 12 lakhs field staff. However, India has approximately about only one lakh (100000) front end agriculture field staffs in India.

### Solution

- To address the information gap, they have developed crop specific mobile apps for farmers in regional language. You can watch the demo here: [https://www.youtube.com/watch?v=UA4\\_xCK0mLY](https://www.youtube.com/watch?v=UA4_xCK0mLY)
- To address the connectivity gap, they have developed "Agri pole" which can disseminate apps to farmers in the absence of internet.

### Impact

In the pilot phase, apps reached 80,000 farmers. As per the dip stick survey from preliminary study, these apps are reducing the input cost by 17%.

Today with their limited reach, their apps are spreading at the rate of one new farmer every 5th minute. With the external support and partnership, it is expected to reach at least one million farmers within 3 years.

### Potential to Scale

Multiplier effect model is key for the growth. They give apps for free to farmers which can be downloaded from Agri Pole in the absence of internet (can be downloaded from internet also). Once downloaded it can be transferred to other farmers through Shareit or Bluetooth. This model helps in reaching the BOP farmers who don't have internet. This model is proven, cost effective and scalable in the absence of internet penetration.





## Study on stored grain quality in hot and cold storage system

**Organisation:** Sanjeevani Disaster Equipments Pvt.Ltd

*Round 4*

### Challenge

India is a self-sufficient country in terms of grain production, and it is the second largest producer of rice and wheat in the world according to the FAO (2014) world agriculture statistics. Food grain production of India was 265.04 million metric tonnes in 2013–14.

About 70% farm produce is stored by the farmers for their own consumption. The remaining grain is stored by traders, big farmers, co-operatives and government agencies like Food Corporation of India. The available storage capacity of government agencies such as the Food Corporation of India (FCI) is 18.55 million tonnes. India's grain production has steadily increased due to advances in technology, but post-harvest loss is constant at 10% out of which storage accounts for around 6% of the total losses as proper storage facilities are not available. The post-harvest losses in India amount to 12 to 16 million metric tons of food grains each year, an amount that the World Bank stipulates could feed one-third of India's poor. These losses are qualitative and quantitative in nature. The qualitative loss can occur due to damage by insect pest, mites, rodents and birds, or from handling, physical changes or chemical changes and by contamination of mycotoxins, pesticide residues, insect fragment. Lack of adequate storage facilities and knowledge of safe storage causes enormous losses in quantity and quality. The government is taking efforts to prevent food wastage by building new warehouses. The need for a cost effective method of storage that can prevent storage losses and protect food grains during storage is being currently recognized.

### Solution

In 'Hot and Cold' storage system, the condensation heat of air conditioning unit or refrigeration in the cold storage is utilized for providing free energy at temperatures of 40–45°C for a hot storage which could

have the potential for providing resistance against heat during storage of food grains. The technology titled 'Hot and Cold' storage system (patented) is aimed to save more than 80% of the cost required for hot storage by making an adjacent hot room to an existing cold storage plant or air conditioning plant making it profitable in terms of cost and saving storage losses. The working prototype was made with the 3.25 lakh grant from MSME through MITCON, Pune in the year 2014–15. The study of the effect of hot storage on grain quality was studied at National Institute of Nutrition (NIN), Hyderabad under the guidance of Dr. Vasanthi Siruguri Scientist 'E' Food and Drug toxicology and research center National Institute of Nutrition, Hyderabad.

### Impact

In the study done at National Institute of Nutrition it was seen that modifications in the storage conditions mainly temperature can prove to be beneficial by hampering the growth of insects and reducing the losses. The Hot storage conditions with temperatures of 40–45 °C were found to be beneficial in not only reducing the insect growth but also killing the insects which were spiked as compared to the cold storage, ambient and warehouse storage conditions. The hot storage conditions reduced the moisture content and uric acid of the grains to safe levels which is a criteria for acceptance in various regulatory bodies like FCI, FSSAI and AGMARK. The Hot storage system could be applied as a means of storage to reduce insect damage and maintain grain quality. The technology can be used by farmers, Government, co-operatives, etc. where mass quantities of grains have to be stored. The cold storage plants for dairy or fruits and vegetables, can be utilized for providing an adjacent hot storage where the waste heat of the cold storage can be utilized for storing grains and for providing the benefit of pest resistance and also the heavy charges of electricity required for cold storage can be compensated.

**Potential to Scale**

They plan to grow by transferring the technology to cold storage installers (like Kirloskar , Bluestar ltd, Voltas). The observations and results of the prototype and all the relevant data will be shared with the companies and they will in turn install the system all over India, the technology will thus be rendered scalable. The

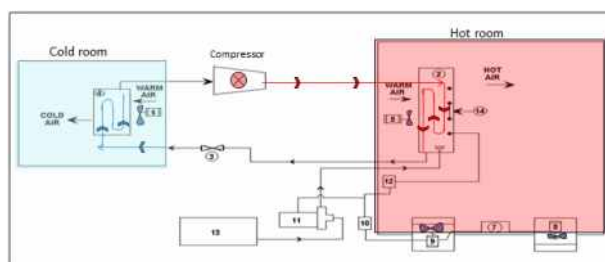


Mr Rajendra Laddkat who developed the 'Hot and Cold' Storage system, with the working protocol which has two compartments hot storage compartment (left side) and cold storage compartment (right side)



Rice samples of cold storage (spiked) with insect larvae and eggs at the end of 4th month

technology can benefit cold storages which are used by farmers and farming co-operatives at village or district level, Government cold storages and large private companies can utilize the waste heat of the air conditioning systems to store their yearly stock of grains in their Hot storage. The project can also be implemented at a smaller scale in bakeries, fisheries and dairies.



Working of the 'Hot and Cold' Storage system. In one thermodynamic cycle we can utilize condensation heat for hot storage by using fresh air fan (9), exhaust fan (8), water pump and some modification in condenser fan coil unit.



Weeviled grains in the 4th month Cold Storage spiked sample, pulse beetles also can be seen.

## Original Indian Table (OIT)

**Organisation:** CropConnect Enterprises Pvt Ltd

*Round 4*

### Challenge

Since the 60's there has been a focus on increasing farm productivity using conventional agriculture practices. Rampant exploitation of chemicals and soils has made farming increasingly unviable due to the rising input costs of chemicals and soil degradation. Today 44% of farmers don't want to continue doing farming. In order to revive their soils and make farming viable, many farmer groups across the country are shifting back to cultivating healthy and nutritious indigenous crop varieties using sustainable farming practices. However, they are finding it difficult to market their produce due to a) lack of consumer awareness and b) fragmented marketing efforts that are restricted to their local regions.

Parallely, they have seen an increase in lifestyle diseases as today's consumers are consuming unhealthy food laden with chemicals and hormones. For e.g. India has 62 million people with diabetes. These customers are looking for healthy local food options to incorporate into their diet but do not have knowledge or access to them.

They aim to bridge this gap of supply and demand between farmers and consumers through Original Indian Table.

### Solution

Original Indian Table is the first pan India brand that uses a market based approach to directly support smallholder farmers and farmer groups growing indigenous varieties of food products, thereby helping them commercialize their products and increase their incomes. They do this using the following three pronged approach:

#### Farmer Engagement:

They partner with Farmer Groups and NGOs working with farmers on sustainable farming and indigenous varieties of products to help market their products. To do this they traveled across 20 states and 70,000 kms to build a pan-India farmer sourcing network for sourcing traditional food. This approach helps them:

- a) bypass middlemen and provide a better price to the farmer,
- b) help farmer groups become more economically sustainable,
- c) leverage the hard work that have been done by several NGOs over the years in mobilizing these farmer groups,
- d) consolidate the fragmented local marketing efforts by multiple farmer groups and present to consumers across the country one united brand
- e) Identify farmer needs and provide post-harvest and marketing related capacity building

#### Knowledge and Research:

There is a general lack of awareness about the variety, benefits and uses of growing and consuming traditional crops for the soil as well as health. To bridge this gap and to enable them to bring an experience to customers they are:

- a) Conducting mapping studies of traditional and current cropping patterns and their impact on farmer livelihoods as well as human and soil health.
- b) Documenting traditional food ingredients along with information on the region they are grown in, nutrition, health benefits and recipes.
- c) Setting up a traditional foods knowledge platform to become a one-stop shop for knowledge on traditional foods, their benefits, recipes etc.

#### Marketing:

The Indian consumer today is not consuming indigenous crop varieties because a) they do not have easy access to these products, b) they do not have knowledge about these products and their health benefits and c) they do not know what dishes can be made from these products.

To the Indian customer they provide products that link health – nutrition – agriculture. They use a systems approach to create winwin partnerships with farmer groups, social enterprises, customers (individuals &

institutions), food networks & media in the following ways:

- a) Setup up distribution channels for these traditional products in tune with the shopping habits of their target consumer base (Amazon, Nature's basket, Grocery shops, etc).
- b) Provide consumers holistic experience with rich content on nutrition, history and recipes.
- c) Provide food solutions targeted to specific health challenges such as diabetes, for e.g. their range of diabetes friendly products
- d) Sensitize restaurants about these traditional products and encourage them to feature them on their menus.
- e) Partner with influencers such as media, bloggers and food writers to create awareness.
- f) Partner with Social Enterprises to target health specific populations through their networks e.g. eKutir for diabetes.

## Impact

### Farmer Engagement

- Sourced from 13 farmer groups working with over 8000 farmers in 9 states incl. 4 women farmer groups.
- Developed 6 new products using traditional ingredients such as pearl millet biscuits (women made).
- On average 30% of final price reaches the farmers.

### Marketing:

- Commercialized 27 products & reached customers including restaurants across 10 states in India with their 4 curated boxes and retail products.
- Their Sugar Control box had products suitable for people with diabetes. One of their customers stopped eating white rice and replaced it with their red rice and barnyard millet as this helped her manage her blood sugar.

### Knowledge:

- Completed a mapping study of traditional crops & eating patterns in villages in Jhajjar, Haryana

### Long Term Impact

Over the long term they will achieve the following:

- 20% to 50% increase in income of smallholder farmers practicing traditional farming more in sync with their local agro-climatic environment. This will not only increase farm income, but also reduce market risk and enrich soil conditions.
- Source from atleast 40 farmer groups including 10 women groups covering 25,000 farmers across 15 states.
- Increased financial sustainability of atleast 20 farmer groups (including atleast 5 women groups) working with atleast 13,000 farmers.

In addition they also aim to decrease the growth rate of lifestyle diseases and health challenges by providing the urban and rural consumer with healthier and traditional food options. For example: decrease in fluctuation in blood sugar levels amongst diabetes patients, decrease in anemia rates amongst pregnant mothers.

### Potential to Scale

There is potential to scale Original Indian Table both on the farmer and customer end:

### Farmers

India has thousands of Farmer Cooperatives and over 759 Farmer Producer Companies. Most of these collectives have financial sustainability challenges as they have fragmented marketing efforts that are restricted to their local regions. Many of these groups have access to unique indigenous products and local knowledge on the uses and health benefits of each product. Original Indian Table has the potential to partner with increasing number of farmer collectives to source new products and in greater volumes as they scale up.

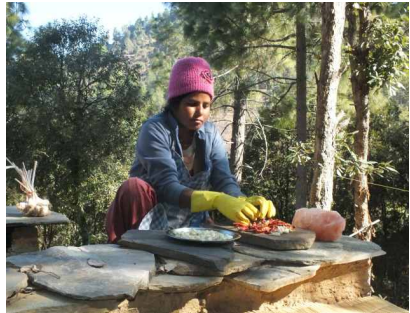


**Customers**

The Indian health and wellness sector is estimated to be \$3.3 billion in size. With rampant lifestyle diseases prevalent there is increasing customer awareness about the impact of food on health. Studies have shown that change in lifestyle (diet and exercise) are the most effective tools of combating these diseases. In addition, there is an increasing number of health conscious, upward mobile and youth customers that are looking for healthy food alternatives.

Hence both on the supply and the demand side their potential to scale is immense. They have a three dimensional model to growth:

- a) In 2016 they will be in 15 modern retail stores in addition to their online channels and have active partnerships with 2 social enterprises to target urban & BoP health segments like diabetes & malnutrition. They will further scale their distribution in the next years.
- b) Expand their product basket to provide customers with more options. Over the next 2 years they will market test 40 products and commercialize 15 products with over 10,000 HHs.
- c) Increase their farmer groups base from 13 to 40 in the next two years to provide market linkages to a larger number of farmers.



## BioAvert I: Biological program of disease aversion for horticulture crops

**Organisation:** Swasti Agro and Bioproducts Pvt. Ltd.

Round 3

### Challenge

Farmers treat diseases of crops symptomatically after seeing the symptoms. Hence, they incur significant losses, irrespective of having products for disease control. In the absence of tools for preventive diagnosis, analysis of predisposal factors, and products for building disease resistance, they lose crop anywhere between 10 and 90% based on the adversities of climate.

### Solution

They want to provide Healthcare system for plants with the help of patented products for building disease resistance, and point of care scalable diagnostics. This will improve the productivity for farmers significantly, without use of toxic chemicals; thus also increasing the value of the product.

### Impact

Farmers will get higher production. Requirement of toxic chemicals will be drastically reduced. Produce being residue free, will fetch better price. They will get 10X to 100X ROI on the product purchase price (Rs. 6000 – 60,000 extra profits per acre)

### Potential to Scale

The products have been tested in sixteen crop-disease combinations. The land under these crops within India – as per FAO estimate – is 240 Cr acres. At minimum value and use of their products, the potential scale for revenue to their company is estimated at Rs 15,000 Cr. The potential for higher production within India is at least worth Rs. 1,50,000 Cr. Toxic chemical use could go down by 60 Lakh Mt.





## Popularising bamboo polyhouses among small farmers

**Organisation:** Self Reliant Initiatives through Joint Action (SRIJAN)

Round 3

### Challenge

There are three development challenges that are addressed by their innovation - one, increasing agricultural incomes of small farmers; two, mitigating climate extremities; and three, promoting robust farmers' institutions. Each is described below in some detail.

### Solution

SRIJAN is a national professional agency that is engaged in livelihoods promotion for the rural poor. As a development agency it is committed to promoting sustainable and self-reliant models of development. SRIJAN team has come up with a solution is that reduction of per unit cost of construction of polyhouses and easy and local availability of appropriate construction material could be the key to increasing the outreach of cultivation of horticulture under protected climatic conditions in India and at the same time small farmers too can grow crops under protected conditions. Bamboo is one such material, stronger than steel yet light, and widely available in large parts of India, particularly tribal India.

To lower the entry barriers to greenhouse technology, SRIJAN propose to scale down and build small polyhouses of the size of 100 to 150 square meter area.

Actualizing this model would include: agriculture extension, in other words, transferring to tribal farmers the skills of growing vegetables under controlled conditions; aggregating and marketing of produce from polyhouses at favourable prices almost round the year; financing of the assets (bamboo polyhouses) costing close to Rs. 65,000 a piece (the size assumed to be 100 square meters in the first instance); and finally the organisation of producers into a legally registered company that could then source funds independently, take over the business from SRIJAN professional team, etc.

### Impact

Their impact study data says that Crop production worth Rs. 50,000 (Sales revenue) in the first year against the cost of Rs. 22,200, leaves the farmer with a gross profit of Rs. 27,800 and net profit after interest and depreciation Rs. 22000. The profit will increase every year gradually as repayment amount will reduce every year. Fifth year

onwards farmer will receive net profit of Rs. 28000 annual. The payback period works out to be 2.3 years. If there were no subsidy, the payback period would be close to 4.5 years.

Impact of innovation on people at the bottom of pyramid would have to be in terms of (i) people who have very small parcels of land and are still able to take up cultivation under BPH (perhaps just one acre or half an acre of cultivable land); (ii) Indirectly, those who are larger farmers can also be counted, benefitting from technology dissemination and collective marketing. The impact would be counted both in economic as well as in social terms, upliftment in the eyes of the others.

### Potential to Scale

With support from The Hans Foundation (THF), they plan to establish 30 Bamboo polyhouses in their Angul Location, Odisha in coming 4 months. In next three years they will establish 300 Bamboo polyhouses with small tribal farmers of Chhindwara, Madhya Pradesh and Angul, Odisha. The successful demonstration of the technological packages would raise the awareness of the local community, local leaders and would result in increased peer pressure to integrate these technologies. In addition to engaging policy makers, the SRIJAN team could also replicate this innovative idea in other resource poor countries like sub saharan Africa - Ethiopia being one, there could be others such as Kenya, Eritrea, and so on.



## Revolutionizing agri business in north east India

**Organisation:** Parvata Foods Private Limited

*Round 3*

### Challenge

Sikkim is a complete organic state. Despite that, farmers are leaving farming as they are not getting right price for their produce. They lack market access. The organic produce from Sikkim is sold in Siliguri mandi as conventional and the organic identity is lost. Also, the farmers use traditional agriculture practices for sowing and harvest, which results in loss of productivity and hampers the quality of produce. It also causes diseases such as rhizome rot in ginger. This reduces the income of the farmers to a great extent. Another major concern in ginger plantation is that 50th generation seed is being used and thus the vigor is lost. This reduces the productivity to a great extent and the keeping quality is deteriorated. There is lack of technology to store ginger in India on commercial basis on large scale. This results in huge price fluctuations and the farmers are at the disadvantage. It also impacts the processing and value addition as round-the-year supply is not available.

### Solution

They build farmer-centric integrated value chain and connect farmers to the markets. They undertake processing for higher value addition in their organic spice processing plant in Sikkim so that maximum returns can be provided to the farmers. They provide on-farm collection services with higher farm gate prices and are setting up village level collection centers in the 3 major spice growing belts in Sikkim with facilities for grading, sorting and electronic weighing with on-spot cash payments. They also train the farmers in modern agricultural practices. They have started from very simple

practices that are suited for North East, are easy to adopt and show maximum results. They are now expanding into making database of best agricultural practices sourced from across the country from research organizations and agri-businesses and will make this available to the farmers in the form of video and easy to understand and implementable content. As with farmers, “seeing is believing”, so they are also expanding into creating demo plots with progressive farmers and use that to train the other farmers. Also, SMS based information dissemination will equip the farmers with market information empowering better decision-making.

### Impact

Farmers get the advantage of the on-farm collection services with higher farm-gate prices. Through the use of better agricultural practices, the productivity and income of farmers will increase. Access to market information will equip farmers with better decision-making. Also, improved planting material will increase the productivity 2 times and improve the quality of the produce. They can then also target the export market, so that better returns can be provided to the farmer.

### Potential to Scale

Working with 1800 farmers by Year 3, they will provide higher farm gate prices. They will be equipping 5000 farmers by Year 3 with modern agriculture practices. Through simple and adaptive use of technology, their productivity and income level will increase to a great extent.



# Low cost innovative and smart irrigation controller

**Organisation:** FlyBird Farm Innovations Pvt Ltd

Round 3

## Challenge

Irrigation and applying Fertilizers to plants/crops are very important and critical tasks in any cultivation. Irrigating water at right time and in the right quantity is very important.

- Small and marginal farmers typically cannot afford Irrigation controllers and have to manually control water flow which can be Inaccurate and Inconsistent.
- Over-irrigation or under irrigation for the crops/plants
- Water table is going down day by day, needs precise and effective utilization of natural and available resources

## Solution

FlyBird Innovations has developed a low cost & innovative Smart/Precise Irrigation Controller for poor farmers to irrigate water as per crop needs & improve crop yields by precise irrigation. By using scientific methods, soil moisture, temperature and humidity sensors very precise irrigation will be done. It prevents the under/over dozing

of water to plants and will improve the crop production and saves water, electric power, time and money for farmers.

## Impact

Impact achieved through Smart Irrigation and Precision Farming

- Water saving 25% to 30%
- Crop yield / productivity improvements – 10 to 15%
- Less dependent on manpower and no human errors

- Conservation of electric power
- Reduces weeds and agri inputs
- Improving the Livelihood of Farmers
- Integrating Affordable Technology for Farmers

## Potential to Scale

There are 47 Million small and margins farmers in India and 22 million hectare of land under Irrigation. There is huge scope and potential to scale the business. And there are big opportunities in African countries too.



## Low cost manual milking machine

**Organisation:** kerala Veterinary Animal Science Society

Round 3

### Challenge

Milking is a skilled and tedious job and form the major work load in a dairy farm. 96 per cent of the 118.59 million milch animals in India are still hand milked and 70 per cent of the work force in this sector is contributed by women, which causes back pain, shoulder pain, finger fatigue and allergic reaction and they are also exposed to hazards like cow kicking and tail lashing. Milk which is secreted sterile often gets contaminated during hand milking increasing the bacterial load and lowering the keeping quality. The young generation is turning away from this vocation as the practices are primitive and due to the drudgery associated with this job. The solution for this problem is the use of eclectically operated milking machines which are very expensive and cannot be afforded by the millions of small and marginal farms who owns majority of the milch animals.

### Solution

Simple low-cost manually operated milking machines with pulsation which is efficient in operation and affordable to the rural society will solve all of the above mentioned problems. Two simple low-cost manual milking machines were invented 1). Bi-cycle type milking machine, with hand operated vacuum creating system and pulsation produced by pedalling a chain drive. 2). Rocker type milking machine, where the teat cluster is attached on the cow with a Velcro strap and milking by rocking a pedal operated cylinder piston with foot. The following are the key benefits of these machine

- Cheap, efficient milking machine affordable to millions of rural people
- Anybody can operate (women & children)
- Complete milking is possible
- Electricity is not required (No recurring cost)
- It eliminated health problems of the milkers with added health benefit of exercise in an ergo cycle.
- Improves the quality of milk with increased Fat & SNF.
- Drastically reduces the bacterial load in milk
- Fetches more milk price to the farmers

### Impact

Scientific and hygienic milk production will be possible for 70 million rural household in India who owns cows and buffaloes, but who cannot afford costly electrical machine. It is easily portable and does not have any recurring operational and maintenance costs. The distinct feature of this invention is that it has a pulsation system which exactly stimulates sucking by a calf leading to high milk ejection. The quality of milk will improve as it cannot be contaminated by dust and microbes in the shed and also prevents falling dung and hairs into the milk. It will prevent damages to the teat of cows due to excess positive pressure hand milking and also reduce the incidence of mastitis. It will fetch more revenue to the farms as the machine can draw the last strips of milk which contains more fat by simultaneous rocking and pedalling.

### Potential to Scale

This machine can be adopted by millions of small and marginal farmers in developing countries. This machine can stimulate rural development being used in remote villages where there is no electricity supply and improve the economic status of dairy farmers. The stigma associated with drudgery of the job of milkers, which prevents the young generation from this vocation will vanish by the use of this machine. The machine will improve the quality of milk which is the need of the hour globally. It will also improve the health status of women who are 70 per cent of the work force of this sector.





# Pilot demonstration and transfer of Solar Conduction Dryer (SCD) from India to Nepal

**Organisation:** Science for Society

*Round 3*

## Challenge

One of the sources of food insecurity in Nepal is post-harvest crop loss. Post-harvest loss of fruits and vegetables in SAARC countries is alarming which is estimated at 20%-50% in Nepal. This is mainly because most subsistence farming communities do not have access to appropriate technologies. A wide range of existing food processing technologies is not accessible to and adapted by farmers. Climatic conditions also contribute to crop losses. Floods, heavy rains, droughts and other related factors also lead to considerable post-harvest crop loss. Overcoming the perish-ability of the crops, enhancing nutritional value and adding economic value through processing are the main ways of increasing food security in Nepal.

## Solution

The development and introduction of new processing technologies offer potential to improve food security and local industrialization. Keeping these aspects in mind; this program is aimed at tackling the problem of post-harvest losses by introducing the innovative solar conduction dryer technology. Solar Conduction Dryer (SCD) is an electricity free solar powered food dehydrator that reduces moisture content in agro-produce so that farmers and rural women can preserve their produce up to 1 year without using any chemicals and earn additional income through the sale of dehydrated products. SCD converts agro-produce into value added dehydrated products. Dehydrated products can be sold at high value and can also be used by farmer families throughout the year.

## Impact

By adoption of this technology, local farmers will be able to process the harvest surplus, making it possible to store and sell produce that would otherwise be wasted. The solar dryer enables control of the drying process so that high quality dried products can be sold in distant markets. This creates new business opportunities for

small-holder farmers in remote areas. The initiative will also aim to enhance nutrition and food security for participating small-holders during the rainy seasons, which last several months.

Number of women farmers benefited: 500 in 3 years

Each SCD processes 3 ton material/year Total processing: 1500 tons/year

Each SCD provides profit: USD 1000/farmers

Total profit for farmers from the project: USD 1.5 million (USD 500,000/year)

## Potential to Scale

During this pilot phase of 36 months, they will create a replicable and scalable eco system of producers (women farmers), local administration and monitoring partner and buyers of the dehydrated products. It will be a farm to fork model. Scope to reach 2000 farmers by the end of 2020.



# CassavaTech: A high-tech equipment for processing cassava

**Organisation:** Science for Society

Round 3

## Challenge

Kenya has been experiencing declining per capita agricultural production with total annual on-farm production of food crops lagging behind consumption. This has resulted in food deficits and the consequential food insecurity being witnessed in the country. In the past, agricultural innovations in Kenya concentrated on improvement of production of major food crops such as maize, wheat, rice, beans and Irish potato. In recent times, agriculturists and extension workers identified cassava, as one of the high value traditional crops with the ability to withstand adverse climatic conditions and an important food security crop for resource poor households. Micro-processing units, a step above the household level can process up to 200 kilograms in a day. Household processing is labor-intensive operation and requires 90 man-hours to process 100 kilograms. The operations account for significant wastage as the cassava tuber is not processed immediately, and the product's shelf life is limited.

## Solution

CassavaTech is designed to overcome the challenges and improve processing efficiency at the household and micro-processing levels, thereby directly addressing household incomes, and offering livelihood diversification options. CassavaTech overcomes issue of operating cost and capital cost by patented technical innovation. CassavaTech will reduce drying time from 10 days to 10 hours with high quality Cassava flour. During the same time, project will create revolving micro-finance fund for 200 farmers to create market demand.

## Impact

With the adoption of CassavaTech local farmers will save 90 % of their time that is required for traditional cassava processing. The CassavaTech will result in

- Formation of 10 Farmer co-operatives each with 1 lead farmer and 20 members
- Awareness on dehydration and prevention of post harvest loss

- Set up 200 cassava dryers units
- Training and demonstration on cassava drying
- Training on production of high quality cassava flour
- Provide market linkage for dry chips/flour
- Reduction of 90% women labor hours involved in cassava drying
- Utilization of extra women hours for family, farming and health

## Potential to Scale

Following the pilot, the program will be evaluated for its success using measurements and indicators that will inform the future scale-up strategy. Project involves mapping of scale up strategy for scaling up CassavaTech from 200 farmers to 20,000 farmers by 2020.





# Portable solar cotton picking machine

**Organisation:** Agventures Corporation

*Round 3*

## Challenge

Cotton harvesting in India & Africa is done by hand. Handpicking of cotton is labour intensive, tiresome and ergonomically challenging. Moreover it has low productivity; only 10 to 40 kg of cotton can be picked per day, leading to high labour requirement and costs. Further, due to the staggered blooming characteristics of Indian cotton hybrids and small sized farm holdings, the large fully automated cotton harvesters used in the US are not considered suitable for Indian farming conditions. Many villages in India and Africa have acute power shortage or have no electricity at all. This necessitated a harvesting solution without the use of electricity or AC recharged batteries

## Solution

In 2012, Agventures Corporation started working towards developing the first prototype of the solution. The innovation is a portable backpack solar cotton picking machine. The product consists of a light weight portable solar panel that can be mounted on the worker's back or head. Workers will mount the solar panel on their back or head and connect the cotton picking machine (attached with a cotton collection bag) to the solar panel. They will then harvest the cotton lint using the solar powered cotton picking machine. During usage, the portable battery stores the extra power that is generated by the solar panel. The stored power can be used in the evening by farmers to light their homes and run home appliances. The invention deploys the use of solar energy to run a cotton picking machine. The circuits behind the solar panel are designed to convert solar power to electricity at the required levels to drive the cotton picking machine; and to store the additional power generated in a battery for later usage at home. Farmers thus can improve productivity, avoid child labour and also have power at home, all with one single device. School going children could study at night even if their homes are electricity deprived.

## Impact

The portable solar cotton picking machine was used by 2000 farmers in Burkina Faso in 2015, who experienced the following:

- Burkina cotton farmers earlier harvested 30 kgs per day by hand. With their machine, they could harvest 150 kgs per day. The per hectare cotton yield in Burkina Faso being 500 kgs, farmers just deployed 3.33 workers per hectare with the machine against 16.66 workers needed for hand harvesting. At USD 2 a day, the labour saving worked out to USD 27 per hectare
- Burkina cotton farmers were happy with the quality of cotton picked and were hopeful of obtaining a 10% premium (4 cents per kg) for their cotton, working out to an additional USD 20 per hectare and enhancing profitability by USD 47 per hectare.
- Women were happier not only because they could now devote their time for household chores and easier farm jobs, but also because they could send their children to school as they weren't needed to help out in the fields anymore.
- Farmers were elated about having lights in their homes in the evenings with the solar panels, batteries and the LED lights provided by them.

## Potential to Scale

India has 12 million hectares of cotton grown by 8 million farmers; Africa has 1.2million hectares of cotton. This gives them a total potential of 10 million farmers = 10 million machines. Agventures Corporation intends to reach out to farmers in these geographies through an effective distribution system, cotton ginneries and mills, government subsidy programmes, farmer co-operatives and agri input partners.

# Producing more with less: Promoting Sustainable Sugarcane Initiative (SSI)

Organisation: AgSri

Round 2

## Challenge

Indian farmers cultivate about 5 million ha of sugarcane. Average size of farm is less than one ha. The current method of sugarcane cultivation is seed, water and fertilizer intensive. Average yields are stagnated and cost of cultivation is raising. There is a need to radically transform sugarcane cultivation, which is to produce more with less.

## Solution

Sustainable Sugarcane Initiative, an innovative method developed by AgSri is to reduce inputs while increasing the productivity. The point of departure is from planting 8-10 tonnes/ha of sugarcane as seed to planting seedlings. Chipping buds from sugarcane, using simple growing medium and manufacturing seedlings which can be planted directly in the field.



## Impact

More than 15-18% of total production of sugarcane in India is used to re-plant the cane. Total value of this cane buried in the ground as seed cane exceeds ` 7,000 crores. AgSri has developed SSI method, tested, improvised and proved that planting one month old seedlings at wider spacing will improve the yield, reduce the water input and requires less inorganic fertilizers. Thousands of farmers have tested and approved the method and ready to adapt SSI.

## Potential to Scale

The process of manufacturing seedlings creates rural jobs, particularly for women and saves large quantity of water. SSI improves productivity, saves water, and creates jobs. Recently the process of SSI has been certified as water saving by Gold Standard which has enabled AgSri to receive water benefit certificates. AgSri innovation is suitable for all the sugarcane farmers with some local modifications and adjustments. Now SSI is being tested in Cuba, Mexico and Tanzania with limited support from AgSri. SSI manual has been translated into several languages including Spanish.



# Portable digital copra moisture meter

**Organisation:** Mr. Sunish Issac (Individual Innovator)

Round 2

## Challenge

Copra is the dried kernel extracted from the coconut shell. It is crushed to extract coconut oil and oil cake. The quality of oil depends heavily on the moisture content of the copra. One of the important issues with coconut/copra farming is, estimating the price of copra based on its dryness. This is currently done purely based on the experience of the estimator. The farmer always thinks that he's supposed to get a better price when the copra merchants feel it is not dried enough. There is also lots of time, energy and man power wasted if the drying process is not stopped when the ideal moisture percentage of 5-6% is reached. The challenge exists in most food crops that are dried for preservation or processing.

The following solutions are available to check the moisture content, but they have drawbacks.



Near IR Analyzer

- Very Expensive
- Non portable
- Time consuming
- Designed for lab use
- Calibration required



Copra Moisture Meter developed by CPCRI

- Inaccurate in giving exact moisture percentage and for values more than 6%.
- Not user friendly.
- Values manually averaged.

## Solution

Portable Digital Copra Moisture Meter solves all of the above problems at a very low cost. It uses modern cost effective



Prototype of Portable Digital Copra Moisture Meter

technology to provide accuracy and usability for all kind of users.

Following are the key benefits of Portable Moisture Meter:

- Portable
- Very accurate
- User friendly
- 3 different models to suit farmers, merchants and lab grade users.
- Auto Power Off to save batteries

## Impact

- Cost effective usable technology for farmers and merchants
- Prevents wastage of time in drying
- Prevents wastage of fuel
- Brings transparency to buying and selling of copra
- Government organizations like NAFED, KERAFED other NGO's will benefit from the speed and accuracy
- Agricultural scientists can use it for quick measurement of moisture as its portable

Since the moisture values can be displayed as percentage as well as in the format required by conventional merchants and farmers, it will be more usable.

## Potential to Scale / Global Transfer

The technology can be used for other crops in agriculture and has industrial applications. Wherever fast and accurate moisture measurements are needed, the moisture meter can be used. Only the calibration data needs to be changed based on the material.

Since the device is portable it can directly be used on the field. The device can be connected to a mobile or tab to do data collection and analysis.

Apart from the coconut cultivating countries, the product can be used in other geographical areas for other moisture measurement applications like drying of fruits and vegetables.

## To achieve higher farm productivity and reduce losses using web and mobile technology in Kenya using the model from India

**Organisation:** CropIn Technology Solutions Pvt. Ltd.

Round 2

### Challenges

World agriculture will undergo far-reaching economic and physical change in the coming 50 years. Population increase, urbanization and income growth will drive the demand for food while high energy prices, stress on natural resources, and climate change may act to constrain supply. To feed the world's growing population – projected to exceed 9 billion in 2050 (UN, 2009) – it will be necessary to boost the production of food and to do so sustainably. To be sustainable, agriculture will need to be intensified and its environmental footprint made to shrink.

Growing more with less is the guiding principle, lowering water and land use per unit of output while conserving the productive capacity of soils. The concept of sustainability is a challenging one in agriculture.

Today agriculture engages 40% of world population and around 500 million small farms world-wide caters to 80% of food consumed in developing nation. One of the challenging questions which still need to be answered “How to unleash the agricultural potential of currently less productive countries and their small farmers?”

This requires technology, access to inputs and services, extension services support, and remunerative links to markets.

### Solution

CropIn was established in August 2010 to develop and offer on a low cost pay as you use product on an IT platform on Cloud integrated with Windows/Android based smart mobile app. The vision was to bring affordable state of the art technology in agriculture and the mission was to make every farm visible on-line, make every farmer adopt the best global agricultural practices and to make every crop traceable so that harvested crops meet global quality standards

### CropIn solution introduces following to the Agri Sector.

1. Mobility in managing farm Operations
2. Collaborative Tools for producers, organizers, agronomist & aggregators & lending agencies
3. Interface to Interact and react on field Issues
4. Real-Time Decision support system for planning, production and supply chain
5. Big Data Analytics to reveal the crop behavioral patterns using statistical modeling
6. Ensures sustainability and traceability for a better future

### Impact

They are monitoring around 25 different crops in 12 different states of India with thousands of small farmers spread across various geographies along with implementing partners. They have seen around 12% increases in productivity and were able to reduce losses at farm gate by 18%. This accounts for more income for farmers. Their solution has also encouraged sustainable practices and 100% digitization of farming practices, which is paving path for sustainable agriculture..

### Potential to Scale:

Millions of small farmers in developing countries do not have a good resource and knowledge base, and this limits their capacity to pursue sustainability goals. This capacity can, however, be created or enhanced by increasing farmers' access to knowledge and capabilities through education and training, and by improving their operating environment through provision of enabling technologies and services.

Their innovative solutions integrated with cloud, mobility and big data processing will enable them to reach these millions of small farmers seamlessly with the help of implementing partners. They strongly believe that by "Digitizing Agriculture", they can play an active role in the addressing current farming challenges.



## Improving farmers' livelihood through end to end agri services in Nepal

**Organisation:** Farms and Farmers

Round 2

Farmers face plethora of problems at every stage of agricultural production like crop planning, inputs availability, unawareness about latest technology, advisory support and Market. Being small farmers, either they do not have access to solution or cost of solution is unaffordable. Consequently overall profitability is too low to survive.

Farms and Farmers (FnF) was started in 2011 with an aim of maximizing the profit per unit area of small farmers by improving efficiencies in agricultural supply chain and connecting the farmers directly to input providers, latest technology and institutional buyers. Team FnF is comprises of highly dedicated people from various background and elite institutes like IIM Ahmadabad, IIT Kharagpur, IIT Delh, ICAR & many more.

They provide end to end services to farmers – right from crop selection to marketing. They have also created a large pool of bulk buyers. Their demand is linked to their farmers and subsequently farmers (cluster level) are trained to meet the demand at minimum possible cost. In other words crop/variety finalization is being led by demand. Their ICT based tools for soil analysis, integrated pest management and crop advisory services assure quality production.

They set up its extension centre “DeHaat” in rural areas at block level. DeHaat is run by last mile entrepreneur

(Micro entrepreneurs) on profit sharing model and carters to 600-1000 farmers in radius of 8-10Km. Micro entrepreneurs take care of day-to-day operations and will supported by FnF’s Core Team for strategic and logistics issues. Through in house technology of mobile applications, DeHaat captures field level data and receives various types of farmers’ queries – Input, Soil test, Advisory & Market.

More than 5000 farmers are directly associated with 15 DeHaat centers in 6 districts of Bihar. Their farmers are fulfilling diversified agricultural requirements of Maize, Wheat, Fruits (Litchi, Papaya, and Mango) Honey & Vegetables for many buyers like Godrej Agrovet, Spencer's, Metro, IPCA and quite a few exporters. Hence DeHaat provides following basic services to the farmers:

1. Seeds & other agri inputs
2. Soil Testing
3. ICT based Crop Advisory:
4. Market Linkage of farm produce
5. Contract Farming of niche crops
6. Cattle Feed
7. Mobile based services for crop reminders and information about govt. schemes & market price
8. Banking facilities



They are targeting 20 DeHaat centers by end of this F.Y., 2013-14. They have already identified and trained 65 micro entrepreneurs so far. Their scale up strategy is to add “DeHaat” at different locations. They are aiming 300 DeHaat in next 3 years to increase their reach directly to 150,000 farmers.

## Ensuring food security and income generation for poor farmers of Bangladesh through innovative water management technology named “BHUNGROO”

**Organisation:** Naireeta Services Private Limited

Round 2

‘Bhungroo’ is the local name of innovative water technology; it assists farmers in two ways e.g. during rain it saves farmers’ land from excess water and in dry period it ensures adequate irrigation. It filters, injects and stores excess storm water in subsoil strata in form of water lenses. In lean period, it allows withdrawing of water from stored water lenses. Each unit of Bhungroo guarantees lifelong food security to more than 30 rural poor and allows farmers to increase their agro income by manifold in lean period. This technology has been invented as a result of eighteen years of field experience in semi arid and disaster affected regions of north Gujarat of India with a special focus on gender centrality in Gandhian principle of Antodaya and Sarvodaya. Till date, it has been transferred from laboratory to field, field to expansion, expansion to scale, scale to state finance budget, state finance budget to self sufficient bankable model. The technology and its interfacing against poverty is recipient of series of global awards/recognition viz World Bank India development Marketplace, US Department of State, Ashoka Globalizer, Department of Science and Technology of Government of India, Government of Gujarat and lastly in 2014 it got awarded by UNFCCC as the unique model of climate change mitigation and poverty eradication.

Naireeta Services Private Limited (NSPL), a social enterprise start up, endeavors to cater food security and income generation needs of disaster affected small landholding farmers across the globe with the use of “Bhungroo”. NSPL has been nurtured by renowned global networks viz LEAD, Ashoka, Commonwealth, Fulbright, US IVLPs (to name a few).

2 million farming families in India and 260 million across globe (FAO 2011), affected by excess water on their land for a duration of more than 15 days in form of water logging, need Bhungroo technology and associated support from NSPL, which is going to increase India's agri-income by more than USD 1.5 Billion annually whereas that of whole world will be USD 208 Billion annually along with attainment of MDG I;

With a monthly cost of as low as USD 2.5 per acre, Bhungroo enjoys high acceptance among the ultra poor

especially when the yearly return from 2nd year onward exceeds next 35 years lifecycle cost. Till date more than 19000 rural poor in India are accessing benefit of Bhungroo. NSPL works in partnership and handholding model where enough space for co-creation for local communities is ensured. Within India, partnerships are getting inked with CBOs, NGO, Cooperative, producers’ organizations, CSRs, Government Departments, private corporations, research institutes, educational institutes, HNI and commercial banks. Globally, NSPL is also successful to have implementation partnership within Ghana, Kenya, Zimbabwe, SE Asian countries and it is in process of creating knowledge partnerships in Europe and USA.

NSPL’s small core team is having more than 103 years of combined experience in poverty eradication and innovation, coached by premier education institute like IIT, IIM, US and UK Universities.





**Awardee Portfolio: Clean Energy**

## Smart nanopower for socioeconomic development of villages

**Organisation:** SunMoksha Power Pvt. Ltd.

Round 4

### Challenge

The socioeconomic development of India's marginalized rural and agricultural communities, needs interventions to move them up the value chain by establishing 'micro-enterprise zones (MEZs)' for agro- and related livelihood activities, leading to 'Gram Swaraj'. Creation of livelihood and microenterprise activities will, in turn, reduce the pressure on agriculture and land, and lead to triple bottom-line impact. Access to energy, creation of business models and development of locally relevant skills play key roles in the goals of socio-economic development. There is a need for reliable, quality power supply with microgrids, operational efficiency, skill development for livelihood, and viable business models for sustainable economic development. The existing solutions in the market have been unable to achieve sustainability and scale, due to several challenges such as single-source power generation which limits the scope to meet all type of loads; lack of peak-load management resulting in overdesign; lower efficiency and lower PLF (plant-load-factor); high cost of running the microgrid operations such as collection, non-payment & theft control, O&M, as well as skilled manpower; and lastly, lack of appropriate business models to make these decentralized solutions self-sustaining and scalable.

### Solution

They have invested years of effort to understand the challenges of energy access and have developed a holistic solution – Smart NanoPower™ – with a 'systems' approach to address these challenges. The key interventions are (1) Smart Nanogrid™ for uninterrupted, reliable green energy supply; smart microgrid with remote monitoring and control; and transparent e-governance; (2) NanoSkill for development of locally relevant skilled workforce and (3) NanoBiz for creating and implementing microenterprises including sustainable business models for Smart Nanogrid that are scalable and geared for local adaptations.

Smart Nanogrid™ has addressed the above challenges with a 'systems' approach. Its plug-n-play system

includes hybrid power generation, dynamic peak-load management and scheduling with higher efficiency and PLF, theft-proof design, auto cut-off for non-payment and/or overloading protecting the asset; differential tariff with time, kW, energy-tiers; and automated operations and maintenance with local resources and remote monitoring. It schedules demands of microenterprises, irrigation pumps, street lights, and other loads to match the power generation constraints. Local consumers get their usage information, payment status, as well as register complaints through a simple Mobile App, that is language independent. The system has been made smart and simple so that locally trained manpower can operate and maintain it with remote technical support from SunMoksha command center.

Availability of quality power and digital connectivity creates infrastructure for smart services such as tele-education, tele-medicine, remote water sensing, tele-panchayat etc.; thereby providing holistic development of the village. Their solution includes training of local personnel for operations & maintenance. It makes data available to experts in real time for a timely intervention; thus bridging the skills gap.

Their solution serves at tier 3 and 4 on the World Bank's multi-tier framework for measuring energy access, and is capable of delivering tier 5. The competitions primarily serve at tier 1 and 2.

The capital cost for microgrid falls well within the benchmark norms of Govt. of India, with 15-20% additional cost for Smart Nanogrid™. With hybrid generation, the cost comes down by 20-30%. There is further reduction in the size of the power plant resulting from demand management and lower peak-load. These reductions more than offset the additional cost of Nanogrid™. O&M costs are almost 40% lower compared to traditional O&M due to their remote monitoring and remote support for local operators.

Their model has been successfully demonstrated in Chhotkei village in Odisha, and endorsed by MNRE, Power Minister, ISGF, ADB, OREDA and won Smart Village Award.



## Impact

The replication projects in the above states are regions where primarily BOP population are the beneficiary. With their interventions, the direct impact is on the livelihood of the beneficiaries – increased agriculture and horticulture due to year-round irrigation, and food processing and cold rooms to increase the life and value of agricultural produce. The latter not only increases farmer income, but also reduces food wastage and distress selling. Local 'micro-enterprise zones (MEZs)' will increase income, at least by 100%. Creation of non-agro livelihood and enterprise activities will reduce the pressure on agriculture and land, and lead to triple bottom-line impact. It will also prevent migration of youth from rural to urban areas (they have even seen reverse migration), and reduce the strain on the city.

At the core of their solution is the UN Sustainable Development Goals. They believe that E3 – Energy, Education and Employment – address most these goals by Empowerment of the people. Their target beneficiaries are mostly marginalized farmers, contract labours, and schedule caste and schedule tribes. While Smart Nanogrid™ ensures reliable energy supply, their education module creates local capacity and relevant skills. Both are linked to their model for creating microenterprises. Additionally, they expect the quality of BOP lives to improve significantly in terms of earnings, children's education, agricultural outputs, and youth empowerment. Once economic growth takes place, citizen's overall well-being improves. The impacts are clearly visible within 2-3 year time-frame.

Smart Nanogrid is designed to be climate friendly. Only renewable energy is used for power generation and energy efficiency is enforced through efficient appliances, LED lights, and demand management. They anticipate a total 30-40 tons of CO<sub>2</sub> reduction per year per village.

## Potential to Scale

The worldwide microgrid market is estimated to reach USD 34.94 Billion by 2022, while India is expected to reach \$2 billion by 2020. SunMoksha's USP is replicable, scalable, sustainable technology and on-the-ground grassroots experience. SunMoksha will address this huge potential through strategic partnerships and dealer network across various geographies. SunMoksha provides its know-how, its Smart Nanogrid™ platform, and long-term hand-holding and technical support to sustain the

project over its life. A few pilots will be owned and operated by SunMoksha, but it will scale through licensing its technology and know-how, as well as, hand holding the implementing organization or entrepreneur for technical support and knowledge upgrades. They have a target of achieving one thousand village projects over the next 5 years, reaching approximately 50,000 to 100,000 BOP beneficiaries.

Their project was covered widely in the media, including BBC News, following which they have seen tremendous interest in Smart Nanogrid™ – nationally and internationally. Domestically, they have demonstrated a pilot in Angul district in Odisha, and have been selected by MoRD Jharkhand to develop Smart Village in East Singhbhum, with more to come in states such as Bihar, UP, West Bengal, AP, Karnataka, and HP. Once these pilots are in place, replicating will be easier across various regions. Internationally, they have seen interest from organizations in Myanmar, Australia, Philippines, and Africa. They have been approached by major players exploring partnership opportunities. They are also expanding their target market from village communities to several peri-urban and urban communities.

Smart Nanogrid™ aligns well with India's multiple National Missions. They are working with MoP to integrate their solutions into DDUGJY-DDG undertaken by REC. MNRE held a workshop in the Odisha village and assured them full support for replication. It is launching a new scheme on ten thousand micro/mini-grids by 2020. Their solutions also align with India's National Mission on Smart Villages, and several international initiatives on Smart Village, such as E4SV at Cambridge/Oxford and Open Innovation at Berkeley. Their microenterprise and skill development models align well with Stand-up India and Skill India missions.



## Women entrepreneurs for energy efficient slum homes

**Organisation:** Mahila Housing SEWA Trust

Round 4

### Challenge

400 million Indians and 1.5 billion people worldwide lack access to modern grid electricity. They are already spending \$50+ billion per year on unclean solutions, such as kerosene fuel for small lanterns. In India, the situation is dire, with human development opportunities greatly constrained for 75 million families that have no access to electricity.

### Solution

Their project combines process and product innovation to offer a unique package that includes 1) Auditing services to educate households on nuances of energy usage such as bill calculation, appliance's wattage consumption, changes in wiring to reduce energy wastage, and use of renewable and energy efficient products (2) sale of customized green energy technologies such as solar lighting-cooling systems; CFLs, LED, stoves, innovative building technology such as Roof Ventilation & Modular insulated roof systems (3) end-user financing with tailored loans & flexible collection (4) after sales service

### Impact

The expected impact of the action will be visible through improved quality of life & productivity of 5000 slum households that they will directly target as part of the project. The action will yield a 10% decrease in household expenditure on fuel consumption. Reduction in energy costs will allow poor households to increase spending on food, health & education, resulting in improved quality of family life. Improved light, ventilation & insulation in slums will lead to an increase in working hours of home based workers by 4 hours/day. Low energy, better-designed homes will also make the households less vulnerable to climate change risks.

### Potential to Scale

They believe that the most effective way of ensuring continued access to modern energy in slums is through mobilizing women, & empowering them to procure better

services for themselves. Towards this, MHT helps women in poor communities organize themselves into CBOs & mentors them to address development needs of slums. Women leaders from CBOs are trained to interface with Govt. & service/product providers & developed as micro entrepreneurs. They plan to intensify their efforts in Bhopal & expand their energy program through this women led model to 3 states where they have a strong grassroots presence. So far their energy program has empowered 2 L poor families in Gujarat & MP to access modern energy. This has resulted in savings of 550T in Co2 emissions. When the project reaches scale, they would have empowered a total of 4 L slum households to climb the energy ladder and demand & pay for more efficient and sustainable products and services.



*KrishnaBen, a trained auditor by MHT educating slum households in Ahmedabad on benefits of sustainable energy products such as improved stoves, LED lights etc.*



*Mod-Roof, A modular roof system that offers better weather protection and insulation and brings down indoor temperatures by 5 to 6 degree Celsius.*

# Expanding solar as a service to lower income households & micro-enterprises in rural India

**Organisation:** Simpa Energy Pvt Ltd (Simpa Networks Inc)

*Round 3*

## Challenge

400 million Indians and 1.5 billion people worldwide lack access to modern grid electricity. They are already spending \$50+ billion per year on unclean solutions, such as kerosene fuel for small lanterns. In India, the situation is dire, with human development opportunities greatly constrained for 75 million families that have no access to electricity.

## Solution

Simpa sells solar-as-a-service to energy-poor households and micro-enterprises in rural India. They sell high-quality solar products, combined with point-of-sale financing and convenient pay-as-you-go payments for topping up the system. Customers make a small initial payment to have a solar home system installed, and then make ongoing “top-up” cash payments to purchase “clean energy days” until the end of the contract, after which they achieve ownership of the system.

## Impact

Simpa has reached over 15,000 customers in rural Uttar Pradesh across 8 districts, and has impacted more than 75,000 lives.

## Potential to Scale

They believe their solution will work operationally and deliver new impact and at a greater scale due to the following reasons: 1) They have demonstrated proven ability in their existing 8 areas of operation; 2) They have invested heavily in planning their expansion to new areas, by assessing the energy need, existing market infrastructure and customer demographics in additional districts within 6 states; and 3) They have assembled a senior leadership team which has had deep experience in operating at scale in rural India across various sectors, such as telecoms, DTH, insurance and microfinance.





## Biogas based cooking grid

**Organisation:** Gram Oorja Solutions Pvt Ltd

*Round 3*

### Challenge

A large part of rural India still uses firewood or biomass for their daily cooking needs. The adverse health effects of traditional, open stove cooking with biomass, especially on women and young children have been well documented. The smoke from such methods of cooking causes suffering to the whole family causing lung and eye trouble, especially to women and children. The collection of firewood for cooking is also very difficult and time consuming for rural women. In addition, open stove biomass cooking is a major source of pollution. The huge demand for firewood in rural areas is also a major cause of deforestation.

### Solution

Learning from experiences in rural India, Gram Oorja has implemented a solution of a Biogas based cooking grid, which will be used to provide cooking gas to households in the community. A biogas grid is one where there is a central biogas plant in the village where all the cow dung is collected daily. This biogas is then transferred using a pipeline to each household, where the flow is measured and the pressure is regulated, in order to provide a satisfying cooking experience.

A local entrepreneur or village body is responsible for collecting the tariff amount, depending on the monthly usage as well as to look after the operation and maintenance of the plant. The tariff collected is used for operation and maintenance of the plant and for paying back the upfront capital costs. The tariff is finalised by Gram Oorja based on the design of the plant and other factors such as willingness to pay of the community, their income levels, previous expenditures on fossil fuels, etc. A person from the community is also trained by Gram Oorja for maintenance and operation of the Plant. The key steps followed for the successful implementation of project are:

### Impact

Across different decentralized renewable energy solutions, Gram Oorja has touched over 25,000 lives

across four states. The projects have enabled people to live better lives with access to electricity, drinking water and cooking fuel.

Women and Children of rural households face maximum exposure to smoke and gases emitting out of a firewood/fossil-fuel dependent kitchen. Biogas based cooking grid will provide them a smoke-free and ash-free kitchen. They can use the time saved on collecting firewood for other productive activities, which may also contribute to an increase in their income. In the long run, this project will improve the health conditions of the family due to the use of cleaner fuels for cooking gas. Farmers can also greatly benefit from this project as they can use the by-products from this project as manure in their fields. This will allow them to save money which was earlier spent on purchasing fertilizers. Thus, their land productivity will increase along with their income levels.

### Potential to Scale

There are large tracts of tribal India where forest cover is depleting and firewood is getting scarce. There is also enough bovine population in these areas. In addition, even in non-tribal mainstream villages, there is a growing need for cooking fuel and a scarcity of easily available firewood. Biogas based cooking grids could be a solution for a very large part of rural India. In the initial period, Gram Oorja has already identified 10 clusters across part of tribal India where it can be implemented across a few thousand villages in the first phase.



# Piloting of a novel table top solar panel laminator in rural locations for decentralized manufacturing and sales of solar panels by rural youth and women

**Organisation:** Jnana Prabodhani

*Round 3*

## Challenge

Lack of energy access for the BOP population is a well known development challenge. Worldwide 1.4 Billion people and 400 Million in India still depend on harmful kerosene as primary source of fuel for lighting after dark. Challenges to provide grid electricity access at the last mile exist due to barriers such as poor infrastructure, increasing cost of fuel for power plants, transmission and distribution losses etc. Solar energy is a viable alternative for India. Under the national Solar mission 100 GW installed capacity is to be achieved by 2022. For this, major focus is on centralized Grid-Tied or off-grid Solar Power plants through various MNRE schemes. Here, following issues that limit energy access to the poor are worth noting.

## Solution

Decentralized generation of solar energy can address all the above mentioned problems effectively. Originally based on a Japanese technology, Jnana Prabodhini has successfully developed and tested a Micro- Solar panel Laminator that can make Solar Panels in the range of 3Wp to 40Wp Power. They intend to install more of these laminators in rural areas. With training, individuals can manufacture their own panels and sell locally. This technology has potential to make smaller panels available at cheaper prices than current scenario since decentralized process is less capital intensive. Moreover, it imparts a key technical skill-set to rural youth/women and provides a livelihood opportunity. This novel approach of democratizing Solar energy will drastically improve energy access across thousands of villages.

## Impact

Both laminators are the size of a Table Top. This dramatically reduces the space requirements of current Laminators which occupy several thousands of square feet of factory floor space. Their laminator can be installed in a small 10x12 feet room. They have created training module and assembly instruction aids such that any rural youth or women can be trained to make these panels. They have already trained several batches of such youth and women in Pune. Through MA intervention, they plan to install three new laminators in Maharashtra, create 50 local entrepreneurs and manufacture and sell panels and related products for 3000 households impacting about 15000 people.

## Potential to Scale

Due to the key USP of extremely low capital investment and accessing local labor at lower costs, the potential to scale is very high. Considering the future demand and favorable government policies there will be scope in almost every district from our country for making decentralized solar panel manufacturing through this model. Central government's ambitious schemes such as National Rural Livelihood Mission (NRLM) or National Skill Development Council (NSDC) can be targeted for mass adoption. Moreover it can be easily incorporated in the list of approved courses for ITI and NCTVT by State Technical Board which will create skilled manpower in the solar industry.



# Development of integrated energy and revenue management system for mini-grids

**Organisation:** Technology and Action for Rural Advancement

Round 3

## Challenge

Access to affordable and reliable electricity is still a distant dream for the rural poor in India. Even in situations where grid power is available it is generally unusable. Renewable energy is a solution for the segment but it has not seen growth. High cost of operation and revenue uncertainty make the sector undesirable for private investors and are a major reason for the inherent latency of and lack of investment flow into the market.

## Solution

### TARAUrja's Innovation in Load Control and Revenue Management

TARAUrja has developed technologies in-house such as programmable load limiters and a cloud based revenue management system to mitigate these risks. Till date, these technologies have been deployed at 22 sites of Bihar and UP. At an aggregate level TARAUrja now has installed capacity to generate an average of 18000 units per month, sells an average of 14000 units per month with a revenue of Rs.3.60 lakhs per month.

With further improvements in technology, an integration of the energy and revenue management system (IERMS) it is possible to prevent theft of power and ensure on time revenue collection. This system will allow customization at the household level allowing for features such as pre-paid or credit based electricity supply, ability to limit electrical loads, SMS based activation and deactivation of connections, and real time monitoring of supply etc., while retaining the already existing benefits.

All of these contribute significantly towards reducing transaction costs and power thefts while driving up revenue security. This allows for availability of high quality and reliable electricity for the sector at affordable rates while enabling profitability of enterprises.

## Impact

The project could impact 25000 households (100,000 individuals) by providing direct access to electricity for lighting, and income-generation activities, etc. In the long term the solution holds the potential of revolutionizing the entire BoP sector by proving it to be a profitable sector and opening it up for investment.

## Potential to Scale

TARAUrja will deploy the IERMS in 300 locations, cutting operations cost by Rs. 3.5 – 4 per unit. The developed IERMS solution will become available as a licensed solution in the market, available to customers in exchange for a one time 'connection fees' that Energy Supply Companies (ESCOs) will charge their respective customers. ESCOs are recommended to charge their end users Rs.500 to Rs.600 for the device itself as a one-time connection fee. The low cost of the technology and benefits it brings to ESCOs will be realized as profits.



# Harnessing the destructive energy in pine needles for rural development

**Organisation:** Avani Bio Energy

Round 3

## Challenge

Recurrent forest fires spread by pine needle litter in large tracts of Himalayan pine forests destroy biodiversity, diminishing access to eco-system services such as fuel, water, herbs, and timber, for which rural people have traditionally depended on forests. This is threatening their habitat in the fragile Himalayan eco-system.

## Solution

They employ people to collect these pine needles before they burn, and use them to produce combustible gases which run engine to generate electricity. The process residue is good quality charcoal, which is briquetted to make cooking fuel for rural areas.

## Impact

Job creation for rural people in their villages, in collecting pine needles and running the power plants; Increase in biodiversity leading to enhanced eco-system services; Reduction in carbon emission; Reduction in drudgery for women in collecting fuel wood.

## Potential to Scale

In the Himalayan region, 2000 MW of power generation capacity can be set up. They plan to do this by setting up small, 10-25 kW size power plants and bundling them together to create an impact.

Globally, 100 GW of generation capacity can be set up using this technology.



## Pre-paid mobile payment based solar micro grids

**Organisation:** Boond Engineering and Development P Ltd

Round 3

### Challenge

About 1.2 billion people across the globe remain without access to grid electricity. These underserved communities and individuals have to rely on expensive and high-emission energy sources such as kerosene oil. Many of such off-grid households and communities can potentially benefit from clean and renewable energy based decentralized solutions. As per Census 2011 there are more than 1 million individuals in India using solar as a primary source of energy, but there are more than 300 million individuals who don't have access to grid electricity or any other form of clean and reliable energy. Challenges which inhibit the large scale adoption and penetration of decentralized solutions are poor ecosystem for end user financing, absence of universal brands which customers could trust, awareness, poor after sales support – especially in remote areas. Such challenges are more atypical to small scale decentralized systems such as solar home lighting systems.

### Solution

Boond has developed Pre-paid system for DC solar micro grids using GSM and bluetooth technology, in an effort to deliver 24x7 democratic access to clean and reliable energy. The pre-paid solution for micro grids empowers the customers to choose a service when they need it, and while also making a decision on how much they wish to spend for it. In essence, customers only pay for the power they consume and they consume power based on their needs. Something like this is unforeseen in decentralized and off-grid energy solutions.

### Impact

Access to clean energy and quality lighting has a direct and immediate impact on quality of life. In the long run, it helps in education of kids, increases productivity, social engagements and many other parameters directly related to Human Development Index. Some of the documented benefits of access to clean energy are:

- a. Considerable amounts of monthly savings because of non-dependence on kerosene oil.

- b. Ease in performing regular household activities after sun set.
- c. Children being able to manage their school homework without straining their eyes.
- d. Freedom from smoke of kerosene, which blackens walls and ceilings.
- e. Security from wild animals at night who occasionally venture into human settlements.

### Potential to Scale

Investments in pre-paid DC micro-grids can already be recovered in a period of 6-8 years. By rigorously demonstrating the financial viability of the proposed solution, Boond will have established a technological and business model that will greatly encourage the provision of debt capital by formal and semi-formal financial institutions, thereby promoting a more rapid scaling up. This will enable Boond, its partners, private entrepreneurs, and even community groups (e.g., SHGs, Farmer Clubs, etc.) to more easily access loans for setting up solar micro grids on a far greater scale than is currently possible. This outcome would have momentous implications far beyond the Unnao and Hardoi districts, providing a scalable model for off-grid communities across South Asia, Africa, and the rest of the developing world. Boond's pre-paid technology also has potential application for decentralized energy systems powered by clean technologies other than solar. With remote monitoring and automation of payment collection, the proposed solution might improve the financial viability of myriad off-grid, renewable energy solutions.



# Scaling Prakti multi-fuel clean cook stoves in India, Bangladesh and Nepal

**Organisation:** Prakti

*Round 3*

## Challenge

166 million households in India, 32 million households in Bangladesh, and 2.5 million in Nepal cook using solid fuels. Smoke from cooking using traditional stoves results in an estimated 875,000 premature, avoidable deaths each year in India alone. Dung and agricultural wastes are used by millions and are the dirtiest fuels with the worst impacts on health. Although people in rural areas of India, Bangladesh and Nepal use a variety of fuels for cooking, there is no existing improved cookstove that allows for clean and efficient combustion of wood, cow dung and agricultural wastes. Further, most available improved cookstoves are single burner while many families cook on double burner traditional stoves.

## Solution

Prakti has developed an innovative solution to address this need – an affordable range of extremely clean, efficient, and user-friendly multi-fuel stoves optimized for burning wood, cow dung, and agricultural wastes for low-income households in South Asia. Prakti's multi-fuel stoves are available in single burner, double burner, and double burner chimney models. While accommodating traditional cooking techniques, recipes, and fuel, Prakti multi-fuel stoves cut fuel usage by at least 60%, and reduce smoke emitted by up to 90%. Cooking is faster by 40%; time saved may be used for educational or income-generating activities. Reduced household air pollution reduces smoke-related health issues. Prakti's multi-fuel stoves have been field tested and are well-accepted by users and distributors in India, Bangladesh, and Nepal.

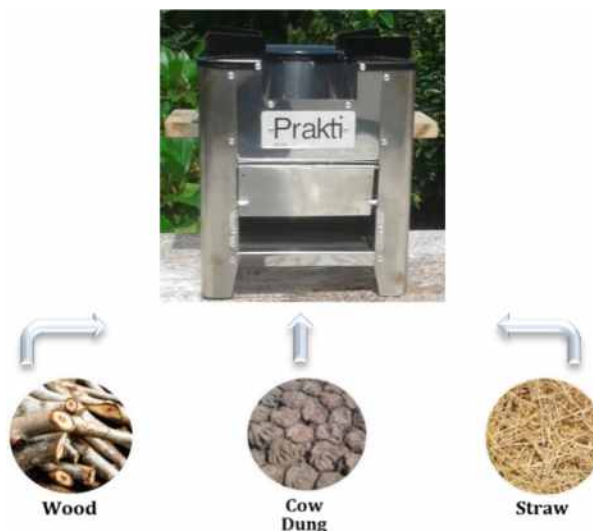
## Impact

The project, within a 3 year period, will commercially launch the multi-fuel stove with 2000 stoves in 6 states in India, 500 stoves in 2 districts in Bangladesh, and 500 stoves in 2 districts in Nepal, in collaboration with local distributor and consumer financing partners. The project,

during its span of 3 years, will impact at least 75000 people, generate fuel savings worth \$6.8 million, preserve 2800 hectares of forest area, save 282000 trees and 112000 tons of CO<sub>2</sub>. Prakti's impact measurement methodology has been validated by experts from the SVT Group and SROI Network. Prakti's impact will be tracked in accordance with Impact Reporting and Investment Standards.

## Potential to Scale

Prakti collaborates with local suppliers, manufacturers, distributors, retailers with existing channels to minimize costs, build local value chains, and execute effective manufacturing, distribution, and marketing strategies that can be sustained and scaled. Prakti is working with ONergy and Dharma Life in India, Minergy and NAMUNA in Nepal, and VERC and Rahimafrooz in Bangladesh. In addition, Prakti is exploring several other partnerships in these 3 countries to scale and sustain the project beyond 3 years. Prakti aims to sell 1 million stoves in 10 years as a result of this project.





## Pico hydro home lighting in hilly areas

**Organisation:** Prakruti Renewable Power Private Limited

*Round 2*

### The Challenge

Reaching grid electricity in hilly terrains is difficult. There are small hamlets that are left out and have no electricity. Many of the houses connected to electricity have poor connectivity due to natural causes and difficulty in maintaining the grid. These houses use Kerosene for lighting. Solar home lighting has been used for lighting such homes. In hilly terrains with extended monsoon solar lighting are not reliable. In many of these terrains small streams are available where pico hydro power can be generated. The innovation proposed is to provide lighting to small hamlets and remote households where pico hydro is possible.

The Villages, hamlets and houses in the State of Uttarakhand located in the foothills of Himalayas are remote. Many of the villages in the districts of Rudraprayag, Uttarkashi and Chamoli face problem in accessing electricity due to unavailability of grid power, broken grid connections and some times due to lack of power. The basic electricity requirements in these villages are restricted to lighting. The hilly areas have water streams from which power could be generated to meeting the lighting and other requirements. The need is to provide reliable picohydro lighting solutions backed by technical support at their location at a affordable cost. This requirement is true for most of the hilly areas across the Himalayas and other hilly areas in India and internationally.

### Solution

Prakruti Renewable has set up a demo 1440 RPM 1 KW Pico hydro power generating unit in a hamlet in village named Khumera in September 2013. The village is located at about 40 kms distance from Rudraprayag in Uttarakhand. The villagers often faced problems in power connectivity due to broken grid connection in rains or due to shortage of power supply. The hamlet had a water flowing in a streams which connect to the river Mandakini. The water flow was about 8 LPS with a head of about 25 meters. There were 6 households located within a distance of about 100 meters from the water stream.

The power generated has been used for lighting and one of the 6 user households has been trained to operate and safeguard the pico hydro unit.

The plan is to set up off grid Pico hydropower generating systems to provide accessibility to power to these remote users in hilly areas. The requirement for setting up these off grid power generating systems is a water flow of about 3 Liters per second with a height of about 20 meters or 30 litres per second at 2 m height. The Pico hydro system would be of a capacity of 150-300 watts with 48 V DC. The power generated would be connected to 6 -9 households located within about 100 meters from the system. One of the households would be responsible and trained for operating and maintaining the Pico hydro system.

They would set up 100 such units as demonstration projects across Rudraprayag, Uttarkashi and Chamoli districts to provide power access in villages. At these locations, a business model for marketing, identifying prospective sites, delivering and maintaining the system through locally identified individual resource persons would be set up. It is proposed that a tablet based communication and management information system would be established so that from a central knowledge center the whole system would be supported.

The target is to provide an income of about Rs. 10,000 per month for each local resource person who provides technical and other support for such systems. The individual household would pay about Rs. 10, 000 per system. Total cost of system would be about Rs 75,000. The individual household would have to pay about 25% as down payment and the remaining in monthly installments. The financing shall be tied up with local banks and Micro finance institutions.

### Impact

There is a large potential for such systems. It has been assessed that over 200,000 systems can be set up India. Each system would reach lighting to potentially 30 persons. At a delivery of 1000 systems per year in a

period of 5 years over 150,000 persons would have access to clean lighting. As part of the delivery about 50 local resource persons would be trained to handle renewable energy devices and earn over Rs. 100,000 per year for their services. There would be direct saving of Kerosene used for lighting. In addition these remote area can have access to electricity driven services using a local resources managed locally like TV, internet and become part of the mainstream India.

### Potential to Scale

The same business model would be extended to the states of Jammu and Kashmir, Northeast states, Karnataka and Kerala. There is requirement internationally in Himalayan belt, South East Asia, Africa and South America for Pico hydro based lighting solutions. It is also possible to integrate the product with Pico solar, Pico wind and Pico biofuel solutions for reaching out basic lighting to house holds on a wider geography.

# Clean energy and women empowerment through women led enterprise

**Organisation:** Sewa Bharat

*Round 2*

## Challenge

Energy access plays significant role in the lives and livelihood of women. There are multiple impact of energy inaccessibility on women compared to men as women are not only primary caregivers in the household but also workers who use home as workplace (basket, leaf-plate, bidi, papad, incense sticks and so on). For example, in India 16 million women homebased workers use their house for income-generating activities. Access to clean, reliable, efficient and affordable energy minimizes household expenditure on fuels, helps women to perform household work and children to study. Additionally women workers augment income by increased productivity possible through increased working hours and days (due to better lighting and health conditions). However, the state of Bihar, where the intervention is focussed, has dismal infrastructure, capacity and resources to meet basic energy needs of base of pyramid population. Here, 16% of total number of household use electricity and 82% use kerosene to meet their lighting needs! Due to pressing need for energy alternatives in lives and livelihood of women, the intervention on promoting decentralised solar home light system (DSHLS) has been initiated by SEWA Bharat.

## Solution

For increased adoption of DHLS, 3 core challenges are addressed by SEWA Bharat which is (i) Lack of awareness, (ii) Affordability and (iii) Technical reliability. Risk perception among end-users is high due to prior bad experience with cheap products or lack of awareness. Widespread awareness about renewable energy and decentralized energy system is undertaken through village level meetings, camps, awareness materials, demonstration units. Energy systems for poor household are unaffordable because products are costly and end-users paying capacity is less. End-users are linked to

Regional rural bank for financing. SEWA Bharat undertakes responsibility of repayment through door-step repayment collection. Subsidy for end-users is leveraged from government agencies and donors. Increase in longevity of systems enables members to use the product for a long time and gain a positive view on the same. After-sales service is provided through regular service and complaint resolution.

## Impact

Economically the significance of lighting is huge on the livelihood of informal economy worker. Due to the light there has been increase in working hours of women and study hours for children by at least 4 hours. There is reduction in usage of kerosene by 3 liters by each household every month. Expenditure on mobile charging has also been reduced. Women find it more convenient to conduct household work in the presence of light. There is reduction in indoor pollution and CO2 emission. Reach of government scheme and program has been enhanced by leveraging of resources from NABARD and Commercial banks.

## Potential to Scale

The model can be replicated by organization which has strong community presence and network. Organizations, like SEWA Bharat, can bridge the gap between technology provider and end-user by creating adequate eco-system. SEWA Bharat has leveraged from existing government programs and similar approach can be adopted. Community contributions can be raised through financial mechanism tuned to capacity and resources of the user. Similar composite service of financing and after-sales can be used for addressing energy needs pertaining to cooking, agriculture, health and livelihood.



## **Awardee Portfolio: Education**



# Invisible Visible: A screening tool for identifying children with dyslexia

**Organisation:** National Brain Research Centre

Round 4

## Challenge

India has an estimated 350 million children under the age of 14, with over 96% of children 6-14 years old enrolled in schools (71% in government schools). While, there are 20 officially recognized spoken languages, and 11 officially recognized scripts, the two “official languages” nationally are Hindi and English. The existing educational curriculum requires a child to acquire literacy in at least the two ‘official languages’ and often also the regional language. This places a huge burden on literate and unskilled youth, in the country and may be the primary reason for school dropout rate.

It is estimated that nearly 10-15% of children have a learning disability, the most common of which is dyslexia. Children with dyslexia do not achieve fluent reading, despite normal intelligence, equal opportunity and sufficient classroom instruction. Based on the statistics above, and using a conservative estimate of 10%, nearly 35 million children might have dyslexia or at risk for dyslexia. We urgently need to identify these children. So far, India has lacked culturally relevant, validated, standardized tools for assessing dyslexia in regional Indian languages.

## Solution

To address this lacuna, the Dyslexia Assessment for Languages of India (DALI) was developed, to meet the need for a nationally validated standardized screening tool for learning disability. DALI consists of a screening tool to be used by school teachers and assessment tools to be used by psychologists.

Further, they have also created a hardware and software technology that will take DALI metrics as an input, convert it into games to generate data that can be analyzed to understand the severity and nature of Dyslexia amongst students.

## Impact

DALI is currently available developed for four languages (Hindi, Marathi, Kannada, and English) for children

between ages 5-10 years (classes 1-5). It validated 4,840 children in five cities. It is well established that early intervention in dyslexia is the key to ameliorating the problem.

Digitally converted by The Balloon Project, the software and hardware combination is used by more than 150 organizations all over the world, this was recognized by Microsoft, NASSCOM Foundation, UNICEF and Coca Cola as the most innovative project in the space of ed-tech and accessibility in 2013.

## Potential to Scale

The objective of the current project is

1. To generate awareness amongst parents, teachers and schools about dyslexia
2. To train approximately 500 school teachers and 100 psychologists to screen and identify children with or at risk for dyslexia
3. Since DALI has already been validated for Hindi, Marathi, Kannada and English they specifically plan to conduct screening for dyslexia for 20,000 students between classes 1-5 in the states of Delhi-NCR, Uttar Pradesh, Maharashtra and Karnataka
4. To extend DALI to three additional regional languages namely Bengali, Tamil and Gujarati.
5. To adapt DALI to a digital platform. This will be done with the support of the technology stack built by team from The Balloon Project. They have created multiple games and eye tracking hardware to analyze data that will help to identify dyslexia at an early stage.

Potential partners that have been identified for project implementation are

- a) ORKIDS, New Delhi
- b) Maharashtra Dyslexia Association, Mumbai
- c) Sunderji Group of Institutions, Pune
- d) The Promise Foundation, Bengaluru
- e) Cluster Innovation Centre, Delhi University

## Making elementary education culturally compatible

**Organisation:** Sikshasandhan

*Round 4*

### Challenge

- i) Difficult geographic terrain and retaining skilled human resources.
- ii) Bringing required competencies among the children because most of the parents are illiterates and there are no opportunities to enhance learning at home by the children.

### Solution

Sikshasandhan has been able to build core human resources from the community itself as well as from the neighbouring community who are not uncomfortable with the terrain and are motivated to work for their community development. Joyful and child centred learning practices in mother tongue will be introduced in schools to bring required competencies among the children. Besides, learning opportunities will be created beyond school hour. Teachers from local community will be appointed to bridge the language and cultural gap between teachers and students.

### Impact

- The intervention will be very critical remedial measures to break the barrier in education and integrate them in mainstream system and hence the development process.
- Required policy changes on this important issue will go a long way to bring this section of BOP at par with rest of the population.

### Potential to Scale

The programme has high potential to scale up in similar socio-economic situation. The programme has already drew attention of media and government at various level. They have to bring political will to scale up the programme in other tribal pockets of Odisha.



## School Transformation Program (STP)

**Organisation:** Kaivalya Education Foundation

Round 4

### Challenge

According to Annual Status of Education Results (ASER) the reading levels of students, especially the ones enrolled in public schools, have dropped at an alarming rate across India.

As per ASER in 2013 (for Udaipur)-

- 55% students from std. I-III cannot read a word in Hindi
- 41% students from std. I-III cannot recognise numbers (1-9)
- 55% students from std. III-V cannot read std. I level text
- 75% students from std. III-V cannot do simple subtraction

As per Outcome Budget 2013-14, Govt. of India spent more than 35,725 crores on 13.4 crores students enrolled in elementary schools at INR 2664 per child per year while only 500 crores (1.3%) were spent on improving Teacher Training Institutions (INR 37 per child per year). While only a fraction of the budget is spent to build capacities of teachers, there is no mandate to build the capacities of principals, administrators, trainers etc. to perform better.

### Solution

The School Transformation Program (STP) will intervene with 3 key stakeholders for 4 years - Teachers, Principals and Resource Persons.

The following are the actions that would be taken in order to implement STP in Udaipur District, Rajasthan: Provide Teachers with: 8 to 12 days of workshop support per year; 20 to 25 days of field support per year; and 20 learning materials (audio, video & print)

Provide Principals with: 8 to 12 days of workshop support per year; 20 to 25 days of field support per year; and 20 learning materials (audio, video & print)

Provide Resource Persons with: 6 to 10 days of workshop support per year; 20 to 25 days of field support per year; and 20 learning materials (audio, video & print)

### Impact

STP will ensure that the learning levels of 11,000 students are improved and continue to do so even after the MA

Grant/STP tenure. At the end of 4 years, STP aims to increase the grade appropriate learning level of grade 3 and 5 students to an average score of 70% & 60%. Such an improvement in the students' learning levels at a primary level will help them in the remaining years of school and it will also help these students and their families have a better chance at healthier and prosperous lives.

Post the STP in 110 schools of Udaipur, the sustained positive changes in the attitude and mindset school staff and education officers will ensure that all the students in the 110 schools perform to a grade appropriate level.

### Potential to Scale

The School Transformation Program has an evolutionary model - District Transformation Program, it impacts more Bottom of Pyramid (BoP) beneficiaries with the same investment. They realized that taking the STP to scale would be very money and human resource intensive model, therefore they developed a district transformation model that would directly work with the district and block level education officers and impact the schools.

KEF's model of growth is to demonstrate change with the STP in a city of a district and then launch the district transformation program to impact the 1000-2000 schools



# Smart Madrasa

Organisation: ZMQ Development

Round 4

## Challenge

Project addresses the Key Challenges of Madrasa Education:

1. Absence of basic contemporary courses of reading/writing skills in Hindi and English, entry level Mathematics and Life-skills education in early grade Madrasa Education;
2. Lack of teachers in Madrasas to provide basic reading/writing skills in Hindi and English, elementary Mathematics and Life-skills education;
3. Lack of preparedness of children to switch to conventional schooling system and mainstreaming;
4. Inaccessibility of Madrasas to girls of poor and marginalised communities;
5. Absence of standardised Madrasa System – like Courses, Time-table, age based grading, Assessment System etc.

## Solution

1. Establishing courseware for building Reading/Writing and Mathematics, Life-Skills for Madrasa Students while at the same time undergoing Madrasa Education;
2. Establishing digital Game based courseware & labs for building Reading/Writing skills in English and Hindi, entry level Mathematic and Life-skills;
3. Establishing system and process for students enrolment from Madrasas to contemporary schools;
4. Provisioning access of Smart-Madrasa Platform to girls, not going to schools & Madrasa in the vicinity of a Madrasa (Home based Smart-Madrasa Model);
5. Standardizing the Madrasa System, Courses, Time-Table and Assessment System;
6. Counselling of community and parents for mainstreaming education.

## Impact

1. Total number of children completing basic Writing/Reading skills & entry –level Mathematics using Smart Madrasa;
2. Total new enrolments in mainstream schools from Smart-Madrasas;
3. Increase in retention of students in Smart Madrasas as compared to other Madrasa;
4. Increase in uptake of Smart Madrasa education by girls in the vicinity of the Madrasa;
5. Increase in uptake of mainstream schools by Girls under going Smart Madrasa;
6. There are other long-term Impacts like employability, increase in standard of living and other but will be accessed at a later stage.

## Potential to Scale

- The project has a huge opportunity to scale in India. In India alone there are 44,000 Madrasas with over 2.2 million students studying in it.
- ZMQ will be replicating the Model with Madrasas in Delhi and Haryana, in Phase II.
- In phase II, they will create Model Smart Madrasas and will work with existing Madrasa bodies to adopt the Smart Madrasa System in UP, Bihar and West Bengal.
- Due to lack of standardised Madrasa education and absence of standard modern course-ware in Madrasas, there is a huge potential to integrate it with Madrasa Boards of the Govt. of India.
- The project has huge potential to be scaled to other parts of the world in countries like Afghanistan, Bangladesh, Uganda, Myanmar etc.
- There are 44000 registered Madrasas in India, with over 2.2 million children, mainly belonging to poor and under-privileged Muslim communities, who go to Madrasas. Only 6% of these students take up mainstream education.



# Kala Samavesh: Education of 3000 children with disabilities using Arts Based Therapy (ABT)

**Organisation:** Snehadhara Foundation

Round 4

## Challenge

1. Achieving Educational & Social Inclusion of Children with Disabilities.

Situation in India:

- 12 million children living with disabilities.
  - Only 1% of children with disabilities have access to school.
  - 35.29% of all people living with disabilities are children.
  - Concept of Inclusion for children with disabilities is not sufficiently mainstreamed in India.
2. Requisite holistic methodologies like ABT to achieve learning and inclusion are missing.
  3. No single learning or therapeutic model has proved to be completely effective.
  4. Recent push from the Government regulatory environment, stringent CBSE directives and growing recognition in society.

## Solution

1. Select, train and certify Arts Based Therapy Practitioners, from 60 educational institutions, each institution working with a minimum of 50 children with disabilities to achieve Educational and Social Inclusion Goals.
2. Create a Methodology of Arts Based Therapy, an Inclusion Array, a quality Curriculum and Action Research Database with a low fee structure to reach out to a broader audience.
3. Improve Geographical Reach of Arts based education by training in Hindi/English/Native Language with a Rural/Urban mix of trainees.

## Impact

3000 children will be the direct beneficiaries of the project.

Self-contained inclusion array – a learning kit titled ‘Serpade Pitara’ offers an autonomous pathway to educational institutions. This would create equal opportunities of learning for populations in both the

formal and informal education systems. Snehadhara Foundation will enable and capacity-build a larger number of institutions to do this.

Besides direct interventions for those in need, this program aims to increase the empathy levels of the larger society towards the learning of children with disabilities.

## Potential to Scale

Exponential Growth of ABT: 60 institutions registered as ABT Practice Sites/Anchors have the potential to train practitioners from another 60 institutions each, year on year.

18000-25000 children to be impacted within 3 years.

Research reports, training aids, instructional kits, published in a database in 3 years.

30,000-50,000 institutions, parents and caregivers can access this database for free.



*Children at a Story-Telling Session outside a Government School, conducted by a Snehadhara Foundation Facilitator. (Bangalore, Karnataka)*



*Teacher in a differently-abled school, undergoing training in Arts Based Therapy conducted by Snehadhara Foundation (Gwalior, Madhya Pradesh)*

# Kakshaa: An innovative teaching method to engross students and enrich classroom environment

**Organisation:** Runira Educational and Allied Services Pvt. Ltd.

*Round 3*

## Challenge

Improving learning outcomes amongst students has proven to be a challenge mainly because 1) children lack access to engaging educational resources that are student friendly and developmentally and culturally appropriate 2) Teachers lack consistent training. 3) Too much time is spent in information dissemination because of lecture type teaching methods. Thus not much time left for child-centric teaching 4) Schools are scattered over geographically challenging areas where skilled teachers are hard to come by. 5) The system is devoid of a scalable solution that ensures uniformity and quality and reduces transmission loss during implementation. 6) Importance of implementation and monitoring is underestimated leading to the failure of projects.

## Solution

Consisting of a large repository (c 560 videos) of audio-visual lessons, Kakshaa is designed to engross students and enrich the classroom environment through the use of innovative teaching methods like activity based learning, muppetry, dramatization, songs, stories and inquiry based learning. Since the program has been made specially for rural schools, it is rife with contextual examples, is age appropriate and delivered in the local medium of instruction. Their content has been made keeping in mind the multiple intelligences of a child and hence has a variety of teaching methodologies used to impart competency based education to children. This ensures that HIGH QUALITY education is ACCESSIBLE to all students irrespective of their geographical or socio-economic location. The numerous teaching pedagogies used in Kakshaa also help in training local teachers. By

viewing Kakshaa lessons on an on-going basis local teachers witness how master trainers teach. This provides demonstrative training that motivates teachers to use innovative strategies in their respective classrooms. Additionally, Kakshaa is a useful aid to the often cumbersome process of information dissemination. Since the virtual teacher handles a part of the teaching through the Kakshaa program, the local teacher has more free time to use for child-centric teaching. This concept (flipping the classroom) has been widely acclaimed and adopted in the charter schools of America.

## Impact

The Kakshaa program was piloted in the districts of Kurukshetra and Kaithal in Haryana where after a year's exposure to the program, students and teachers showed significant improvements in learning levels. The program covered all subjects (English, Hindi and Mathematics) and skill sets such as reading, writing and listening (for languages) and mathematical skills like number operations, time, spatial understanding etc were tested for class. I-IV students. The impact study conducted at the end of the year gave the following results: Improvement in English and Hindi skills; improvement in mathematical ability; introduction of effective teaching methodology; reduction in absenteeism.

## Potential to Scale

Given that Kakshaa is a runs on technology it can reach far flung areas and can be scaled up easily with minimal transmission loss. With a carefully designed implementation and monitoring framework, they ensure that the program runs as desired.

## Art in education

**Organisation:** Nalandaway foundation

Round 3

### Challenge

The absence of a well rounded arts curriculum in most of the schools in India often fails to engage students with their academic content and not only deprives them of a joyful learning experience but also fails to sustain enrolment ratios in schools leading to increased absenteeism and dropouts. The problem is further compounded in schools located in marginalized, rural and urban slum dwellings. Their interactions with teachers, educational officers, school authorities and the students have helped them understand that children studying in the above schools are often emotionally disturbed. Difficult home environments further limit their social efficacy and they often struggle to make successful transitions in the community. Given the above challenges, it is imperative that schools in India focus on a more structured approach towards art education, one which NalandaWay strives to achieve through the 'Art in Education' programme. Studies show that activity and arts based learning not only provide an outlet for creative expression but also provide opportunities for increased exposure and interest among students.

### Solution

Through the proposed innovative project, NalandaWay would train 1000 primary school teachers in ten regions across the country through its partner organizations over 3 years on using fine arts, drawing, painting, craft and storytelling techniques in the classroom to engage students in their subjects better. Training would include a standardized teaching kit for fine arts consisting of trainers' manual, exercises and evaluation approach content to help teachers on:

- Using core art concepts, methods and techniques for effective teaching.
- Enhancing creativity, communication & critical thinking skills and aid self-development
- Sensitization in child-rights

At NalandaWay they have developed a well-researched and tested curriculum, audio/visual content, resource materials, teacher training manuals, mentoring tools and programme monitoring design. They would like to translate their existing curriculum and books in all major Indian languages, customise it to suit local needs, build partnerships across India with NGOs who run schools for the marginalised, and help them implement the 'Art in Education' programme.

### Impact

Direct: (in short term and long term - how many):

The project will impact 1000 primary school teachers and 30000 children in the short term. The expected outcomes are: 1) Empowered teachers who are more child-friendly 2) Increase in attention levels of children inside classrooms 3) Inquiry based learning and learning with fun leading to happier classrooms

In the long term, the project will spread to impact 3000 primary school teachers and 90000 children. The expected long-term outcomes are: 1) Increase in attendance levels and decrease in drop-out rates in schools 2) Increase in confidence levels and class management skills of teachers across schools 3) Better reading, writing and listening skills for children in other academic subjects

Indirect: The project will indirectly impact the parents of children in the participating schools, the school managements and the wider community. The school management and parents will understand the benefits of arts-based education and support the project thus making it sustainable.

### Potential to Scale

There is a clear visibility of a scale-up across the country thereby impacting thousands of schools and millions of children. They are also in talks to adapt this model in other countries in the sun-continent.



# RIVER Multi-Grid Multi-Level (MGML) dissemination

**Organisation:** Rishi Valley Institute for Educational Resources,  
RVEC (Krishnamurti Foundation India)

Round 3

## Challenge

In most developing countries, there are a large number of mixed age/multi-level primary schools wherein there is no co-relation between student's age and competency levels. Restricted to age-specific textbooks, it is nearly impossible for teachers to address the literacy requirements of a roomful of students belonging to different levels of learning; hence eventually students become alienated and teachers demoralized. Ultimately millions of children suffer in these joyless schools leading to low levels of learning & high dropout rates.

## Solution

The RIVER model offers an Activity Based, Joyful Learning Approach that allows teachers to handle multigrade primary schools in a creative way. Government curricula are adapted for local context, and organised into smaller meaningful modules called 'RIVER LEARNING LADDERS' so learning is aligned with each student's ability. These ladders are linked with a series of graded fun activities such as language games, math's puzzles, science riddles, folk tales, theatre games etc., which enable students to learn from local examples, from things around them and from real life experiences. While students, working in groups and individually set their own pace for advancing through various levels of a subject learning ladder, the teacher facilitates the learning process. RIVER has a digital component also wherein the current material is made available through low cost tablet-based tools in an interactive format for students. The system has data storage and feedback tools, which will be used to continually monitor progress of students and test the efficacy of learning materials. In addition, the system includes collaboration tools that will enable teachers to communicate with each other, their coaches and the RIVER community.

## Impact

RIVER model covers 'over 250,000 primary schools and more than 10 million children in over 13 states' (UNICEF Desk Report 2013). Evaluation of MGML's implementation in the state of Tamil Nadu revealed an increase of 25% to 29% in class II and IV students' proficiency with Mathematics, Tamil and English. A UNESCO – 2003 Report states "Offshoot programs of RIVER with the highest learning scores in language and math in the country"

## Potential to Scale

RIVER had been awarded the first prize of the Global Development Network Award for the "Most Innovative Development Project 2004". This Award is given to the institution that holds the greatest degree of innovation and the potential for broad application of the project in other countries. According to 2006 UN ILO report, "No school improvement initiative has as successfully designed an operational model for scaling up its innovations, as RIVER".





## The classroom library

**Organisation:** Akshara Foundation

Round 2

### Challenge

The ASER study reveals that Government schools in India are unable to provide quality education. The schools are poorly equipped and teachers wanting in skills that can transport children beyond the textbook and classroom strictures. Government-school children in rural schools are from deprived backgrounds, mostly first-generation learners, disadvantaged by the illiteracy of their parents and the dearth of stimulating educational resources at home and in school. Most government schools in Karnataka have dysfunctional libraries.

### The Solution

**The Classroom Library (TCL)**, an Akshara Foundation innovation, will go a long way in addressing the deficits in government schools and building the essential, cornerstone tool of reading in children.

TCL is a suite of innovations that include:

- (a) Selecting age-appropriate, graded books in multiple Indian languages and English;
- (b) Setting up infrastructure;
- (c) Training teachers;
- (d) Measuring the reading habits and outcomes of children using biannual assessments and the Reading Histogram; and
- (e) Collaborating with government to work on change from within the system.

A TCL unit is a strategic asset in a classroom, supporting the curriculum, an aid and incentive to learning. The books range over many genres, drawn from a cross-section of reputed publishers. There are concepts in these books that the trained teacher-cum-librarians link to what is taught in the classroom. The books chosen also provide that rich, expansive, other dimension which government school children so sadly lack.

The grant from Millennium Alliance will help provide access to a TCL unit to around 35,000 children in grades 2- 7 in around 220 government primary schools in rural blocks of Kushtagi, Koppal district, in Karnataka.

### Scale

The TCL has already brought the world of books to children, with a TCL unit in around 1800 individual classrooms in around 440 schools in Bangalore; Hoskote block, Bangalore Rural district and Mundargi block, Gadag district. So far, over 105,000 books have been distributed to these libraries.

Akshara believes that if children have to be liberated from a spiral of under-achievement and begin their learning ascent, a library is a necessary educational accessory in school. Through TCL, Akshara Foundation aims to ensure that every child in every government primary school in Kushtagi has access to library facilities to improve their learning skills, as they believe that books and reading impact children's learning outcomes in classrooms, by helping them become better readers. The library becomes a pillar that supports the curriculum in interesting and fun-filled ways, an aid and an incentive to learning.

### Impact

TCL's were first set up in 87 schools in Bangalore in 2013-14. In these schools, 526 TCLs are set up with around 75,000 books. Over 550 teachers have been trained to become classroom libraries. During the current year, the effectiveness of the programme is being measured using Reading Histograms. Since the books are graded as levels, using the Histograms, they were able to track the book borrowing patterns of children which in turn helps them to ensure that children are reading well.

Based on the Histograms, they were able to infer that:

- a. Out of around 12800 children in the 87 schools, around 12200 children have been borrowing books, which means that over 95% of the children are borrowing books.

- b. They have seen an increasing trend in book borrowing rate every month. Through the year, on an average, the book borrowing rate increased from less than a book in August 2013 to around 1.5 books in September 2013, around 2.7 books in November 2013, 2.9 books in December 2013 and 3.2 books in January 2014.
- c. It is also evident that the book borrowing rate has increased every month, across every class. On an average across 87 schools, in the month of January 2014, children between grades 4 and 7 have borrowed more than 4 books/month. Specifically, children of grade 5 and grade 7 have borrowed more than 4 books between November 2013 and January 2014.

## Hamari Paathshala: Collective action for education

**Organisation:** Caritas India

Round 2

As per Census 2011, India's literacy rate stands at 74.04 % and Bihar ranks last with the literacy rate of 54.1 % . Mushahars<sup>1</sup> community concentrated in many districts of Bihar have the lowest literacy rate among the SCs (6.88%), the lowest for women (1.43%), and the lowest attendance rate amongst SCs and non-SCs. Discrimination against Dalits in the educational system is a widespread problem in caste-affected countries, resulting in illiteracy and high drop-out rate among dalit children. While Right to Education Act in India provides free and compulsory education for all children, but falls short in addressing underlying causes such as gender disparities, geographic isolation, and disability, caste, and religion, ethnic and linguistic disadvantages. Reasons for the exclusion of Dalits from education includes their location, exposure to child labor, insufficient education facilities, poor teaching methods and discriminatory attitudes by teachers and children of other caste groups. Gender discrimination in addition to caste inequity multiplies disadvantages for dalit girls. Lack of female teachers, sanitation facilities at school, gender bias favoring boy child and the fear of sexual harassment hinders the girl child's access to education. Early marriage and child bearing, lack of education and essential life skills further add to her woes.

### Solution

The proposed initiative “Hamari Pathshala – a Collective Action for Education” endeavors to promote education and learning opportunities for 3-19 years old girl children in the marginalized community of Mushahars in Bihar. This intervention forges a holistic approach to the education of dalit girl child -from early childhood education to elementary education, life skill development and vocational education. The intervention seeks to improve access to education and learning opportunity for

girls' children and integrate them into mainstream education system; build conducive environment for education by sensitizing community and key stakeholders towards gender and caste equality and strengthen the implementation of education programmes and schemes especially for girl child education.

The girls in the age group of 3-6 years would be enrolled in the ICDS centers for early childhood education. Out-of-the school girls in the age group of 7-19 years would be grouped into clusters of informal school platform called Hamari Pathshala. These clusters would come together 5 days a week for 2 hours in their vicinity, to strengthen their literacy skills by trained facilitators. The clusters would be further constitute into a 'federation' and act as a pressure group to promote education and empowerment of girls in the community. This is an important strategy for providing ownership of the programme to community and also in the long-term sustainability of the change process. The progress of each child enrolled in the program would be tracked and attempt would be made to integrate them into the mainstream education system for continuing their education.

### Impact

The project would be implemented in 12 villages<sup>2</sup> in Kochas block of Rohtas District. Selected villages have high concentration of Mushahar community. Mushahar community lives in isolation from mainstream society and has poor access to livelihood, educational and employment opportunities. It is expected that proposed intervention will improved access to educational opportunities to girls from Mushahar community. The proportion of girls completing their elementary education and accessing higher education and vocational training opportunities will rise significantly. This would further contribute to empowerment and economic

<sup>1</sup>The Mushahar are predominantly landless agricultural labourers. 'Mushahar' means 'rat-eater', a label that stigmatizes this Scheduled Caste (SC); they are considered the 'dalits among dalits' even today.

<sup>2</sup>Selected villages for the intervention are - Harnathpur, Balathari, Dhanutta, Kapasiya, Sahawalia, Padumsidihira, Kuchila, Chittaw and Sadhaw.

independence of girls. The intervention in long run would also reduce the cases of early marriage in the community.

### Scalability

Education of girls in marginalized communities has been a challenge in many underdeveloped regions. The inherent design of the intervention which is based on convergence of pre-school component with ongoing ICDS programme of the government and linking the participants of Hamari Pathshala in mainstream education system and making the National Open School system and vocational training linkages available for those who cannot enter the formal stream, offers the

scope of scaling up the model. The intervention is designed to involve all the probable stakeholders and existing government structures to promote the education for dalit girls in the intervention area including strengthening the Village Education Committee, School Management Committees and Parents teachers associations to ensure quality of education and effective implementation of education services. They envision that their intervention would create a conducive environment where all the girls would be able to assert their right to education and an alternative platform like Hamari Pathshala would not be required.



# Angel Xpress Foundation (AXF) - Free learning centers that connect educated adults with slum children

**Organisation:** Angel Xpress Foundation

Round 2

## The Challenge

- Coexistence (slums, affluent communities and public areas are present across Mumbai)
- Over 50% of the 2 cr people in Mumbai lives in slums
- 4.5 lacs underprivileged children attend free municipal schools
- 90% of children in municipal system study in vernacular schools, with almost 0 exposure to English which is a life skill in a metro, less than 50% can do basic Math
- < 10% of children enrolled students clear class 10 board exams

## Effect

- Decline in vernacular school enrolments
- Poor parents sending children to private schools
- For the rest - An unbroken circle of illiteracy.

**The solution** – Social change through large scale intervention

- Use effectively a scenario where slums coexist in close proximity to high-rises across Mumbai and large groups of the educated affluent exhibit an inclination to giving back and making a direct contribution
- Empower and evolve underprivileged children to reach their potential by connecting them their educated neighbours through free classes operated in easily accessible public spaces like parks and promenades.
- Appoint efficient and capable English teachers to support the vernacular public school system – effectively close the gap that makes poor parents send their children to private English medium schools they can ill afford while the facilities provided in the public school system go waste

## Impact

- For Children - Exposure to build aspirations and realize potential, A happier childhood and raised

self-esteem, Children find real people as mentors and role models for life

- For Empathetic Adults - Opportunities for direct contribution to their community and a feeling of satisfaction for having made a real difference.
- For the public school system - Better enrolments/takers for the service
- For parents - An opportunity to use the benefits of the public school system without fear that their child will not have the essential exposure to English which makes him more employable/better suited for higher education in metros

## Scalability

Over 2 cr people living in Mumbai, large number are children who are first generation learners. Over 60% of Mumbai's affluent women are stay at home mums, there are a large number of retired and student communities who have time at hand. There is desire to give back displayed by the middle classes and there are plentiful gardens/community halls available across Mumbai.

There are over 4.5 lakh children studying in the municipal school system in Mumbai, there are over 1000 vernacular medium schools. Currently they are reaching out to a mere 8 schools through their teachers.

There is good potential for scalability for both projects.



## Communityled solutions for girls education

**Organisation:** Educate Girls

Round 2



### Challenge

Over 3 million girls across India are out of school, the 3rd highest number in the world. More than 60% of out of school children in India are girls. In 2012, India was ranked as the worst of the G20 countries to be a woman in, and 4th worst in the world. This ranking reflects rigid social systems, limiting attitudes towards gender roles, neglect and lack of support by parents and community. Educate Girls (EG) has focused on Rajasthan because 9 of the 26 critical gender gap districts of India with the worst gender indicators are located in Rajasthan. The female literacy rate is 44% compared to 76% for males. In rural areas, only 40% of girls' complete class 5 and only 1% reaches class 12. Rajasthan also has the highest number of child marriage. 68% of girls are married before the legal age of 18 and 15% are forced into marriage before the age of 10.

### Impact

EG's innovative "comprehensive model" for school reform and cluster approach creates depth of the program and allows EG to leverage its impact to enable grassroots change. By leveraging the government's existing investment in schools, EG delivers measurable results to a large number of beneficiaries at an extremely low cost and avoids duplication or parallel delivery of services. From a 50 schools pilot in 2007, EG has metamorphosed into a 7,500 schools program. Since inception, EG has enrolled over 80,000 girls and over 970,000 children have benefitted from improved education infrastructure.

### The Solution

EG is focused on improving the Enrollment – Retention – Learning cycle of every girl child in the gender gap districts in which it operates. EG effectively involves and empowers various stakeholders to create a system that truly promotes and supports girls' education. The model includes the following strategies:

- *Increasing Girls Enrolment by conducting door-to-door & child tracking survey to identify all out-of-school girls.*
- *Reforming School Administration to execute school improvement plans.*
- *Improving Learning Outcomes by imparting Child-centric learning and teaching techniques.*
- *Creating Girl Leaders in schools and training them in life skills.*
- *Facilitating community ownership through Team Balikas who work as champions for girl child education.*

### Potential to Scale

By 2018, EG aims to scale operations to 15 critical gender gap districts across India. Their goal is to improve access and quality of education for around 4 Million Children living in underserved communities in India by 2018.





**Awardee Portfolio: Healthcare**



## Smart and portable intensive care unit

**Organisation:** Chitkara University

Round 4

### Challenge

- To provide the virtual presence of doctor in case of emergency in remote area or in ambulance
- To make the entire system portable so that it can be carried anytime, anywhere
- To make it cost effective

### Solution

- The team is using the following technologies in order to provide virtual presence of doctor:
- Transmission of patient's vital signs to doctor on smart-phone/tablet/pc
  - Transmission of real time video of patients to doctor
  - Allow doctor to Plan/Deliver the Drug through Smart Phone
- They are making portable trolley equipped with all life saving drugs in infusion pump and vital sign devices.
- They are also in in process of designing and development of portable remotely operated infusion pump.

### Impact

The project will particularly benefit the elderly, critically ill and disabled population located in rural and remote areas of India. Due to scarcity and uneven geographical distribution of doctors in India, there is a great need to maximise doctors' expertise and availability at the point of patient care need. This could be:

- on the road as in the case of patients in an ambulance,
- at home in the case of chronic or disabled or elderly patients or even patients in remote location where there is no doctor.

This device allows for better utilisation of doctors' diagnosis and treatment skills without wastage of time by reducing unnecessary movement of doctor and most

importantly, provide timely care for patients. It also improves patient safety and quality of care through automation. It will also ensure on-time treatment for critically ill patients.

### Potential to Scale

It is a cost effective and life-saving system and it works on the concept of centrally located base station server using latest technologies i.e. cloud computing & Wireless Sensor Network (WSN). Multiple numbers of devices can be installed on various locations like ambulances, homes, medical colleges, remote rural dispensaries/hospitals, battle fields, post surgery critical care unit in real time. Its scope is global and is the need of the hour.

Complete Patent has been filed in India and PCT is filed as well for international coverage. It is also published in World Intellectual Property Organisation (WIPO) and received the International Search Report (ISR) mentioning that the system is novel and has widespread industrial application.



*Working Model of Smart and Portable Intensive Care Unit*



*Expected Device for Smart and Portable Intensive Care Unit*

# FlapCut technology for cost effective Mycobacterium Tuberculosis (MTB) diagnosis

**Organisation:** Pentavalent Bio Sciences Private Limited

Round 4

## Challenge

- Delay in treatment decision due to conventional diagnostic approach.
- Multiple drug resistance presented by TB.
- A tool detecting resistance in MTB to all TB-drugs is not available.
- High cost associated with diagnosis prevents poor to afford.
- Unavailability of high end diagnostic systems like GenExpert in TB reference labs of remote areas.
- Tuberculosis (TB) diagnostics is not accessible to all and not penetrated in poor sectors globally.

## Solution

- A rapid technology comprised of point of care assay.
- Faster and reliable complete drug susceptibility profile (MDR and XDR).
- Treatment decision within 5 hours.
- Highly cost effective and affordable in poor countries.
- High degree of specificity and sensitivity at zeptogram (10<sup>-21</sup>) concentration of the targets.
- Can be performed in simple thermal cycler and signal can be recorded in fluorescent reader.

## Impact

- Affordable TB diagnosis will reach the large untapped poor sectors worldwide.
- Immediate treatment decision will save lives.
- TB infections and spread of drug resistance will be drastically reduced.

## Potential to Scale

- Due to high volume of TB infected patients and faster rate of infection spread, there is an absolute and pressing need for technologies like FlapCut.
- Since the tool is estimated to achieve greater detection sensitivity and does not require specially designed equipments or softwares it will be cost effective in scale up and production.
- The technology can be employed in other genetic related diseases and currently the team is working on prenatal disease diagnosis.



FlapCut-MTB/MDR Demo Kit

## “MosziQuit” to make the world free of mosquito menace

**Organisation:** Leowin Solutions Private Limited

Round 4

### Challenge

People, Cows and Animals at the Bottom of the Pyramid are suffering and badly affected due to the Mosquito Bites as mentioned here below:

1. The frequent, continuous and unwanted free bites of tiny Mosquitoes to all people, cows and animals who live on this earth irrespective of their colour or caste, rich or poor and of age whether just born infant of 1 day old or the senior most lying on the death bed.
2. Mosquitoes are the only tiny insects, one of the creations of God on this earth which need human or animal blood for their breeding process having the full pledged facilities provided to them by the creator God to fly, to land of people and animals and their supersonic needle which pick and extract blood without the knowledge of the person or the animal who will come to know only after the extraction of blood by the irritation of itching, rashes and swelling on the body.
3. Discovery of Sir Ronald Ross, an Indian born British National that Malaria Parasites been transmitted by Mosquito bites which got him Nobel Prize in 1902 who had served in top position in British Army carried out R&D in India between 1892 to 1897.
4. The Deadliest disease is ZIKA Virus which is been spread by Mosquitoes recently in Brazil, other 24 countries in South American Continent and now to other parts of the World for which no Medicine is available or made as of date to save the new born babies due to mosquito bites to Pregnant women. See [https://en.wikipedia.org/wiki/2015%E2%80%9316\\_Zika\\_virus\\_epidemic](https://en.wikipedia.org/wiki/2015%E2%80%9316_Zika_virus_epidemic) and information in WHO website <http://www.who.int/emergencies/zika-virus/en/>
5. Governments of all the 24 Countries in South American Continent including Brazil have banned Pregnancy for 2 years due to the present threat of Deadly ZIKA Virus being spread by Mosquito Bites.
6. Banning of Pregnancy for 2 years (which will get imposed for some more years as there is no cure or no medicine for ZIKA Virus) in the Continent of South America is a clear indication of elimination of human population on this earth which is similar to the end of Dinosaurs happened in the past for which as of today there is no evidence available on the reason.
7. Before the recent spread of ZIKA Virus, Various other Deadly Diseases transmitted by mosquitoes since Centuries include malaria, dengue, West Nile virus, chikungunya, yellow fever, filariasis, Japanese encephalitis, Saint Louis encephalitis, Western equine encephalitis, Eastern equine encephalitis, Venezuelan equine encephalitis, La Crosse encephalitis etc. which have made people, cows and animals to get panic after each mosquito bite. See [https://en.wikipedia.org/wiki/Mosquito-borne\\_disease](https://en.wikipedia.org/wiki/Mosquito-borne_disease)
8. About 3.2 billion people – nearly half of the world's population – are at risk of malaria. In 2015, there were roughly 214 million malaria cases and an estimated 438 000 malaria deaths. Increased prevention and control measures have led to a 60% reduction in malaria mortality rates globally since 2000. Sub-Saharan Africa continues to carry a disproportionately high share of the global malaria burden. In 2015, the region was home to 89% of malaria cases and 91% of malaria deaths. See <http://www.who.int/features/factfiles/malaria/en> and [http://www.who.int/gho/publications/world\\_health\\_statistics/2016/whs2016\\_AnnexA\\_NTDs.pdf](http://www.who.int/gho/publications/world_health_statistics/2016/whs2016_AnnexA_NTDs.pdf)
9. Victims of mosquito borne disease lose their energy, lose their daily income as they are not able to work till they recover totally from the disease after few day of treatment for such disease.

See in <http://www.bbc.com/news/world-latin-america-35388842> and in <https://www.theguardian.com/world/2016/feb/01/zika-virus-world-health-organisation-declares-global-health-emergency>

10. Billions of Dollars are presently spent/wasted all over the World for clinical tests of blood to detect type of disease transmitted by mosquitoes.
11. Billions of Dollars are presently spent/wasted all over the World for Doctors Bills, Medicines, Treatments of various mosquito borne diseases.
12. Governments lose Billions of Dollars on payment to Mediclaims mostly claimed for treatment of Malaria as people do not die of Malaria disease instead suffer seriously demanding admission to hospital and medicines to recover from diseases.
13. Mosquitoes have killed number of people much more than the number of people got killed in all the Wars as of now in the World. Please ask yourself this question.
14. Un-noticed information as of recently till the innovator himself found out through his research is that density of mosquitoes in cow sheds is too high compared to the density of mosquitoes inside the houses due to the foul smell and as it is practically not possible to restrict entry to mosquitoes inside cow sheds.
15. Cows are in tied up position in cow sheds and cows get panic when mosquitoes bite them frequently in large numbers everyday. Cows try to chase mosquitoes by hitting/swinging hardly their tail right side, left side and all over their body continuously making cows to lose their precious energy. They try to chase biting mosquitoes also by moving/shaking their skin, legs, head, ears etc. which is of no use. Mosquitoes keep biting cows at their neck part on bottom side as the cows tail cannot reach bottom side of their neck to chase biting mosquitoes as a result cows get more and more panic of mosquitoes and their bites, cows food intake drops and their precious energy is lost as they do not get enough rest and as a result cow's Milk Yield reduces than their actual milk producing capacity. Income reduces to the cow owners due to reduction in milk yield.
16. The innovator never know which new deadly disease could be transmitted by Mosquito bites any time in the future after introduction of deadliest disease ZIKA Virus after many diseases in the past i.e. Malaria, Filaria, Dengue, Chikungunya, Kala Azar, Japanese Encephalitis, Yellow Fever, etc.
17. Present rate of multiplication of Mosquitoes at their external breeding locations is as follows:
18. Repellents such as liquid vaporizers, mats, papers, diethyltoluamide, and herbs are widely used to combat mosquito nuisance and diseases. The scientific staff of the Malaria Research Centre, New Delhi, led by V. P. Sharma had designed in 2001, a multicentric questionnaire-based study revealed that repellents are harmful to human health, and their use should be avoided and discouraged.
19. Many people do not know that use of Mosquito Repellents available in the market cause Cancer. Dr. Sandeep Salvi, Director of Chest Research Foundation, Pune published on 13/12/2014. See details in <http://www.eyesonmalaria.org/content/mosquito-coil-killing-softly-0> And <http://www.ndtv.com/india-news/one-mosquito-coil-equals-100-cigarettes-says-expert-466301>

Mosquitoes Day 1	No. of Mosquitos on Day 100 assuming 50% female out of 300 eggs	No. of Mosquitos on Day 200 assuming 50% female out of 300 eggs	No. of Mosquitos on Day 300 assuming 50% female out of 300 eggs
1	150	22500	3375000
10	1500	225000	33750000
100	15000	2250000	337500000
1000	150000	22500000	3375000000



**Solution**

Their Solution to the present Challenge of Mosquitoes is the Patented Innovative “MozziQuit” Mosquito Trap Device made in three Models i.e. MozziQuit MQ-MAX priced Rs. 2,990/-, MozziQuit MQ-MINI-3 Pins priced Rs. 1,500/- and MozziQuit MQ-MINI-2 Pins priced Rs. 990/- which attracts, traps and kills female Mosquitoes in large numbers every day at lowest operating cost of less than 10 paisa per day without use of any Chemicals or Consumables or Liquid or Mats or Coils or Smell or Smoke or Ash enabling to eliminate mosquito multiplication in

order to eradicate mosquito borne diseases so that the innovator could Make the Entire World Free of Mosquito Menace in short period by using their innovative MozziQuit and their other advanced Technologies discovered during their single handed R&D efforts put in since 2001 onwards after seeing Mosquito Magnet of American Bio-physics Inc. at their Indian Sole Distributor Shri Shakthi Gas and Energy Ltd. at Hyderabad priced Rs. 1,10,000/- per unit with operating cost of around Rs. 5,000/- per month for 3 to 4 LPG Cylinders and one Hazardous Chemical Biscuit called Oct-e-nol.



“MozziQuit” MQ-MAX Heavy Duty (Rs. 2,990/-) For use in Cow Shed



“MozziQuit” MQ-MINI 2 Pins (Rs. 990/-) For use in labour rooms/chauls



“MozziQuit” MQ-MINI 3 Pins (Rs. 1,500/-) for use in flats



Orwin Noronha with “MozziQuit” & trapped Mosquitoes



Trapped Mosquitoes in cow shed more than 10 crore in count in three months trapped in 1 device



“MozziQuit” installed in a Cow Shed at Kenjar Mangalore

### How MozziQuit Device Works

Food grade proprietary additives are added in the raw material of plastic while producing few parts through injection molding machine which is one time mixing only as it is not a consumable or get over due to wear and tear. Circuit within the device generates temperature equivalent to the temperature of human/animal blood nerves.

"MozziQuit" when switched on emits attracting effect mainly due to the food grade proprietary additives added in its few parts in combination of light which attracts mosquitoes towards the device. Once the mosquitoes are attracted towards the device the temperature equivalent to body/blood nerves temperature generated by "MozziQuit" will make the mosquitoes to come near the trapping zone which is on the top portion of the device. The vacuuming technology within the device will suck the mosquitoes from the trapping zone forcibly inside the trap making the mosquitoes to pass through the perforated holes within the device. Mosquitoes will die due to dehydration and non availability of blood meal and get collected in the removable collection container which is at the bottom side of the device. Dead mosquitoes need to be disposed on daily basis otherwise ants will pick dead mosquitoes and walk away in queue.

### Information on how and when to use "MozziQuit"

- When mosquitoes found flying inside the room Switch On "MozziQuit" device, switch off the light in the room, close the door and be in other room for some time. What ever mosquitoes already found inside the room will get attracted towards the device and get vacuumed inside the device and get collected in the removable collection container of "MozziQuit".
- Same way use "MozziQuit" in other rooms when ever mosquitoes are found in other rooms.
- Switch on "MozziQuit" through out the night till morning in bedroom or hall or toilets and in cow sheds so that what ever mosquitoes fly around in the night will also get trapped.
- When ever while leaving the house, switch on "MozziQuit", switch off lights in the house for "MozziQuit" device to trap the mosquitoes.
- Every next morning could personally see dead mosquitoes in the removable collection container depending on the number of mosquitoes found inside the room/house and cow sheds on previous night.
- It is noted that the performance of "MozziQuit" is excellent when it is dark.
- "MozziQuit" have trapped large number of mosquitoes inside rooms when person sleep inside the mosquito net keeping the windows open which makes more and more mosquitoes to get inside the room due to the carbon dioxide exhaled by the person and the person will have sound sleep inside the net without any mosquito bites.
- "MozziQuit" do not attract mosquitoes from external place and it traps mosquitoes which have entered inside the house/rooms or cow shed because of smell of carbon dioxide of people/animals.
- "MozziQuit" MQ-MAX traps and kills large number of mosquitoes every day in cow shed resulting in increase in milk yield and increase in weight of cows as the cows get enough rest/sleep in the night without any mosquito bites.
- Killing 1 female mosquito is equivalent to eliminating millions of mosquito offsprings as one female mosquito lays between 300 to 1000 eggs during its life span of 30 to 100 days.

### Impact

- Incidence of transmission of various mosquito borne diseases to people and cows will decrease.
- Incidence of suffering from various mosquito borne disease at BOP level will reduce as the mosquito population reduces by attracting, trapping and killing of female mosquitoes on daily basis in large numbers by MozziQuit mosquito trap device in most economical and eco-friendly way.
- Incidence of death from various mosquito borne diseases at BOP level will also reduce as the mosquito population reduces drastically by attracting, trapping and killing of female mosquitoes on daily basis in large numbers by MozziQuit device in most economical and eco-friendly way.
- No more itching of body from free bites from mosquitoes once their multiplication rate is controlled.
- People at the BOP level will save doctor's bills and hospital charges as they do not require to get

treated for mosquito borne disease once mosquito population is under control by using MozziQuit device.

- People at BOP level will not lose their daily income as they remain healthy without any mosquito borne disease once mosquito population is under control by using MozziQuit device.
- Government will save huge amount of Insurance Mediclaims presently supported by government funds.
- Increase in Milk Yield by using MozziQuit in cow shed has multiples of benefits i.e.
  - a. It provides total relief to cows from mosquito bites and diseases.
  - b. It provides total relief to workers working in the cow shed from mosquito bites while extracting milk and while working in the cow shed.
  - c. It provides additional daily income to cow owners at the BOP specially to Women who mostly work in cow shed from increase in Milk Yield by using MozziQuit in cow shed which is

possible as the cows precious energy is saved and cows food intake improves and as the cows get maximum rest without any mosquito bites.

- d. It provides each Dairy to earn more income from increase in Milk Yield without any additional investment.
- e. It enables GDP of the State and Country to improve with increase in Milk Yield as well as by eradication of Mosquito borne diseases by use of MozziQuit in cow sheds and in houses.
- f. MozziQuit also provide similar benefits by using it in Horse Stables, Dog's cage, Piggary Farms, Chicken Poultrys, Sheep/Goat Farms, etc.

#### Potential to Scale

- Potential Market for MozziQuit MQ-MINI of 2 Pin Model priced Rs. 990/- and of 3 Pin Model priced Rs. 1,500/- for use in rooms/flats/houses is more than 20 to 200 crore units only in India market.
- Potential Market for MQ-MAX Model priced Rs. 2,990/- for use in cow sheds and Villas is more than 10 crore units only in Indian market.

# A rapidly deployable device for wound care

**Organisation:** ExCel Matrix Biological Devices P. Ltd.

Round 4

## Challenge

An easily deployable primary wound care device is needed to handle traumatic wounds, burns and chronic wounds rapidly, conveniently and effectively on site before proper clinical attention is available.

Acute wounds related to road accidents and chronic wounds linked to aging/ diabetic population need both novel technology and innovative business model to cover large BOP market in rural and economically deprived population.

## Solution

The innovator offers a novel solution to wide spectrum wounds care. A single composite device to handle all types of wounds for primary or secondary care is contrary to the current paradigm. This device fills the gap beyond Band AID/ Burnol till professional clinical attention is available.

However, a novel technology also requires an innovative business model to reach diverse BOP market.

They propose pilot scale manufacturing and trial marketing to generate real data on clinical relevance of

the product for B2B and B2C markets. Validation of FMCG business model will be demonstrated from pilot manufacturing and trial marketing undertaking.

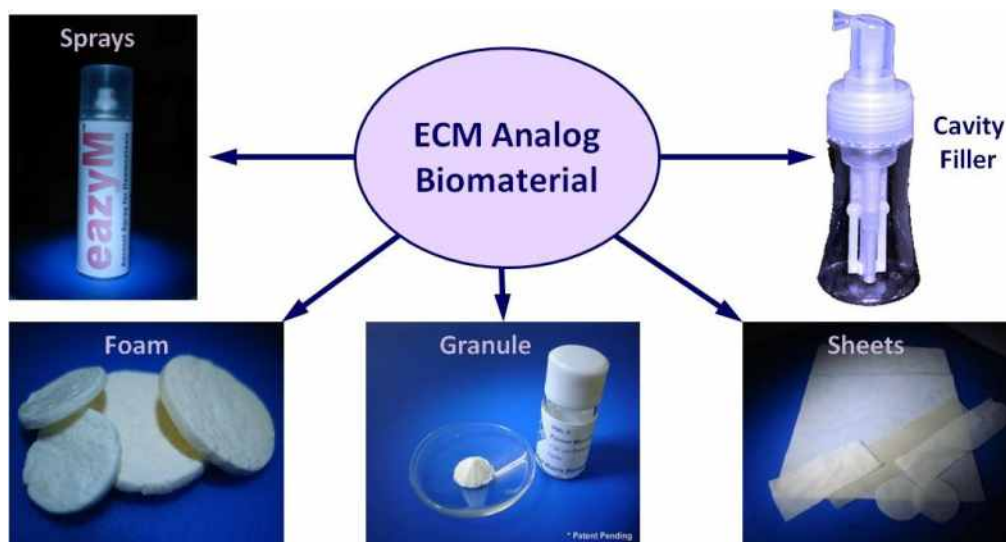
## Impact

**Business:** Profitable in BOP market segment with low risk and breakeven point

**Social:** Affordable, rapid and easy wound care solution, redefining first-aid

## Potential to Scale

- Potential market but for affordability is Rs. 20000 Crore
- Current total wound care market in India is Rs. 2000 to 3000 Crore
- Pilot scale manufacturing as proposed is 10000 unit per year
- Target market at pilot scale operation is Rs. 5 Crore by second year
- Projected commercial operation with partners Rs 100 Crore by fifth year



Wound care devices for quick, convenient and affordability to address huge gap beyond Bandaid/ Burnol till clinical care



# MiraCradle™ to fill void in birth asphyxia treatment

**Organisation:** Pluss Advanced Polymers Pvt Ltd.

Round 4

## Challenge

At 28 per 1000 live births, India is still struggling with a heavy burden of neonatal deaths.

Birth asphyxia causes nearly 25% of neonatal deaths in India [World Bank reports] and the Project addresses current void in its treatment, especially in low resource settings to increase neonatal healthcare in BOP populations.

Neonatal cooling or Therapeutic Hypothermia (THT) is the standard of care for birth asphyxia treatments. Majority of Indian health system is not geared to perform THT due to a twofold challenge

- i. High price (\$30,000) of current imported devices which make them inaccessible
- ii. Dearth of clinical capacity to perform THT.

Pluss has broken the affordability barrier with MiraCradle™, a CE marked device. Priced at 1/10th of the current devices, MiraCradle™ has been marketed for about 18 months and is currently installed in >90 hospitals.

However, the real need in India is about 4000 devices. Clinical capacity building and sensitization will be essential to trigger widespread adoption. The proposed project seeks to address this challenge that impedes this innovation from achieving its true impact potential.

## Solution

Pluss Advanced Technologies has developed an innovative CE marked neonatal cooling device MiraCradle™ that is priced at 1/10th (USD 3000) of the current imported devices and addresses the former problem of device inaccessibility. Developed in collaboration with Christian Medical College (CMC) Vellore, MiraCradle™ is a robust device engineered with proprietary Phase Change Materials (PCM) to maintain the clinically recommended temperature of 33-34 C (91.4 - 93.2F) consistently for the entire duration of treatment of 72 hours.

To address the above challenges, the innovator propose creating a model network of hospitals- the End Asphyxia Deaths (EAD) Alliance, consisting of both public and private hospitals in an EAG state (Madhya Pradesh), equipping them with the MiraCradle™, training them and building clinical capacity within the healthcare providers in these hospitals (20 in number-50% of total estimated Level-III NICUs in Madhya Pradesh). The activities and the corresponding result would be:

- i. Infrastructure enhancement: EAD Alliance hospitals equipped with a robust device to deliver THT for birth asphyxia
- ii. Increased Clinical Capacity: Clinical team in the EAG Alliance hospitals trained to effectively perform THT - through capacity building programs and workshops, clinical knowledge exchange sessions with current clinical champions using the device
- iii. M&E data on birth asphyxia treatment and neonatal health outcomes from the EAD Alliance & a model network setting benchmarks for birth asphyxia treatment, especially for BOP populations - to lay foundation for widespread national and global adoption of MiraCradle™ in low resource settings

## Impact

With demonstrated impact, the project will ultimately seed national and global adoption of MiraCradle™ in public and private neonatal critical care across low cost resource settings as a cost effective yet robust and technically sophisticated device for birth asphyxia treatment. The anticipated impacts are:

- i. Improve health outcomes - reduce neonatal deaths due to birth asphyxia, reduce long term complications such as brain damage and cerebral palsy
- ii. Create greater clinical capacity and strengthen health system to handle birth asphyxia
- iii. Improve overall capacity in neonatal critical area across India, especially for BOP populations

- iv. Finally, take India closer to accomplishing its SDG (previously Millennium Development Goal –MDG4) of reducing neonatal mortality to 12 per 1000 live births by 2030 [WHO Fact sheet]

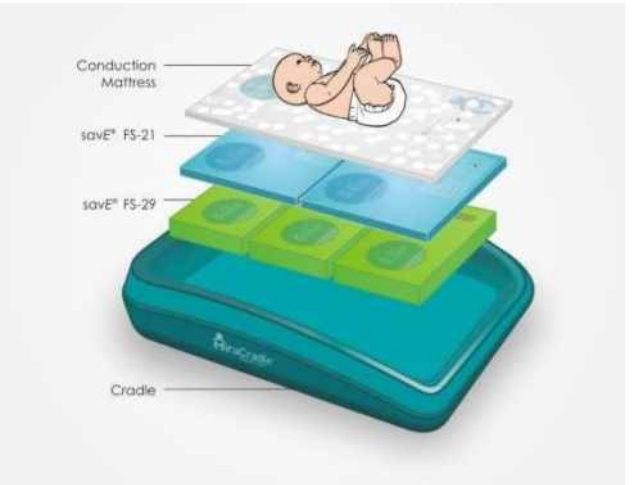
**Potential to Scale**

MiraCradle™ is now installed in more than 90 hospitals in India, including 20 devices in EAG states. Awareness and clinical capacity strengthening will enable scale-up to true need of the estimated 4000 devices in India. Most significant void is felt by BOP populations as greatest dearth in clinical capacity for neonatal cooling is in hospitals serving them.

Creating a model network in an EAG state, involving national and local experts to build capacity, seeding EAG state advocates for MiraCradle's benefits and feasibility of responsibly performing THT in low resource setting will be catalytic; and open doors for widespread adoption in private hospitals and Government programs.

They are also exploring other funding avenues to expand such catalyzing efforts to create a wider validation and advocacy network.

Beyond India's need of 4000 devices, there is significant global potential to globally scale-up in low and middle income country (LMIC) settings and anticipate that need across LMIC countries is more than 16000 devices.



# Nurse centres electronically linked with city doctors to provide gynaecological and reproductive health services in rural Kenya

**Organisation:** World Health Partners (WHP)

*Round 3*

## Challenge

Rural areas, where 75% of the population resides, have very poor availability of doctors. With the availability of electronic opportunities, health conditions that can be treated with medicines are being dealt with through remote consultations from city doctors, but conditions that need skills and medicines (such as gynaecological examinations) need appropriate, often gender-sensitive arrangements close to the communities.

## Solution

Using trained nurses at the village-end and enhancing their competency and utility by connecting them with city doctors through a highly stabilised technology platform will bring many currently unavailable services close to the doorstep of these communities. The electronic system, stabilised over 200,000 consultations and already being used in interior Kenya, works wherever a 2G cellphone does. Each case generates an electronic medical record, stored on the cloud for easy retrieval and to facilitate a continuum.

There are an estimated 20,000 un- or underemployed registered nurses in Kenya. Many are willing to work in rural areas. The electronic system enables the doctor to get a range of parameters and diagnostics. WHP seeks to set up 10 nurse centres, each close to a cluster of villages which will primarily focus on gynaecological, obstetric, reproductive and paediatric health. The network of rural entrepreneurs and Community Health Workers will be trained to counsel and refer cases to the Nurse Centres to earn an incentive. The Health Ministries of Homa Bay

County and the adjacent Kisumu County in Western Kenya have officially supported this initiative. All services will be for a fee which will enable the centres to break even when the client load per day touches 15, expected in year 3. Services are provided for a nominal fee. With a client load averaging 15/day, the project will break even in Year 3.

## Impact

WHP's electronic system has been stabilised over 200,000 consultations. The frontend providers treated 4.5 million cases of diarrhoea, 3.04 million pneumonia and 38,755 of tuberculosis last year. The programs also delivered, in collaboration with the public sector, family planning services, primarily long-term and permanent methods, amounting to 3,436,627 couple years of protection in 2014. Over 70% of pregnant women three ante-natal visits in the project area in UP versus less than one earlier. With the addition of nurses to the Kenyan operation, their ability to handle cases requiring haptic care increases manifold, ensuring project breakeven by Year 3, as planned.

## Potential to Scale

Scalability is in-built into this model. The human and technological resources are already available. Only the capital and the initial start-up funds are needed. Each centre, handled as a profit centre, will break even by Year 3. If the centres make profits, venture capital or impact investment will be explored.

# Empowering women through menstrual hygiene solutions

**Organisation:** Aakar Innovations

Round 3

## Challenge

Drop-out rates for female students across developing countries is a significant problem and often caused due to lack of access to adequate female hygiene products. Kenyan school girls miss 6 Learning weeks per year due to this issue. In rural India, 1 in 4 adolescent girls drops out after they attain puberty and those who stay in school miss about 5 days each month. Absenteeism lowers girls' academic performance, effects their self-esteem, and widens gender disparities in educational achievements. When girls drop out, they are also at greater risk for child marriage. Studies have shown that the use of sanitary napkins can decrease dropout rates by 90%. Moreover, lack of sanitary pads – and resorting to unhygienic solutions, such as leaves, cow dung, old cloth, sponges, soil, or feathers – leads to health issues, including urinary tract infections, reproductive tract infections and other long term reproductive health problems, including fatal toxic shock syndrome and infertility.

## Solution

Aakar Innovation work to establish reach of affordable sanitary napkin in different part of India. The team establish sanitary napkin manufacturing unit in the community which is run by the local women. They produce high quality affordable sanitary napkins. Two types of sanitary napkin are produced 100% Compostable Sanitary Napkins and Normal Sanitary Napkins.

The women take the ownership to run the unit. They design the strategy for production, sales and marketing. This unit makes the women socially and economically empowered at community level, they openly discuss about menstrual hygiene management at community level.

## Impact

Providing employment opportunity of 400+ women through 25 Sanitary napkins manufacturing units in 14 states & in Uganda. The women have earned 15 Million INR. 150000+ consumers reached in rural and slum surrounding communities of the units.

Basic understanding of Menstruation Hygiene Management are being developed among the school going girls and community women as well as boys & men.

## Potential to Scale

Aakar implements a “hub and spoke” model for developing its sanitary napkin business. Aakar Innovations set-up mini-factory in villages, blocks, urban slums which provide employment opportunity to 15-20 women per unit & another 20-30 women in sales. The unit can easily establish and operate anywhere with a capacity to produce 1500~2500 Sanitary Napkins per day. Aakar receives 150+ queries every month to set-up production unit from across India, Africa. They have setup a unit in Kenya, Uganda. They are also setting up their 1st pilot unit in USA in March 2016.





# Mobile partograph mLabour

**Organisation:** Dimagi

*Round 3*

## Challenge

Although the majority of maternal deaths are preventable, each year an estimated 287,000 mothers die during pregnancy, delivery, and the postpartum period (Hogan et al., 2010) with almost all of these deaths (99%) occurring in developing countries (WHO 2012). Despite renewed efforts to improve health outcomes, in 2012, India's maternal mortality rate (MMR) remained high at 178 maternal deaths per 100,000 live births. India's National Rural Health Mission has identified prolonged and obstructed labour as two primary causes for maternal mortality as, and both are key focus areas under the RMNCH+A initiative. While obstructed and prolonged labour are estimated to account for 5% of all maternal deaths in India, this is significantly underestimated since most obstructed labour-related deaths are documented as sepsis, a ruptured uterus, or haemorrhage, rather than the underlying cause.

## Solution

Working in collaboration with local and international design consultants and content experts, this past year Dimagi developed a prototype of the mLabour application in India through funding from Grand Challenges Canada Rising Stars. mLabour is a simple mobile application that provides real-time graphing and decision support to healthcare providers in order to assess the course of labour and carry out appropriate interventions if and when necessary. The mLabour prototype has built-in WHO protocols and incorporates Indian specific workflows observed during the formative research. To address the challenges and complexity in the healthcare system that have resulted in the low usage of the partograph to date, Dimagi has built a mobile phone and tablet-based partograph tool called mLabour.

## Impact

Individuals who will directly benefit from the innovation include:

- **Expectant mothers:** The use of mLabour by healthcare providers will help in preventing maternal mortality from obstructed and prolonged labour and serious complications, including ruptured uterus and obstetric fistula.
- **Infants:** Correct use of the partograph can help prevent stillbirth, identify dangerous foetal heart sounds, and other complications that arise from obstructed and prolonged labour.

Individuals who will indirectly benefit from the innovation include:

**Intrapartum Care Providers (nurses and OBGYNs):** mLabour will allow real-time decision support to nurses in order to assess the course of labour and carryout appropriate interventions if and when necessary, and will integrate doctor's support through SMS alerts.

## Potential to Scale

After developing and finalizing a standardized mobile partograph and incorporating feedback from various levels in the Indian healthcare system, Dimagi will work in partnership with hospitals, NGOs, and the government to deploy the tool across labour wards in India.

# Device for lab diagnostics at the doorsteps

**Organisation:** Neurosynaptic Communication Pvt. Ltd

Round 3

## Challenge

Access to lab diagnostics in rural and remote areas is a huge challenge. Almost all of the 100,000 diagnostic labs in India are urban. Patients have to travel tens of kilometers for diagnostics. Sample pick-up costs are high. Availability of qualified Pathologists and Lab-Technicians is an issue. Stringent storage conditions for liquid reagents is an issue for most clinical tests: Lipid, kidney, Liver profiles, Electrolytes, Hematology. Present diagnostic solutions do not offer a wide range of tests, and are very expensive. The challenge is to make available a complete point-of-care diagnostic lab, which will cover almost all the tests required in the primary care scenario, requiring low skill-set, no special storage, and affordable.

## Solution

Device for Lab Diagnostics at the Doorsteps (DLDD) will cater to about 80-85% of the primary care diagnostic requirements, with physiology sensors. It combines "Motorized Microscopy" for Whole Slide Image (WSI) scanning, "Multi-Wavelength Dry Chemistry Colorimetry" and "Optical Reader" for POC rapid tests into a single platform. These Components have been indigenously developed with support from Grand Challenges Canada (GCC). This proposal is to further develop the Platform for market readiness. The Project brings together Partners and Consultants with specific expertise –M/s Bhat Biotech (BBI) for dry chemistry, optics & microscopy

expert from National Centre for Biological Sciences (NCBS), SJRI for Clinical Validations and Product Design & Certification expertise.

## Impact

It has potential to create huge disruption in the diagnostics industry, democratizing access. Patients will get direct affordable diagnostic services in rural areas. This Platform shall be placed on general physicians' desktop, telemedicine, as well as health workers for carrying to the patients' homes. Immediate access, early disease detection, significantly reduced transportation time & costs for patients would be the outcomes. An estimated 1 Million patients will benefit directly from this in the 3rd year alone.

## Potential to Scale

This platform has a potential to scale Globally. Developing countries would find use for this device due to access, skill-set and affordability issues. Developed countries would find several use-cases in Geriatric, Home care and tele-care requirements. DLDD is planned to be deployed at thousands of ReMeDi® enabled village e-health centres already in operation. Further, in India alone, there are close to 12 Lakh (1,200,000) General Practitioners. A good interest is expected in the semi-urban / towns for this platform. Neurosynaptic, along with its partners will also make this platform available to 35 countries through its existing distribution channels.



Test: Creatinine | micro -albumin | Optical Reader with GUI | Slide Scanner with Image | Liquid Colorimetry result

## An automated and affordable point of sample collection screening tool for cervical cancer

**Organisation:** Aindra Systems Pvt. Ltd

Round 3

### Challenge

Cervical Cancer is the largest killer cancer for women in India, making India the Cervical Cancer capital of the world. A 2012 report by GLOBOCAN, International Agency for Research on Cancer, indicates that India has more than a quarter of the global incidences (~125,000) as well as mortalities (~68,000). This number indicates that one woman dies every 7.5 minutes in India due to a disease that is completely curable, if only detected early. But early detection can happen only through a Screening program, something that has currently failed in India as

reflected by the above statistics. Screening has been shown to be effective as proven by developed western countries.

### Solution

The innovator and his team are developing an affordable and portable, 'point-of-care' Cervical Cancer Screening tool to automate the analysis of the Pap smear slides. The slides are stained, scanned, digitized and then analyzed using computer algorithms to triage them into normal, suspect and abnormal samples, all at the 'point-of-care'. The images are then sent over a Telepathology medium to pathologists for further confirmations and recommendations.

Added to this, their solution utilizes the gold standard of cervical cancer screening, i.e, Pap Smear and uses Artificial Intelligence to be able to provide a high quality screening outcome at an affordable price point.

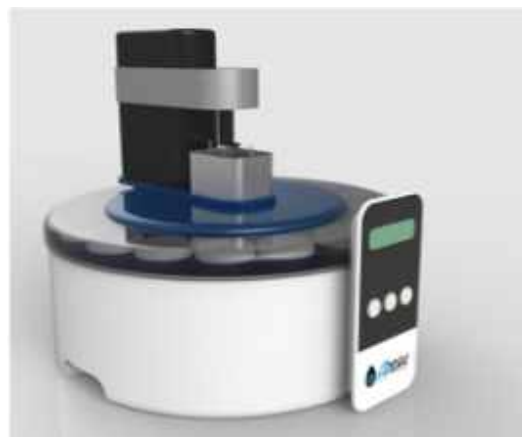
### Impact

With about 350 million women in India who are at risk of Cervical Cancer, the impact of their solution is in helping augment the existing capacity in a country and help screen for such large numbers of women, giving an indication of the impact of our solution.

### Potential to Scale

With a large population that has to be screened in India alone, they have a large potential to scale. In addition to this, the other geographical locations like Nepal, Bangladesh, Africa, etc ... that share the same kind of

demographic challenges as India, demonstrates that the CaCx Detect© solution has a huge potential to scale.



Auto Stainer



Image Acquisition Device



Computing Unit

# “Saans” - A device to keep, lungs of neonates with RDS (Respiratory Distress Syndrome) open while transferring them from a low resource setting to an NICU (Neonatal Intensive Care Unit)

**Organisation:** Coeo Labs Pvt. Ltd.

Round 3

## Challenge

The transition from intrauterine life requires major changes to the respiratory and circulatory systems of the neonate to maintain adequate respiratory gas exchange without the benefits of the placental circulation. In most instances, this complex series of events goes quite smoothly. However, some babies develop respiratory distress, necessitating evaluation and possible neonatal intensive care. As per WHO, the incidence of respiratory distress in the newborn period ranges from 2.9% to 7.6%, also 4.3% of all newborns may require supplemental oxygen therapy. A recent study suggests that around 15 million babies are born premature every year, and around 1.14 million of these die because of Respiratory distress.

In India alone we lose around 162000 babies annually of which around 32 per cent die while they are being transported to a tertiary care hospital from the rural PHCs.

## Solution

Saans is a low cost and easy to use CPAP (Continuous Positive Airway Pressure) device, used to maintain a pre-set constant pressure, constant air flow in the lungs of neonates and infants ( to prevent collapse of the alveoli) while they are being transferred to a higher centre for advanced care. The product being of an entirely mechanical assembly operates without any power and could be used by a minimally trained person (ASHA workers/ ANMs/parents/relatives) without any external supervision from a trained medical professional unlike the other CPAP's available in the market.

## Impact

Saans device will be deployed in all PHCs, CHCs, and private nursing homes in rural areas, to be used during transportation of neonates with troubled breathing. Use of the device will drastically reduce the mortality rates associated with RDS. The functional prototype of the device has been validated with 36 Clinicians (11 general

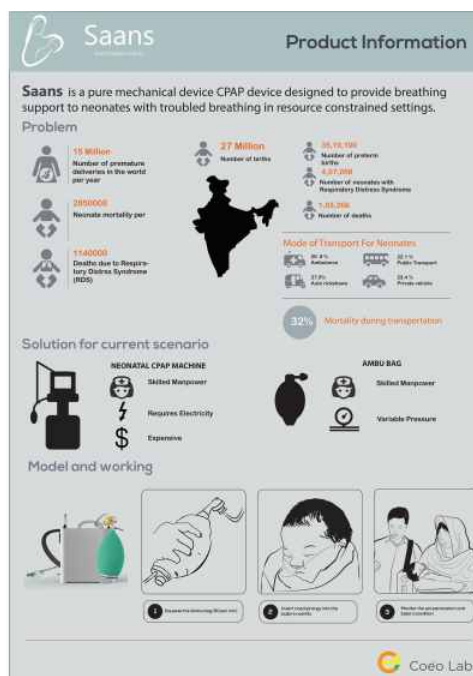
physicians, 6 paediatricians, 5 neonatologists, 2 gynaecologists, 2 medical officers, 2 medical college professors, 7 staff nurses, 2 ASHA workers)

Many organisations working in the social sector like WISH foundation, Acumen fund have shown early stage interest in adopting this technology and piloting the project.

Project Saans has also won many awards and competitions including FICCI Healthcare excellence award, TATA social entrepreneurship challenge, IIM A Masterplan business plan contest, Empresario, Global Business Model Competition IIT kharagpur.

## Potential to Scale

The project will be piloted in the state of Karnataka and after proving efficacy, it will be scaled to 5 states and later pan India within a plan of 2 years. They will start operation in Africa simultaneously in collaboration with Mbrara University (MUST), where they have already established connections, to get access to African markets.





# Affordable Smartphone Integrated Non Invasive Fetal electrocardiogram Monitor

**Organisation:** Sattva Med Tech Pvt Ltd

*Round 3*

## Challenge

Around 300,000 annual perinatal deaths, related to fetal asphyxia, fetal acidosis, meconium aspiration and other underlying causes of fetal distress are reported in India every year. With proper monitoring and timely care, these deaths are avoidable. The current standard of care for fetal monitoring in India is the Non-Stress Test and Cardiotocography. This device is bulky, and requires an uninterrupted power supply. It is unreliable and prone to false positives. A skilled Obstetrician is needed to operate, interpret and make decisions. The device is also expensive. It has severe usability issues and requires a lot of maintenance. It is unviable for India's healthcare setting where 70% deliveries are non-institutional and are conducted by midwives and ANMs. This rural market remains under serviced.

## Solution

Sattva Fetal Lite - a affordable, smartphone integrated, non-invasive, fetal ECG monitor - which detects Fetal ECG, Maternal ECG and Uterine contractions. The device is a wearable which connects to a tablet/smartphone application which has advanced machine learning algorithms to co-relate changes in FHR with Uterine contractions and give indications of distress. The system is a plug and play system and does not require a skilled operator. An ANM can place the belt on the abdomen and turn on the smartphone application. No-repositioning of the belt is required with fetal movement. The device is light-weight, portable, has a 24hour battery power and is USB re-chargeable. The product design accounts for the extreme movement of the mother during labor and the device is designed to be sturdy to survive rough usage and sub-optimal operating conditions in rural India. Remote monitoring can be enabled with an added module which allows tracking of various mothers under an ANM and guidance to the ANM from a Gynaecologist.

## Impact

The team has completed an observational study in St.John's Medical College, Bangalore under IERB. The

Sattva Fetal Lite has been tested on 40 patients and have identified 2 definite fetal distress cases. Sattva MedTech has won several awards and accolades - Top 10 innovator in the DST-Lockheed Martin India Innovation Growth Programme, YourStory Tech 30 startup 2015 and among the 40 startups which presented at the Indo-US startup Connect during PM Narendra Modi's Silicon Valley visit in 2015. Sattva MedTech has also raised seed funding from InnAccel, Bangalore and a grant from the BITS 75 charitable trust. They aim to launch a CE certified Sattva Fetal Lite in early 2017.

## Potential to Scale

India will have 60,000 institutions by 2018, which will conduct high-risk deliveries. Each of these institutions will require between 1-10 devices. Beyond these, each ANM and mid-wife can potentially be equipped with a Sattva Fetal Lite device and they plan to develop innovative business models like pay-per use to make their device accessible for these health care providers. For high risk mothers home monitoring is a opportunity. This represents a requirement of 1,80,000 to 1,90,000 devices in 2018. This will grow to a requirement of 2,50,000 devices per annum by 2023! Post 2020, we will target other developing markets like South-East Asia, Bangaldesh, Nepal and some African countries through liscencing deals and distribution partnerships. The total global requirement by 2023 is estimated to be for 8,00,000 devices.



# A cost efficient and portable point of care complete blood count (CBC) device from capillary or venous blood based on patented lab on a chip platform technologies

**Organisation:** Micro X Labs

*Round 2*

Complete Blood Count (CBC) tests are critical in monitoring maternal, antenatal and neonatal health and often the primary diagnostic indicator of multiple life threatening disease states in both mother and the newborn such as anaemia, thrombocytopenia, hepatitis, thalassemia, sepsis/ pneumonia etc.

## Opportunity

For most of the diagnostics tests (Hemoglobin, TLC, DLC etc) ASHAs have to assist expecting mothers to nearest PHCs or CHCs thereby travelling tens of Kms to reach nearest PHCs/CHCs just for a HB test and there they have to wait for hours. Similar is situation for many others living in resource limited setting. Besides the health delivery e.g. PHCs use traditional methods microscope to perform the test. Consequently, add on costs of tests accompanied by unavailability of trained practioners deprives quality health care services.

MicroX Labs believe that such primary blood tests should be performed at point of care and diagnosis results should be sent to nearest PHCs/CHCs with ICT applications.

MicroX Labs is developing a cost-efficient fully automatic and portable medical device for 14 parameters Complete Blood Cell Count Test, which can work in the remotest village of India. It can be operated by minimal trained worker. Accurate diagnostics have the potential to affect health care decisions to a degree well out of proportion to their cost. It has been estimated that diagnostics account for only 2% of the cost of health care, but affect 60-70% of treatment decisions. 7&8

## Technological innovation and Product stage

MicroX Labs is currently completing early stage prototyping of a cost efficient, battery powered, portable, ICT enabled and regulatory grade 14 parameter (with 3 part white blood cells diff.) CBC device for point of care use by non laboratory trained personnel based on

lab on a Chip (LoC) Microfluidic Impedance Cytometry (MIC) techniques, at a target cost of < Rs 25/test.

The device consists of single use disposable polymer microfluidic cartridges with pre-loaded reagents to which capillary blood sample is injected; and a portable bioelectronics reader with test results display storage & print capability and enabled ICT peripherals. The disposable microfluidic cartridge design for the multiplexed sample preparation (dilution, lysis, quenching, fluid metering, focusing etc) with pre-loaded reagents is based on patent pending [1,2] rapid mixing in soft micro channels technology developed by its scientific advisers at Indian Institute of Science, Bangalore. The subsequent counting and enumeration of constituent blood cell types is based on patent pending [3-5] Microfluidic Impedance Cytometry techniques developed at the Centre for Hybrid Biodevices, University of Southampton, UK.

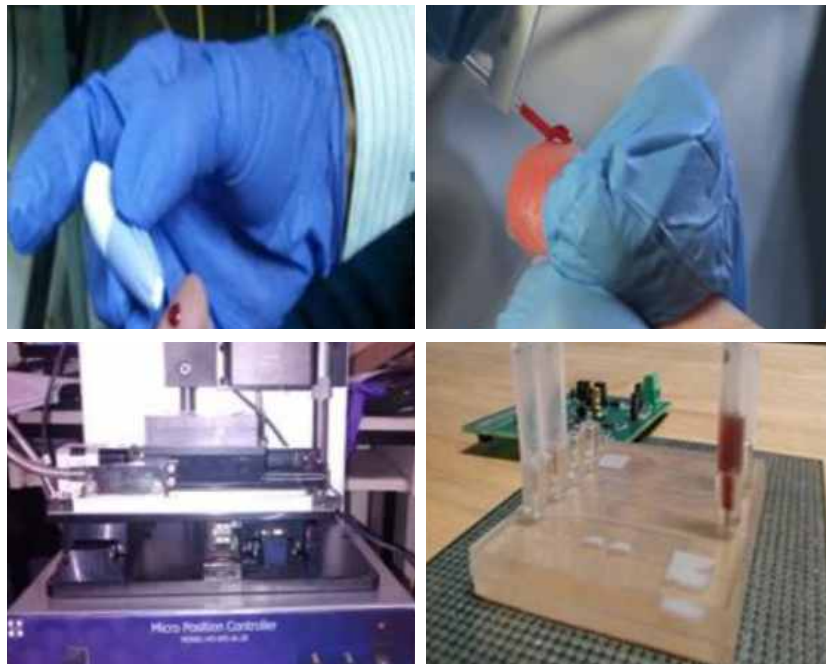
Blood cells have been traditionally identified, counted and enumerated by laboratory based hematology analyzers using optical (light scatter) or electrical (Coulter) methods, or a combination of both. Electrical detection methods readily lend themselves to cost efficient miniaturisation. Microfluidic impedance cytometry is an evolution of the micro-Coulter counter where bioMEMS fabricated micro-electrode arrays are integrated into the walls of the micro-channel and cell impedance properties are measured over a range of frequencies, with demonstrated concordance with lab scale haematology analyzers. [3] The platform technique has already been extended to incorporate fluorescent and large angle side scatter detection techniques for CD4+ T cells [6] and can be extended to lab on chip detection schemes for malaria, dengue etc.

MicroX Labs is incubated and seed funded by the IISc Bangalore; raised grants from Govt. of India and the Millennium Alliance awards 2014. MicroX is also the winner's of the TATA Social Enterprise Challenge 2013-14,

Jagriti-Google India for Entrepreneurs 2014 and the IndiAfrica 2014 Business Venture event, Ministry of External Affairs, India and held at Accra, Ghana.

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5. A sheath-less combined optical and impedance micro-cytometer, D. Spencer, G. Elliot and H. Morgan, "Lab on a Chip" 2014, p3064.
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(clockwise) (1) Finger prick (2) Collect in a reservoir (3) Mount reservoir (4) Mount the reservoir Note that the above images are from early prototype

# Adapting and piloting MIRA (Women Mobile Lifeline Channel) project from India to Uganda and Afghanistan

**Organisation:** ZMQ Development

Round 2

## Challenge

India has a high maternal mortality rate of 190/100,000 live births and infant mortality rate of 44/1,000 live births. 51.1% of women opt for traditional method of home-based delivery and only 48.8% of births are assisted by skilled health workers in India, which puts both mother and child health in high risk. MIRA is an integrated mobile phone channel which provides total communication, information, management and service delivery for Maternal and Child health in the rural India. The project won the Millennium Alliance award in 2013.

## Impact

MIRA is operational in Haryana. In Mewat district (Haryana), MIRA is reaching to over 266,000 women, has been rolled out with SHG Federations and Haryana Livelihood Mission with 130,000 women. MIRA is also distributed through telcos, recharge kiosks, OEMs and CR stations. A set of dedicated 50 MIRA workers are working in over 80 villages covering almost 67,000 people. In the intervention area, there is an increase in ANC visits by 59%, institutional deliveries by 49% and immunization rates by 41%. MIRA PHC connect model is piloted in Haryana state and is being scaled to 180 ASHAs and 25 ANMs reaching to 63,000 women. Prompt action has been taken by ANMs in 84% of the High Risk Pregnancy (HRPs) queries raised by ASHAs. Live data produced by the platform enables the state to take timely action.

## Solution

MIRA is an integrated mobile phone channel which provides health communication and information tools to rural women through mobile phones in low-resource settings. It has multiple components on issues related to Pre-natal care, Child immunization, Newborn care, Family planning and Adolescent health using RMNCH+A approach. Information is delivered through interactive tools by creating awareness on critical health issues, building knowledge & timely connecting with the public



health services. MIRA uses iconic language with audio support making it interactive 'Talking toolkit' designed for millions of semiliterate women. In addition, it also has numerous VAS tools like stimulating social mobile games and decision-making stories to motivate communities adopt new behaviors.

- 1) MIRA Individual App is available on mobile phones of individual women for self management of health. It has multiple registration facility on a single handset which allows group of women sharing a common phone in the communities.
- 2) MIRA Worker Toolkit is used by set of health workers who go from house-to-house to do household registrations, register pregnant women and under 5-year children for RI. MIRA workers deliver weekly iconic information to these communities using mobile.
- 3) MIRA-PHC Connect is a communication and service delivery platform in sync with public health system which connects ASHAs and ANMs and enable them take timely action on high risk pregnancies. The platform generates Live-Data for the state to take decisions.

## Scaling / Global Transfer

MIRA aims to reach to over two million people in next one year. Success of MIRA program in Haryana triggers its adoption in other states in India. MIRA is expanding in Africa, Asia & is currently exploring partnerships.



## Building an evidence based scalable & sustainable eye care model for Ethiopia

**Organisation:** Forus Healthcare

Round 2

### Challenge

App. 12 million classified blind people are in India (25% of 45 million worldwide) and over 80% is needless. Cataract, Diabetic Retina, glaucoma, cornea issues and Refraction problems constitute 90% of blindness. They do not show any early signs and is often too late for treatment. This combined with illiteracy, scalability, rural reach magnifies the problem multifold. Only 18000 ophthalmologists practice in India and a mere 800 ophthalmologists graduate every year. Ophthalmologist to patient ratio is approximately 1: 70000. It is much worse in rural India. Identification of problem is the biggest bottleneck even for bigger hospitals to direct appropriate treatment. Only around 7% of people at various stages of blindness are screened and treated as of today. Current system needs expensive diagnostic devices for screening (single device for every problem) coupled with the availability of high skilled ophthalmologist/technologist. Rural market remains grossly underserved. Single device easily usable in remote environment operated by minimally technicians is not available.

### Impact

Their areas of impact include globally reputed eye Institutions like Aravind Eye Care, L.V.Prasad Eye Institute, Sankara Nethralaya, International Agencies like Sight Savers, Orbis International, large private sector chains like, Dr. Agarwal Eye Hospital and several Individual Ophthalmologists, Diabetologists & Telemedicine Service providers. The product has also been deployed in remote locations in the Indian States of Orissa, Uttar Pradesh, Andhra Pradesh, Assam and connected to the main hospitals through telemedicine. They estimate to have touched over 800,000 lives till date. Forus Health has won several awards and accolades. Piramal Prize winner 2010 of technologies that democratize Healthcare, Top Innovation in DST-Lockheed



Martin India Innovation Growth Program 2011, Samsung Innovation Quotient Winner 2011, NASSCOM emerge "League of 10" for year 2011. OEM –Enterprise organization in Start-up category by India Semiconductor Association, MIT's Technology Review India's Grand Challenges (TRGC) awardee, CNBC-TV18 & Mercedes-Benz Young Turks Awards – Change Maker of the year, Frost & Sullivan Award 2012, 5th Annual India Leadership Awards 2014- India's Most Promising Company in Healthcare Innovations, Pride of India Award '2014 by IDG Ventures- Exceptional Business growth and Successful Fundraising.

### The Solution

1) 3nethra - A Single, portable, Intelligent, non-invasive, non- mydriatic eye pre-screening device, detects 5 major ailments of eye automatically – cataract, glaucoma, diabetic retina, cornea problems and provides refractive error measurements. Indicative the device through Automatic Screening algorithms and provides "OK-See a Doctor" Report for the above problems. Telemedicine Connectivity is enabled through communication infrastructure including mobile and broadband for remote diagnosis. "Foruscare", their unique telemedicine solution using the cloud is already deployed in over 30 locations connects needy patients in the remote areas to the specialists in cities.



2) 3nethra is designed and developed by Forus Health Pvt. Ltd., a Bangalore based innovation led social enterprise. Forus as the name stands for means "For us" - me and my community. Forus Health vision is

"To address Health issues of emerging world through innovative products and solutions combined with innovation in deployment in an inclusive environment". Forus Health strongly believes that healthcare solutions for emerging countries have to be different both in terms of the development as well as deployment.

### Potential to Scale/ Global

#### Transfer

Their Innovative solutions integrated with complete end to end deployment (that includes the community) will enable reach thereby democratizing healthcare. They strongly believe that by "Democratizing healthcare", they can play an active role in the addressing Global healthcare issues. 3nethra is already clinically validated and CE compliant. Today they have more than 450+ installations in India with 60+ installations outside India.





**Awardee Portfolio:  
Water & Sanitation**

# Solid waste resource management and environmental sanitation

Organisation: ENVIRON

Round 4

## Challenge

Present scenario of mixing of plastic waste along with the biodegradable solid waste has ruined the entire solid waste management activities and is developing huge 'waste land' and 'toxic land' day by day in India. Improper disposal of solid waste is creating lot of problems like- dirty surroundings with faulty odour, facilitating microbial growth and diseases, clogging of drains and artificial water logging leading to the sources of different vector born diseases like Malaria, Japanese encephalitis, Dengue etc. Solid waste is the major source of various diseases due to the indiscriminate dumping (CPCB, 2000). ENVIRON's study reveals that, if the present scenario of 'use and throw' practice continues, after 10 years, most of our Children will be surrounded by the heaps of garbage and diseases and our neighbourhood will be full of unhygienic garbage dumps along with the acute water logging and flash flood problems.

## Solution

ENVIRON believes that, only a house to house cleanliness drive & collective impact of our individual role can secure our children's future & neighbourhood. Where, biodegradable solid waste can be managed at household to produce 'Vermicompost' along with the collection of 'Vermiwash' & 'Micronutrients'- organic manure cum 'bio-pest repellent' and the same can be used to grow small plants forming an organic kitchen garden in the household or to promote large scale organic farming. On the other hand, plastic waste can be managed at source up to some extent by introducing household level 'plastic craft' followed by the source collection of plastic waste through the organized rag-pickers.

For household level biodegradable solid waste management ENVIRON will introduce domestic "Waste Assimilator" (Patent Application No. 1352/KOL/2014). Community "Waste Assimilator" will be introduced for community or market generated biodegradable solid waste management. The invention is also generating the concept of production of 'bio-pest repellent' and 'organic manure' for promoting organic farming and to attract the beneficiaries. Moreover, ENVIRON will also introduce some innovative components for plastic waste management like household level 'plastic craft', source collection of plastic waste in exchange of 'Ginger' and 'Garlic' through a specially designed Tricycle- "Seuj Bahan". In this connection ENVIRON has also designed a

"Money Earning Litter-bin" for source segregation of plastic waste.

## Impact

Palasbari municipality is typical in comparison to the other municipal area as most of the households are having the space for kitchen gardening. Through the use of the "Waste Assimilator", beneficiary household will be able to utilize their biodegradable solid waste for practicing 'Organic Kitchen Gardening'. ENVIRON will also encourage them for 'Organic Green Tea Gardening' which can be processed easily at household level and there is a high market value. On the other hand, by selling non-biodegradable solid waste and exchanging plastic waste through Ginger and Garlic, households will be able to earn some revenue out of their waste where as 'Plastic Craft' may create direct livelihood opportunity for them.

## Potential to Scale

Through the project activities haphazard dumping of solid waste in the drain, roadside and low lying areas will be protected, inserting biodegradable solid waste inside the plastic carry bags will be stopped and the burning of solid waste for reducing volume will be prohibited. Due to the project activities, every household will practice 'Organic Kitchen Gardening' and 'Organic Green Tea Gardening' by utilizing their biodegradable solid waste resource. Households will also generate benefits out of the waste plastics. Thus the project will initiate a clean, green and healthy 'society'.

Through the project activities both biodegradable solid waste and non-biodegradable solid waste will be utilized for generating resources toward achieving successful environmental sanitation which will also open a path for economic growth and enhancement of green cover in India to achieve the real meaning of "Swachh Bharat" and "Make in India" mission.



# Desolenator: Solar empowered drinking water system

**Organisation:** Innovation Experience

*Round 3*

## Challenge

### DESIGN

- (a). Large number of water filtration systems either run on-grid or have filters, which require constant maintenance, thus, increasing costs and reducing adoption rate.

### ENVIRONMENTAL

- (a). Poor quality of water and improper filtration practices at household level

### INFRASTRUCTURAL

- (a). 30-40% of rural water systems are unsustainable due to continuous wear and tear.

### HEALTH

- (a). High influx of water-borne disease due to consumption of dirty and unfiltered water.

### DISTRIBUTION

- (a). Lack of a well-knit distribution channel to reach the households/community

## Solution

Water Independence for life by using the power of sun!

Desolenator is a patented device that uses sunlight to convert any source of brackish or impure water in to clean, drinkable water.

Desolenator will be distributed through a network of micro-entrepreneurs, set-up by eKutir to engage, market, and train the households. eKutir's micro-entrepreneurship model is a proven, awarded, and well-recognized model to yield personal customer touch points and drive economic sustainability in the process for BoP markets.

## Impact

The outcome of wide spread availability of clean drinking water through this unique approach will create compounded social impact on the household level and at a broader systemic level.

The populations that will benefit from these pilot projects directly are:

- (a). Women in Self Help Groups and members of their household. The impact is both in the reduction of time spent fetching water, the increased productivity as a result and the health implications of drinking from a reliable clean water source on a daily basis.

- (b). Children under the age of five will have reduced risk of cognitive development disorders as a result of drinking poor quality water and suffering from diarrhea and water borne diseases.
- (c). Micro entrepreneurs (female and male) between the ages of 18 – 35 will benefit from education, training and engaging in income-generating activities by providing water to local communities.

The indirect impact of their proposed project affects:

- (a). Partner organizations; such as MFIs, local government and commercial partners that benefit from increased productivity and incomes at a community / village level.
- (b). The community at large will benefit from a healthier ecosystem and increased standard of living through access to clean water from a renewable energy source.

## Potential to Scale

Globally, Desolenator units have already been ordered from 24 countries around the world; and have proved to be highly effective in energy deprived Indian states with proximity to the coast - once the units are rolled out globally it will be possible to analyse exactly if there is a technological limitation to expand beyond India.

Within India, eKutir Svadha has a current customer base of 15,000 households and counting, which will be scaled-up to 24,000 by April 2016 with plans to ramp-up to 300,000 households by 2019. This will be the customer base with safe sanitation systems installed through its ongoing partnerships with Unilever, Kimberly Clark, Toilet Board Coalition, Acumen Fund, Asian Development Bank, and World Toilet Organization.

Post this project, which will deploy 200 units, Desolenator will have a customer base of 300,000 households or 1.5 million people to impact their health and livelihoods through clean energy, clean water system. The idea is to showcase efficacy of the current partnership with eKutir Svadha and based upon evidence gathered of impact through the project, tap in to the Svadha's customer base of 1.5 million people in India, post 2019 onwards.

And in parallel, explore local distribution partners, global partnerships, and local governmental schemes to distribute Desolenator units across India.



# Samagra: Providing access to clean, safe and reliable community toilets for the urban slum-dwelling poor

**Organisation:** Samagra Waste Management Pvt Ltd

Round 3

## Challenge

India accounts for 600 million of the nearly 1.1 billion people worldwide who regularly defecate in the open due to lack of proper sanitation facilities. The problem is especially acute in India's dense urban environments, where women and children bear a disproportionate burden of the negative effects stemming from poor sanitation. Despite the great need that exists and the transformative effect that community toilet facilities can have on the poor, few organizations have been able to address this issue effectively. Most sanitation programs fail or have limited impact because they fail to realize that solving these issues is not just about technology or infrastructure, it is also about user engagement and behaviour change.

## Solution

Samagra's holistic model incorporates the “change framework” into its DNA. Samagra is the first social enterprise in India that is dedicated to providing access to clean, safe, and reliable community toilets for the urban slum-dwelling poor. What makes the model innovative is the seamless bundling of other value-added services along with the toilet block: ? Access to digital goods (mobile Top Ups and TV subscription) ? Access to Financial services (including savings accounts, bill payments) Samagra effectively partners with municipal agencies and re-designs community toilet infrastructure

to create a “one stop community center” for slum residents. The model has proven its ability to attract and retain users to the toilet facility, promote hygienic behavior and still achieve sustainability. By providing access to clean facilities that are available 24 hours a day, 7 days a week – that also doubles as a center of commerce and other activity – Samagra has proven it can reduce rates of open defecation and effect improved health and security for its members.

## Impact

10,000+ daily users; 320 toiled seats under operation; 4500+ female users; 500+ first time toilet users; 50% increase in toilet usage; 600% increase in people paying for toilets; 92% customer satisfaction

## Potential to Scale

Samagra attacks head-on the urgent sanitation crisis in India through a unique and highly effective solution that creates “win-win” alignment of incentives amongst all stakeholders involved. That is why Pune Municipal Corporation has already given permission to Samagra to manage 100 toilets this year and many others ULBs are interested in implementing Samagra's Model. As it expands, Samagra has the opportunity to put city of Pune on the map as a model city for India that has perfected the community toilet block for its citizens, and also to create a “demonstration effect” that inspires other large cities across India to adopt Samagra's Model.



## Creating green jobs turning trash to treasure for farmers

**Organisation:** Waste Ventures India

*Round 3*

### Challenge

The current options for managing the countries waste are insufficient: only ~60% of waste is collected and just 10 – 20% of waste is recycled. The rest festers on streets and in dumpsites, releasing toxic emissions in the air. In megacities, bulk generators, such as apartment complexes, produce 40% of the waste, but lack a green, professional, and single-point option. Small cities, meanwhile, produce low waste volumes and lack the capacity to properly process it.

### Solution

Waste Ventures India's 'Total Waste Solution' is a one-point waste collection and processing solution for all waste types across varied clients, thereby dramatically reducing waste that is dumped by up to 90%. This service is broken into two components:

- 1) Total Waste Management (TWM) for bulk waste generators (e.g. corporate campuses, manufacturing plants, waste pickers) in megacities

They provide Hyderabad's first professional Total Waste Management solution. They scientifically compost the organic waste on-site, leveraging 3+ years of experience, and collect all recyclables including low/negative value recyclables. Compost generated is sold on Amazon, Flipkart and local retailers at a premium under brand name Sanjeevini Compost. Recyclables are sold in bulk to their network of green recyclers, which includes partnerships with large packaging and FMCG companies such as Tetra Pak and ITC's Wellbeing Out of Waste.

- 2) Trash2Treasure Parks (T2T Parks) for small municipalities

Their Trash2Treasure Parks establishes processing facilities in partnership with municipalities in a city-cluster approach (1 processing facility for 2 – 4 cities). WVI's T2T Parks convert the received mixed and segregated waste into RDF, compost, and marketable recyclables. They have experience managing organic waste for two municipalities in Telangana and have a request from the state of Telangana to scale to 40 municipalities.

### Impact

To date they have averted 1,500+ tons of waste from dumpsites, produced 120+ tons of organic compost, and generated income increases of up to 15% for 400+ waste pickers. In the next five years, they intend to scale to two new megacities, averting over 28,000 tons of waste from dumpsites, 43,000 tons of CO<sub>2</sub>, and channelling >14 lakh to waste pickers.

### Potential to Scale

The market for recyclables collection market alone in urban India is USD 1.1 billion and growing by >4% annually. Additionally, as seen in Bangalore and Pune, regulation is getting increasingly supportive.

# Solar Powered Water Purification Centers for Urban and Rural Regions with Poor Grid Access and Water Quality

**Organisation:** Swajal Water Pvt Ltd

*Round 3*

## Challenge

Lack of clean drinking water has reached calamitous proportions in thousands of habitations across nations . Also, in poor water, the associated costs in the form of medical bills, loss of jobs (in case of prolonged illness) etc further promote poverty.

## Solution

Swajal addresses the need to provide safe drinking water to communities that have poor water quality and no access to grid electricity by using solar power for energy efficient, automated and remotely controlled systems.

## Impact

A typical swajal community system impacts by providing water to more than 2000 people, mitigates 5 tons of carbon, generates employment for 4-5 people and considerably reduces bottle/pouch pollution.



Their beneficiaries range varies from urban to rural, from aggregated slums in peri-urban cities to individual households in rural regions. Swajal machines have been installed in regions that have a fairly consistent grid electricity supply to regions that do not have electricity at all. Further Swajal civil structures use environment friendly local biodegradable materials and water harvesting is built into the designs.

## Potential to Scale

Ministry of drinking water and Sanitation has declared 78000 villages to have unsafe drinking water. This does not take into account bacteria infested regions. The challenge lies in accessing these areas and designing appropriate systems.



# Waste picker franchise model

**Organisation:** Hasiru Dala Innovations Private Limited

Round 3

## Challenge

**Social Need:** There are over 30,000+ wastepickers in Bangalore city struggling to make ends meet in difficult conditions, with no social security benefits.

**Problem of city:** Breakdown of local municipal corporation processes and systems in dealing with over 4500 tons of waste per day in Bangalore city, has citizens crying for a reliable and predictable waste management service.

## Solution

Marry the need and problem to start a social enterprise offering Total Waste Management Services to bulk generators who are the paying customers. The beneficiaries are the wastepickers who are the service providers through a franchisee model. The service includes the collection of segregated-at-source municipal solid waste and transportation to appropriate destinations for further processing into compost, bio-gas or recycled materials. Nearly 90% of total waste generated is diverted away from landfills. The service is offered through wastepicker/scrap dealer franchisees who employ at least 4 wastepickers to do the collection, transportation and sorting/grading of the waste.

## Impact

The pilot program since 2014 started by the non-profit Hasiru Dala has generated employment for over 60 wastepickers and currently provides services to over 16000 households across 80+ apartment and villa complexes.

## Potential to Scale

Hasiru Dala Innovations Private Limited was set up in Nov 2015 to scale the business, attract investment to the sector, and bring financial and operational rigour to the model. Bangalore has 4508 apartment complexes with unit prices over Rs.50 lakh comprising of nearly 3 lakh households. The projected 3 year impact of just operating in Bangalore is:

FIGURES REFLECTING GROWTH YEAR ON YEAR	YEAR 1	YEAR 2	YEAR 3	TOTAL
Cumulative number of franchises	16	35	64	64
Cumulative number of households served	24,862	61,262	110,962	110,962
Cumulative number waste pickers employed	80	175	320	320
Annual collective income for all waste pickers	\$117,414	\$363,908	\$756,304	\$1,237,625
Annual volume of waste collected (tons)	5133	15,565	31,630	52,329
% of waste diverted from the dump	89%	89%	89%	89%

The model can be replicated in other cities pan India as well as in other developing countries. The potential to scale is substantial.



# The women for WASH initiative

**Organisation:** The Global Interfaith WASH Alliance

Round 3

## Challenge

Reports the World Bank, the equivalent of 6.4% of India's GDP is lost each year due to the premature deaths and lost wages associated with our nation's poor water, sanitation and hygiene (WASH) conditions. Yet, sanitation and hygiene, simply donating toilets and clean water systems to communities in need does not necessarily mean they will be used. Instead, far too often, such facilities fall into quick neglect, are shuttered completely or are used as storage facilities by communities that don't understand their importance. The challenge for delivering improved WASH is not just one that can be solved by simply gifting communities with toilets and water systems. Instead, communities must be motivated to fully accept the importance of WASH, and to embrace the use of toilets and improved WASH as must-haves for their every-day life.

## Solution

The Women for WASH Initiative will be a first to address WASH by enabling women to scale new WASH innovations while also inspiring behaviour change within their communities. This unique model has been carefully developed after extensive consultations, including through GIWA's historic Women for WASH Summit, held at their Secretariat in collaboration with UNICEF.

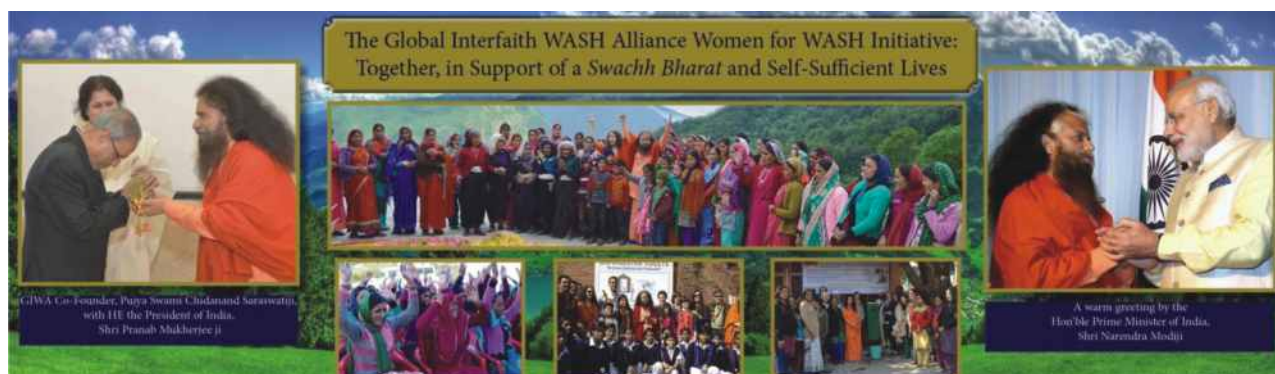
## Impact

The Women for WASH model will enable women to organize as cooperative WASH producers, suppliers and beneficiaries, so that they may earn sustainable livelihoods while propagating healthier, cleaner lives. As their incomes rise and community health improves, a new paradigm will be demonstrated for which:

- WASH technologies will be more-widely scaled
- Healthy WASH behaviours, such as using toilets, will be implemented into daily life
- Community health will improve
- And women will be enabled to graduate from poverty to prosperity

## Potential to Scale

To progressively build scale in response to the Swachh Bharat Mission's historic call for toilets and other WASH provisions, the Women for WASH model will be packaged as a Social Franchise, which will include marketing assistance, materials and extensive training for women at the BoP. In addition, other agencies, communities and NGOs will be empowered to carry-forth their own Women for WASH programmes in other regions across India through training and technical support.



GIWA Co-Founder, Purna Swami Chidanand Saraswati, with HE the President of India, Shri Pranab Mukherjee ji

A warm greeting by the Hon'ble Prime Minister of India, Shri Narendra Modi ji



# Water for all

**Organisation:** Watsan Envirotech Private Limited

**Round 3**

## Challenge

The non availability of affordable water solutions. The available alternatives in 2009 were:

1. Bubble top / canned. bottled water – whose source of water is not known
2. The dispensers – Mostly run by electricity and have replacements often.
3. The available microfiltration products have not reached the majority of the users- the rural Indian villages – 72 % of the Indian population

## Solution

They started to do affordable and electricity free water filters, approved by the country's premier institutes CSIR, DST and CIPET; now since 2013 they have joined hands with Inno Nano Research private Limited, a company incubated in the Nano technology department of IIT Madras for making arsenic filters. So this was the idea in which they built brick by brick and have catered to almost 80,000 users till now across the country.

They are now working with IISC Bengaluru for 100% removal of bacterial contamination removal, and with another US based science lab for removal of fluoride in water, both without using electricity.

## Impact

Considering a focussed marketing and scaling up to reach all villages of India in next 10 years, they would be giving water almost free of cost (amortization cost of filter ` .900/10 years - life of candles for giving 164250 litres of water per family), intangible benefit would be reduction in payment to hospitals and doctors as the filtered water stops water borne diseases.

## Potential to Scale

They are making 1, 50,000 candles a year manually. With the grant fund they will automate the plant to make 10 times the volume. Once the automation is successful, they can replicate the candle making plant in any other part of the country/ world, wherever need arises!

## What we have done so far



For Anganwadis



For orphanages



For Schools



Larger Capacities  
At L&T ECC site, Trichy



At Kannigaiper Govt. Hr Sec School, TN



At L&T site Gujarat

## Community drinking water systems from India to Rwanda

**Organisation:** Waterlife India

Round 3

### Challenge

More than 60% of people in Rwanda do not have access to safe water and bottled water is out of reach for most poor people. Rwanda has one of the highest incidence of infant mortality and waterborne diseases globally.

### Solution

Provide sustainable and affordable safe drinking water thru Community Water Systems. A family can get 20 litres of safe water at less than 20 cents.

### Impact

Poor and marginalised people can get access to safe water- resulting in reduced diseases like diareah, typhoid, jaundice, reduced infant mortality, increased savings, girl child being able to go to school etc. A \$1 investment in water results in \$ 4-32 economic returns as per UN

### Potential to Scale

Huge potential for scale and providing access to safe water to the BOP. The model has successfully scaled up in India and they expect same results in Rwanda and Africa.

Low income India states can scale it up like other successful states.



# Jeevandhara handpumps with filtration system for rural areas

**Organisation:** Transerve Technologies

Round 2

## Challenge

In India, around 883 million people live in rural areas and majority of habitations are affected by chemical and bacteriological contaminants. Around 56 % of our rural population depend on tube wells/bore wells for drinking water but unfortunately majority of these water sources are heavily contaminated.

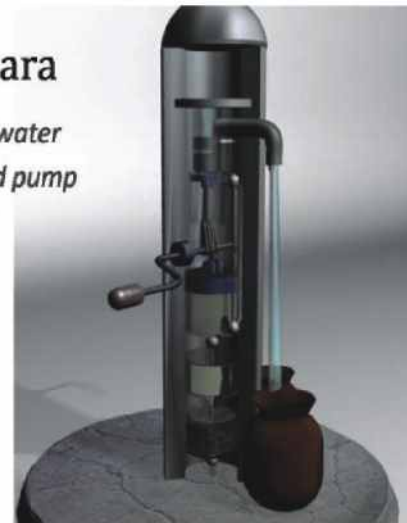
## Impact

Jeevan Dhara, a hand pump with RO filtration system aimed at catering the needs of rural India in providing clean drinking water to the masses. The Technology is a modified community water hand pump which filters water. Jeevan Dhara uses the combination of muscular power and solar energy to pump and filter water. The design of the hand pump is such that it provides RO grade drinking water for a whole community of 100 people thus eliminating the need for a point of use filtration system in rural, semi-urban and slum areas. They realize that there are three constrains which needs to be dealt simultaneously; high level of water contamination, lack of electricity supply and low affordability of the rural population. They need to tackle all these three constraints together, then only they can successfully reach masses."

## Solution

The solution proposed is a low cost affordable, community based device which runs without the need of grid electricity and removes all water contamination. The technology is a patented uniquely developed community water hand pump called JEEVANDHARA, which simultaneously filters water as it is pumped out. Water quality is ensured by a monitoring system round the year.

**Jeevan Dhara**  
*solving drinking water  
 problem one hand pump  
 at a time*



- Requires No Electricity
- Removes all type of Chemical and Bacteriological Contamination
- Lower cost per household ( 20 families per unit)
- Can be fitted in existing bore wells and the present hand pump heads
- GSM based monitoring system to ensure optimum water quality

They believe that at Transerve Technologies Pvt. Ltd. they will able to create better social impact through technological innovations in Water Sector. The real innovation is in making simple yet efficient and sustainable solution such that it gets adopted on its own and reaches masses.

## Installation of pressurized recharge wells for creating fresh water pockets in saline ground water areas to make water available for drinking and sanitation purposes in water scarce schools of Mewat, Haryana

**Organisation:** S.M.Sehgal Foundation

Round 2

### Challenge

Semi-arid regions have limited surface water resources. The groundwater in these areas is saline with freshwater found in small pockets. Many people collect water from distant sources. Some depend on tanker supply from freshwater areas, which is expensive and time consuming. Erratic electricity supply, low maintenance and high set up costs make solutions like reverse osmosis unfit for poor villages.

### Solution

S M Sehgal Foundation innovated pressurized recharge wells as a solution. The well has raised height above the ground and also extends below the groundwater table. It holds enough water that creates hydrostatic pressure pushing aside the existing saline groundwater. This forms a pocket of harvested rainwater within the saline aquifer. The pressure exerted by the saline groundwater keeps the freshwater pocket intact.

The harvested rainwater is then extracted from the freshwater pocket through a hand pump. Further, a bio-sand filter removes biological contaminants, making the water fit for drinking.

### Impact

The solution improves health and hygiene of communities. It ensures water for drinking and sanitation, which leads to reduction in water borne diseases. Girls also get an opportunity to study when water is available.



### Potential to Scale/Global Transfer

Sehgal Foundation has implemented this in a few schools of Mewat, Haryana. The structure serves about 500 children in one school. It can be replicated at household level across semi-arid and inland salinity affected areas in India. It can address drinking water problems and mitigate salinity in many Asian and African countries facing similar issues. These countries include Thailand, Fiji, Vietnam, Guam, Kiribati, Iran, Afghanistan, and Australia.



# JALDOOT: Safe drinking water delivery model

**Organisation:** Swayamsiddha Mahila Utkarsh Foundation

Round 2



## Challenge

- In India, 600 million people do not have access to improved and safe drinking water. Resulting in avoidable healthcare-related expenses, productivity-linked losses and even morbidity & mortality
- Local governments incur huge costs reaching far and deep to meet the water demand gap.
- Proximity to and Reliability of available water resources is also a big question mark in rural areas
- Sustainability and operating efficiency of existing solutions remains uncertain in most cases leading to a near-despair situation
- Private sector efforts more aligned to Profit maximization than service optimization hence often neglecting needs of low-income communities in rural and small towns AND Quality remains a?
- Focused Demand generation efforts and Use of Technology & Automation still at a Low Key in the current scenario

## Opportunity to Address

JALDOOT Model has emerged as one of the preferred solutions to overcome the above mentioned challenges and serve the community at Bottom of Pyramid (BoP) by providing safe drinking water via:

- Expanding Access – `Jaldoot' being a mobile as well as stationary water filtration and distribution model, it provides a better solution by filtering water at one location and delivering it within 10 to 15Kms reach.

- Last Mile Reach – `Jaldoot' provides safe filtered drinking water at Door steps of the rural community, thus reduces the physical and mental stress of women and children of walking far away to fetch water from the source.
- Current Technology – `Jaldoot' uses indigenously-developed, robust Ultra Filtration (UF) & Reverse Osmosis (RO) based customized solutions to treat source water at different locations. Uniqueness of mobile filtration unit is that it does not require Electricity and works on vehicle engine's power itself. [Jaldoot works with NCL (National Chemical Laboratory) & US patented technology licensed under CSIR (Council of Scientific and Industrial Research)]
- Affordability - `Jaldoot' delivers filtered water at very affordable price of just Rs. 0.50 to 0.80 per liter as against the cost of Rs.15 to 20 per liter of bottled water.
- Operations Support - `Jaldoot' provides a continual O&M support to Entrepreneurs for up keeping the units and to establish it as a sustainable business model.

## Jaldoot Impact

Jaldoot with 20+ units and 2 distribution centers has ensured direct coverage of more than 30 villages and serving more than 50,000 clients like rural households, small shop keepers, MSME within 15 to 20 Kms periphery since last 4 years, resulting into reduced expenses on health-care - related waterborne diseases, Improved productivity and enhanced savings via a uniquely designed mobile, women-entrepreneurs driven model



### Towards Community as Customer

Jaldoot target customers segments that are rural users at BoP (Bottom of pyramid) and the LISDISC (Low Income and Socially disadvantaged Community), resulting in:

- The community now getting safe & clean drinking water at their door-steps, with especially women are saving at least 1 to 3 hours per day which was spent in fetching water wherein such time saved can be better utilized for other productive work and can generate additional source of income to family.
- Families are saving @ Rs. 1500 to 2000/ annum on medicinal expenses as a result of reduced expenses on health issues whereby also improving human productivity
- It is recognized as an Inclusive model for Lower Income Groups and LISDISC
- An innovative model where Users can get drinking water anytime (24x7), without any operator dependency

### Towards Employment as Service Provider

‘Jaldoot’ as a Social Entrepreneurship model generates local opportunity of employment as Entrepreneurs, operators, drivers and support staff.

- Promotes rural women to become an Entrepreneur and generate local employment, can earn Rs.10000 to 15000/month as regular income.
- Promotes rural women to work as driver and operator, can earn Rs. 5000 to 6000 as regular income.

- Improves financial status of people at local level without rushing to urban and semi urban areas in search of job/livelihood
- Provides social recognition in community and encourages others for involvement.
- Provides additional source of income by adding other daily essential consumer products at affordable price.
- Also Reduces Health burden on Government bodies as well as improves social equity

### Potential to Scale

Since low-access to safe drinking water is a wide-spread issue in India, ‘Jaldoot’ has a good potential for scaling up in Maharashtra as well as in other states in India.

- Jaldoot is currently planning to scale its project activities in rural Maharashtra in next three to four years with atleast 200 to 300 units operating in rural and small town areas.
- With 200 units in action it has potential to generate @2000 new rural & local employments in the form of Entrepreneurs, operators, drivers, support service providers etc.
- Have plan to expand its reach in other affected states like Bihar, Rajasthan, Orissa, Karnataka, Uttar Pradesh, Andhra Pradesh, Jammu & Kashmir etc.
- Is actively looking for partnerships and alliances with Government, Private, NGO, International agencies , Individuals for expanding social, health and economic impact of Jaldoot Project.



## Low cost odour trap for waterless urinals

**Organisation:** Ekam Eco Solutions Pvt. Ltd.

Round 2

### Challenge

Around 1100 Million (= 18 % of world population) people in the world do not have access to safe drinking water

Polluted water is estimated to affect the health of 1.2 billion people worldwide and contributes to the death of 15 million children each year.

1.5 million annual U5 diarrhoeal deaths and of these 16% deaths are attributed to diarrhea. Of these 1.5 million, 80% were under 2 yrs age (WHO 2009). In India alone, total number of annual child deaths approach 400,000. 38 % of global child deaths due to diarrhoea take place in India. One of the major reasons for this situation is unsafe & unscientific sanitation practices. The issue is not only about child mortality but about rampant contamination of water bodies & ground water resulting in high concentration of disease causing pathogens in drinking water.

### Impact

One water flushing urinal wastes around 50,000 to 1,50,000 ltrs of water each year for flushing which if avoided, can result in millions of ltrs of water saving and subsequently give access to safe drinking water to millions of people. Also the pure urine recovered, can be utilized for farming and N,P,K salts can be recovered using a separate reactor.

### The Solution

Waterless Urinals do not require water for flushing and can be promoted at homes, institutions and public places to save water, energy and to harvest urine as a resource. Reduction in infrastructure required for water supply and waste water treatment is also a spinoff arising from installing waterless urinals. The concept, founded on the principles of ecological sanitation helps in preventing environmental damage caused by conventional flush sanitation systems.

The technology Zerodor – Waterless Urinal, does not uses any chemical or any consumable and is a onetime fitment which can be retrofitted in to the existing urinals and does not demand the change of Urinal Pans.

Normally, in a water flushing urinal, the water and urine are mixed together and is being drained through the drain pipe into the main sewer line and it ultimately lands up into the water bodies.

This is a very low cost technology with no recurring costs involved which aims to reach the Urban, Peri- Urban and Rural areas. This technology not only saves water but, opens possibility of harvesting urine and extracting the nutrient present in the urine.

### Potential to Scale/ Global Transfer

Ekam Eco Solutions aims to install 100 K Waterless Urinals which can save upto 15 bn ltrs in a year.







**Awardee Portfolio: Others**

## Wireless communication infrastructure for rural settings

**Organisation:** Kritsnam Technologies (P) Ltd

*Round 4*

### Challenge

Progress in the domains of smart agriculture and water resource management in rural areas as initiated by public/private sectors is presently being limited by the lack of basic monitoring and automation tools. This is due to the high cost and high power requirements associated with the popular GSM/GPRS based communication solutions. Additionally the task of setting up a communication infrastructure in rural landscape is especially onerous considering challenges like sparse cellular coverage, no power supply, lack of security and harsh weather conditions.

### Solution

Globally the field of IoT has taken-off in the last decade with advancements in wireless hardware technology and networking but its applications were strictly confined to developed areas. The cost-effectiveness, range, bandwidth and power efficiency of wireless communication is improving day-by-day, opening up opportunities in rural landscape for technologically innovative applications like smart villages, smart irrigation, smart energy grids and hydrological research. Although, there are similar existing solutions worldwide that are targeted towards smart cities and home automation, their product has been specifically designed from the ground up to operate in rural Indian conditions and facilitate the development of indigenous applications for rural upliftment. It functions in the thin 2MHz delicensed ISM radio band and has minimal datatransmission costs. The power efficiency facilitates miniaturised form-factor, which ultimately enhances the physical security and makes it less vulnerable to human and environmental interferences. The proposed device has a field life of over 5 years and a range of over 10 Kms, making it a practical solution for unattended monitoring for long durations in remote areas.

### Impact

The establishment of low-cost long-range RF based wireless communication infrastructure in rural landscape will empower its people and policy-makers with smart agriculture and water resource management practices. This also enables the developers in agricultural

automation and researchers in hydrology with seamless data monitoring and control tools.

Within the time-frame of MA grant, they will address the water-distribution problems identified in the pilot area, which coincides with the hydrological experimental area being setup by IIT Kanpur. The continuous data collection using the sensor network on irrigation channels and agricultural lands will be used for obtaining optimal water routing system. The data will be provided to research institutes and relevant government agencies for further analysis and action. In the long run, the same methodology can be applied for various problems, the starting point of the solution to which lies in the ability to collect data from field and deploy an interconnected network of smart instruments. The project targets rural population in India comprising mainly of agricultural households. Although the proposed wireless communication infrastructure has applications in several domains, this project focuses on addressing water-related problems. Thus, the primary beneficiaries of this project are low-income farmers who are affected by water scarcity and water logging problems.

When the project reaches a nation-wide scale, it can serve as a backbone for various monitoring tasks. The data collected will empower government agencies to make informed decisions for efficient execution of policies aimed at public welfare. Additionally, other innovators like previous MA grant awardees in the field of smart irrigation and energy grids can use this infrastructure for cost-effective implementation of their services.

### Potential to Scale

While their focus application area is in water resources, the growth model relies on making the wireless sensor nodes and communication gateways as generic as possible for wide number of applications. The network established for hydrological monitoring and smart agriculture in rural landscape can be utilized by other technology innovators requiring low-cost and reliable wireless communication. Additionally, variants of the same technology stack will be released for other geographical areas across the globe with different ISM radio band regulations. Cisco estimated that by 2020 over 50 billion IoT devices will be connected to Internet for a number of applications.



# Entrepreneurship program for youth: Self-employment opportunities for marginalized youth in semi-urban and rural areas

**Organisation:** Magic Bus

Round 4

## Challenge

Youth and Employment - Key Challenges in rural and semi-urban areas:

A recent report from the United Nations Development Program (UNDP) states that India faces a serious challenge of finding jobs for a growing youth population for the next 35 years as job creation has not kept pace with the number of people entering the labor market every year. In addition, the majority of Indian youth are unskilled making it difficult for them to get and retain employment.

In semi-urban and rural areas sustainable employment opportunities are further constrained due to lack of employers (factories, retail sector etc.), declining opportunities in farm-based employment, reluctance to migrate, and difficulty in commuting for work.

Rural India still accounts for 80 per cent of the poor in India (World Bank). It is essential to address the aspirations of the growing population of rural and semi-urban youth and provide them with sustainable employment opportunities in their communities. However, there are significant gaps for skilling opportunities in these areas. According to a UN-HABITAT and IRIS Knowledge Foundation report, a person in an urban area has a 93 per cent greater chance of acquiring training than someone in a rural area.

Innovative solutions are needed to address unemployment among rural youth and to provide a direction to their aspirations. Given the constraints in wage employment and the scale of the problem, there is a need to shift emphasis from jobs alone and encourage self-employment through micro and small business ventures. This would help to support the local economy, generate additional employment as these enterprises establish and grow, and keep youth in their communities.

## Solution

Magic Bus Entrepreneurship Program for Youth - Addressing the employment challenge and the skills gap

among Indian youth in rural and semi-urban areas through self employment.

The Entrepreneurship Program is a part of their Livelihoods Initiative and addresses the critical need for youth employment in rural and semi-urban areas in 11 states of India. It offers training, mentorship, linkages to finance and other important entrepreneurship resources to selected youth for establishing micro/small businesses in their communities. The Program falls within the GOI's National Skill Development Mission to create convergence across sectors and States in terms of skill training, setting standards for skilling in the country, and achieving scale.

Through the proposed grant, Magic Bus would scale the program from pilot stage that provided 40 youth with entrepreneurship training and support to training 525 youth in general employability skills and selecting 105 entrepreneurs from this pool to set up micro/small businesses. These 105 entrepreneurs would receive, training, resources and mentoring to help identify, plan and launch business as well as grow it. Each entrepreneur would, in year 2, hire a local youth and thus provide employment/mentoring to an additional 105 youth in the area.

## Innovation and "Big Solution" Approach

The Entrepreneurship Program for Youth offers a process innovation that is replicable, scalable and sustainable thus serving as a model for other initiatives in the nationally critical area of youth employment. The three innovative characteristics of this approach are:

1. Education to Livelihoods: Magic Bus starts to work with adolescents from marginalized communities at the age of 12 providing them with the essential building blocks of learning, leadership, gender equality and the skills that facilitate their growth into young adults with greater control and choice. They use a Sports for Development model to achieve a range of social and personal outcomes and address gender as a cross-cutting issue (both boys and girls)

are a part of their gender sensitization modules). As program participants approach late adolescence, they are able to participate in their Livelihoods Program for career guidance and counselling, training and employment/entrepreneurship support. They currently serve more than 400,000 children and they expect the majority of them to access their Livelihoods Initiative as they transition into working life in the coming years.

2. Youth Centric: The proposed program is youth centric and has been designed keeping in mind the specific constraints faced by youth in rural and semi-urban areas and the aspirations they have as part of the emerging India story. They have a detailed process to understand the interests and capabilities of every individual and nurture their entrepreneurial skills. They provide participants with the guidance and training to understand the resources and skill set required to establish and grow a micro/small business. In addition to entrepreneurship training and assistance in planning and launching enterprise, they also provide business exposure and a mentor so that participants are well prepared for challenges ahead.

The program presents an exciting new way of working with youth to achieve sustained employment through local entrepreneurship. It also addresses critical gaps in the current employability programs in India as most do not take into account individual needs and capabilities which lead to high dropout rates.

3. Collaboration-based Ecosystem: The unprecedented scale of the Indian youth population and the need to provide them with sustainable employment requires leveraging strengths across organizations and sectors to achieve impact. Their Livelihoods Initiative model has been able to aggregate financial, technical, training and other resources to drive growth and achieve impact. They are using the same approach for the Entrepreneurship Program through partnerships with private, non-profit and technical agencies. Magic Bus serves as an enabler, delivering an innovative and integrated program to support semi-urban and rural livelihoods through self-employment.

### Impact

The main impact of the project would be to provide BOP youth in semi-urban and rural areas with the road map to visualize, start and grow a business enterprise that provides them with a sustainable income, impacts their family and serves local needs through their enterprise.

The longer term impact would include contribution to the local economy and generation of additional employment through their ventures. These young people would serve as role models in their community and be mentors for other young people.

#### Number of BOP Youth impacted

Youth receiving general employability training	525
Youth receiving ILO certified entrepreneurship training and support to launch business	105
Additional youth employed by new business in year 2	105
Families members impacted indirectly	900 appx.
Magic Bus staff trained in entrepreneurship curriculum	10
At least 30% of all youth impacted would be girls/women	

## Potential to Scale

Magic Bus has consistently demonstrated its ability to deliver high quality programs at scale. They currently work in 22 States and 58 Districts in India and have an outreach of 420,000 children with the support of 9,000 Community Youth Leaders. Approximately half of all those they serve are girls.

Magic Bus started the Livelihoods Initiative in 2015. Since then, they have set up 33 learning centers across India since then through partnerships with Barclays Bank, Bloomberg, Bank of America, Mondelez, Tata Motors, JP Morgan and others. Till now, they have served 4,569 youth. Their goal is to reach 10,000 youth by the end of 2017.

Magic Bus strongly believes that to address the challenges in communities as diverse as those in India, they need to create models that can be scaled up easily. Their Entrepreneurship Program innovation has completed its pilot stage and achieved the following:

1. During the pilot stage, qualified staff was hired/trained (counsellors, trainers, language and computer instructors). Quality assurance, M & E and other processes were put into place.
  2. Quality curriculum has been developed by technical partners including NIIT and Callysto InfoTech.
  3. For entrepreneurship training, they have identified and are using internationally recognized, ILO certified curriculum with Development Alternatives as their partner.
  4. Strategic partnerships with funders, vocational skill providers, capacity building organizations, sector specialists, employers and businesses are in place.
5. Magic Bus outreach and presence in 4,000 communities across India and their work with 420,000 children and youth provides a strong pipeline for identifying youth entrepreneurs in the coming years.

Due to lack of opportunities and a reluctance in migrating/commuting to work, there is a clear need for self-employment in semi-urban and rural areas. Support from the Millennium Alliance would provide the following benefits for scaling up:

1. Financial support for the next stage.
2. The grant would help to train Magic Bus staff in ILO certified curriculum for entrepreneurship and this would provide a crucial resource as they scale up further in the next 2-3 years.
3. The grant would help them to leverage additional resources from private sector partners including:
  - a. Banks with a mandate to support BOP entrepreneurs (Direct loans from banks). (Approximately 25%)
  - b. First time individual venture capitalists wanting to invest in small and micro businesses (Equity and Debt). (Approximately 25%)
  - c. Institutional funders like IIM-Centre for Innovation, Incubation & Entrepreneurship (CIIE) - IIMA ( Grant/ Investment/Shareholding Equity). (Approximately 25%)
  - d. CSR funding for small/micro businesses (Grants) (Approximately 25%)
4. Networking opportunities, knowledge exchange and a supportive platform for their work in livelihoods and entrepreneurship.

## Dhakka brake: A regenerative brake device to store the momentum needed for pushing the brake

**Organisation:** Individual

Round 4

### Challenge

Highly strenuous to paddle a cycle rickshaw

### Solution

A regenerative brake device for storage of momentum when brakes are applied. As the brakes are released, this device provides the necessary highly strenuous initial force to restart the vehicle

### Impact

This device will have an impact on more than 1 crore cycle rickshaw paddlers ( and their families) in the country

### Potential to Scale

This device has an addressable market of more than Rs. 300 crores just in India. This device has a market worldwide in more than 20 countries.



# Financial deepening and economic inclusion @ tapping the unbanked billions

**Organisation:** FIA Technology Services Private Ltd.

*Round 2*

FIA is a services company founded by a team of students from MIT to provide inclusion services in underserved geo-settings.

## Company Highlights

- Full spectrum of Services - Banking, Asset protection and diversification products
- Clients - 19Banks, 1 Life Insurance, 7 telcos and 9 utility providers in India
- Operating in 25 states servicing 20,000 villages and suburban pockets in India

## Awards

- o Winner, India Development Marketplace, grant by World Bank 2014
- o DST-Lockheed Martin Gold Medal for Top 30 Innovations, India 2012
- o Runners-up, Emerging markets, MIT \$100K Entrepreneurship contest, 2011

## Innovation

Their comprehensive mobility-based financial inclusion software has been deployed in leading banks in India. One component of the financial inclusion software, which has seen rapid adoption and growth, is the domestic remittance solution. It is designed to meet the remittance needs of migrant laborers in cities, who can send money instantly to accounts maintained in 68 banks anywhere in the country. They are currently offering this service in 150 cities, covering all states including the DMIC (Delhi-Mumbai Industrial Corridor) and other major industrial corridors.



# Low cost technology to distribute financial services across the country

**Organisation:** Eko India Financial Services Private Limited

*Round 2*

## Problem

In India itself, more than 40% households do not avail banking services. The lack of availability is visible in a simple ratio that RBI tracks; In India, a single bank branch caters to a population of 12,500 as compared to 1000 in some European countries like Spain.

Despite the support from the regulators and permitting intermediaries, Business Correspondents, to provide financial services outside of a typical Bank branch, there has been limited success. Small islands of financial inclusion have emerged, not able to inter-operate.

One of the major limitation of this model is that it has not been able to include relevant last mile partners like MFIs (Micro-finance Institutions), NGOs, NBFCs (Non-Banking Financial Company), etc., particularly in rural areas, that already offer financial services to a significant mass of unbanked customers.

## Solution

Eko intends to extend its technology platform "Connect" to MFIs and other financial intermediaries, through an on-the-cloud platform such that the capital expenditure for these organizations to plug into the platform is minimal.

The inter-operability in the network will ensure customers, agents and entities are able to benefit from the growing network with access to more customers, agents and as well as products and services without geographical and regional limitation.

Eko believes that this will strengthen the financial inclusion initiative and will allow the institutions to offer a more inclusive offering to the customers in both urban and rural geographies with agility.

Using "Connect", MFIs, NGOs and other financial intermediaries will be able to access the platform with the following features and advantages:

1. Minimal capital cost, pay on per-use basis.
2. Offer products offered by Eko partners on the network like – Savings/ RD/ FD accounts, remittances

3. with interoperability across all network agents and customers
4. Real-time transactions on the platform
5. Extra income on account of new products and a better offering for the customer

## Impact

Customers in the BoP segment will be empowered through a direct as well as a mediated access to financial services.

Customers would be in control of their accounts and transactions using their mobile phones. This will enable them to save, spend and send electronically and securely.

Inducing savings behavior, especially while empowering the women in the family would have a strong positive effect by providing an additional source of funds for the families to bank upon in times of emergency and for special needs.

## Potential to scale

The problem of lack of banking infrastructure persists in other parts of the world as well. These problems are more prevalent across Africa and South-East Asia. Eko's solution can be easily customized to the needs in Africa & South-East Asia

## Impact till date

Number of local mom-and-pop shops working as banking agent	1,300
Number of feet-onstreet agents working as banking agent	1,500
Accounts opened	4.5 Lakhs
Value of transactions processed	4,000 Crore
Banking partners	SBI, ICICI Bank, Yes Bank & IndusInd Bank
Number of customers	40 Lakhs



# Round 1 Awardees

## HaldiTech: A high-tech turmeric processing unit

**Organisation:** Science for Society

Round 1

### Challenge

Turmeric originates from South or Southeast Asia, from western India. India is a leading producer (90%) and exporter of turmeric in the world. The primary processing is carried out with traditional methods which implicates a number of hygienic problems which can pose tremendous risks for farmers, producers and consumers. Furthermore, turmeric quality may also be adversely affected. No alternate solutions are available in the market, only traditional method is practiced. Traditional method of turmeric processing is very laborious and requires 30 days at the cost of Rs. 30,000 for 10,000kg (produce of 1 acre). HaldiTech technology developed by Science for Society (S4S) requires 1 day for the same quantity at the cost of Rs. 15,000 with the minimum handling of labours. HaldiTech suggests organized and compressed supply chain, proposing value at each stage

### Impact

HaldiTech targets Rs. 15 billion annual market of turmeric processing. With this technology they will provide one point turmeric processing service to farmers. Farmers can bring their raw material to processing unit in their region and process 10,000kg of raw turmeric to till its powder in only 1 day.

For this service they will charge Rs 15,000 which is 50% less compared to traditional method. Apart from this, HaldiTech retains 45% more curcumin (key ingredient that adds colour and medicinal value to turmeric) than traditional process. Currently technology is running successfully with 1000kg/day capacity.



### Value proposition

For Farmers:

- One point processing unit
- 1 month time saving and 37% rise in profit
- Early arrival of product with better market price

For Processor:

- Better ROI than traditional process
- Minimal handling and labour
- A scalable business model, opportunity to be a trader

For Trader and Company:

- Hygienic and better quality product
- High curcumin content (50% more): A niche for market

For Consumers

- High curcumin: Better health
- Lower price

### The Solution

HaldiTech is a unique system which requires very less electricity or can run on small generators where washing, cleaning, peeling, drying and pulverization took place in a single system and farmer will get turmeric powder from fresh turmeric rhizomes in a day. Halditech requires very less maintenance and two unskilled people can operate a whole system.

### Potential to Scale / Global Transfer

HaldiTech will replace traditionally done open sun drying by men and women in farms for 25-30 days. It will also save the biomass used for boiling and pollution created in traditional process. Halditech can be scaled to any quantity as required.

## On demand electricity generation using waste heat generated during cooking for rural households using thermoelectric generators

**Organisation:** Greenway Grameen Infra

*Round 1*

### Project Description

To cater to the need for 'energy on demand' and clean cooking, Greenway has developed two distinct solutions based on low cost thermoelectric modules that generate electricity from widely used biomass stoves during cooking. These generators have been integrated into the following two products- Greenway Magic (GrM) – a thermoelectric power generation device that uses any heat source to generate electricity and is optimized for biomass based cooking. Greenway Power Stove (GrPS) - a clean biomass cookstove that employs thermoelectrics to power a fan to provide cleaner combustion for healthier cooking and excess electricity for household needs.

The project aims to prototype 20 units of each product and user trials across 6 -8 geographies. It also involves components on value engineering for the two products, as well as manufacturing & test marketing 1000 units of each product.

### About the Organization

Greenway Grameen Infra (GGI) is a collaborative effort between enterprising individuals, institutions and NGOs to create and satisfy rural markets and infrastructure needs in a sustainable manner. GGI aims to develop and deploy technological solutions that create value for society at large.

More on Greenway Grameen Infra:  
<http://greenwaygrameen.com/>

# CLT e-Patashale: Low cost innovative e-content for STEM K-12

**Organisation:** CLT India

*Round 1*

## Challenges

Education is the single most important factor to address socio-economic problems. Even though India has achieved almost 100 percent access to school for its children at the primary level, it still has a high 40 per cent drop-out rate at the elementary level, getting more dismal as they come to the last year of High-school. That being so, to bring a focus on STEM education for children in rural government schools is highly challenging and children miss out on the learning opportunities for STEM education and career opportunities. One of the main reasons is due to the shortage of teachers that have subject expertise in Science, Mathematics, Technology and English in rural schools. This apart, with limited learning resources both at school and at home, kids lag behind their expected learning curve by many years, till it becomes too difficult to catch up in higher grades, thus leading to dropping out of schools.

## Development Innovation/Solution

Create a world of opportunities for quality education for every child anywhere by bringing together pedagogy experts and resource people with expertise in STEM to design and develop curriculum-aligned low-cost, localized digital courseware for K-12. CLTe-Patashale is both a product and service for- practitioners and learners- providing resources for teachers' mediation in remote schools. Good pedagogy and innovative methodologies and engaging learning resources are transferred to remote schools in DVDs, android mini-PCs and low-cost Tablets. It can facilitate teacher-mediation, self-learning and collaborative learning. The content is in different formats to give flexibility to the needs of each classroom. Ex.: Flash slides without voice-over, short videos with voice-over and e-books. It can be accessible in non-connectivity environment and online environment as course-ware videos and e-books.

## Impact

High-caliber teachers are still essential to good instruction and remain core to our approach.

Nevertheless, by using digital technology for its strengths in replication and scaling and reach, CLT e-Patashale is able to provide a cost-effective model of high-quality instruction, with a special focus on Mathematics and Science with live experiments and activity-based demonstrations with step-by-step constructivist approach. This brings about a new shift in the way teachers and children transact in classrooms, with engagement rather than teacher delivery, leading to better learning outcomes. Preliminary evaluations show gains in learning and changes in improved teaching style among local teachers. They have licensed their content at very low-cost to other Technology partners, NGOs and government schools and within a year, they are in more than 1,200 rural classrooms with close to 150,000 children.

## Potential to Scale / Global Transfer

CLTe-Patashale content is modular and designed to be replicated easily. The Master content modules are in English and in their R & D center they have a complete eco-system for replication and up gradation. They have started the replication to regional languages. Kannada (Karnataka State) is almost complete and Hindi has begun. They are able to scale their program if they have support to replicate content into other State languages, like Marathi, Bengali, Oriya and other South Indian language. One partner was interested in replication of their content to Chilean schools, while another one showed interest for Cambodia. In the next 3 years, they aim to increase their reach by ten-fold for the schools and by manifold to students and parents on Mobile phones. Their solutions are for base of the pyramid population and hence their content delivery is based on low-cost solutions - A television / screen and an Android mini PC (\$100) can enable a poor school across the globe to set up an e-learning classroom with high-quality content. Other schools in developing countries with similar challenges of recruiting high-quality teachers in remote areas should be able to access quality courseware on cloud or low-cost Tablets.





## I Love Reading (ILR)

**Organisation:** Katha

Round 1

### Challenge

The 2013 Annual Status of Education Report (ASER), states that over 96% of children in the age group 6–14 years are enrolled in school. However, 47% of children in Standard V still cannot read a Standard II level text and 40% of children in Standard III cannot read a Standard I level text. What worries most educators and teachers is the fact that many children do not attend class regularly. And those who do are not learning enough. “Reading is the foundation for all other learning activities in the classroom. Children who do not learn to read in primary grades are less likely to perform well in higher grades, limiting their future economic and development opportunities.” - The Abdul Lateef Poverty Lab, Massachusetts Institute of Technology

### Impact

In Delhi, over the course of the 5 year MOU they have with government till 2017, they expect to cumulatively reach approximately 300,000 children (direct beneficiaries) across 500 MCD primary schools and 500 slum communities. They estimate this based on their previous experience of being able to reaching about 600 children per slum community.

Every year during the 2-year intervention, ILR directly benefits an estimated 160,000 children (45,000 of whom are students enrolled in MCD primary schools), 20,000 women and 1,000 teachers. Indirectly, approximately 500,000 family members, parents or siblings of the children benefit from the intervention.

### The Solution

I Love Reading! (ILR) is an innovative reading and school transformation program that Katha currently runs in Delhi’s municipal government primary schools and surrounding slum communities. ILR is based on Katha’s proven education and teacher training methods that Katha has developed, tested and refined over the last 25 years. ILR is a holistic model that engages all key stakeholders by:



- Helping children improve their reading skills, in school and in slum communities using stories that provide a culturally rich environment;
- Training teachers to use Katha’s Story Pedagogy to engage children in learning, manage large class sizes, develop interesting curriculum, and linking learning to community issues to ensure education is relevant
- Creating forums for school principals to share best practices
- Empowering parents to take action on community issues such as access to safe drinking water, sanitation and healthcare to remove obstacles to regular school attendance; and
- Engaging government to give Katha access to schools and demonstrate the model’s successes.

### POTENTIAL TO SCALE / GLOBAL TRANSFER

ILR is currently being scaled-up and holds significant potential for widespread adoption within the next few years. Katha aims to achieve this by on one hand partnering with other NGOs to run ILR and, on the other hand, partnering with state governments for access to their primary schools.

## Technology based solution, with a strong educational core, in improving reading levels of primary schools students in Hindi language in India

**Organisation:** Education Initiatives

Round 1

### Innovation

Technology based solution, with a strong educational core, in improving reading levels of primary schools students in Hindi Language in India

### Challenge

The solution directly addresses the problem of reading and language acquisition difficulties in India and thereby also addressing the problem of early drop-outs from the schools to some extent. Since a technology platform is used, this solution also becomes a strong tool for teacher capacity building by using data driven insights from the students.

### The Solution

Mindspark Bhasha is a teacher-supporting but non-teacher-dependent, personalized, engaging and scalable computer-based audio-visual solution for developing language reading skills among students. It is an internet based adaptive learning program that helps students learn at their own pace. The complexities of the process of student learning are such that one has to rely on computer technology if one really wants every student to learn with understanding. This ensures consistency in providing high quality instruction and learning tailored to the needs of each student. Students are able to sufficiently practice problems that interest, excite and challenge them thereby causing long term retention of the knowledge.

Mindspark complements what the teacher is teaching in the class and closes the shortcoming of a teacher to provide individual attention because of the large class size. Mindspark believes that students learn when they have to think – either to answer a question, or do an activity on the computer and hence provides interesting problems for students to practice that is aimed at their current level of understanding.

### Impact

The pilot directly impacts around 500 students and 15 teachers from classes 2 to 6 in the implemented school.

The technology based reading pilot saw a 9 to 10 percentage point improvement in Hindi learning levels over a 4 month period of intervention, with a significant effect size ranging from 0.48 to 0.69. Students are showing visible improvement in reading skills and

vocabulary. Teachers have pointed out examples of students whose language skills are strengthened post Mindspark sessions. Students are feeling more confident about their reading and language skills.

### Potential To Scale / Global Transfer

The delivery/implementation of the reading solution can be immediately scaled across multiple Hindi speaking states in order to reach out to students in rural areas as well as urban. (30% of the 1.2 billion strong Indian population speak Hindi). More language modules can be developed for further scale up.

### Partners / Resources Used

Support from The Department of Education, Delhi for rolling out the programme in one govt. school in Shaktinagar, New Delhi.



## Mobile-technology driven family planning model: An ecosystem to achieve high contraceptive prevalence rates among rural and tribal communities – Project Vikalp (“Options”)

**Organisation:** U-Respect Foundation

Round 1

U-Respect Foundation is an evidence-based, not-for-profit organization working in the areas of health, education, water and sanitation in rural/tribal areas and urban slums, reaching out to the BoP population. Headquartered in Mumbai, U-Respect is currently implementing a Millennium Alliance (MA) supported project (Project Vikalp) in the tribal block of Shahapur, Thane district as one of the nine awardees of the prestigious first round MA innovation grants. MA is a consortium of USAID, FICCI and Department of Science and Technology, GOI.

### Challenge/problem being addressed

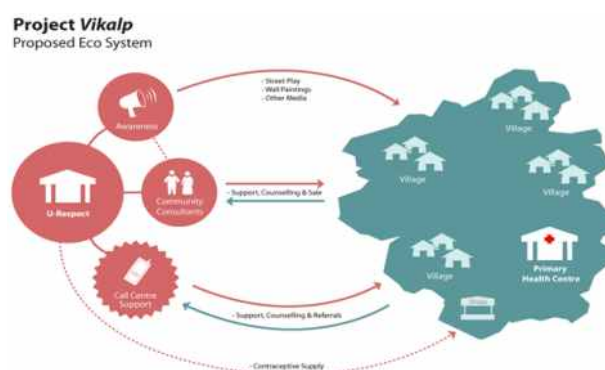
With the world's second largest, 1.2 billion population, India has the oldest family planning program; its contraceptive prevalence rate (CPR) today is around 56%, of which 38% are sterilisation users, mainly female sterilisation (male sterilisation is to the extent of 1%)(NFHS, 2005). Over the last two decades, the government of India has been promoting the use of reversible contraceptives (condoms, oral pills, and intra-uterine devices (IUDs)). However, the prevalence of reversible methods is still very low in India (all reversible contraceptives together constitute only about 10% of CPR). Couples are still hesitant to talk about contraceptives or purchase a pack of condoms or a strip of oral contraceptive pills. Women still face many barriers to contraceptive access and use and male involvement in family planning is still not evident. The situation is worse among tribal population living in remote areas. In their intervention area, the unmet need for family planning is as high as 25%, necessitating an innovative and effective intervention.

### Solution

The innovation is based on a triangulation methodology – services through a toll-free helpline (information, counseling and linkages to services), products (contraceptives) in place, and the use of local health care providers/on-field community consultants effectively for support functions.

Mobile phones are increasingly affordable and accessible even among the poorest and youth. They hence believe that mobile technology needs to be leveraged to achieve better healthcare, specifically family planning and reproductive health services in this case. The project therefore works towards achieving the following objectives -

- To implement a system based on widespread mobile phone use, and link it up with a toll-free number to provide rural/tribal couples, both men and women, as well as young unmarried people access to information and linkages to easily accessible service providers with total confidentiality (for relevant information pertaining to sexual and reproductive health, including family planning)
- To link communities to a network of health providers, both government and private, to render sexual and reproductive health services to communities
- To ensure easy access, availability and affordability of a range of temporary contraceptives, mainly condoms and oral pills
- To implement relevant Information, Education and Communication (IEC) activities in rural areas and normalise discussion on family planning in the community
- To monitor the contraceptive usage in the area and analyse the data by types of method used



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## Impact

- Fully functional toll free mobile-based call centre providing 24x7 sexual and reproductive health and family planning counseling, and linking communities to available services as mapped out initially. In 13 months since project launch, a total of 2,580 calls have been recorded in the call centre
- Over seventy percent callers to the toll free call centre are male. Since most of the health functionaries target women for sexual and reproductive health services, men see the call centre as an excellent platform to resolve their sexual health concerns and get directed to relevant services
- Total no. of new rural contraceptive outlets created - mainly non-traditional outlets: 204 (out of 391 mapped outlets)
- The project has been able to reach over half the targeted population (150,000 people) through various mid-media and IPCs over 13 months, as well as through the mobile technology, that has proven to be very successful
- A steady increase in the number of men buying a condom (a shift from the free distribution from government centres), as well as women buying oral contraceptive pills through newly opened outlets (both traditional and non-traditional outlets)
- Direct sales through U-Respect community consultants in 13 months: condoms: 2452 pieces,

oral pills: 310 cycles, besides sales from non-traditional and traditional outlets

- A contraceptive prevalence rate increase of 2 to 4 % at the end of three years of the project cycle is envisaged, mainly through increased acceptance and use of reversible contraceptive methods. Increased reach and enhanced quality of services is also evidenced through stringent project monitoring and evaluation
- Monthly call centre recordings available for on-going quality check on the counseling being given over the phone line

## Potential to scale/global transfer

The current innovative model will show greater impact if taken to scale. Since the toll free call centre is already set up and operational, the model is easily scalable in states within India. Their simple innovation using mobile technology to reach out to masses for family planning and reproductive health services, supported by a limited IEC (Information, Education and Communication) campaign, can easily be implemented in any country where wide-spread and reliable mobile connectivity is in place. This can be implemented along with partners operating in similar functional areas in those countries. The objective of their intervention is "Full Access, Full Choice". Their model has enormous benefits for the target audience and therefore their focus is on leveraging the benefit of this model for the betterment of larger numbers of BoP populations across countries.



## MIRA: Mobile channel on Rmnch+A for rural women

**Organisation:** ZMQ Development

Round 1

### Challenges

Like any under-developed and developing country, India also has a high maternal mortality rate of 212/100,000 live births and infant mortality rate of 52/1,000 live births. Also, 51.1% of women opt for traditional method of home-based delivery and only 48.8% of births are assisted by skilled health workers in India, which puts both mother and child health in high risk. MIRA or Women Mobile Lifeline Channel is an integrated mobile phone channel which provides total communication, information, management and service delivery for Maternal and Child health in the rural India. The project won the Millennium Alliance award in 2013.

### Impact

MIRA is operational in Haryana and Rajasthan. In Mewat district (Haryana), MIRA has been rolled out with 6 SHG Federations with 130,000 women. MIRA is also distributed through telcos, OEMs, re-charge kiosks and CR stations. Set of MIRA workers are working in 43 villages covering almost 47,000 people. In the area of intervention, there has been an increase in ANC visits by 73%, institutional deliveries increased by 63% and immunization rates by 87%. MIRA PHC connect model is piloted in Haryana state and is being scaled to 180 ASHAs and 25 ANMs. Prompt action has been taken by ANMs in 84% of the HRP tickets raised by ASHAs. Live data produced by the platform enables the state to take timely action.

### The Solution

MIRA is an integrated mobile phone channel which provides health communication and information tools to rural women through mobile phones in low-resource settings. It has multiple components on issues related to Pre-natal care, Child immunization, Newborn care, Family planning and Adolescent health using RMNCH+A approach. Information is delivered through interactive



tools by creating awareness on critical health issues, building knowledge & timely connecting with the public health services.

MIRA uses iconic language with audio support making it interactive 'Talking toolkit' designed for millions of semi-literate women. In addition, it also has numerous VAS tools like stimulating social mobile games and decision-making stories to motivate communities adopt new behaviors.

- 1) MIRA Individual App is available on mobile phones of individual women for self-management of health. It has multiple registration facility on a single handset which allows group of women sharing a common phone in the communities.
- 2) MIRA Worker Toolkit is used by set of health workers who go from house-to-house to do household registrations, register pregnant women and under 5-year children for RI. MIRA workers deliver weekly iconic information to these communities using mobile.
- 3) MIRA-PHC Connect is a communication and service delivery platform in sync with public health system which connects ASHAs and ANMs and enable them take timely action on high risk pregnancies. The platform generates Live-Data for the state to take decisions.

### Potential to Scale / Global Transfer

MIRA aims to reach to over two million people in next one year. Success of MIRA program in Haryana triggers its adoption in other states in India. MIRA plans to expand in Africa and is presently exploring partnerships.



## Waterlife: Community drinking water system

**Organisation:** Waterlife India

*Round 1*

### Project Description

Waterlife aims to set up community water plants in the most drinking water-scarce areas of Orissa and Jharkhand, in a manner that ensures both the immediate and continuous availability of safe drinking water, and the long-term sustainability of the project. These community water plants shall employ technologies appropriate to the particular location. In case only ground water is available and it is contaminated beyond acceptable limits, an RO (Reverse Osmosis) plant might be required. If chemical contamination is within limits, then simple chlorination or other technologies might suffice. Similarly, these plants will be equipped with solar panels so that they can function even in the absence of grid electricity.

### About the Organization

Waterlife provides customized and specific drinking water solutions by working with communities and local governments. Waterlife provides Community Water Purification Systems that provide relevant purification solutions at a reasonable cost. Waterlife also provides Operation and Maintenance for long term periods & Annual Maintenance Contracts for the Water Systems.

Waterlife brings in the purification technology that is specific to the water contamination in the area it is working in.

More on Waterlife India: <http://www.waterlifeindia.com>

## Rang de: Making microcredit affordable for the poor

**Organisation:** Rang De

*Round 1*

### Challenge

Rang De is trying to address the problem of poverty by focusing on making microcredit affordable for the people who really need it the most. According to a World Bank report, only 35% of Indians (above the age of 15) have a bank account at a formal institution. Despite the Reserve Bank of India making financial inclusion a priority, large sections of the Indian population still do not have access to affordable credit. The poor in India are usually landless (or owners of small tracts of land) who usually have multiple sources of income, depending on what kind of work is available and where. And while the middle and upper classes are courted by banks and credit institutions and given loans at competitive interest rates, the poor often pay anywhere between 60-100% interest rates on their loans. While addressing poverty means more than just providing loans, affordable microcredit can enable families to plan ahead and be prepared for financial or health emergencies that typically prevent families from overcoming poverty.

### Solution

Rang De uses technology and the Internet to crowd source funds from social investors and corporate to provide low cost, collateral free microloans to borrowers across India. The organization uses the term “social investors” to describe individuals who invest funds not with the objective of maximizing their financial return but to create social impact. Their aim is to fight poverty by enabling their borrowers to escape the vicious poverty trap by capitalizing on their own abilities and honing their skills. They try and reach out to first time borrowers (who have never taken a loan from a formal financial institution before).

In order to keep their interest rates low they

- a) use crowd-funding to reduce the cost of capital
- b) partner with local NGOs and MFIs to not only reduce their transactional and operational expenses but also to identify and serve better communities in need. Rang De uses technology, marketing and social media to connect borrowers and social investors. Rang De’s Impact and Finance team identify field partners and work closely with them to ensure timely

disbursements and repayments, proper borrower identification and documentation etc.

### Impact

**Raising Social Investments** One of the most important indicators that Rang De’s impact assessment focuses on is the number of first time borrowers that the organization reaches out to. They define first time borrowers as individuals who haven’t taken a loan from a formal financial institution (banks, MFIs, cooperative banks etc). Another indicator is the increase in productive assets of the borrower’s household. At the same time, they are experimenting with other tools such as Grameen Foundation’s Progress out of Poverty Index to quantify their impact. Data pertaining to borrower’s history (previous loans, assets, household details) are collected by the field partners and submitted to Rang De. Impact assessment is primarily carried out by the Rang De team members through regular field audits. Occasionally Rang De’s social investors also assist in carrying out audits through audio interaction with borrowers or through independent field visits.

Rang De’s social accounts report for the year 2012-13 was also audited by Centre for Social Innovation and Management.

### Potential to Scale

The impact that a not for profit organization like Rang De has is a direct function of the amount of funding it receives and the loan capital it raises.

To scale its operations and impact Rang De aims to create a middle ground which combines the best of both worlds - the doggedness of a mission oriented organization and the focus on metrics and performance of a for-profit social enterprise. With this view, Rang De proposes to raise equity for its Section 25 company, Rang De India Micro Capital Foundation, from social investors who are passionate about maximizing impact in a sustainable fashion. The total amount the company is seeking to raise is Rs 5 crore which represents 10% of its total valuation of 50 crores. The funds raised will be utilized to enhance their technology, marketing and fundraising team, invest in building processes and systems so that they can fulfill their mission to fight poverty in India more effectively.











## MA Partners

Technology Development Board (Department of Science and Technology, GoI)	<a href="http://www.tdb.gov.in">www.tdb.gov.in</a>
United States Agency for International Development (USAID)	<a href="http://www.usaid.gov">www.usaid.gov</a>
Federation of Indian Chambers of Commerce and Industry (FICCI)	<a href="http://www.ficci.com">www.ficci.com</a>
UK's Department for International Development (DFID)	<a href="http://www.gov.uk/government/world/organisations/dfid-india">www.gov.uk/government/world/organisations/dfid-india</a>
ICCO Cooperation	<a href="http://www.iccoindia.org">www.iccoindia.org</a>
ICICI Foundation for Inclusive Growth	<a href="http://www.icicifoundation.org">www.icicifoundation.org</a>
Wadhvani Initiative for Sustainable Health (WISH)	<a href="http://www.wishfoundationindia.org">www.wishfoundationindia.org</a>
World Bank Group	<a href="http://www.worldbank.org">www.worldbank.org</a>
Facebook	<a href="http://www.facebook.com">www.facebook.com</a>

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