THE INTELLECAP LIGHTHOUSE

AN ANTHOLOGY OF IDEAS & INSIGHTS

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Overview

Intellecap has been at the forefront of developing insights and shaping new ideas that have benefited and empowered underserved markets since its inception in 2002.

Along the course of it's journey, the organization has taken bold initiatives to foray into uncharted territory and become a key influencer as part of the social impact discourse.

Intellecap has made concerted efforts through its advisory team to capture the most relevant themes across its key focus sectors, namely Agriculture, Livelihoods, Financial Services, Healthcare and Energy, and distil them into concrete thought pieces that lend credibility and offer definitive solutions across key stakeholder groups.

The Intellecap Lighthouse is a culmination of various perspectives and insights from its thought leaders on topics that demand our attention today, and trends that will capture our imagination in the future.

Be it the Uberization of financial services, approaches for solving healthcare challenges in low resource settings, the potential for Agtech in Southeast Asia, or a Special Series collaboration on India in 2050.

This caravan of articles and ideas is meant to help you gain newer insights from the impact sectors and draw inspiration from the ecosystem we serve. Written by employees both old and new, many of them have been published by reputed print media, and serve as a testimony to its relevance while being engaging in thought and appeal.

You can now download this booklet, available in a simple PDF format, and navigate through its myriad scope of contents. You can also directly go to an article/sector of your choice by clicking on the title in the index page.

We've tried our best to ensure this compilation serves as a useful means of reference and information, and that with time, The Intellecap Lighthouse will be regarded as a critical piece of commentary on the state of affairs in the markets we serve, or aspire to serve.

INDIA IN 2050

India in 2050: Future of Food

by Nisha Dutt and Dipika Prasad

By 2050, India's population will reach 1.7 billion people, creating the most populated country in the world. Food demand will increase by 70%, and is already lagging domestic food production.

Food wars triggered by scarcity and price of food are likely by 2050 unless we change how food is produced, processed, and supplied

Most major wars fought in the last two centuries have been focused on control of precious resources like minerals, oil, and land. This picture has started to shift in the past few years, with armed conflict increasingly focused on control over depleting water resources and by association food. Climate change-linked droughts in Northern Africa and Sahel, and the resulting shortage of food is one of the triggers behind the European refugee crisis. As these populations relocate to other areas, competition for scarce resources intensifies and results in conflict against the "others" – as we have seen in Western Europe. This is by no means an isolated trend, but the beginning of a pattern we can expect to see in India as well. By 2050, the India's population will reach 1.7 billion people, creating the most populated country in the world. Food demand will increase by 70%, and is already lagging domestic food production.

Growing prosperity coupled with changes in food patterns will mean that much of this demand will be for water intensive food commodities such as meat. Output of animal products has already overtaken cereals, and accounts for one-third of all agricultural output. Eventually we will reach a tipping point when the demand for meat can no longer be met without shifting agricultural land towards cultivation for cattle, or importing meat.

Unfortunately, growing prosperity will walk hand-in-hand with growing inequity – leaving those who live on less than $5 a day unable to afford high-protein diets with requisite micronutrients. If agriculture and food production continues its "business as usual trajectory", low income and vulnerable communities will likely only be able to access carbohydrates as staple foods. We are already seeing the impact of carbohydrate-rich foods on these communities in terms of higher prevalence of chronic diseases such as diabetes and hypertension. As diets worsen the prevalence of these diseases will continue to increase, resulting in a vicious cycle which wipes out economic prosperity gains because of increased healthcare expenditure, and in-turn curtails spend on healthier food options. Solutions of the past decade such as high quality inputs and farm mechanization will start to prove insufficient in our quest to feed more and more people healthy diets at affordable prices.

Disruption is imminent in the next decade across value chains and commodities; the future is likely to be one of abundance rather than scarcity

So does this mean the future is bleak? We think not. Human history is a story of triumphs of ingenuity in how food is grown, processed, and distributed. From shifting cultivation, to fixed and specialized farming, to the industrial revolution, and finally the green revolution in India – every few generations we see a leap in technologies that pivot eras of scarcity into eras of abundance. The next pivot is coming, and it is unlike anything we have ever seen before. As exponential technologies such as IoT, machine learning, and robotics commercialize and converge; we will see fundamental shifts in terms of where food is grown, what food is grown, who grows it, and what we expect from it.

WHERE FOOD IS GROWN: Farms of the future will be decentralized, and located in currently unused resources such as oceans and building sides and rooftops

Traditional models of horizontal land farms will soon reach their peaks of efficiency in India despite high quality inputs and mechanization. The growing demand for meat and protein-based food will be a key driver behind this. Further, as population growth continues, farmlands will compete with more economically lucrative uses of land – for industries, housing, and cattle rearing. So what will be do when we run out of arable land? The answer to this problem will likely be found in 3 ways. First, cultivation will increasingly move to the sea. India has a coastline of 7,517 kilometers, which could potentially provide arable surface area of 15 million hectares on the surface of seawater. But experiments have shown that it is possible to grow food crops to a depth of 5 to 8 meters, indicating potential to grow food in layers – and potentially increase the arable surface area by 4-5x. However, given maritime trade considerations and weather, only a portion of this potential can be unlocked. So other alternate resources are required to grow food. The second avenue will be vertical urban farming – growing food on rooftops and sides of massive multistory buildings that dominate city skyscapes in major metros. It is estimated that a city such as Mumbai with a population of 12.5 million could produce enough food for itself by building an infrastructure of 100 vertical farm towers of 30 storeys each. The third land-like resource unlocked for farming will be individual homes. Kitchen gardens are by no means a new concept in India – in fact the authors of this article recall that while growing up, most of the vegetables consumed at home were also grown at home. With growing urbanization, space for these gardens has disappeared, as has the time to look after them. IoT-enabled, fully automated, and self-contained kitchen garden devices can solve this challenge. And as prices of staples such as onions skyrocket every year – market forces are ripe for commercial-scale adoption of these devices. We expect that by 2030-2040s, urban and home-level farming will be the primary source of fresh food – decreasing the need to package, store, and transport food over large distances – and hence decreasing the overall carbon footprint of farming.

WHAT FOOD IS GROWN: Food sources will shift from resource-intensive and slow-growing plants and animals to resource-efficient and rapidly growing microbes

To truly pivot from a future of scarcity to a future of abundance – shifts are needed in what we consider to be a food source. Plants and animals will be replaced by microbes, manipulated and processed into food that imitates plant and animal foodstuffs in flavor and texture, but without being as resource intensive and slow-growing. In fact, this shift is already happening as parts of the developed world adopt meat-like alternates to replace meat. These are grown using plant proteins and algae in industrial and laboratory settings, and taste so much like the originals that consumers cannot tell them apart from real meat and eggs. As the technology is perfected, it is easy to imagine microbes being used as the starting material for any number of foods – from rajma-chawal to butter chicken-naan. In fact, coupled with artificial intelligence like IBM Watson Chef and 3-d food printers, microbes could result in a Star Trek-inspired food replicator by 2050. The affordability and economies of scale possible with microbes could also mean that high-quality and tasty food may be truly democratized for all. In fact, with our changing and largely sedentary lifestyles, many Indians no longer require as many calories per day as we once did. Given this, and the growing trend towards maintaining healthy Body Mass Indices, meal-replacement products such as Soylent could find widespread adoption and further decrease demand for food, as we know it today.

WHO GROWS THE FOOD: Deskilling of food production and processing will once again distribute responsibility for farming across communities

One of the greatest tragedies of modern-day India is the lot dealt out to our farmers. 55% of Indians are employed in agriculture but they create a net contribute of only 16% to the GDP – primarily because most of these farmers are engaged in subsistence agriculture. For the farmers who grow crops for market, value chain inefficiencies and lack of market linkages means that farming is always a net-loss activity – farms invest more effort and cash than they are able to get back by sales of produce. As a result, the number of people engaged in agriculture is declining year-on-year; and will ultimately result in an unbalanced system where a small minority grows food for a large majority. We believe by 2050, this picture will change quite drastically. In the short-term technology and democratization of information will help to upskill farmers and help them grow based on markets needs and climate trends. However in the medium-to-long term, large scale agriculture on land, oceans, and vertical urban farms will become highly mechanized and supervised by technical talent. On the other side of this spectrum, communities and homes will take more accountability for growing their own fresh food.

WHAT WE EXPECT FROM FOOD: Personalized health and wellness outcomes will be increasingly expected from food in addition to nutrition

As we progress from scarcity towards abundance, food will become a basic human right in India much like water and air are. The debate around food inequity will shift from a calorific or micronutrient debate to a quality and function debate. With a shift from plant and animal-sourced nutrients to microbe-sourced nutrients, extreme transparency on the nature of food will become a standard expectation from consumers much like food calorie profiles are today. This is important given that the allergen profile of microbes is only beginning to be understood. For instance, Soylent had to recall of several batches of its products last year after some customers started to fall ill after consuming them. Food transparency has even more complex connotations in India – especially given cultural norms around vegetarianism. While most vegetarians consume microbes with food such as yoghurt, many may not be aware of the exact composition. There are likely

to be questions raised about the faith-based ethics as well as regulatory challenges of classifying foods made of microbes as vegetarian or non-vegetarian.

While on one hand, consumers will expect harm from food to be completely eliminated; on the other hand it might also be possible for food to create positive impact beyond just nutrition. Consider this – Indians living in most urban centers face ubiquitous exposure to risk factors such as air pollution which trigger chronic diseases like diabetes, cardiovascular diseases, and cancers. But what if this ubiquitous exposure to disease triggers could be combated with ubiquitous exposure to risk mitigations through food? After-all most non-communicable diseases develop through metabolic pathways, and could potentially be combated at a deeply personalized level. Imagine that an individual at risk of breast cancer from genetic as well as environmental triggers is able to manage it by simply asking her artificial intelligence-powered food replicator to grow microbial foods that shift her metabolic pathways. In fact, in a truly connected world, her healthcare provider may simply prescribe code that is fed into her kitchen computing system automatically, with always-on body sensors detecting minute changes and continuously reprogramming how food is being grown.

The future of food is coming, but will it be inclusive?

While it might seem like many of these technologies are too far-fetched and futuristic to be true, it is important to remember that the pace of technological advancement we're currently witnessing is unprecedented. 50 years back, Apollo 11 put the first man on moon using its era's most advanced computer navigation system. Today, the phone you're probably reading this on can navigate up to 120,000,000 Apollo 11 rockets simultaneously. The question for those of us working in inclusive development is not whether the future of food will be disrupted by technology. It is how can we ensure that this disruption results in equitable access to good quality food for all, regardless of how much they earn or where they live. To do this, those at the forefront of food innovation must be exposed to real-world problems of the 3 billion low-income and underserved people in emerging markets. The onus is on those of us working to bridge the gap between the private sector and development goals.

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India in 2050: Future of Health

By Chandana Kiran, Nakul Goswami and Saurabh Sinha

Customization in healthcare services will be delivered by 3D printing and fuelled by the insights of the data from the Human OS. Print your organ, print your medicine will drive the future of care.

By 2050, India's population is expected to reach 1.7 billion people, creating the most populated country in the world. Growth of the Indian population and transition of its demography will need for leapfrogging in healthcare delivery including transformation of public healthcare system. Major shifts await healthcare industry in India.

What lies ahead?

India's demographic and epidemiology profile will witness a change by 2050 which will demand healthcare sector needs to evolve. India's population is projected to be 1.7 billion in 2050 with maximum number of people in the working age group of 15 to 64 years and average life expectancy at 80+ years. The old age population is expected to grow to 14% (from 4% at present) with geriatric healthcare specialized services such as dementia, nutritional services and home care services expected to have a larger role. The shift in demographic patterns and lifestyle trends will necessitate preventive healthcare to reduce cost of healthcare spend. Moreover nearly 51% of India's population is expected to live in cities by 2050 (up from 30% in 2015). Increased urbanization may offer some advantages to the healthcare practitioners such as a larger set of population will be accessible for availing healthcare services at relative lower costs.

Trends shaping future health

India is leapfrogging the use of technology innovations such as mobile health devices, technology integration with healthcare data and telemedicine strategies which could reduce the burden from health system while still trying to boost healthier lives, reducing disabilities and increasing life expectancy. This trend will continue to evolve as there will be a shift in population profiles, disease burden and care protocols by 2050 and a future will emerge where chronic diseases are things of the past, patient dependency on public healthcare systems is minimal and more preventive care is sought for, life threatening diseases such as TB, Cancer or AIDS are cured and people lead healthy lives post treatment.

Significant investment in research and development activities both from Indian government and private sector will propel innovations in drugs or improve medical devices. A strong digital infrastructure with IoT integration across personal devices, hospital and public healthcare databases will help spur efficient growth. Healthcare Big-Data will be available as public healthcare systems in India will be digitized and patient data standardized and interoperable. A wide range of medical and healthcare functions, including clinical diagnosis, decision support, disease surveillance, and population health management would be possible through predictive analysis facilitating better preparedness for addressing onset of disease burden.

Healthcare Pillars for India in 2050

The core healthcare pillars in India will transition to a care delivery model which is more personalized and focused on preventive and predictive healthcare rather than the reactive and curative care at present. Health system has started to witness these changes and the future medical technology is immanent with hope. We are witnessing advancement of emerging technologies like brain-computer interfaces, nano robots, gene manipulation, robotic surgery, synthetic organs, organ cloning, individualized

drugs, bionic body parts across the developed world. Many of these technology innovations are here to stay and will be adapted in India in near future. A more equitable healthcare care delivery system will be established making it faster, cheaper and better for all income levels to access these services.

Devices transformation

Explosive growth in mobile devices and rising internet penetration will drive transformation and the healthcare sector will be reap the benefits of a digitally connected India; In 2050 we can expect to see a future of connected devices, wearable both invasive and noninvasive sensors like biomarkers, electronic tattoos, bluetooth-enabled implants, and other sensors that track our vital signs, organ health monitoring that will change the modes of how and when the care is received. These advancements coupled Big Data analytics and AI will improve health and life experiences as part of a Human Operating System (Human OS) a platform for innovation.

Advancements in Drugs

A distinct trend is observed in transformational breakthroughs with personalized, predictive, preventative, and participatory drugs paving way to improve care all at an affordable and manageable cost. Breakthrough in technologies used to discover new drugs, to the processes used to clinically evaluate them will drive the Indian pharmaceuticals industry in the next few decades. Vaccines for major infectious killers in India such as malaria and AIDS will be widely available and distributed, Human genome engineering platform will pave the way for the modification of disease-causing genes in humans, leading to the prevention of ailments translating into actionable guidelines for use of an array of drugs that will lead to widespread use of pre-prescription genotyping. Advancement in proactive medicines that rely of continuous stratification of 'at-risk' individuals will be seen in India, ensuring preventive action even at public healthcare systems. Low cost bio-electronic devices that could be implanted inside the body, will be developed and programmed wirelessly to release doses of drugs at the right time particularly focusing on chronic ailments such as diabetes, cancer, stroke and cardiovascular diseases. Regenerative medicine cuts through the ethics debate by helping everyone gain access to clone-able organs. Nano-bots will be able to assess and fix us from within.

Delivery of care

Availability of medical data from wearable and other sensors will allow the doctors and health center's to interact with the patients universally, diagnose problems and offer personalized services such as customized drugs and device use for the patient and utilize the Human OS. India will be the centre of frugal innovation to develop affordable solutions and products such as wearable organs through 3D printing. Customization in healthcare services will be delivered by 3D printing and fuelled by the insights of the data from the Human OS. Print your organ; print your medicine will drive the future of care. The care delivery will transition from hospital, clinic and doctor centric to self – self-diagnostics, self-monitoring, and self-medication for majority of Indian cities and urban population. The rural parts of India will be well connected digitally and point of service available within home premises for primary and secondary healthcare services.

The wave of future in healthcare innovations across healthcare organizations already are deploying mobile technology, mobile devices, wearable technology, remote monitoring, telemedicine and information sharing platforms all are transforming healthcare to solve some of the problems in the healthcare industry today. And in the foreseeable future, drones, robots and artificial intelligence will breakthrough in healthcare that are performed by humans, to reduce variability, cost and error whilst providing 'quality' healthcare system.

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India in 2050: Future of Work

By Stefanie Bauer and Samruddhi Mulye

Job creation is one of India's biggest development challenges. Unemployment is projected to increase from 17.7 million last year to 17.8 million in 2017 and 18 million next year. The challenge is increasing with one million young Indians entering the labor market every month

Digitization and exponential technologies like the Internet of things, big data, blockchain, artificial intelligence, 3D printing, machine learning, and robotics not only disrupt the ways we design, produce, manage and maintain products and services at a fast pace, but also the way we will work in the future. IBM's Watson technology is already complementing human decision-making in fields such as cancer diagnostics through artificial intelligence. So will Watson and Co replace human labor in 2050? Global thought leaders like Stephen Hawking are warning already that the very technology that has been an enabler for mankind in the past, has the potential to destroy the world, as increasing automation is going to decimate middle class jobs, worsening inequality and risking significant political upheaval.

While emerging technologies bring higher productivity and efficiencies, estimates already suggest that up to 45% of tasks people are paid to do every day could be automated in the future—with big impacts on emerging markets. China is acquiring 160.000 robots this year and a recent report by Citi and the Oxford Martin School shows that the Chinese market has already replaced the US as the largest market for industrial automation. In India, textile giant Raymond is planning to cut about 10,000 jobs in its manufacturing centers in the next three years, replacing them with robots. IT-Giant Infosys has already announced reducing jobs through automation. The future will see business without people, like the fast-food chain Eatsa that requires zero human interaction.

The 'future of work' is not only shaped by automation, but also by changing aspirations: Enabled by technology and driven by increasing entrepreneurialism, the idea of 'employment' is already changing: The current generation of millennials is increasingly looking for purpose and personal development. The rise of the 'on demand' economy gives more power to the individual: Estimates suggest that by 2020, 1 in 2 people in the US and UK will work in a freelance capacity. While routine tasks are expected to be increasingly completed by intelligent machines and technology, creativity, analytical skills and problem solving will be requirements of the job of the future.

Is the picture so gloomy? Human history has shown that technology has not only improved working conditions and living standards, increased value creation and raised incomes, it also created life-changing innovations such as the steam engine, the conveyer belt, airplanes or the internet – and yet we fail to predict its implications. "The global demand for cars will not exceed 1 million, one reason being the shortage of drivers," estimated Gottlieb Daimler in 1901. In the same year, Wilbur Wright, a pioneer in aviation, estimated: "It will not be possible for humankind in the next fifty years to take-off in a metal plane." The rest is history. We are certain that the future of work is changing, but the effects will not only be negative. These shifts will play out differently in India – and we need to join forces to prepare and make it inclusive.

THE FUTURE OF WORK IN INDIA 2050 – Threat or opportunity?

Job creation is one of India's biggest development challenges. Unemployment is projected to increase from 17.7 million last year to 17.8 million in 2017 and 18 million next year. The challenge is increasing with one million young Indians entering the labor

market every month: The average age of an Indian in next two decades will be an average of 29 years as compared to the age of 37 years for China and 48 years for Japan. Job growth is not keeping up with this pace: According to Labor Bureau data, only 0.13 million jobs have been created in the last year, while 13 million people are added to the workforce every year. So where are the jobs? World Bank estimates that automation could replace up to 69% of jobs as we know them today in India. As per a recent survey, over 25% of employers in India expect to reduce the headcount as a result of digitization. At the same time, India 2050 will have 1.6 billion people connected to a global 9.7 bn market, opening up new opportunities for income generation and the way people engage with 'work'. So against these trends, how does the future of work look like in India 2050?

WHAT WE DO: Complementing forces – The worker of the future leverages technology

The future will look positive for high skilled labour – but what does it look like for unskilled and semi-skillled labour? In India in 2050, many of the routine jobs will most likely be replaced by technology and cheap labor will cease to be a competitive advantage in India. Agriculture will be one of the sectors most affected by the shift, as 55% of Indians are employed in agriculture. They contribute only 16% net to the GDP, as most farmers are engaged in subsistence farming. Technology advances may change the scenario: In the short term, the farmer of the future will leverage technology to gather knowledge, increase his skills and produce closer to the market requirement, at higher prices and without losses along the value chain. In the long run, the 'farm of the future' will be driven by talent that leverages sensors, IoT, robotics and artificial intelligence to increase productivity and reduce cost, hence increasing competitiveness of the sector and potentially leading to another 'green revolution'.

Similarly, the manufacturing sector will go through a transformation. While India's share of manufacturing employment is small with just 12% of all jobs, emerging technologies such as 3D-printing, robotics, and artificial intelligence will impact the way we think about "Make it in India" and its impact on employment creation. While in the short-term, automation may replace routine and manual jobs, the factory of the future will be driven by newly skilled professionals leveraging a connected environment of technology and data insights from research and development to production processes, maintenance and repair, creating customized products and responding to shorter product life cycles. Future factories will operate hyper-efficiently: Internet of things, connectivity, artificial intelligence and analytics will create a more agile and flexible shop floor, improving asset efficiency, at the same time requiring new skills from operators. As a result, India's manufacturing has the potential to boost productivity and hence increase competitiveness.

Likewise, India's IT industry will experience a major shift: A report released by NASSCOM predicts that the industry will generate $350 billion revenue by 2025, but because of automation, the total number of jobs generated will be 50% less than predicted.

At the same time, new type of jobs will be created: While today, the IT-sector has mostly routine-jobs, the sectorwill see a 56% increase in high-skilled jobs that require analytical and problem solving skills. Intelligent technologies will augment existing jobs and enable us to be more productive, make better decisions, produce goods and services faster and closer to the user, and create new jobs. Rather than fearing how automation, robotics and 3D Printing are replacing jobs, the potential for India lies in creating new kind of jobs that combine automation with human interaction, as machines and humans are highly complementary and make use of productivity gains.

HOW WE DO: The "Uberization of labor" and Micro Entrepreneurship 2.0

Mass employment through boosting manufacturing has not been a "silver bullet" to take Indians out of unemployment; however, emerging technologies will act an enabler for generating new employment opportunities. No one has demonstrated this better than Uber: The company's success in developing a mobile application that allows individuals to submit a trip request to drivers who use their own cars has disrupted not only the transportation sector, but the way we think about exchanging underutilized capacity of existing assets or human resources with close to zero transaction costs.

Talent platforms like Pilot show that the next wave of the 'on demand' economy will give more power to the individual and disrupt the way we think about employment. Indian-startup Squadrun provides a platform for individuals to take up tasks remotely such as verifying, categorizing and enriching data for global businesses. OlaCabs, TaxiForSure or Russsh are other Indian examples leveraging 'on demand' and providing jobs for India's underutilized masses and giving rise to a new kind of micro entrepreneur providing services for those who value convenience. The pool of contingent workers may soon include students, single parents, young unemployed and pensioners. According to GSMA, 1 million jobs have been created in 2016 alone by the 'on demand' and sharing economy.

HOW WE ORGANIZE OUR WORK: The future of work is decentralized

Enabled by technology, the future of work will strengthen decentralization of work: On the individual level, this means work and value creation can happen from anywhere. Transformation of the workplace is already happening: Remote working, co-working and teleconferencing are today's drivers empowering the individual and providing new kind of freedom. Mobile and cloud technology allow remote and instant access, democratizing access to jobs and income opportunities. With the shifts is what and how we work in India of the 2050, the way work is organized changes: Roles within companies will change and the way business is organized will shift to more decentralized structures, empowering individuals and teams.

This trend of individuals offering their service on platforms

to increase their income opportunities will boost a new form of collaborative economy and give rise to new organizational models: While traditionally, organizations were formed to reduce transaction costs, technology enable new forms of getting work done—to the extent of removing the aggregating entity, the firm, completely and allowing individuals to transact directly with each other. In a system where information can flow easily and emerging technologies can reduce the transaction costs of matching labor and requirements, the individuals can become nodes in a single marketplace and form "just in time" teams and organizations. New collaborative platforms enable a seamless integration into global labor market on one hand, while it strengthens localized market places on the other hand. Token-based payment systems will support individuals to work seamlessly with each other and receive value for their work.

HOW WE NEED TO PREPARE: The future of work is near, but will it be inclusive?

India in 2050 will see new opportunities for those ambitious to learn and engage, while providing opportunities to engage and to offer labor on new kind of market places for those engaged in routine-tasks. To prepare, the task ahead of us requires re-skilling and strengthening of current capabilities to prevent a growing gap between those who have opportunities and those who are excluded. We face the risk of rising class struggles if we don't take action and prepare. We believe preparing for an inclusive future of work means i) massive efforts in up-skilling through innovative forms of training delivery, ii) new kinds of job discovery for those un- and semi-skilled workers, iii) re-thought incentives for automation in countries with high population like India, and iv) social security structures that support those excluded from opportunities.

1. Up-Skilling Innovations

The future labour market will reward those who are keen to learn, the problem solvers and creative. But this is not everyone: India can take advantage of new forms of learning, training and skill building to up-skill those willing to learn. Emerging technologies enable customized, and contextual training delivered through videos, text, games and other mediums, independent of centralized educational institutions such as universities. While MOOC-enabled distance education has been around, the future lies in a combination of 'education on your fingertips' through formats such as accessible nanodegrees in vernacular languages and more engaging virtual reality-enabled class room education enabled via mobile phones. Platforms like Udemy are already today providing new ways of 'just-in-time' skilling and providing trainings on core competencies. In the future, these offerings may have to be broadened to include all part of society.

2. Job Discovery & Matchmaking Innovations

The micro entrepreneurs of the future require open access platforms to offer their talent. The Facebook is already making headway and providing help to lower skilled people to find jobs. Platforms like US-based Viridis use advanced algorithmic technology to assist students and job seekers with mid-level skills to find jobs. Startups like India-based Shortlist use smart algorithms to match talent, especially young job entrants, with opportunities. Models exist in other forms of the world, like Kenya, where mobile-based platform KaziConnect is connecting informal workers with jobs and offering them the chance to skill up through training courses and mobile education, and offering certifications that can be uploaded onto their profiles. Such platforms offer particular potential to bring women from lower income groups into the workforce, who often find it more difficult to access the job market.

3. Re-thinking Incentives

While some of thinking of regulating automation, this is not the answer: Policy makers need to encourage innovation and competitiveness; however, they can incentivize the private sector to take part of the re-skilling investment. Private investment is critical to address the re-skilling task, and incentives need to be created to crowd in private capital. In addition, decrease in overall amount of number of jobs is not per se a negative thing, if coupled with other interventions: Countries are already moving to 4 day work week or 20 hour work week, and as long as the income earned pays the bills there is no problem with that. This re-structuring of work provides opportunity to give work to more people and hence counter the effects of job destruction caused by automation.

4. Protecting those at the Base of the Pyramid

We need to think of new systems to secure income for those who cannot keep up with the speed of technology: Ideas like universal basic income and tailored ways of transferring social benefits to those in need and complementing their incomes will be needed to prevent growing inequality and the rise of a two-tiered society. Innovations are needed that allow those micro entrepreneurs working in the 'freelance' and on demand economy to articulate their interests. With the advent of the on-demand economy, the structure and the ability of unions to fight for labor rights will be diminished, due to the latent and flexible nature of jobs. New structures will need to be thought of to empower individuals to raise their voice.

Call for Action: Towards an inclusive future

Will the future of work mean we need to be afraid of machines solving tomorrow's problems: Not necessarily, if we take action nowt! We do not believe that machines will have replaced humans in doing everything we consider valuable: Eradicating diseases? Erasing poverty? This will be done only with the people-centric innovation economy that uses machines to provide insights at speed, customize solutions, democratize access and change existing systems to elevate the value of people and empowering them. At the same time, we need to jointly work on creating mechanisms to provide opportunities and income to those at the Base of the Pyramid and to create an inclusive futureof work.

This article first appeared in *Future Series - BW*

India in 2050: Future of Rural Prosperity

By Yoshita Arora and Manish Shankar

Demographically a large proportion of population may migrate to urban India by 2050; however about 850 million people will continue to reside in rural India.

"Imagination is the only weapon in the war against reality." — Lewis Carroll, Alice in Wonderland

In 2050 we can visualize a large population enjoying an amazing quality of life with access to such services and privileges as are not accessible even to the urban middle class of today. Higher income levels, universal access to quality education, healthcare, safe drinking water and sanitation services shall characterize rural India in 2050. Women's participation levels in India's workforce shall be rivaling that of the men with all discrimination based on region, caste, community, ethnicity, gender, age and disabilities being minimized. The optimism for future stems not only owing to the rate at which the technology is evolving and is being adopted by the masses but also owing to the changing attitudes of the new generation towards "holistic development for all".

Demographically a large proportion of population may migrate to urban India by 2050; however about 850 million people will continue to reside in rural India.

Despite a view that India is rapidly urbanizing, it will have just half of its population in cities even in 2050. By 2050, India will still be one of the least urbanized countries in the world. It's likely that the simplicity of life, improvement of income levels and availability of basic services may significantly improve the quality of rural life in India.

Farm and non-farm rural households are likely to improve their incomes and reduce their vulnerabilities significantly by 2050.

The per capita income for urban India in 2011-12 was INR 1, 01,313, whereas for rural India it was only INR 40,772.

However in 2050 rural India is likely to have significantly higher incomes. This will largely be driven by a quantum leap in the cropping intensity, riding on almost all the arable land coming under irrigation. For instance, the gross irrigated area is expected to increase from 76 million hectare in 2000 to 117 million hectares by 2050. Besides, the vulnerabilities arising out of climate change will have become a non-issue with universalization of crop insurance across rural India. The core value chains will have completely integrated vertically, performing at the highest level of efficiency, aided by world class infrastructure, resulting in smooth access to markets. Non-farming rural households too shall be experiencing buoyancy in their incomes aided by a burgeoning demand for services and non-farm goods. The rural population shall have access to social security owing to the entire workforce being a part of the formal sector and high level of financial inclusion among the rural population leading to access to life insurance, health insurance, insurance cover against accidents, pension services and credit for both consumption and production purposes. The expected increase in per capita income for India to over INR 26 lakhs (USD 40,000) will also reflect in rural incomes.

Access to primary and secondary healthcare services in vicinity supported by technology and improved infrastructure.

Unfortunately, despite being low-income most of the rural population still pays a higher cost for basic services or makes do with sub-optimal quality solutions. For instance, WHO has prescribed a 1:1000 doctor patient ratio, but this

ratio in India is about 1:2000. Rural India has one-fourth the doctors as compared to urban areas. However the need for the government to attain the Sustainable Development Goals, likely improvements in healthcare infrastructure and proliferation of technology enabled solutions will bring about a paradigm shift in the quality of healthcare services in rural India by 2050. We believe that the population will be well connected digitally with primary and secondary healthcare services being made available within one's premises or in an easily accessible healthcare center. It is likely that telemedicine will have struck deep roots with the capability of running diagnostic tests remotely with many of the generic drugs being made available to the patients through 3D printing in the remotest of the rural areas by 2050. The average life expectancy will have increased by at least 15 years rivaling that of the European nations with infant mortality rates and maternal mortality rates being reduced to the extent of being insignificant.

Relevant and individual focused education system to improve quality of education and employability.

As per the NSSO, literacy rate in rural areas was 71% in 2014, compared to 86% in urban areas. Lack of quality ecosystem- in terms of infrastructure, teachers and relevant content has led to this gap. Teacher-student ratio in rural schools is abysmally low today, with each class fitting in about 100 students of different age groups. The Annual Status of Education report 2014 highlighted that barely 47% of grade-5 school children could read a grade-2 textbook. However, India will have achieved universal primary education goal much ahead of 2050. By 2050, education at all levels will be radically different from today with a far-reaching shift from currently run education factories to individual education aimed at meeting the goals and aspirations of individuals. It would use models such as school in a box, online classes to ensure access to best quality education in the remotest areas. One major shift would be the wide range of subjects being made available to the students to choose from even in rural areas. Further, higher education would be characterized by an array of domains requiring super specialization. One can also expect a near equal emphasis on science, arts and humanities as each of these streams shall be offering equally lucrative opportunities to their students.

Improved awareness levels and availability of infrastructure will ensure that universal access to safe drinking water and sanitation services shall be achieved in rural India well ahead of 2050.

About 63.4 million people in rural India are living without access to safe drinking water. As per the statistics shared by ministry of drinking water and sanitation, in 2017 only 26.9 million out of 167.8 million households in rural India have access to piped water supply. On the sanitation front, 55% of rural India already has access to toilets. However, given that only about 1.5 lakh of over 6 lakh villages have been declared open defecation free by 2014, it'll take a few years before universal access to sanitation is achieved. Riding on huge government investments in social infrastructure, spurred by strong demand from the rural voters and based on the proliferation of models that work at the grass root level, India will have achieved universal access to safe drinking water and toilets much ahead of 2050; so much so that these shall become non-issues long before 2050.

Women empowerment will play a critical role in inclusive development of India by 2050.

Despite some of the top notch positions being held by women as CEOs and senior officialdoms, it remains a relatively unfair depiction of the real picture. As per 2011 census about 65% of the women were literate compared to over 80% of men. Further India has also witnessed a decline in female participation in the country's labor force from over 35% to 25% between 2004 and 2011. Social norms and absence of supporting infrastructure have led to the current scenario. However, improving literacy rates, policy push in terms of access to crèche and longer maternity leaves along with creation of tech based jobs could push greater number of women back into the workforce. Vocational training based courses in rural India have the potential to bring women, from lower income groups, who often find it difficult to access the job market, into the workforce. Rising awareness in the society would lead to a slow and steady dismantling of the patriarchal social system that pervades our society today. This shall lead to women finding an equal place with their male counterparts in terms of decision making and ownership of property. It is quite likely that one shall find work participation rate for both men and women to be equal in India by 2050. Further discrimination based on caste, community, ethnicity, age and disability would be obliterated owing to strengthening of class identity and economic well-being.

Improved quality of life combined with the simplicity of life, aided by sophisticated means of transportation, shall make rural India one of the most coveted places to live in the country.

Access to higher incomes and improved infrastructure will result in decline of distress migration along with a higher quality of life for the rural residents. Access to quality products and solutions in the villages due to improved road infrastructure, internet connectivity and digitization will ensure a better life. Local governance represented by decentralized panchayti raj institutions shall bring in localized leadership to ensure efficient governance. However, improved focus of organizations towards building the rural areas is expected to result in self-sufficient units with a blurring of line of distinction between urban and rural in terms of opportunities, access to basic services and the resultant improved quality of life. Revolutions in transportation systems would provide speedy transits from the rural areas to the urban areas and this could lead to people residing in rural areas, physically accessing their work places in faraway urban areas. While a lot of these transitions will take place over time, one of the key characteristics of rural India is likely to endure: the simplicity of life that is characterized by a much lower carbon footprint than any urban area can afford.

The challenge however is that the businesses and the innovators will need to design relevant solutions for ensuring access to basic services in rural India. At the same time they will need support from the government to build the infrastructure and ecosystem to support and sustain these solutions. The ideal scenario would be to see the solutions emerge from rural India – solutions that are focused and localized. The expected simplicity of rural life coupled with increased incomes and access to quality services at fair prices may even make living in rural India an aspiration for the next generation by 2050!

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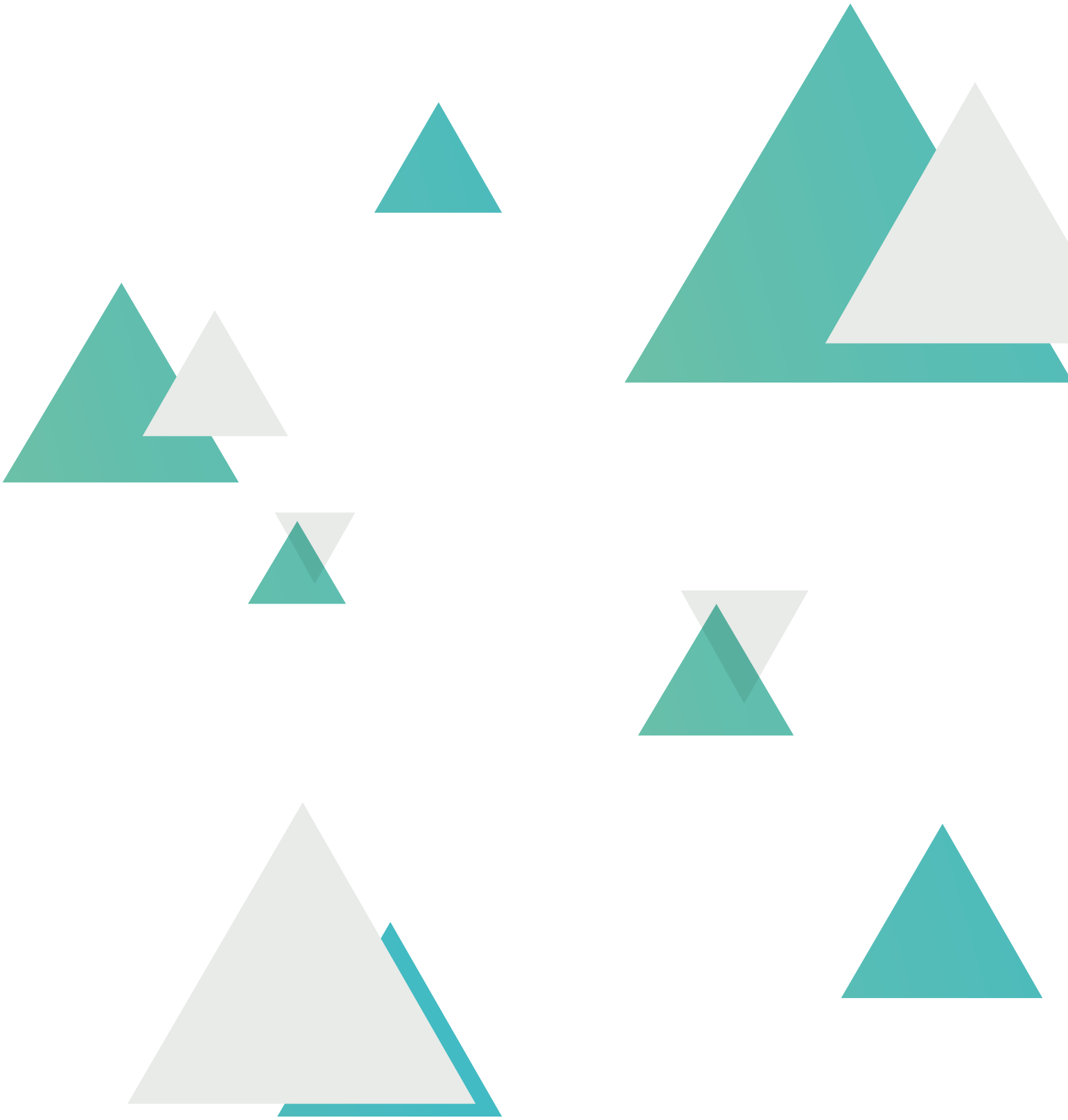
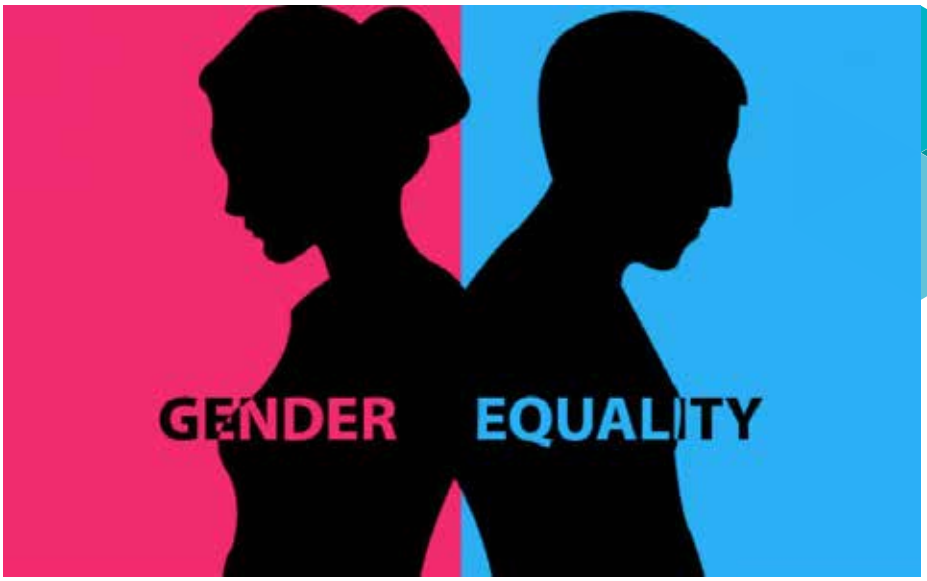


India in 2050: Future of Gender Equality

By Nitin Agarwal and Amar Gokhale



In private lives, women are the pivots around which family members revolve. Ironically, the role they play in binding and managing the family enables patriarchal norms to sustain. The unrecognized and non-remunerated work of millions of women in childcare and domestic caregiving sustains the economy. Such invisible and unpaid labor has supported the 'productivity' of men for generations.

The moment we think about the future, and as far as 2050, imagery moves to automation, artificial intelligence, robotics, human race being super powerful, and every individual being empowered with choices. In this milieu, gender is often not considered the most exciting topic and is treated as a 'women's issue'. It is, however, critical that gender be brought to the forefront of public discourse, as something that impacts society as a whole.

Beyond gender roles, towards gender participation

In India, while we often hark back to mythology and culture to give evidence of the importance and dignity of women, it is a hard fact that India is failing its women today. India was ranked a lowly 108 on the WEF's Global Gender Gap Report (2015); highlighting the need for specific and concerted efforts to achieve gender equality in the country. Women will have a major role in how the country is shaped - through public policy and business leadership.

The inclusion of women in the democratic process of shaping public policy is critical to ensure fairness and justice in the distribution of benefits and responsibilities between women and men. When more women are involved in public policy making, Governments become more open, democratic and responsive to citizens. Although India has had a woman prime minister, there continue to be grossly insufficient women in the Lok Sabha and state legislative assemblies. The current Lok Sabha has just over 12% women members, against a global average of over 22%. Legislative assemblies of states in the country have, on an average, less than 10% women members. This indicates the need to encourage active participation of women in building the democratic capital of the country. A start has already been made in this direction. The 73rd and 74th Constitutional Amendments mandate a reservation of 33% seats in Panchayati Raj Institutions (PRIs) in the country. As a consequence, today, close to 50% of elected representatives in PRIs are women. Numerically, that amounts to more elected women representatives than the rest of the world put together. It is only a matter of a couple of decades that India will have over 40% women members in Lok Sabha and state legislative agencies. This bodes well for the role of women in the future of Indian democracy, and indeed, for Indian democracy itself.

In private lives, women are the pivots around which family members revolve. Ironically, the role they play in binding and managing the family enables patriarchal norms to sustain. The unrecognized and non-remunerated work of millions of women in childcare and domestic caregiving sustains the economy. Such invisible and unpaid labor has supported the 'productivity' of men for generations. As of now, economists fail to quantify the economic role of women's household work. Future economic discourse is likely to include unpaid labor as a part of GDP. While unpaid labor gets incorporated in economic assessments, there is also a need to enable greater participation of women in the formal labor force. Indeed, with women increasingly attaining higher education levels in India and becoming part of the formal economy outside the home, this is inevitable.

At work places, women will increasingly be entitled to more accommodative work-time, salaries at-par with male employees, facilities and choices that enable their career-growth. This will help women work longer tenures and be a part of senior managements. Until we reach gender parity in senior management organically, perhaps some accommodative stance is essential. A start has been made by making it essential to have women on boards of public companies in India. Similar enablers in 'Ease of Doing Business' for women would enable women entrepreneurs succeed and we would see larger number of women led businesses.

Men driving gender equity

It is increasingly apparent that men have a pivotal role to play in achieving gender equality – not only through supporting women's organizations and efforts towards that end, but also through themselves addressing gender issues. MenEngage Alliance is a global network of groups and organizations working with men who met at a global symposium in India in 2014. As part of the global symposium, a Delhi Declaration and Call to Action were proclaimed to build awareness about the inherent patriarchy in the world and its effects on gender relations. Such initiatives play the crucial role of involving men and boys in promoting gender equitable socialization. It is only through such socialization, especially among men, that gender equality can ultimately be achieved – globally and in India.

The market has intervened in substantive ways in changing definitions of masculinity. From metrosexual men who groom and preen to those who are 'fair and handsome', there have been leaps in including men in domains earlier considered feminine only. Taking cues from women's movements and feminist rhetoric, advertisement call out to men for 'sharing the load'. As society becomes more inclusive, household responsibilities will gradually be more shared. Men will take more responsibility of activities like cooking, raising children, caring for the elderly and performing household chores. The boundaries are already blurring and are likely to disappear. A shift in the burden of childcare from women to men will be a key trend of the future. This is indeed in the interest of attaining gender equality as more men doing more housework will work towards creating gender equitable socialization. Witnessing the men of the house working in kitchens, cooking and cleaning, and being involved in caregiving has a much larger impact on the psyche of children than textbook awareness creation. We can expect a central law which grants men paternity leave for extended periods in order to raise children by 2050. We would see more stay-at-home dads in India. Men being care-givers and homemakers would be a chip on their shoulder for being progressive - beating stereotypes of the bread-earning, strong man. Strength would be in equity and playing to strength and not in stereotypes.

Further, family planning and maintaining sexual and reproductive health is traditionally seen as the sole responsibility of women. Over 95% of all sterilizations in the country today are tubectomies. Despite being a simpler procedure, vasectomies continue to be unpopular in the country. Men's lower involvement in these matters places expensive and unnecessary burdens on the healthcare systems. However, as memories of the Emergency fade, this will change in the future. Also, injectable contraceptives for men will be mainstreamed, further reducing the burden of family planning on women. Civil society alliances like MenEngage will facilitate this change such that 2050 will see a basket of contraceptive methods which offer as many options for men as women.

Beyond heteronormativity – of acceptance and inclusion

Gender issues are also expected to expand beyond the women's issues. The norm of the gender-binary and 'opposites attract' has been shattered - in science, literature, art, movies, and increasingly now in policy. It is increasingly clear that gender is a continuum. While India is still struggling with Section 377, Queer Pride marches taking place in more and more cities of India give testimony to the strength that the rainbow is gathering, slowly but surely. The recognition of various kinds of gender identities and sexualities would mean massive changes in policy and practice. Tamil Nadu has set an example through its policies on transgender persons. It is only a matter of time and persistent advocacy for other states to follow suit and implement the NALSA judgment which enshrines basic rights to people who do not identify as either male or female. With rapid technological advances and an acceptance of gender non-normativity, India will witness higher demand for gender reassignment surgeries. Such procedures could well be covered under medical insurance.

2050 could well be a time when the rainbow is more mainstreamed than it is now. With recognition of same-sex unions, will come various other ways of living, naming and being which have great implications for gender equality. We will take after Sweden in redoing how we socialize our children, in making significant changes in pedagogy and curriculum.

Conclusion

Significant ground still needs to be covered, though. Workplace harassments, dowry deaths, attacks on sexual minorities, acid attacks by rejected lovers, child abuse, heinous sexual assaults; all of these are murky truths which are still widespread. However, we are also in times when gender based norms are being challenged - a trans-person is a school principle in Kolkata, a woman police officer in Punjab had a wedding with her same sex lover, the Indian armed forces is to include women in combat roles.

What 2050 will bring us are new ways to imagine the world; with diversity in schools, colleges, board rooms and the Parliament. It will be exciting to see how India becomes more gender-equitable and claims it place in the world. What we need is strong public policy along with civil society movements which push the heteronormative boundaries set by patriarchy. What this will lead to is a more humane, sensitive India; where the gender of your teacher, bus driver, manager or President will be irrelevant!

This article first appeared in *Future Series - BW*

India in 2050: Future of Energy

By Sambit Nayak, Ankit Gupta & Trideep Kumar Roy

In 2050, India will achieve reliable, economically competitive and environmentally sustainable electricity system, addressing the energy security and environmental strains.

In past few years, India has achieved an impressive growth in adding renewable energy generation. Efforts have been made to alleviate the long standing problems like power shortages, rural electrifications, poor distribution companies (Discom) financial health and non performing energy assets through various policy interventions. However the current penetration of renewable energy is low about 15% of total energy supply. The energy supply spectrum largely entails coal (about 50%) followed by oil and gas. It is envisaged that in 2050, India will have an annual energy demand of about 14,500 TWh per year (with a moderate CAGR of 6.7% till 2050). Largely the demand will be from industry sector followed by transportation and buildings. In the absence of paradigm shift towards the low carbon alternatives, the dependence on fossil fuel will increase, causing a serious threat to nation's energy security and GHG emissions in future.

With determined efforts by the policy makers, India can overcome barriers to enable investment in clean and sustainable energy supply options. In 2050, India will achieve reliable, economically competitive and environmentally sustainable electricity system, addressing the energy security and environmental strains. A couple of trends under current energy sector reforms are converging to create game-changing disruptions like electrification of large energy intensive sectors coupled with accelerated renewable energy capacity addition, parallel efforts to strengthen electricity supply to underserved and un-served through integration of grid and distributed renewable energy, adoption of emerging storage technologies to increase the grid appetite to accommodate intermittent sources and enabling cost optimization through the best use of automation and communication analytics.

Electrification of large energy intensive sectors coupled with accelerated RE capacity addition

Clean energy is India's top priority to meet the global commitment under INDC (Intended Nationally Determined Contribution) to meet the target of reducing GDP emission intensity by 35%. The reduction is to be made by 2030 considering 2005 as a base data. With an aggressive chase of INDC targets on renewable energy capacity addition, India can have more than 50% of electricity generated from renewable source, leading the global renewable energy generation in 2050. India is eyeing towards massive electrification of its energy intensive sectors, the majority of which in 2050 will be seen to be supplied from renewable sources like solar and wind. Ongoing efforts towards greening the passenger & freight transportation by railways and an ambitious plan to electrify the entire road transportation by 2030, indicates that the second most energy intensive sector- Transportation is targeted. A mammoth pipeline is to be built in coming years to reach the target of 100GW by 2022.

In 2050, the renewable energy system in India will have large utility scale RE projects connected to central transmission grid to supply energy through Open Access to large industrial and commercial establishments. Some parts of it will be feed to state utilities to fulfill their Renewable Purchase Obligations. Under Green corridor programs, robust electricity grid with evacuators at high voltage levels will support the electrons fed from the large solar parks. On the other hand, a large number of consumers connected at low voltage will get supplied through distributed renewable energy like rooftop solar and mini grids.

Strengthen the electricity supply to underserved and un-served through integration of grid and distributed renewable energy

While electricity generation is on track in India, the challenge lies in making the generated electricity/energy accessible to all. In

a country of 1.3 billion people, more than 200 million people live without electricity including large parts of the rural population. Misleading definitions of electrification continue to cover up the grassroots situation of lack of enough power reaching real households. India needs to revamp its DRE policy to reduce the risks for private investors and encourage scale up.

A comprehensive reassessment across following three dimensions will reshape the integrated power supply scenario with DRE in India in future by 2050. Enablers like rational pricing, rapid technology cost reductions, increasing economies of scale, adoption of smart measures and more competitive supply chains are expected to make DRE penetration high in the integrated grid.

Adoption of emerging storage technologies to increase the grid appetite to accommodate intermittent sources

The need for storage will become critical with increasing RE penetration. Renewable energy rich countries are facing problems where excess supply of energy from intermittent sources on a day with reduced demand has led to negative pricing with formation of duck load curve. Globally energy storage has emerged as an unavoidable solution to smoothen the loads. In addition the storage supports in grid stabilization, peak shaving, improved capacity utilization, and improve generation efficiency. Battery market is evolving following the need of storage, witnessing efficiency improvements and cost reduction. Lead-acid batteries, which are the default technology for energy storage in developing countries, have significant technical challenges that limit their usability. Lithium ion battery technology as a better alternative has scaled commercially, with a cost reduction of 70% in last 2 years and further reductions are expected to continue going forward. Apart from batteries, molten or liquid salt; compressed air; pumped hydro; hydrogen are also identified as storage alternatives. India is currently lagging behind it global competitors in storage manufacturing space. By 2050, some of these technologies will be highly penetrated in India. Moreover, flywheel technologies (for automotive and rail transport), compressed air energy storage (CAES), super capacitors and superconducting magnetic electricity storage systems will also find wider applications in 2050.

India is assessing various storage alternatives to transform the transportation sector where lead-acid batteries are prevalent technology. Electric vehicle (EV) technology has rapidly evolved over the past five years and has witnessed dramatic decline in cost of about 65%. Low-cost models like Nissan Leaf, Chevy Volt, Tesla are making their ways to disrupt the automobile sector. USA and China having lion share of about 70% of EV market. India through its new EV policy has ambitious plans to completely electrify its automobile sector by 2030.

In 2050, India transportation network will be completely running on electric energy. India will have electric vehicles with a plug and play system where discharged batteries on lease/rent basis can be swapped with the recharged battery taking 2.5- 10 minutes for 4 wheel sedan to large buses. There will be charging stations also set up at concentrated areas such as shopping malls, cinema halls, restaurants.

To achieve this however, Government has to incentivize and provide tax breaks to support electric vehicles. On the other hand the penalties and capping will discourage diesel/petrol based combustion engines. The operational barriers also need to be assessed and addressed for example- setting up of large scale battery producing units, transportation of the batteries to the retail /service centres, local EV manufacturing capabilities and safety features which requires a critical analysis to avoid the EV policy to collapse.

Enabling cost optimization through the best use of automation and communication analytics

Digitization has been the mantra for the new government, with several key interventions being introduced across sectors such as finance. However the deployment of these digital interventions are still at a nascent stage with only use cases of some technology such as smart meters visible in the market. Hence there is a need for creating an enabling regulatory & policy framework that will shape the future of the use of digitalization in India's energy sector in 2050. With the digital disruption underway a few key technologies such as the Internet of Things (IoT), Artificial Intelligence & Blockchain are increasingly finding an application across key areas both on the grid as well as beyond it.

As the grid infrastructure itself develops to facilitate two ways energy flows, IoT is enabling the grid to communicate useful customer data leading to the evolution of next level use of smart metering. In 2050, communication channel will enable better grid management, operation as Artificial Intelligence enabled automation and real-time optimization reducing distribution losses. Application of Blockchain based smart ledgers & contracts in this regard will seems to be significant penetrated under distributed energy production & consumption and peer-to-peer energy trading.

In 2050, the key issue around access to energy will overcome through digitization as the power of production shifts from the energy supplier to the customer themselves, offering accurate metering, enabling a real-time energy market place where in the customers via smart contracts can set specific rates at which they seek to buy and sell their energy from the grid.

In 2050, integrated energy system will evolve, with a higher DRE penetration and equipped with modern and smart technologies, offering wide ranging benefits to operators, customers, and society. In 2050, the customer will take the center stage of the energy system preferring- greater and low carbon choice, real-time interaction and sharing, always-on connection, higher transparency, experiences and learning opportunities. This smarter, more decentralized, yet more connected electricity system could increase reliability, security, environmental sustainability, asset utilization and open new opportunities for services and business.

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AGRICULTURE

Agtech in Southeast Asia: An Untapped Opportunity

By Saurabh Sinha

Out of the ten ASEAN countries, Lao, Cambodia and Vietnam have more than 50 per cent population employed in agriculture and allied sectors (such as fishery), while Indonesia, Philippines and Thailand have more than 35 per cent of the population dependent on the sector for their livelihood. Cumulatively this corresponds to nearly 150 million people directly or indirectly dependent on the agriculture sector in the region. This indicates heavy reliance of the region's economy on agriculture. In other words, any advancement in agriculture sector is bound to propel economic growth. Also, the role of the agriculture sector in inclusive development has been well acknowledged. A technologically advanced agriculture sector can trigger high GDP growth, alleviate poverty and narrow income disparities, provide food security, and deliver environmental services (Byerlee, de Janvry (eds.), 2007).

Majority of farmers in Southeast Asia region either have small land holdings (farm area less than 2 hectares) or are small fishermen. They are most susceptible to climate and weather change, information asymmetry due to the non-availability of technical knowledge centers and may suffer from lack of market linkages due to land fragmentation and less developed waterways. Technology innovations in agriculture can play a key role in transforming the lives of farmers with small holdings and fishermen, with improvements across the entire agro value chain.

In the pre-harvest value chain, farm and productivity efficiencies have been achieved by mapping irrigation zones through geo spatial mapping utilizing drones; weeding of crops have been carried out through robotics, computer vision and machine learning; genomics and non-GMO crop technologies have been developed for yield improvement etc.

In the post-harvest value chain, integration of mobile communications technology with real time computer and cloud based data servers gives farmers real-time information on the market demand and supply situation and connects them directly with consumers for better price realizations.

It has to be noted that agriculture technology or Agtech has been largely observed in developed economies and suitable customization is required before implementing these across the developing world. Agtech implementation may be a challenge in emerging countries due to poor IT infrastructure, low availability and affordability of technology products and low adoption of sophisticated agro technologies and methods by farming and fishing community.

As per estimates from Agfunder, year 2015 witnessed nearly $4.6 Bn invested across 500+ deals across 450+Agtech enterprises. Food e-commerce, irrigation and water technology, drones and robotics and decision support technology were the key sub-sectors of investment accounting for nearly 70 per cent of the deal volume. While agro-tech enterprises from India and China accounted for the majority of the deal activity in the developing economies, the Southeast Asian region is showing signs of being ripe for agrotech start-ups.

For instance, in 2015, there were three to four investments in the agro tech sector in Indonesia. Agro tech and aggregator start-ups emerging from the region have attracted interest from various investors, technological companies, and other stakeholders. Enterprises based out of Southeast Asia such as North Atlantic, Inc, Vasham, iGrow, eFishery have attracted investments from PE/VCs such as Aavishkaar, Ideosource, East ventures in the last 2-3 years. The business model and operations for many of these enterprises has the potential to assist many small holder farmers and fishermen of the region and improve their livelihoods and source of income.

North Atlantic, Inc, for instance, assists to rationalize fish processing supply chain throughout the Indonesian archipelago.

It works directly with local fisherman to assess fisheries growth potential, sets up local mini-processing plants for effective market linkages, and hence, plays a key role in improving incomes of local fishermen. Through rationalization of the supply chain and use of technology for improving traceability, the enterprise aims to tackle lack of transparency and pricing information, which leads to instability of businesses for small fishermen, and perpetuates an environment of fraud and misinformation.

Another aquaculture technology sector firm 'e-Fishery' provides automated machines that can feed fish automatically, sense the fish's appetite and adjust the amount of feed given, thereby reducing feed costs and boosting profits of local fishermen. iGrow is a marketplace that helps farmers with under-utilized land, to produce high-quality organic food and sustainable incomes with cloud-based agricultural management software. Vasham assists small holder farmers in Indonesia by optimizing the food supply chain to guarantee them above-wholesale market prices as well as provide them with financial support as required.

Low presence of funded Southeast Asian agtech businesses at global events and validated in AgFunder's reports indicates that startups in the region may lack exposure at the global level. Events such as Sankalp Southeast Asia summit, Jakarta's Arena Pitch Battle and Ring Pitch Competition are good initiatives to identify such enterprises to enhance their visibility with leading investors and agro focused funds.

This article first appeared in *Sankalp Forum*

5 Reasons Why Technology Will Fail To Disrupt Agriculture Value Chain In India

By Shruti Goel and Nilotpal Pathak

With two successive droughts and effects of global warming looming at its face – the pressure on all the stakeholders related to agriculture is at an all-time high in India. While technology may offer a solution to the problem – the challenges with its commercialization are often understated.

Here are 5 top reasons that were highlighted at a discussion at the recently concluded Sankalp Global Summit 2016 on why technology innovations in agri-value chain will fail to be disruptive in India. However, addressing these 5 pertinent issues will itself pave the way for technology to be the savior in these grim times.

Farmer is not at the center stage of all innovations

Dr Dilip Kulkarni, President of Food Division of Jain Irrigation Systems said most of the innovations fail to keep the farmer at the centre stage. Farmer, the first link to the value chain falls at a complicated mix of distressed political economy in India and is powerless to judge and adopt a technological solution. However, farmer is an expert of his own land and needs to be invested in. Need is to also innovate for improving the condition of the farmer and make him a partner in the process. Currently, there is lack of innovation that increases productivity and strengthens the condition of the farmer. For existing innovations, farmer needs to have adequate incentive to invest in the innovation and as of now, most of the innovations fail at this stage.

Disruption is not managed

Innovations might create disruption but these disruptions need better management lest they create their own chaos. Mr Kunal Prasad, Co-founder of Cropin Technologies believed that there is a need to reimagine the processes at various levels of agriculture value chain. For example, new technologies are well placed to do away with the need for food preservation and can potentially change the entire food logistics industry. However, the disruption will have to deal effectively with the middlemen and those who will get affected. With lack of proper management to handle this, innovations face extreme resistance from existing channels, often leading to delays in execution. Farmers are looking for innovation and are willing to pay so long as they generate surplus at their level.

Not enough importance to logistics and last mile service delivery

Mr Rohtash Mal, MD & Chairman of EM3 Agriservices (often known as the Uber for tractors), emphasizes that only 10% of farmers in India can afford farm machinery. This it can leave most of the western agtech innovations irrelevant for India. Breakthrough innovations in last mile delivery are still at a nascent stage and far from reaching any scale. Products from the west like cold storage remote sensing, digitization of field level data, are unaffordable for most Indians. Jinesh Shah, Partner, Omnivore equity advisors (an agriculture technology fund) questions what are the innovators and entrepreneurs trying to innovate? There are not enough businesses that address bottom of pyramid solutions. Moreover, backward integration of services in agriculture does not attract many innovators and funds, as not many want to get their hands dirty.

Investors do not believe in patient capital

Investment in agriculture offers a decent return – however the gestation period for investment is relatively high and not entirely in sync with the market expectations. There is not enough funding coming to start ups in this sector. According to Traxcn, a start up activity tracking platform funding for Indian agriculture start ups declined to $56 Million in 2015 from $ 123 Million in the previous year.

With India still being a largely agro based economy there is no dearth of opportunities, however factors like government control at most levels and no- reliability of weather conditions makes it a very high risk proposition for investors. Agtech innovations in India needs patient capital and an ecosystem that has the appetite to program these innovations for scale and success.

The current set-up is a set-up for failure.

No data use for decision making

While analytics and data for decision making including software, IOT, drone technologies, big data are the buzz words in silicon-valley. In India, data collection related to agriculture is skewed and mostly within the government and academic realms, making it inaccessible. The biggest challenge is to take all that data generated from multiple sources and turn it into information that a farmer can use to make informed decisions through real-time data coalition, analytics, and decision support tools. Investment is data analytics is poor and unrealized. We have failed as a society on technology deployment says Kunal from Cropin Technologies.

This article first appeared in *Sankalp Forum*

A Water-Starved India By 2050

By Lakshmi Poti and Vineeth Menon

We are staring at an apocalypse. This can only be averted if efficient practices are integrated into industries and services

The future of water will be a gamble — resting entirely on the way we decide to play the game here on. Either we continue to use water irresponsibly, threatening the very existence of this planet, or we adopt sustainable and smart water management practices to build a water secure future.

Scenario 1: Status quo

By 2050, India's total water demand will increase 32 per cent from now. Industrial and domestic sectors will account for 85 per cent of the additional demand. Over-exploitation of groundwater, failure to recharge aquifers and reduction in catchment capacities due to uncontrolled urbanisation are all causes for the precarious tilt in the water balance.

If the present rate of groundwater depletion persists, India will only have 22 per cent of the present daily per capita water available in 2050, possibly forcing the country to import its water.

Scenario 2: Smart deviations

Optimists believe that India's people, some 1.7 billion by 2050 , will have integrated water efficient practices into their daily lives. If the ambitious water sustainability goals set by global industries and governments are testament, we dare say that the world has begun to recognise water as a resource after all.

While beverage giants are focused on returning water to the communities where they manufacture their drinks, food processing players are engaging with farmers and upstream actors to minimise water usage across the supply chain, and textile houses are evangelising the concept of sustainable fashion. Companies have realised the business risks emanating from the possibility of a water-scarce future. This has triggered companies to re-engineer processes, implement water optimising technologies, establish water audit standards, and use a collaborative approach to wade through the water crisis.

There are many examples. Coca Cola and PepsiCo replenish water through community water recharge and conservation projects. SAB Miller helps its partner farmers reduce groundwater use. General Mills is planning to sustainably source 10 priority ingredients by 2020.

By 2015, IKEA achieved its target to use 100 per cent sustainable cotton, grown using less water and chemicals. Levi Strauss has saved over 1 billion litres of water through its patented Water<Less process. Maruti Suzuki's use of dry wash, and bio degradable chemicals, has enabled a 50-per cent reduction in water used for car washes.

Water-efficient technologies will continue to be developed like they already are today, but more importantly, it is the renewed understanding of water as a shared commodity that will help these technologies find acceptance with industries, agriculture, and individuals alike.

New habits will be created over the coming decades and efficient water usage will be synonymous with all users. To help visualise this future, we have drawn out interventions that will have become second nature to the country's populace and found large scale use in India by 2050.

Efficient water use

Agriculture will continue to be the mainstay of India in 2050. However, what is going to markedly change is the utilisation of water by the sector — efforts of which have already begun

to take shape, reflected in the country's 'per drop-more crop' mantra. Currently, the world's leading virtual exporter of water, India will have integrated water efficient practices into the way it farms. Produce yields will not take a beating, instead, data-driven farming will enable efficient water utilisation.

A number of these technologies are already in play: soil sensors that analyse moisture content of soil and relay the information to a cloud based platform, which in turn controls the amount of water released to crops; drone enabled thermal imaging of farms that help in predicting the temperature and water requirement of crops; and IoT sensors that detect leakages in irrigation pumps and pipes and automatically plug the leaks.

Industries will be judged by their shareholders and customers on environmental sustainability practices integrated into core business operations. As a result, industries will reduce their dependency on freshwater altogether. Treatment of waste water and the use of recycled water in manufacturing products will be prevalent across industries.

Innovative technologies that reduce water will be used in operations — for instance, Nike and IKEA backed DyeCoo Textile Systems swaps water intensive dyeing processes with a carbon based process, where carbon dioxide is transformed into liquid at high pressure and heat and this liquid is used for dyeing fabric.

As an unexpected by-product of hydraulic fracturing industry, there has been a high demand for highly mobile waste water treatment facilities. Investments are being channelled into facilities which can treat waste water. With higher volumes of water and technology improvements, the prices can be kept at optimal levels.

Shared goals

Technology will have incredible impact on domestic water consumption. Leaky taps will no longer be a problem with users being able to remotely shut off valves using 'smart meters'.

Behaviour change in water utilisation will be driven through gamification models that will score households in comparison to their neighbours; smart meters linked with mobile apps will rank users on their water usage patterns.

Flush-less urinals, solar-powered flushing systems, dirt-sensor taps, and self-cleaning surfaces will be standard fixtures in homes, offices, and public institutions. Off-grid atmospheric water generators, like that being prototyped by Uravu Labs, and 'self-filling' biking bottles that produce water as you pedal, will create water from thin air.

While countries such as Australia have made water a tradable commodity, it could become a norm in most countries by 2050. Strategies, forms, pricing may differ across countries, however, water trading through financial instruments could be a common thread, primarily because of its inter-linkages with agriculture and energy.

Water availability will be treated as a national security issue, like in the case of Israel, thus providing the impetus to make it a priority. Coastal regions will be more dependent on sea water by using desalination technologies. Simpler and cheaper solutions like rain water harvesting mechanisms, which have been in existence since A.D. 550 would be routine forms of accessing water.

As of now, the narrative suggests a bleak water future and that by 2050 almost 50 per cent of the world's population will be living under extreme water stress. While this may be true if the current usage (read 'exploitation') continues, people armed with technologies and an appreciation of shared risks of water will ensure that stress levels are minimised. Engineered solutions may be the answer to our water woes. However, the success in securing a water safe future will always be tied to the ability to use water a shared resource.

This article first appeared in *Hindu Business Line*

ENTREPRENEURSHIP

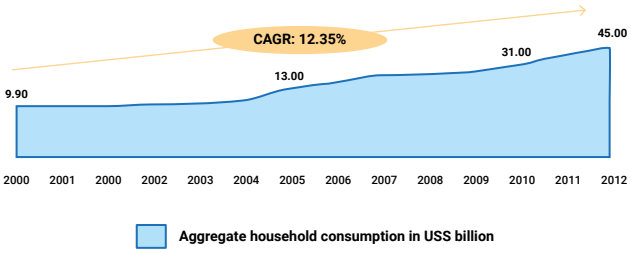
Tapping The Untapped : Opportunities For Businesses

By Sheena Raikundalia

Every single social and global issue of our day is a business opportunity in disguise." – Peter Drucker, management guru

Poor and low-income families have many unmet needs from food, water, shelter to sanitation, healthcare and livelihoods. There are 3 billion people living on less than $2.50 per day—nearly half of the global population.

This low income market with its size and potential latent demand provides huge opportunity for business. Taking Kenya as an example, the Kenyan consumer market is growing at a fast pace, household consumption expenditure has grown at a CAGR of 12.35% in the past 13 years[1] with low-income households comprising 86% of total consumption[2]. Typical monthly consumption levels of a low-income household are KSH 5,472 (US$ 60) for rural areas and KSH 10,953 (US$ 109) for urban[3].



The future projections are also promising. Growth trends are likely to continue, with the result that a portion of low-income consumers today will grow to become middle-income consumers. In the next 15 years Kenya's population set to grow by 30%, urbanisation to increase by 45% and poverty set to reduce by 3100 basis points[4].

Whilst many corporates and small and growing businesses (SGBs) deal with this low income market either as suppliers, customers or employees for the most part, markets are not set up to service this population. For example, poor infrastructure means that it is particularly difficult and expensive to reach the low income market.

1. Index mundi, World Bank
2. Source: IFC's consumption database
3. Kenya Inequity Report, Society for International Development
4. World Bank Development Indicators

Success Stories

Opportunities in low-income markets are frequently considered riskier, lower margin, or at least longer term. Even Vodafone's M-PESA mobile money transfer service, which now reaches 18 million users and moves more than £500 million through the Kenyan economy every month, required a £1 million matching grant from the UK's Department for International Development to get started and cover the initial risk of developing a new product.

Yet, some corporates that have tackled this market have experienced astounding success:

Financial Inclusion: Equity Bank from being declared technically insolvent in 1993 currently has more than 8 million customers making it the largest bank in terms of customer base in Africa with nearly half of the total bank accounts in Kenya.

Social Durables: The solar lantern market has grown by more than 200% in the last 3 years with c 700,000 solar lanterns sold to off-grid families in rural Kenya. Use of solar lighting has increased fourfold from barely 2% in 2009 to about 8% in 2013[1]. d.light and Greenlight Planet emerged as leaders in the solar lanterns

market and Mkopa headed the market for solar home systems.

Consumer Products: Unilever has specifically tailored products for the low income market, in terms of product size, price, alternative distribution strategies and seen resounding success and made sustainable living part of its vision.

By addressing latent needs for the low income customer, these corporates were able to achieve financial success as well improve access to finance, energy, water, food and create employment. This in turn, lays important foundations for further growth: increasing incomes, greater purchasing power, more skilled and sophisticated workers, suppliers, distributors, and retailers, and more stable societies.

How can businesses tap this potential?

While low-income consumers represent an attractive market, the reality is that reaching them is difficult. Challenges include sparse population with uneven population density, nascent last-mile infrastructure, predominantly informal retail networks, latent demand and a limited ability to pay upfront.

One route into this market is through partnerships between corporates and SGBs. While corporates have scale and resources and have highly qualified teams, they are confronted with high opportunity costs of investing in products with uncertain return. Due to the higher perceived risk, many business opportunities remain untapped.

SGBs, on the other hand, often operate on a limited scale and are constrained by limited human capital and financial resources.

By working together, corporates and SGBs can address key challenges that prevent product or business model innovations from scaling up, creating "win-win" situations for both sides and accelerating business growth, while increasing social impacts.

A recent examples of successful collaboration in Kenya include the Total/d.light partnership whereby the innovative, reliable solar technology and phone charging solutions by d.light are sold through Total's extensive distribution network in Kenya and Africa enabling off-grid, low-income communities to meet some of their most basic everyday needs.

[1] Kenya Qualitative Off-Grid Lighting Market Assessment, International Finance Corporation

What next?

It is fitting to end with reference to C.K Prahalad's assertion of the fortune at the bottom of the pyramid. The opportunity to make profit whilst creating impact exist particularly in Kenya and Africa as shown in the examples above. It is just a matter of taking the next steps.

Any parties interested in exploring collaboration opportunities in Kenya please reach out to us directly. With the support of USAID, we have recently launched a Collaboration for Impact Facility to help set up such partnerships and we'll be happy to discuss how your organization can get involved.

This article first appeared in *Sankalp Forum*

What The World Needs To Know About African Enterprise

By Sheena Raikundalia

Ahead of the 2016 Sankalp Africa Summit in Nairobi, Kenya, Pioneers Post and the Sankalp team spoke to the founders of four ventures based in the continent to find out: 'What does the world need to know about African enterprise?'

High number of funds, but impractical mandates

Sun-Culture is a business that designs and sells solar powered irrigation systems and agricultural extension services that make it cheaper and easier for farmers in East Africa to grow high-value fresh fruits and vegetables.

Co-founders Samir Ibrahim and Charles Nichols founded the business, which is headquartered in Kenya, in 2013.

Ibrahim offers his take on what the world ought to know about African enterprise. "This isn't Europe and this isn't the U.S. Solutions for Africans are not going to be developed in nice buildings in New York or London.

"It's a very interesting scene right now. There are a lot of funds and donors putting money into sustainability in Africa, which is fantastic, and Nairobi is at the centre of all this activity.

"But what we're seeing is that a lot of the Limited Partners (LPs) of the funds being set up in Africa have not spent time in the places they wish to allocate capital. This is not a good thing. When a fund is created, investors create an investment thesis and then a mandate is set outlining future investment parameters – how much each deal will be, what sectors they will invest in and what impact they will achieve. These parameters are being set by people who do not have much experience on the ground so the negotiation is happening without full understanding.

"What that translates to is a lot of money coming into the space, but with impractical restrictions. This is further exaggerated because most of the limited partners investing in impact funds are the same, which means we have a high number of funds that have the same, impractical mandate."

Listen and think long-term

Kigali Farms was founded in 2010 by Laurent Demuynck to "teach farmers how to grow mushrooms so they get good quality food to eat and sell, and at the same time make some money". Kigali Farms is now the largest supplier of fresh mushrooms in Rwanda.

Demuynck explains that mushrooms are both highly nutritious, helping to reduce malnutrition, and "an excellent fit for Rwanda" agriculturally.

"Mushrooms are the 'meat of the vegetarians'. They have 30% protein and contain all the essential amino acids that the human body cannot synthesize (i.e. those that need to be obtained from diet).

"The require very little land and yet can produce high yield. Less than an half an acre of land can yield 230 tons of mushroom – it can become a mini-cash crop without the farmer having to make any changes to current land," he says.

Sometimes well intentioned aid really ruins things.

Demuynck was the CEO of a high-end microbrewery in New York, before moving to Rwanda in 2010 to launch Kigali Farms. After finding it "very difficult to work with" mainstream banks, Demuynck admits he "almost gave up" the struggle to get the enterprise off the ground.

He continues: "Finally, I got my break. Through Intellecap's Impact Investment Angel Network (I3N) we managed to secure funding... Not only did we get funding but we found a partner that was enthusiastic about the project, shared our vision and passion. With this funding we were able to unlock more, including a bank, and are now building a factory and diversifying into button mushrooms."

So, what does the world need to know about enterprise in Africa?

"I think people who come to Africa, need to listen more… businesses have their own way of operating here which must be respected rather than imposing Western standards.

"Sometimes well intentioned aid really ruins things. With oyster mushrooms there was so much potential but the pricing structure is a mess. Historically, aid was given to farmers to grow mushrooms but no thought was spared for post-harvest issues such as cold storage facilities or a centralized buying mechanism (like what we offer our growers now).

"The predictable result was producers rushing to market with a perishable product, competing the only way they knew – on price – and hence a buyer's market with prices too low to allow primary producers to accumulate profit and reinvest.

"Rather than aid in Africa, the opportunity is to use business, create value-chains creating great impact and earning money in the process."

Educating entrepreneurs in Tanzania

EA Fruits Farm is on a mission to reduce the estimated 4.5 million tonnes of annual fruit and vegetable waste in Tanzania. It's director Elia Timotheo explains: "A huge amount of fruit and vegetables goes to waste due to lack of storage facilities...The other problem is poor quality.

"We are solving these two challenges by buying from smallholders at fair prices and utilising cold storage facilities to increase the shelf life of produce… Our company is also putting a lot of effort in capturing the urban market, where people have high purchasing power and can easily access internet-first solutions. We are currently developing an online platform for selling our fresh produce."

Timotheo describes the entrepreneurial community in Tanzania – entrepreneurship is "not yet booming, just rising," he says.

"A few years ago, in international entrepreneurship platforms, you would see very few Tanzanian companies, only one or two, compared to so many companies from Kenya. Now, where you get 10 Kenyans, you get at least three Tanzanians, so the ratio is going up!

"Local people, before, were not educated in a way that they could run companies. The model of education in the past was meant to get people employed. The spirit at the moment is that once they finish school students can start employing themselves and that's why the number is rising," Timotheo concludes.

Tackling misrceptions

In 2013 Luke Kyohere and Dan Kleinbaum launched Beyonic – a Ugandan based business that aims to eliminate dependency on cash by helping businesses quickly set up and manage mobile money payments.

Kyohere, who is from Uganda, explains: "A lot of Africa uses cash, which doesn't allow people to save or to become part of the formal economy. It's also insecure and costly. Mobile money for person-to-person payments is really taking off, but businesses are not using these systems. We make it easy for a business to pay people using these existing mobile money systems, instead of using cash."

Kleinbaum, who is from the U.S., recalls a moment in the businesses journey where the stark misconceptions about doing business in Africa were made clear. "We were in Texas pitching the idea, before Beyonic was a solid business… it was a room probably with 50 people, and after we got through our 10-minute pitch, this guy says: 'Aren't there people with guns and stuff over there trying to keep you from doing business?'

"But it's one of the reasons why there is so much opportunity – the level of ignorance in terms of how things operate. There are 700 million mobile handsets on the continent. If you're talking about infrastructure to build any type of service on, it's better than perhaps anywhere, with the exception of China and India… 80% of Ugandans have mobile phones and 60% have mobile money accounts – that's something that western investors are just starting to figure out."

This article first appeared in *Pioneers Post*

The Face Of The African Entrepreneur

By Sheena Raikundalia

Vava Coffee is a social enterprise whose main aim is to contribute to better future prospects for local communities and the coffee industry as a whole. Vava Coffee is creating sustainable livelihoods for over 30,000 smallholder coffee farmers in Kenya as well as employing HIV-positive women and ex-offenders in the informal settlements surrounding Kenya's capital. Now employing 15 full-time and six part-time staffers, the company was founded by Vava Angwenyi in 2009.

Sheena Raikundalia: Describe your business as if you're explaining it to your grandmother or a 10-year-old child.

Vava Angwenyi: I will just describe it how I describe it to my 6-year-old every day: "Mummy sells coffee to help change lives."

SR: Why this solution in particular?

VA: There is significant potential in the industry but while coffee is the second largest traded commodity in the world after oil, the injustices suffered by coffee farmers are atrocious. The coffee industry seems to just benefit large corporates who have been around since the colonial era.

It is time for change. I want to ensure that coffee farmers are integrated into supply chains, and trained so they understand why their coffee may be rejected by buyers, understand what international markets require, and are able to supply this. I want to ensure market transparency and that farmers get a fair price.

SR: What drives you?

VA: I have had a privileged life, studied all over the world, obtained three degrees … but rather than getting a cushy job in Wall Street, I wanted to come home and benefit my community. My father, a banker, who passed away 12 years ago, always said "employment is slavery." That stuck in my head. Whilst entrepreneurship is not for everyone – it is tough, stressful, risky – I think that getting a steady paycheck is addictive, controlling. With Vava Coffee in addition to [making] money I am creating a sustainable form of employment for many people and making a difference.

For me it's not about getting cash quickly. Entrepreneurship is not a microwave , it is a slow process, more of a marathon with ups and downs, which takes a lot preparation. I try and focus on the long term and not let the tough times get me down. Life is too short not to take risks.

SR: What's been the most difficult thing about getting to where you are now?

VA: Funding! Interest rates are extremely high at around 24 percent and all loans require collateral. In fact, at the moment, demand for Vava Coffee is exceeding supply but we struggle with lack of working capital to facilitate the trade process.

Whilst there is a buzz about Kenya and money coming in, it seems to be targeted mainly in the IT and technology sector. Capital for businesses like mine is extremely tough to get. Despite the rhetoric, banks do not seem to want to lend and with other capital providers we seem to go through meeting after meeting, interview after interview, and no response. Whilst there is grant money available, this tends to be for a specific purpose.

It's not just me – there are many hard-working, educated, passionate, driven people who want to do good things for the country but are overlooked. We tend to be in the middle tier, i.e. not the small jua kali (small business) sector who have access to microfinance loans and certainly not the big corporates whom the banks are flocking to get. We are those in-between businesses who are ignored; we are the "Forgotten Middle" who can quickly effect positive change but struggle to get the capital.

SR: What's it like on a bad day – and on a good day?

VA: Where to start! There can be a myriad of problems to deal with: shipments going wrong, coffee burnt in the roaster, a client

wants 300 packets in three days, being stuck in traffic when deliveries are due. … Good days are more than just money in the bank. For me, good days are when I know I have made a difference or even when a customer emails me saying "I love your coffee." Makes it all worthwhile.

SR: What is the one thing you wish you'd known when you started out?

VA: I wish I had been better armed with collateral for borrowing's sake and a bigger pile of seed funding.

Entrepreneurship is a lonely journey so it is important to create a strong support network. It is tough, people are judgmental. When I started out, I had people say to me: "That is one expensive hobby you have!" As a woman, it is even more difficult to be taken seriously. Further, there is a perception of the African entrepreneur, and if you do not fit that stereotype, woe befalls you.

Also, brand is extremely important. Don't just focus on on making money quickly, think long-term, formalise, create good structures and a brand that outlives you.

SR: What is the entrepreneur community like in Kenya?

VA: It's difficult. I get more support from entrepreneurs, partners and donors in the U.S. than in Kenya! I don't know why that is, but I am looking for that spirit, support and have not really found it.

Attitudes are different. In Europe and the U.S. failure is embraced – in fact, there is a badge of honour with having a failed start-up. A now successful entrepreneur friend managed to raise $700,000 worth of funding for her business in the U.S. following on from her experience of her first failed enterprise. In Kenya we have not adjusted to the concept and there no mechanisms to deal with failure.

SR: What do you think the world should know about African enterprise?

VA: The Kenyan or African entrepreneur is not one to be pitied, we are not looking for a hand-out. We have started our own businesses, we need investment. We are looking to scale, make impact. I have done the craft fairs, entered programmes, traded in Kenya for six years. I now want to take it further – to the export markets, commercial buyers – but I need some support.

I have been sustaining my business for quite a long time. I know coffee, I am a certified coffee Q-Grader, I understand my business – the market, the demand, the potential. I go on the ground with the famers, roll up my sleeves, get my hands dirty. The face of the African entrepreneur is not a helpless-looking person – the face of the African entrepreneur is me , a fierce, female changemaker!

This article first appeared in *Next Billion*

Balancing Entrepreneurial Values With Social Impact

By Sheena Raikundalia

Social entrepreneurs in Africa have developed innovative ICT-enabled models for agriculture with the aim of combining profit with inclusive rural development. Their main challenges are scaling-up and earning an income while serving the poorest rural communities.

The concept of social entrepreneurship, the idea of using business to solve major social and environmental problems, is gaining traction in East Africa and particularly in agriculture. Poor farming practices, inefficient processing, storage and supply chain infrastructure leads to wastage, distorts pricing and supply. For the social entrepreneur such challenges in the food value chain provide business opportunities.

Intellecap analysed over 400 social enterprises across East Africa, of which many are working in agriculture. The findings have been captured in the Game Changers Report (2016). Technology was identified in the report as a key enabler for social entrepreneurs in agriculture; lowering transaction costs and enabling scale through provision of information, finance, collectivising smallholders and providing market linkages. The report classifies social enterprises across three levers based on their interaction with the bottom of the pyramid (BoP): access, ability, and knowledge.

Access/Ability/Knowledge Framework (Source: Intellecap 2016)

	BoP Involvement	Value to BoP	Agriculture Models	Target Market
Access	As consumers of critical products and services	Improved access to critical products and services that are high quality and affordable	Agriculture inputs	Rural and urban BoP
Ability	As partners in enterprise value chain and/or skill development	Through skills improvements, increased productivity and output	Agro-processing and capacity building of farmers	Rural, urban and export market (middle and upper income)
Knowledge	As consumers of information	Improved awareness and behaviour change towards better quality of life.	Information linked to good farming practices	Rural and urban BoP

Business opportunities

Social entrepreneurship has the opportunity to improve rural employment, to empower communities, and to tackle various constraints in the food value chain. While private sector actors (e.g. short-termism), public sector actors (e.g. budget constraints), and civil society (e.g. entrepreneurial limitations) leave many options open for improvements, it is social entrepreneurs' mission to fill this gap by combining social and entrepreneurial values.

The majority of small-scale farmers are excluded from formal financial institutions and borrow at high interest rates from informal sources. Most lack information and awareness of the benefits of improved inputs such as hybrid seed, concentrate feeds, fertilisers and pesticides, or machinery. Most smallholder farmers rely solely on rainwater for their crops, while basic irrigation systems could double a field's productivity. Social enterprises play an increasing part in using innovative business models and technology to solve such challenges. Esoko, for example, is a social enterprise that has developed apps that train and support farmers in monitoring production, increasing yield and marketing. Esoko tracks data generated from the apps for analytics and uses it to improved farm yields.

One way to strengthen the efficiency of lending to smallholder farmers is through mining the credit history of potential customers for financial institutions. FarmDrive, for instance, conducts credit assessment of smallholder farmers using a digital book-keeping platform. The enterprise's technology enables farmers to track their productivity, expenses and revenues which are analysed to reveal performance patterns. The information helps financiers to make lending decisions based on the credit profiles of the borrowers.

Small vendors lack money and time to travel distances to remote rural markets to purchase fruits and vegetables. Therefore, social enterprise Twiga Foods has developed a tool that vendors can use to order stocks. It procures the produce directly from farmers at a guaranteed price and delivers it to the vendors. The vendors are allowed to make flexible payments using mobile money depending on what they sell during the day.

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Challenges for social enterprises

Social entrepreneurs that serve poor and remote rural communities face many obstacles. Although for social entrepreneurs the social mission is as important as profit-making, earning an income from their activities is a must. A key challenge, however, is the limited purchasing power of a low income rural population. Intellecap noticed a shift in the way social enterprises in Eastern Africa react to the challenges of affordability. Creating affordable products was synonymous to creating low-cost products with basic features. However, social enterprises now focus on designing innovative pricing and payment solutions for full-feature products and services. They use sliding fee scales or special discounts for people of lesser means or introduce new payment models.

For example, there is the pay-as-you-go model that is also referred to as a progressive ownership model or rent-to-own model. Social enterprises use this model to provide rural asset financing for the low income population. In this model, a consumer pays an initial deposit for an asset and pays instalments on a regular basis. Once the instalments are paid to cover the balance cost, the consumer owns the product and can stop paying instalments.

Another challenge for social enterprises is that they often have to build markets, create demand for their offerings and educate customers. Poor infrastructure and uneven geographic distribution make it cost-prohibitive for small companies with limited scale to reach a network of thousands of disparate farms while larger companies encounter a host of logistical issues. Transportation bottlenecks can also run up costs. The price to ship a storage bag from Asia to a warehouse in Nairobi is negligible compared to transporting the same bag from Nairobi to a farm in the Kenyan countryside making it costly for social enterprises to scale.

Way forward

Intellecap's analysis has shown that East Africa has seen a proliferation of entrepreneurship and innovative business models with two factors emerging as key for success. Firstly, the importance of providing end-to-end support across all stages of the value chain. Those enterprises that provide quality inputs and processing facilities, support capacity building of farmers, and ensure market linkages were the most successful. This model locks in revenue stream and collectivises smallholder farmers to reap economies of scale whilst ensuring that farmers receive fair pricing for their products on a regular basis. Secondly, enterprises should consider leveraging technology. Enterprises with access to customer data can collect, analyse and predict future trends and highlight business opportunities. In the absence of such data, customer insights remain locked within individuals and enterprises and responses to challenges remain reactive.

Despite numerous examples of social enterprises in e-agriculture, social entrepreneurship is still nascent in East Africa and more than 60% of enterprises interviewed for the report were younger than five years old. Around half of the enterprises have

not achieved break-even and 67% earn revenues of less than US$100,000. Investments of US$100,000 to US$500,000 are critical for the growth of these enterprises, but currently demand for such investments outstrips supply. As such, impact investors focusing in East Africa need to design innovative financing mechanisms such as multi-year financing plans, result-based financing, and other forms of blended finance in order to cater to the growing demand. With financing and support the enterprises will be able to scale simultaneously creating profit and much needed impact.

Ultimately, social entrepreneurs need a lot support; not only financially, but in capacity building and networking. This can come from governments, NGOs, donors, private sector actors (e.g. angel investors or impact investors), and increasingly specialised support organisations for the social enterprise. The support should not only target the individual social entrepreneur, but must seek to create the perfect ecosystem for social entrepreneurship to succeed in their social mission. Because such ecosystems are less advanced in rural areas, support should take into account the special measures to succeed social enterprises in rural circumstances.

This article first appeared in *ICT Update*

Technovation: Can Tech Entrepreneurs Solve Africa's Development Challenges

By Sheena Raikundalia

There is real potential for technology entrepreneurs to be game-changers in solving development challenges in Africa provided there is a supportive high impact tech innovation ecosystem to help growth and scale.

Much has been written on the African tech scene; many referring to the Silicon Savannah as the beacon of hope with others more skeptical of the hype. The African continent has the lowest levels of human and social development and struggles with age-old problems, with large parts of the population living in poverty, facing unemployment, and inequality. Access to basic infrastructure is still extremely low. 75% of the continent's population lack access to grid electricity and internet; 48% of Africans live in extreme poverty today; and 40% lack access to clean drinking water. Yet, entrepreneurs have found innovative ways to address many challenges leveraging technology as an enabler. For example, innovations such as Peek, a smart-phone based portable eye examination kit for comprehensive eye examinations in even the remotest of settings, Bitland which registers land titles in Ghana to a public blockchain enabling banks to lend against these previously unregistered titles and Nigeria-based Hello Tractor leverages IoT to provide farmers with the opportunity to rent a tractor on demand.

Millions of Africans have simply bypassed traditional infrastructure stages such as landlines and branch banking, skipping straight to cellular telephones and mobile money. Smartphone connections in Africa are forecasted to increase to 720m by the end of 2020, more than twice the number projected in North America illustrates the potential case for technology to solve development challenges.

The case for Technology

There are three reasons to be optimistic about the case for technology with a caveat that an enabling digital ecosystem is required to truly reap the benefits for technology to solve Africa's development challenges.

1. Exponential rate of technological change: The pace of technological change is exponential. Looking at how quickly things have changed in the last decade with wireless internet, social media sites and smartphones supports Ray Kurzweil's prediction that we will not experience 100 years of progress in the 21st century but more like 20,000 years of progress at today's rate. Looking at the impact of technologies such nanotechnology, robotics and AI, today's unsolvable problems may very well be easily overcome though technology.

2. Technology works notwithstanding infrastructure: Lack of infrastructure has led to various innovations. High penetration of mobile money in Kenya was due to the lack of bank accounts and banking infrastructure. In Rwanda, poor road infrastructure and the time required for blood deliveries to reach hospitals paved the way for Zipline drones to deliver blood supplies to hospitals. As such, Africa's challenges can be its opportunities. For example, taking the poor African connectivity. Global corporate such as Google's Project Loon, and Facebook's Internet. org as SpaceX are looking at planet-wide constellations of low-earth orbit microsatellites to beam continuous internet across the planet. Tech enterprises are also looking at the challenges. goTenna Mesh, Tuse and Village Telco have already started to provide connectivity using mesh networks. Kenya-based BRCK provide a hardware solution that provides connectivity in rural and remote locations.

3. Strong Entrepreneurship Culture: Africa has the youngest population in the world with a strong entrepreneurship

culture of using innovative technologies to solve challenges. Taking 3D printing for example. A Togolese inventor Afate Gnikou built a 3D printer from electronic waste which cost $100; a Ugandan 3 year old received a prosthetic and socket costing $250 a fraction of the normal $5000 price tag; a Zambian scientist is working on a project to create a 3D printed device that enhances the capabilities of existing malaria testing technology. Internet of Things and Artificial Intelligence is another example. In addition to corporates such as IBM with Watson or Africa equivalent Lucy, startups are also utilizing these technologies. East-Africa based Tala, for example, is a data science and mobile technology company gathering information about a customer from over 10,000 data points to form a financial identity with a credit score within five seconds. SophieBot, is Kenya's Siri for sexual and reproductive health information and South Africa-based Obami provides customized education through a platform solution that facilitates communication between learners, teachers, parents, and educational administrators.

Whilst these examples are encouraging, in order to truly reap the benefits and use technology to solve development challenges an enabling environment is required. Intellecap's report: Imagine Africa 2030: Technologies that will shape Africa's tomorrow: analysed around 100 enterprises across Africa using emerging technology such as robotics, 3d printing, Internet of Things, Artificial Intelligence and Block-Chain and identified the need to create a high impact tech innovation ecosystem for enterprises. What was clear is that technology itself was not enough. Innovations are also required to drive technology adoption through business model and process innovation and awareness building. For wide-scale adoption in Africa, clear tangible benefits such as affordability, improved access and income enhancement from the tech-enabled products and services is needed. Without a high impact tech innovation ecosystem it will be difficult for tech entrepreneurs to scale and create impact.

Creating a High Impact Tech Innovation Ecosystem in Africa

Three opportunities for creating a high impact tech innovation ecosystem in Africa are apparent:

1. Risk- Taking Capital: High risk-taking innovation capital is a gap. Tech investors who understand the potential of technologies are unfamiliar with the African context, while local investors often lack the appetite for technology investments. Philanthropic capital, donor and government funding hence can play a particularly critical role in filling the proof-of-concept funding gap in the short term. In the medium term, intermediary organizations can help build knowledge around the investment needs for tech entrepreneurs and increase tech savviness of investors. Networks of experienced tech investors in other markets such as US or Europe can help crowding in such investors into the African market. In addition, new financing structures such as blended financing structures are needed that can reduce risks and crowd in private funders.

2. New forms of Collaborations: Many technology innovators are developing solutions in R&D labs, but often outside the African continent and far away from the context in which those solutions need to be applied for creating maximum impact. Local, real world test-beds that enable quick prototyping and getting instant user feedback are required. Partnerships between corporates, research labs and innovators are required as well as open source data platforms and communities that enable knowledge sharing between local and international communities shortening learning cycles and reduce the risk of failure or making mistakes others have gone through before.

3. Business Model Support: Pure technology companies in Africa, for example, local social networks, have had limited success as poor enabling environments have hindered scalability and rapid distribution. Companies which use technology as an enabler that significantly reduces the cost of service delivery and/or improve access to goods and services are more likely to be successful. However, these companies need more than just innovative technology, they require robust business models, revenue streams and process innovations. As such, unlike their Silicon Valley counterparts, these companies require longer time to scale, require more support and capital to scale. Technology.. Not a silver bullet

To conclude, technology can prove to be game changer in solving development challenges in Africa but it is not a silver bullet. Along with the technology, innovations to drive technology adoption and raise awareness are required. A high impact tech innovation system attracting risk taking capital, enabling new forms of collaboration and providing more business model support can help technology entrepreneurs to grow and scale and truly deliver impact which can be game-changing for Africa's development challenges.

This article first appeared in *LinkedIn*

For Social Innovations Failing To Scale, 'Human-Centric' Design Thinking Is The New Buzzword

By Stefanie Bauer

Much has been said about the scaling challenges of startups, especially those aiming to address underserved segments of society in emerging markets. While the number of impact startups in ecosystems like India, Kenya or Indonesia are flourishing, the number of solutions that have scaled are still small.

At the same time, the excitement for "Base of the Pyramid" innovations and business models has never been greater among investors, donor agencies, philanthropists and governments - with hardly any month passing in which not a new business plan competition or challenge is being launched to find business solutions that target low income population.

Against rising expectations, the sector must prove its ability to generate scalable solutions, which is why increased emphasis is given on creating an ecosystem that nurtures and supports impact startups and addresses scaling barriers. Commonly identified scaling barriers on various levels include:

1. Scaling challenges that occur on the level of the founder and entrepreneur, his managerial capabilities, ability to build a strong leadership team, scale his vision and lead his organization towards growth.

2. Scaling challenges that occur on the level of the organization, its business model as well as financial capital and nonfinancial capital such as team, culture, and capabilities to deliver

3. Scaling challenges that occur on the level of the industry or sector, where markets do not function, customer awareness is limited, or distribution channels are missing

4. Scaling challenges pertaining to government laws and regulations, policies and macroeconomic framework conditions.

Most attention is given to capital as the top scaling barrier for impact ventures, with most ecosystem support going into providing incubation, investment readiness and capital support.

Lesser attention is given to the other scaling barriers, such as leadership, talent and organizational health. Least attention is given to the question- why the intended solutions do not work.

Re-look at scaling-challenges

Design Thinking and human centric approaches have become state-of the art approaches in the business mainstream, where an increasing number of corporates like GE or IBM are embracing principles like empathy, prototyping, and agility in solution development processes. These principles are increasingly being applied to solve so called 'wicked problems', complex, intangible issues - for example how different customers experience a service.

In recent years, Acumen and Ideo.org have played a critical role in bringing Human Centric Design into the context of startups and social innovation by helping to build capabilities. However, design thinking and human centric approaches involve principles such as empathy that have a much broader potential to help address scaling barriers :

1. Contribute to leadership development of founders and senior management. Innovation, creativity and organizational culture is driven from the top. Great leaders find great teams, empower them to find innovative solutions and create an environment in which teams can cultivate their creative energies and grow their potential. Human-centric approaches can help founders to build organizational capacity to create and execute new ideas, but also to develop strategies that help to thrive in today's increasingly volatile world.

2. Strengthen the organization's ability to make sense of the context, market, consumers, and needs that are to be addressed, the behavioral change that is to be triggered and to identify the appropriate target segment for their solution. Human centric approaches and participatory design help organizations to understand the desirability of their solutions

and to co-create products and services together with the end-user.

3. Identify the solution that best fits industry and sector demands through helping understand levers for influencing user behavior through the wider system. Human-centric approaches bring in the human perspective to complex systems. They help to create customer, producer or channel awareness which are critical for creating markets.

4. Reimagine government and policy framing by leveraging human centric approaches and system- thinking to develop more holistic and cohesive policy interventions.

Making sense of the market context hence requires a deep understanding of low income consumers and their social worlds. What is therefore needed is a truly immersive approach to solution development that is able to understand and catalyze the embeddedness of markets and economic action.

This article first appeared in *Economic Times*

FINANCIAL SERVICES

Fintechs To Drive Financial Inclusion Or Will Banks Save The Day?

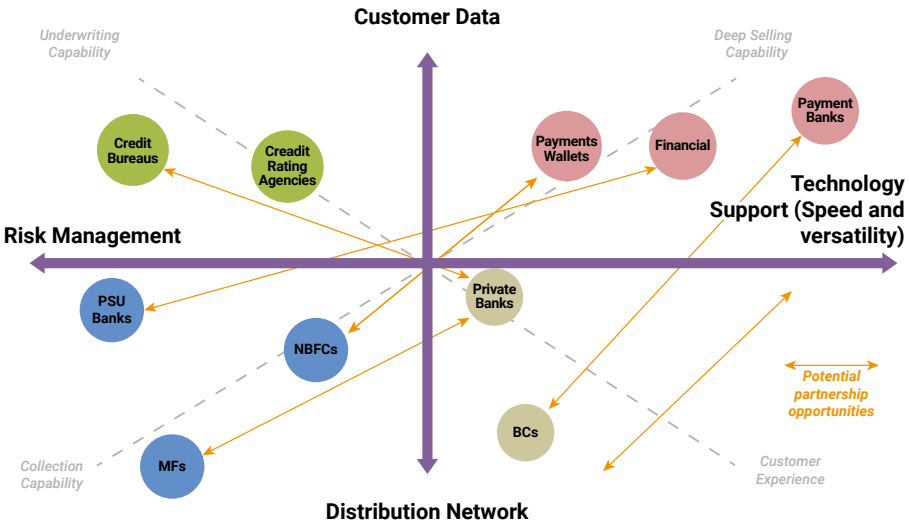
By Himanshu Bansal

At a recent digital banking conference in Africa, I was asked if fintech is sustainable. The response was simple - fintech is not singular. It is an amalgamation of multiple digital financial services trends across regions, and across payments, lending, and banking. The question is which of these are solving a real problem vs those solving a perceived problem. There are a few trends out here that I like, which are solving real issues, which will sustain, and merge with the overall financial services ecosystem:

Disintermediation of the lending value chain - Banks would traditionally source, acquire, underwrite, onboard, collect and service customers. Most would do some parts well, and a few parts not so well. This is increasingly now being solved by the entry of new 'customer owning' entities into the game, who will acquire, owners of data who can underwrite, and the lenders who can lend and collect.

This makes partnerships key.

With new technology and data capabilities becoming criticals partnerships will drive scalable ecosystems



However, the cost of acquisition, collections and data partnerships is turning out to be quite prohibitive (upto 6-8% in some cases), especially in telco-dominated markets, for example Kenya, which is driving the fintech business models towards non-feasibility.

Alternate data - Lending to the bottom of the pyramid and micro SMEs has always been the problem to solve for financial institutions, due to lack of documented income and collateral. Non-traditional data promises to come in and provide an alternative.

However, most such data algorithms do not seem to be working out. Many fintechs across India, Africa etc, are running NPAs upwards of 8-10%, including some of the flagbearers of the phenomenon, but that is not out in the public domain, and typically shoved under the carpet. The main reason for this is that the algorithms are raw and untested. They have not run their credit cycles yet.

Sometimes all dimensions do not get covered or with the wrong weightages. It will take time for fintechs to refine them and scale them.

You cannot short-circuit that process and it won't be a lot more blood on the floor. VCs will also need to learn to underwrite the scoring models than just business models (they should work more with business consultants who understand both!)

Lending tool: 6 keys dimension of building an MSME application scorecard

Financials (20-25%)

- This is traditionally the most used underwrting creteria
- Has limited accuarcy in india SME scenario
- Banks satetment reconstruction, SME crawing, industry margin based income computations

Business performance (10-15%)

- Business turnover, growth, customers concentations etc
- Customer ratings, product return ratio off e-commerce sites can add great value to the scorecard

Credit track (10-15%)

- Creait bureau scores
- Repayment on past loan performanoes with the lender
- Bank satetment reconstruction, chq bounces
- Supplier checks

Promoter (20-25%)

- Promoter eduction, experience, track record and capability assessment 'across the table'
- Psychometric assessments
- Social merdia profile crawing

Industry (15-20%)

- Industry score based upon size, growth, margin, projections
- Industry value chain
- Key opportunities and risks
- Aggrassive vs defensive industry

Micromarket (15-20%)

- Socio-economic data
- population demsity/ growth
- Points of interest/ Traffic data
- Competition data
- Micromarket performance data

Payments - Payments as an innovation is done. It's commodity now. Fintechs who continue to invest in incremental experiences will find it difficult to scale. The trend to watch for will be digital ecosystems. What I mean is digital marketplaces, the likes of Ping-an and Alipay, serving the integrated needs of the digital consumer a.k.a the millennials, enabled through digital payments and leveraging financial services cross-sell sitting on top of all of this, as the revenue driver. The catch here is that the only region where this has scaled so far is China, where traditional banks do not even look at retail or MSME customers. Banking competitive markets is another game.

Notwithstanding the above opportunities, If I critically look at the steady state business model of a pure play lending fintech - with blended cost of funds at 15% plus, 6-8% cost of acquisition/ collections/data partnerships, 2-3% operating cost, plus NPAs, we are talking about a lending rate in excess of 25%. This automatically creates a downward spiral of negative selection and a self-fulfilling prophecy with regards to the NPAs. You cannot realistically expect all customers who borrow at this rate to earn a higher margin on their business and pay it back. And, this is also the reason why financial inclusion is running in the reverse direction in many markets, with customers borrowing at high rates and going bust.

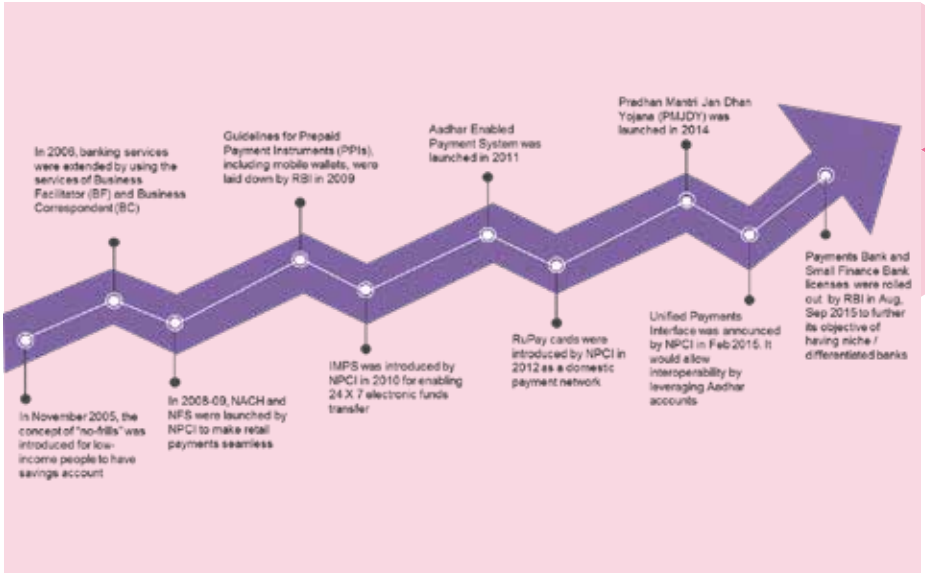
For fintechs, the inherent potential advantage of near-zero cost of transaction, or data driven risk-based pricing is also lost in this operating model. And what this means for fintechs running on equity funding and adrenalin, it is only a matter of time.

The above is also a golden opportunity for banks - They have the distribution, the risk management capabilities, low-cost funds and the customers. And the ability to acquire or partner with data and technology capabilities to offer advanced services such as microsegment based cross-sell (as they have the customers), risk-based pricing (have low-cost funds) etc. And real financial inclusion if they can find the will.

This article first appeared in *Economic Times*

'Uberization' Of Financial Services: How Technology Is Driving Financial Inclusion In India

By Rishabh Parakh



Universal access to financial services is a key ingredient for achieving socio-economic development. Financial inclusion is a theme that is particularly relevant for India, where around 21% of the world's unbanked population resides. Until recently, financial inclusion initiatives have been entirely bank-led, with very limited participation of non-bank players. However, the low risk-appetite and asset-heavy model of banks have restricted wider coverage and penetration has been limited. Even in the cities with strong brick-and-mortar infrastructure, the frequency of transactions using bank accounts has been low, with more than 40% of accounts lying dormant.

Recent years have seen a big push towards digital financial inclusion, spearheaded by RBI and NPCI. The following timeline presents landmark policy measures in India's path to achieving financial inclusion:

Complementing the regulatory push is a market-led pull by FinTech startups that have mushroomed across India. The convergence among banks, telecom players and technology startups is paving the path for higher integration and innovation. Development in mobile telephony, the government's increased focus on financial empowerment of the under-banked, and a vibrant entrepreneurial community are together leading to the emergence of a digital finance ecosystem. Just as cab-aggregator Uber has turned the taxi industry on its head through an innovative platform model, FinTech startups are challenging the status quo and causing disintermediation in the banking industry. The young FinTech startups have forced mammoth banks to re-think their strategy, re-orient their business model and redesign their technological capability.

Sitting on the cusp of a revolution

Agility and innovation are the factors that set FinTech startups apart from the 'too big to change' banks. FinTech startups are fundamentally technology-led, unlike banks that are deposit-led. The FinTech startups have 'out-of-the-box' business models and leverage technology to deliver financial services in a cost-effective, swift and convenient manner. Hence, they can potentially enable last-mile reach to the financially excluded population through alternative digital channels, which is more scalable than the legacy high-touch model of banks.

For millions of financially excluded Indians, the gateway to financial services may not be traditional bank branches but access points such as mobile wallets and POS machines. This opportunity to deliver financial services at high scale and minimal operating costs has a huge potential for a larger impact to society.

In India, the process of 'uberization' of financial services is being catalyzed by the following five trends

Demographic dividend: More than 65% of India's population is under the age of 35 years and more than 50% smartphone users in India are aged between 18 and 30 years. These consumers are tech-savvy and ready to experiment with unconventional digital financial services products that promise speed and convenience.

Internet-enabled mobiles: A majority of the low-income population in India is leapfrogging into internet usage via mobiles, bypassing fixed line internet. The increasing affordability of mobile phones and decreasing cost of data has resulted in a highly digital populace. The emergence of smartphones is

enhancing mobiles from a simple communication device to a full-fledged payment device.

JAM Trinity: Jan Dhan–Aadhar–Mobile is a win-win combination that has created the building blocks for a cashless pathway to financial inclusion. Mobile phone, bank account and unique digital IDs are the pillars on which the DFS environment is being built in India.

E-commerce boom: The rapid growth in e-commerce has seen lakhs of proprietors and wholesalers become online sellers. It is estimated that every month roughly 30,000 retailers are inducted as online sellers on e-commerce platforms This offline-to-online migration is enabling FinTech companies to tap into the digital trails of these merchants – social media footprint, customer ratings/reviews, purchase history and other factors – and make credit decisions based on machine learning algorithms.

Significant advancement in ICT: Higher computing capability and storage capacity have given rise to 'big data' analytics, facilitating better risk assessment and trend discovery. The access to wider and richer consumer data has allowed players to extract behavioral insights and develop targeted solutions. The SMAC (social media, mobile, analytics and cloud) and API technologies have allowed different data streams to 'talk' to each other in a highly efficient manner. This has led to the amalgamation of multiple services into a common platform, thus creating different use cases for delivery of financial services and a parallel 'app economy'.

Striking while the iron is hot

FinTech startups are present across the entire gamut of financial services in India, with most of them operating in the payments space. Presently, a majority of the present customer base of these payment service providers includes only the banked population. This is because cash-in and cash-out are presently largely restricted to the banking system (net banking, credit/debit cards). The introduction of payments banks, however, will soon change the game and allow lakhs of retail merchant points to act as agents for cash in/out. These niche banks have a huge opportunity to collaborate with the main banks and digitize their distribution model by acting as business correspondents.

The latest mega-news of the launch of Unified Payments Interface (UPI) by RBI and NPCI is a huge step in enabling cashless micropayments. UPI will make payments across multiple partner banks much faster, more convenient and seamless. One unique digital ID will replace the multiple steps that the present IMPS and NEFT transfers entail. The expected onboarding of payments banks and mobile wallets into the platform will drastically boost interoperability (W2W, B2B, W2B, B2W) and reduce commission structures, breaking the cost barrier of digital transactions for the low-income consumers.

Gazing into the crystal ball

With the maturity of the ecosystem, FinTech startups will lead the way to India's financial inclusion. The usual 'banked' criterion for financial inclusion is set to undergo a paradigm shift, with financial services such as digital remittance, credit, insurance etc. available to consumers even without accounts in the commercial banks. With a billion mobile subscriptions and a billion Aadhar IDs created, financial services through mobile phones is expected to dominate all other channels.

The success factors for FinTech players in India will be the usability, affordability, reliability and ubiquity of their services. To ultimately benefit consumers at the grassroots level, financial literacy and awareness among low-income customers would be paramount. Trust factor will also play an important role, especially to mobilize rural and semi-urban consumers to transition into digital channels. Hence, transparency in fees, easy recourse in case of fraud, and multi-lingual customer service will have to be institutionalized by all FinTech players. Product design, cost of transaction, speed and interoperability will be the levers on which FinTech players would be able to differentiate their offerings.

People will no longer have to stand in queues to pay bills or send cash back home. People in remote places will soon be able to replace cash with mobile money for bill payments and remittance. Lakhs of mom-and-pop shops and kirana stores are going to function as micro ATMs where withdrawal, deposit, fund transfer and eKYC can take place, complementing ATMs. With mobile wallets and payments banks starting to target to the online-to-offline business, the era of plastic cards will soon be a thing of the past. For example, payments banks will be able to issue virtual cards, and with the help of a QR scanner, consumers will be able to pay at merchant locations through their smartphones. Even ATMs are experimenting with cardless cash withdrawal and remittance. Given the high awareness of social media even in the hinterlands of India, FinTech startups will use Facebook or WhatsApp in a big way to source customers and enable micro P2P payments for remote populations. The future will also see cryptocurrencies, contactless payments, biometrics and IoT reshape the market in ways one may never have imagined.

With the confluence of finance, technology and innovation, the possibilities are endless, but imagining millions of Indians into the formal financial system has now become much easier. Last year, Infosys co-founder and former UIDAI chief remarked that 'India is witnessing a WhatsApp moment in finance', drawing an analogy between how WhatsApp disrupted the telecom sector and how FinTech is transforming the financial sector. Right now, 'co-opetition' is the mantra adopted by FinTech startups and banks to co-exist and find synergies with each other. However, it won't be long before non-bank FinTech startups become mainstream and, rather than piggybacking on the banks, start competing with the incumbent banks on end-to-end delivery of financial services.

This will be India's 'Uber' moment in finance.

This article first appeared in *Sankalp Forum*


Lifestyle
Blood
Glucose
A1c

HEALTH


Body Mass
Glucose
A1c
105
6.0
You
25
18.5
0
Overweight

The Present And The Future For mHealth In Underserved Markets

By Kaushik Mahadevan

mHealth is at a significant inflection point. With 7 billion mobile phone subscriptions world-wide, there are more than 165,000 mobile health apps now available, almost doubling over the last two years. High mobile penetration and good level of computing capacity available in even basic cell phones make way for tremendous untapped possibilities to impact healthcare delivery and associated aspects.

mHealth applications range from wellness applications targeting affluent markets to simple SMS based apps reaching out to a wide audience at the Bottom of the Pyramid (BoP). This article tries to shed light on the latter, where **only few applications made in-roads** due to problems around affordability, limited internet infrastructure and inability to comprehend complex applications. In addition, most mHealth service providers catering to the underserved segment rely on funding from international donor organizations, limiting operations scalability.

Present state of mHealth in Underserved markets

Currently, mHealth in underserved markets focusses on specific challenges, such as mainly:

Managing community programmes

Stakeholders in the healthcare value chain (patients, caregivers, service providers and regulators) face problems in collecting, storing and sharing information due to poor communication infrastructure in the form of outdated IT solutions and paper-based systems. A majority of mHealth applications in these markets are trying to resolve these challenges.

Reporting Wheel – a simplified data reporting application for remote workers is being used in Southeast Asia to integrate disease surveillance and implement nationwide communication systems. Other mobile applications in this category are designed to help vaccination registration (mTikka), monitor disease outbreaks (Veegilo) and screen tuberculosis (eMocha TB detect).

Promoting good health practices

mHealth is also being leveraged by governments and foundations to communicate and promote healthy behaviors and prevent unhealthy ones. For instance, the Mobile Alliance for Maternal Action (MAMA) is being used in India, Bangladesh and South Africa to support and educate mothers, providing them with lifesaving information. Similarly CycleTel Humsafar in India and Mobile for Reproductive Health (m4RH) project in Mexico are used to educate women about family planning. SMS based applications are also used widely to encourage breast cancer screening and HIV testing.

The future of mHealth in Undeserved markets

Emerging applications

Although there are a plethora of applications addressing issues such as drug adherence, connections to doctors and online purchase of drugs; they have made very little in-roads in rural markets as these applications are developed only for smartphones. While it is true that little can be done to develop complex applications due to the technological limitations in feature phones, a few companies have come up with simple technological solutions to address complex issues. For instance, African social enterprise mPedigree has developed an application which can potentially resolve the issue of counterfeit pharmaceuticals by enabling people to easily check the authenticity of their medication by SMS. Other mobile based

solutions that have recently emerged are low-cost medical devices attached to mobile phones. EyeCatra developed by MIT media lab is a simplified, affordable device which can be attached to most smartphones and can accurately diagnose and measure cataract, eliminating the need for a specialist – a resource constraint in most developing countries. Another example is a new cell phone based fluorescent imaging and sensing platform for detecting dangerous bacteria in water, developed by a team at the UCLA Henry Samueli School of Engineering and Applied Science.

Potential and challenges

mHealth offers benefits to players across the healthcare value chain and can solve systemic challenges. In underserved markets, mobility's ubiquity and potential to leapfrog laptops and broadband connectivity technology can enable solutions to address various challenges around affordability, access, awareness and quality in healthcare. Currently, mHealth applications targeting rural markets have to proceed with the lowest common denominator approach of using voice calls, IVR, SMS and USSD in their applications. As smartphone usage increases, the quality and breadth of services offered is bound to increase. On a final note, it will be interesting to see if consumer behavior in terms of willingness to pay changes in the future as and when success of these mHealth applications becomes more prominent.

This article first appeared in *Sankalp Forum*

Six Promising Approaches for Scaling Healthcare in Low-Resource Settings

By Nakul Goswami

Resource-constrained settings are constantly evolving and their challenges are varied and unique. Cohabitation, heterogeneous populations, fragile networks (of people and infrastructure), migratory populations, poor living circumstances, poor hygiene and limited healthcare access, make low-resource settings a difficult challenge for public health. This reduces life expectancy and quality of life.

Many pilot-based interventions aimed at addressing these challenges are able to create initial impact, but low-resource settings are such unique entities that there are few healthcare models that have the potential and are able to show scale.

Economic growth drivers are interwoven closely with the risk factors for poor health. Aging populations and urban squalor are increasingly intensifying these factors, leading to poor health and adding to the disease burden. There is a need to decouple these and to develop models that are able to deliver quality, affordable healthcare – and to do so at scale.

APPROACHES SHOWING POTENTIAL TO SCALE

Approaches that innovate around the very challenges presented by low-resource settings are interesting to investigate. Some promising examples include:

Mohalla clinics are an initiative to bring diagnostics and treatment of common ailments such as fever, headache, simple infection, skin rash, etc., closer to people. Designed to offer essential drugs and a large variety of tests, they target patients who would otherwise go to unqualified healthcare providers. These neighborhood clinics are equipped with medicine-dispensing machines, and the model also aims to create the right patient-to-doctor ratio. By bringing care closer to the patients and communities, and simultaneously freeing up doctors at tertiary care hospitals to focus on more complicated diseases and surgeries, mohalla clinics exhibit the potential to create a blueprint for scale, by creating targeted mass delivery of care.

HCG Hospitals offer a unique gateway approach by creating spokes – part of the hub and spoke business model – deep into low-income and resource-constrained communities. Focusing primarily on routine, diagnosis and follow-up care, the spokes are able to maintain a healthy interaction within the community. These spokes surround four urban hubs in Ahmedabad, Mumbai, Chennai and Bangalore. The specialists are concentrated in the hubs and have access to the best equipment, while the spokes have less specialized doctors who provide care using protocols and low-cost equipment. There is a constant stream of patients, which attracts doctors who seek to rapidly increase their skills, capabilities and knowledge. Protocols are created – including protocols for complex procedures, based on medical history and lifestyle – according to the needs of the communities and are extremely important to provide high-quality care.

Swasth India is exploring a model in which they act as service integrators for low-income and constrained-resource communities. They create partnerships with doctors, laboratories, pharmacies, hospitals, nursing homes, drug companies and insurance companies. All of these partners are brought together on a common platform, and services are delivered through community-based organizations. Creating strong linkages between primary, secondary and tertiary healthcare ensures completion of the healthcare value loop. The leveraging of social- and community-based organisations further deepens the goodwill and trust built up by these organisations.

Nephroplus provides affordable dialysis through its dialysis and kidney care. The clinics are operationally extremely lean but maintain high-quality service through implementation of deep clinical protocols and a patient-centric approach. Nephroplus extends care in a holistic manner, even offering a pick-up and drop-off service so as to reduce dependency on patient family members. It has also expanded to clinics (new or existing) in larger hospitals.

Uber is delivering flu shots and wellness kits, making the last mile of care access and delivery on-demand. Health packets

consisting of hand sanitizer bottles, tissues and a linkage to nurses are being delivered, independent of the individual's insurance status. This model has a huge potential impact for resource-constrained settings and communities.

The Innovation µ-Lab (pronounced micro-lab) approach by Intellecap, where I am associate vice president, creates a replicable blueprint for rewiring healthcare delivery infrastructure. Originally designed for infectious diseases, the infrastructure was rewired for affordable, comprehensive and quality screening, detection, treatment and prevention of non-communicable diseases. This approach deploys best-in-class innovative technologies, protocols and processes and involves a wide variety of players such as community members, aggregators, community leaders, care providers (physicians and independent health workers), clinics, etc. The approach is also experimenting with innovative cost-sharing models between clinics and social marketing firms.

LEARNINGS

Sustainable healthcare models across low-resource settings are built on tools and processes that support urban health systems; create the most cost-effective ways of reaching vulnerable communities; integrate awareness, detection, prevention and management into care; improve disease surveillance and monitoring systems; and improve health information systems.

The innovations above attempt a broad systemization that distinguishes them from other approaches that don't show a similar potential to scale.

These approaches are embedded deep into communities – they are co-created by the communities – and are based on world-class medical technology. They focus on up-skilling community resources and build on strategic partnerships, making them more likely to succeed from a scale and impact standpoint.

Creating value and translating this value to low-income populations is an important step in creating scalable models. The examples above use technology and innovative processes, create new infrastructure or rewire existing infrastructure, and establish linkages with players in the healthcare value chain. All of them keep the patients and their needs central to value creation and value translation.

Looking beyond the individual and engaging the larger community for co-creation of the solutions is equally important, where the creation of the solution is owned by the community. The delivery of low-cost, quality care requires continuous innovation from a technology and a process standpoint, as well as the ability to shift care delivery (protocols and activities) from high-skilled to lower-skilled professionals.

Scale is utilized to achieve profitability and sustainability while keeping costs low and affordable for low-income populations. Traditional examples of creating scale through offering specialised services – heart care and tertiary eye care, including Aravind EyeCare and Narayana Health – are being supplemented by models that offer more generic services – primary care and general ailments, including mohalla clinics and Uber.

The generic services models are progressively adopting specialised care delivery capabilities and are best positioned to leverage scale, as these are able to get closer to the patients much faster and deeper, and can further build toward specialised services through innovative technology and protocols. The linkage between generic service providers and specialised service providers is essential for scale of low-cost and affordable models.

This article first appeared in *Next Billion*

IMPACT INVESTING

Connecting Corporations and Social Enterprises

By Sheena Raikundalia

Kenya-focused entrepreneur Moka Lantum, Founder and Managing Director of Microclinics, is preparing for pitch to a large pharmaceutical company. The Nairobi-based healthcare management company provides patient and clinic management systems to peri-urban and rural clinics. The software developed by his company, tracks commodities in clinics and enhances, availability, accessibility, quality and affordability of medicines in low income markets. The network of clinics and pharmacies as well as his "Blue Angels", a network of trained youth that promote the service, can be an interesting distribution channel for healthcare and pharmaceutical companies and can potentially lead to cost savings of 30-60% for 2.5 mn customers.

Unfortunately not many small and growing businesses have the opportunity to pitch to a large corporate and explore the potential of a partnership like Microclinics. While it is widely accepted today that partnerships between corporates and small and growing businesses can bridge scaling challenges and help to co-create innovative service offerings for low income markets or develop impactful delivery and distribution channels, establishing these partnerships is a challenge. There is an information asymmetry on both sides, as a result of which it can take up to a year to form a meaningful partnership. The information gap is even larger for corporates interested to enter into a new market and looking for partners.

"The platform that we have created can provide a lot of value to corporates. However, it is difficult for us to find an entry into corporates. Establishing a winning partnership can therefore sometimes take up to a year." - Moka Lantum, Managing Partner, MicroClinic Technologies

The potential for partnerships between corporates and small and growing businesses is huge. While low-income families at the so called "Base of the economic pyramid" have many unmet needs and aspirations, they lack access to affordable and high quality products and services. Excluded from mainstream markets, they find it difficult to access and nutritious foods, affordable healthcare, quality education, clean water or reliable energy.

Despite progress in recent years to reach out to those living in underserved markets, there are 3 billion people living on less than US$2.50 per day—nearly half of the global population. Similarly, East Africa with its current population of 280 million people with growth predictions of 182% by 2050 and an annual consumption of US$49million with low income consumers comprising 90% of the total expenditure, make it an interesting market for corporates and start-ups alike.

Although low-income consumers represent an attractive market for both corporates and social businesses, the reality is that reaching them is often difficult. Corporates have extensive financial and human resources and existing sales and distribution networks which can enable them to reach scale quickly in these low income markets. However, the markets are riskier and more long-term and the opportunity costs for corporates are too high. Further, corporates lack insights into the aspirations, incentives, disincentives, and daily behaviours of the poor and have limited internal resources to test innovative new approaches.

Small and growing businesses, on the other hand, have a nuanced understanding of customers and on-ground challenges and are able to building innovative products and services for low-income market contexts. They are nimble with testing, improving, and iterating and can learn fast and cheaply. However, they lack capital to support scale-up or attract talent, do not have access to a sizable customer base and distribution networks which makes it difficult for them to penetrate the market.

To fill the gap in the current ecosystem and create a market infrastructure for corporates and small and growing businesses looking for partnerships, Intellecap and USAID have recently launched the Collaboration for Impact Facility during the Sankalp Africa Summit, a new initiative that facilitates innovative partnerships between corporations and small and growing businesses in East Africa. Stefanie Bauer, Associate Vice President at Intellecap explained how the facility will help corporates and small and growing businesses during the launch. The facility will:

- Help businesses discover partnership opportunities;
- Match and curate partners;
- Build operating models;
- Facilitate formalisation of partnerships; and
- Drive scale-up of partnerships

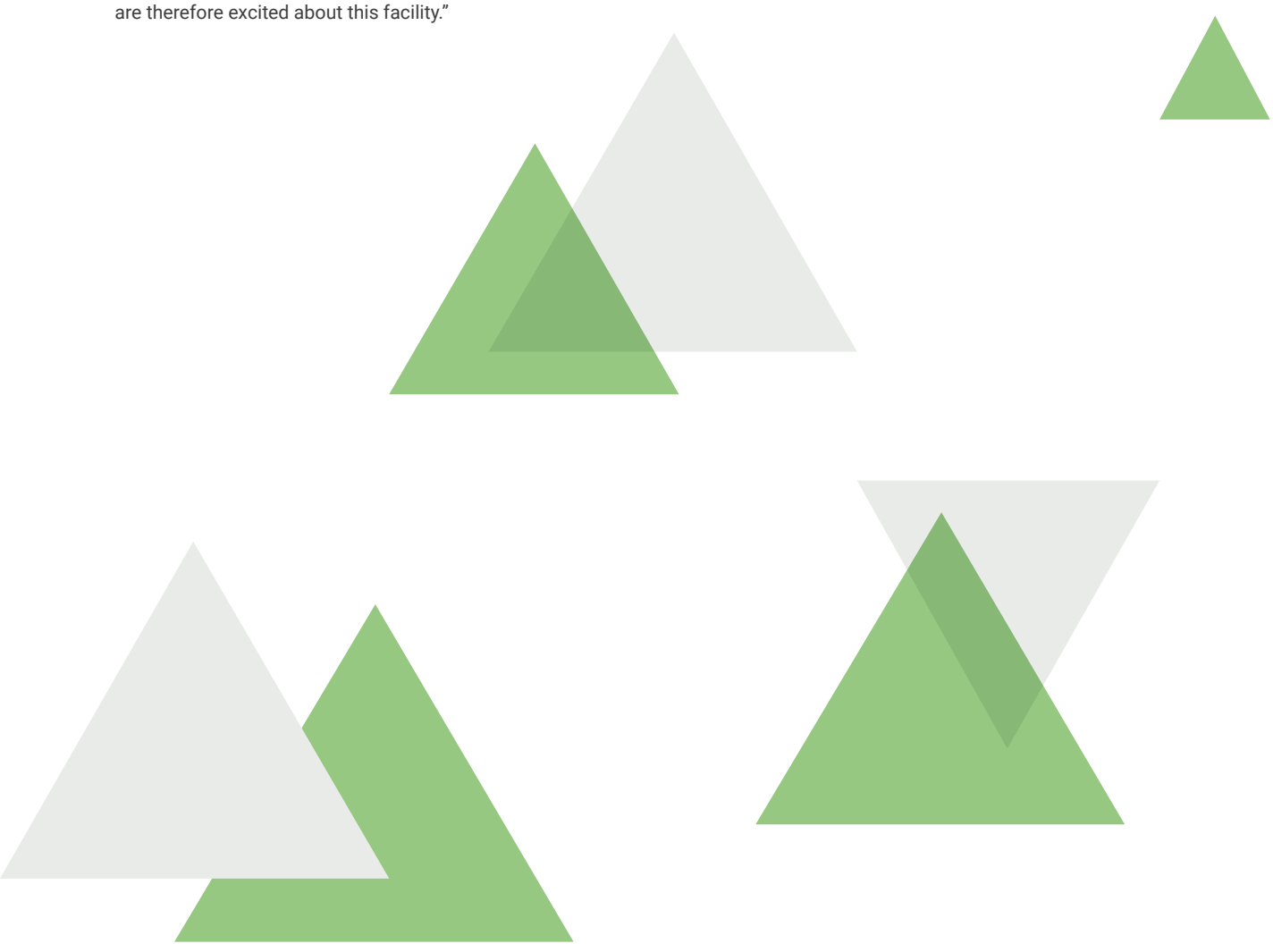
The initiative will help to structure partnerships that help small and growing businesses and their impacts reach scale, while ensuring that the interest of the enterprise are protected (e.g. intellectual property rights), especially in places that have weak contract enforcement. Besides offering strategy and implementation support to corporates and small and growing businesses, the facility aims to become a knowledge hub for partnerships between corporates and small and growing businesses.

"We are interested in learning and collecting lessons from corporate-enterprise partnerships through this facility that can help others to replicate these kind of partnerships," said Matthew Guttentag, Partnership Advisor at USAID, who is supporting this initiative under the Partnering to Accelerate Entrepreneurship (PACE) Initiative. To endorse the facility, Jumaane Tafawa, Group Director Strategy and Partnerships at Equity Bank highlighted the need for partnerships for Equity: "We have more than 200 partnerships. However, finding the right partners takes time. We are therefore excited about this facility."

Recent success stories demonstrate the power of partnerships in East Africa: With a 300% growth in the last three years with 1.37 million products sold in Sub Saharan Africa, the solar industry offers some interesting case studies. Companies such as Greenlight Planet or MKopa have emerged as market leaders in Kenya whilst simultaneously creating impact, making solar products for accessible and affordable, while creating health and environmental benefits by replacing kerosene lamps which emit on an average 370kg of CO2 each year per lamp.

The success is partly related to the ability of Mkopa and Greenlight Planet to build impactful partnerships: Mkopa partnered with Safaricom, a leading telecommunication, and leveraged the Safaricom's network to ensure financing of innovative solar products via Mpesa. Similarly, Greenlight Planet has formed partnerships with Orange Sunny Money all over East Africa to facilitate financing and scale.

This article first appeared in *Business Fights Poverty*



5 Reasons Why Investors Can't Seal The Deal In East Africa

By Sheena Raikundalia

Whilst startup investment in East Africa is at an all-time high, recent reports[1] have shown that 72% of capital went to only three startups in 2015 and 2016. With enterprises citing access to capital as the biggest barrier and funds and investors highlighting lack of investment ready enterprises in East Africa it is essential to dig deeper to understand how to support more deal closures. Following numerous conversations with investors and entrepreneurs from the Intellecap Impact Investing Network (I3N) investment challenges can be summarized as the 5 Cs below:

Competition - Investors compete for enterprises that are post revenue but there are not enough post revenue enterprises and many require early investment to get to that stage

With increasing investor interest in the region, Africa's private equity market has grown over the last 25 years with over 200 Africa focused funds with more than $30b under management with international investors being the dominant source of funds. Most of these funds are looking at ticket sizes range from $100k – $10m. Intellecap's Game Changers Report which looked at over 400 enterprises across East Africa showed that entrepreneurship is still nascent and more that 60% of enterprises interviewed were younger than five years old. Around half of these enterprises have not achieved break-even and 67% of these enterprises earn revenues of less than US$100k. As such small ticket size investments are critical for the growth of these enterprises and currently demand for such investments far outstrips supply. On the other hand, supply of higher ticket size investment outstrips demand leading to intense competition for the coveted few which have proven product/market fit and are post revenue.

Credit - Lack of debt such as working capital and other specialized forms of debt means that businesses cannot grow

High collateral requirements, the inflexible collateral definition and high interest rates mean that most enterprises lack access to credit. Interest rates are in East Africa are stiflingly high, Ugandan rates being the highest averaging 25%, with Tanzania at 21% and Rwanda and 20%. In Kenya, an interest rate capping was introduced, however this has led to a reduction in lending to micro, small and medium enterprises. Whilst fintechs, banks and mobile network operators such as Branch, Tala and Mshwari have stepped in to offer loans without the collateral requirements, interest rates still range from 13-15% depending on the amounts. Many early stage enterprises are unable to service these interest requirements and therefore unable to access working capital required for expansion, productivity and growth. Businesses require different forms of capital and end up trying to raise equity to do the things that debt should be used for which raises red flags for investors who are more inclined to reject the deal.

Context - Opportunity cost for local investor is too high with traditional investments offering high rates of return meaning that most investment capital is international bringing its own unique challenges

The concept of angel investing is nascent in East Africa with most local investors focusing on more traditional forms of investment such as real estate, stock market. These investments offer high rates of return, with yields from property development, or lending to the government ranging from 6- 12%. Additionally, with no comparable African success stories that are common in Silicon Valley the opportunity costs for local angels is too high. The East African landscape is therefore dominated with international capital. This in turn brings its own unique challenges. International funds often lack local context and tend to have small teams with limited bandwidth, decision making occurs internationally resulting in deals taking longer. Investors further miss out on opportunities as they lack on the ground understanding of local problems and solutions for example the fact that pace of business in East Africa is slower here than in US or Europe.

Culture - Most capital goes to foreign start-up founders who are more familiar with venture capital and can structure business and vision accordingly

90% of all disclosed investments over the past two years went to startups with one or more European or North American founders. With the majority of capital being international, it is likely that foreign entrepreneurs are better able to understand how venture capital is different from traditional business and thus structure and articulate their vision accordingly. Investors are looking for fast growing, scalable businesses, taking the risk on unique ideas and betting on the founder and team. Whether local entrepreneurs need to articulate and evidence their business according to the criteria identified or investors need to modify their expectations understanding cultural niceties is key to ensure more deal closures.

Cost - Deal closure takes longer in East Africa with substantially higher costs

Cost of investing in East Africa is high. The East African ecosystem is rather nascent, especially beyond cities such as Nairobi, Kampala, Kigali. Entrepreneurial skills, start-up infrastructure, government policies, and availability of talent is not as developed. For instance, the average deal closure of an investment in East Africa takes 9-10 months where-as in India it takes 4-6 months. Due diligence, documentation preparation, legal costs are high with entrepreneurs not familiar with the process and unable to understand deal terms and valuation. Further many investors need to fly into East Africa to analyze and monitor various aspects of the investment, which increases the transaction cost. In many cases, external experts need to be hired to fill compliance and regulatory gaps, further adding to the hike in transaction related expenses.

In conclusion, whilst there is a lot of potential in East Africa a lot more work is required to facilitate more deal closures. Much of the conversations are focused on getting entrepreneurs investment ready and whilst this is correct, perhaps capital also needs to be contextualized. This is an emerging market after all and it is more difficult to find businesses that are already unique, scalable, revenue generating, impactful. Perhaps investors will need to take more risk, bring in more patient capital and add value if they want to seal more deals here.

[1] Breaking the Pattern: Village Capital/BMGF Foundation, 2017 report

This article first appeared in *Inclusive Business Hub*

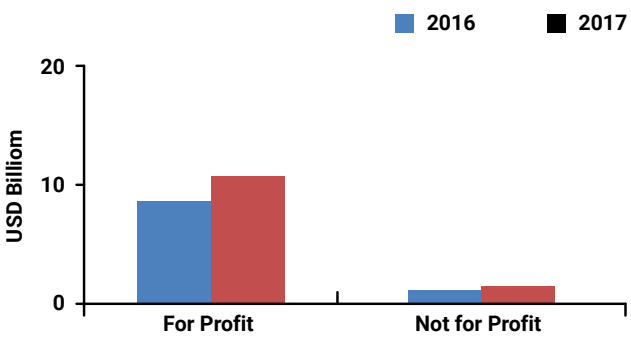
The End Of A Debate? India Highlights The Dominance Of For-Profit Capital In Impact Investing

By Disha Gandhi

Can impact investing be as commercially viable as mainstream investing – or does it work better as a nonprofit model, or as a less-profitable niche in the broader investing space? This question remains widely debated, even as more and more empirical evidence has demonstrated the commercial success of impact investments across the globe. However, an analysis of the evolution of the impact investing sector in India suggests that this long-running debate may be winding down, as a clear consensus emerges.

Though both nonprofit and for-profit approaches have contributed to the growth and success of the impact investment space, for-profit capital has far overtaken philanthropic capital – in India and beyond.

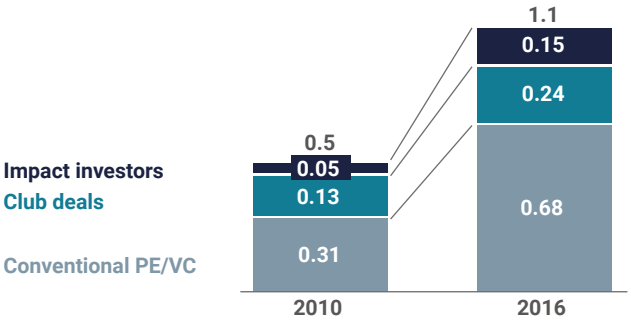
According to GIIN's 7th Annual Impact Investor Survey, the total capital invested so far in the impact space stands at US $181 billion and the total planned investment for 2017 is expected to be at US $25.9 billion. That constitutes a 17 percent rise from 2016, and the share of for-profit capital invested by fund managers in this total is expected to be almost 60 percent, with fund managers' not-for-profit capital investments at around 5 percent. It is interesting to compare the growth seen in both of these pools of capital over the last year (see table below). While the growth in the not-for-profit pool has been stagnant, the for-profit pool is expected to see a 35 percent gain.

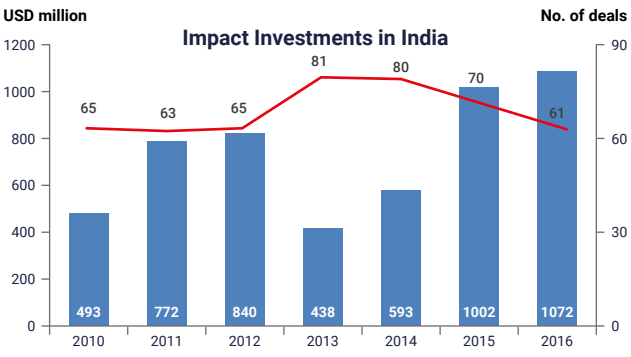


Source: GIIN 7th Annual Survey

IMPACT INVESTING IN INDIA

Meanwhile, in India, the demographic dividend of a young population with higher disposable income and consumption has combined with socio-economic disparities to provide a large opportunity for the social sector to play a role in inclusive growth and sustainable development. Hence, it is not a surprise that the country has attracted US $5.2 billion in impact investments since 2010 and is emerging as an attractive market for social investors.





Source: VCCEdge

India has witnessed an increasing number of deals year-after-year in the impact space, but with enterprises showing strong growth, the average deal size has also grown from US $7.6 million in 2010 to US $17.6 million in 2016. Investor interest has been further

boosted by the strong exits witnessed in this space. A recent McKinsey analysis of exits between 2010-2015 showed a median internal rate of return (IRR) of 10 percent, with the top 30 percent of deals providing 34 percent IRR – all of this while creating favorable social outcomes.

THE EXAMPLE OF MICROFINANCE

The Indian microfinance sector is a good example of how the narrative of impact investments went from purely social outcome-based to strong commercial-based models. Microfinance initially started as a not-for-profit model trying to solve the problems of bringing finance to the unserved masses at the bottom of the socio-economic pyramid, where traditional financial channels were unable to reach. But with the liberalization of the Indian economy in 1991, the microfinance sector witnessed strong growth. Private sector actors leveraged the self-help group lending model, and created business models that were commercially viable and scalable. The strong repayment rates among these (often women-directed) self-help groups, along with MFIs' joint-liability lending model addressed credit-risk issues and increased the availability of capital in the form of credit from the private sector. Meanwhile, equity capital from investors – among them Caspian, Aavishkaar and Elevar – contributed to the growth of this space.

As of March 2017, the total gross loan portfolio of India's microfinance sector stood at approximately US $16.4 billion, and it had attracted cumulative investments of approximately US $1.5 billion from April 2011 to that date. This represents almost 30 percent of the total impact investments in the country, and these investments have led to some of the most profitable exits by investors. For instance, impact funds Aavishkaar and Caspian (India Financial Inclusion Fund) saw 13x and 4.5x return, respectively, on their exit from Equitas through an initial public offering in 2016.

IMPACT IN OTHER SECTORS

Other sectors like agriculture, waste management and handicrafts have also witnessed investor interest following validation of scalable business models:

- Agriculture equipment rental company EM3 Agri Services has raised around US $14 million in the past three years. The company clocks monthly revenues of approximately US $150,000.
- Nepra, a waste management company offering collection and sorting of dry waste, has received around US $4 million in investment. The company has a processing capacity of 100 metric tons per day in the city of Ahmedabad, Gujarat.
- Companies like Fabindia and handicraft e-commerce marketplaces like Jaypore and Craftsvilla have garnered attention from the investor community, and each has raised institutional funding. These companies provide market access to artisans working across India who otherwise face dwindling incomes, and they have been instrumental in reviving some of the handicraft clusters in the country.

(Note: Aavishkaar has invested in Jaypore and Nepra.)

CONCLUSION

Social enterprises play an important role in meeting social objectives and impact funds perform the crucial function of providing risk capital to them. And for impact funds to have continued access to capital pools, they need to match the performance of mainstream private equity/venture capital funds in generating returns for investors. Impact funds can no longer survive while showing only favorable social outcomes without demonstrating comparable returns – and indeed, impact measurement itself has increasingly become commercial-metric driven, with impact-focused metrics coming in secondary. In India, impact investors like Aavishkaar have embraced this philosophy for years, seeing profitable exits that have made the case for commercial impact investing even stronger.

This growing evidence of profitability is reshaping (and perhaps ending) the long-running debate around impact investing's commercial potential. In response, increasing numbers of mainstream private equity investors have started focusing on impact enterprises, including some that have created separate impact funds – from TPG's US $2 billion global impact fund, RISE, to Abraaj Group and Goldman Sachs' growing focus on their own impact strategies.

Due to the success of the impact investment space and the trend of more mainstream investors adopting stricter ESG mandates for their investments, the line between impact and traditional investing is blurring. If these trends continue, soon the classification of funds into impact and mainstream will be all but redundant.

This article first appeared in *Next Billion*

Top photo: Rohtash Mal, co-founder of EM3 AgriServices, which serves as an Uber-like rental service for farmers. (Image credit: EM3).

The Scope Of Private Actors Strengthening Philanthropic Giving And Impact Investing For Development

By Sheena Raikundalia

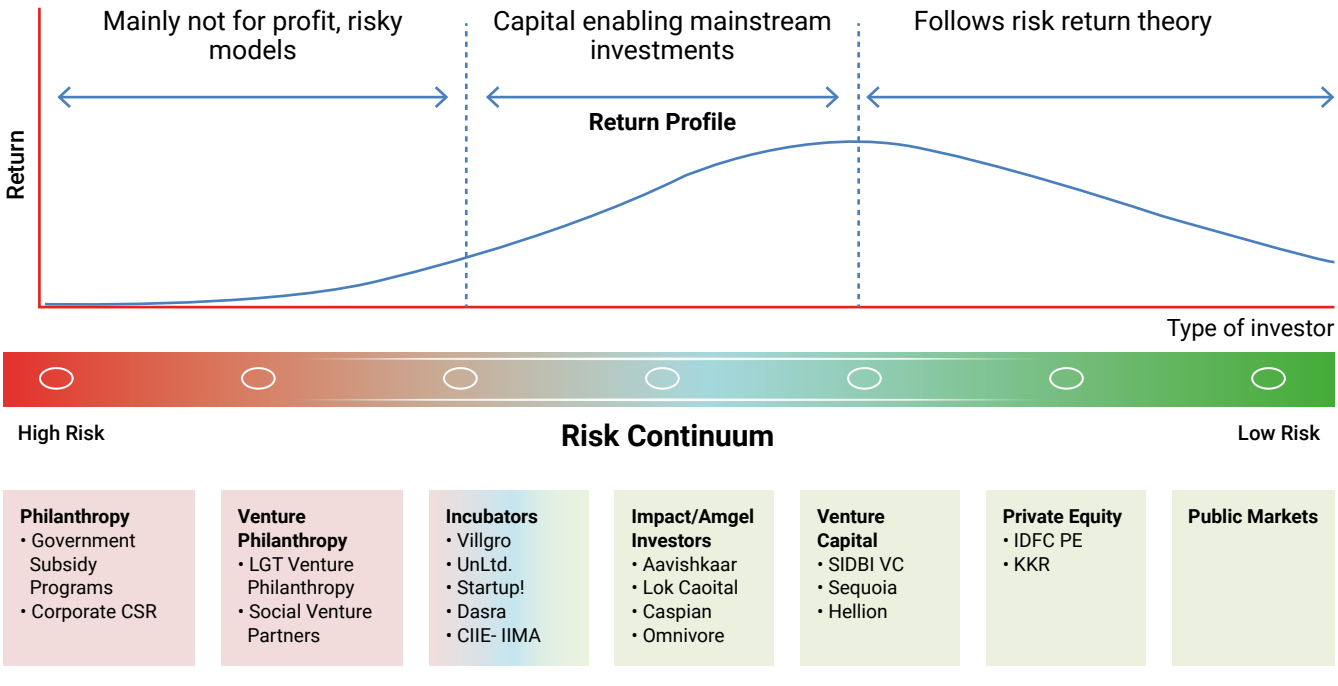
There are 3 billion people living on less than US$2.50 per day nearly half of the global population. These low-income families have unmet needs which tie directly with many of the Social Development Goals (SDGs) such as food (Goal 2), water and sanitation (Goal 6), shelter (Goal 11), healthcare and livelihoods (Goals 3 and 8). Philanthropic giving and impact investing both play an important role in achieving these development goals.

In Africa, the philanthropic work done by global industrial families and business houses is notable. Examples include the Bill & Melinda Gates Foundation which is one of the biggest private donors in Africa, supporting health and agricultural development and the Rockefeller Foundation has been working in the continent for over 150 years, active in health and education.

High net worth individuals in Africa have grown by 150% between 2000 and 2013, more than double the global rate, which has given rise to more local formalized philanthropy over the continent.

Most are channelling their giving through their businesses and private foundations for example Nigerian Aliko Dangote, who is estimated by Forbes to be worth $15.6 billion has set up the Dangote Foundation which is active in health, education and disaster relief. Other notable African philanthropists include Mo Ibrahim, Patrice Motsepe, Tony Elumelu, Strive Masyiwa and Manu Chandaria.

Figure 1: Role of Impact Capital on the Risk-return Continuum



The continent has also emerged as a major hub and centre of innovation for social enterprises and impact investing globally. Africa was ranked the world's second most attractive investment destination in 2013 attracting traditional, angel and other impact investors. More than US $9.3m has been disbursed by Development Finance Institutions (DFIs) and other impact investors in East Africa

The role of both giving and impact investing as seen is best understood through the Risk Return Continuum. This continuum indicates the increasing level of risk towards the left of the spectrum given the absence of a market based solution and lack of social and physical infrastructure.

From the Risk Return Continuum it is clear that traditional giving and venture philanthropy play a significant role in supporting traditional NGOs and social enterprises that address issues that may not get addressed by the market at all or are focused on driving deep impact within local communities but may not be very scalable or replicable. Impact investors can then take on enterprises focusing on sectors which are high risk due but with the right support and patient capital have the potential to scale resulting in a combination of profit and impact

East Africa is one of continent's innovation hubs. The success of innovations such as M-Pesa, M-KOPA and One Acre Fund has triggered a boom of high impact enterprises working to solve development challenges whilst being sustainable businesses. As such, impact investing has a key role to play in supporting these enterprises to solve development challenges.

SDGs through Entrepreneurship

In East Africa, there has been a shift in ideology towards the use of entrepreneurship to solve development challenges with the role for impact investing growing.

Intellecap analysed over 400 social enterprises across East Africa with findings captured in the Game Changers Report (2016). The report showed that market challenges are crucial triggers for impact entrepreneurship. For example, a key issue in East Africa is the limited purchasing power of the low income population. Rather than just creating low-cost products with basic features, enterprises such as M-Kopa, Bridge International and Sanergy are designing innovative pricing and payment solutions for full-feature products and services. They use sliding fee scales or special discounts for people of lesser means or introduce new payment models such as pay as-you-go, prepay, and the franchise model to ensure services and goods are accessible to the bottom of the pyramid.

These disruptive models demonstrate how entrepreneurship can be a key tool in achieving the SDGs. For example, in addition to creating decent work and economic growth (SDG Goal 8) M-Kopa provides affordable and clean energy, (SDG Goal 7), Bridge International provides low cost, quality education (SDG Goal 4) and Sanergy sells prefabricated toilets in urban slums improving sanitation, (SDG Goal 6),

However, social entrepreneurship and impact investing is still nascent in East Africa and more than 60% of enterprises interviewed for the Intellecap report were younger than five years old. Much of the activity is concentrated in Kenya, while other countries were starting to see fledgling growth in impact enterprises. Around half of these enterprises have not achieved break-even and 67% of these enterprises earn revenues of less than US$100k.

Lack of finance was a key challenge cited by social entrepreneurs. Small ticket size investments from $100k- $500k are critical for the growth of these enterprises and currently demand for such investments outstrips supply. As such, impact investors focusing in East Africa need to design innovative financing mechanisms such as multi-year financing plans, result-based financing, and other forms of blended finance in order to cater to the growing demand. With financing and support the enterprises will be able to scale simultaneously creating profit and much needed impact to solve the SDGs.

In addition, many entrepreneurs require non-financial support such as capacity building however this needs to be contextual to the local environment. The type of support required depends on the stage of the enterprise for example there is a need for targeted interventions to support later stage enterprises. What is required is a strong entrepreneurial ecosystem across the region. An ecosystem approach is therefore recommended.

Strengthening Impact Investing: Ecosystem Approach

An ecosystem approach looks at all the factors that can enable the entrepreneur to grow and scale. The Intellecap approach for ecosystem building involves three pillars;

Capital

Intellecap research shows that 84% of early stage enterprises in East Africa are unserved or underserved, financing their venture with personal funds. Ensuring that appropriate capital is available for enterprises is essential for growth and scale. The amount and type of capital at each stage of the enterprise life-cycle changes and there is a need for blended forms of finance, including philanthropic, impact and commercial which means that different types of players from can work together, collaborating on deals, creating de-risking funding structures and exchanging deal flow.

Intellecap has set up the Intellecap Impact Investment Network bringing together high net worth angel individuals from East Africa and international and local funds interested in investing in East Africa in a co-investment model. This enables social enterprises to obtain the much required early stage capital as well as support and guidance from experienced local angels.

Business Support

In addition to capital, early stage enterprises require technical assistance and specific capacity building support to enable growth and scale. Whilst the number of passionate entrepreneurs that are dedicated to cater the development challenges articulated in the SDGs is increasing, stakeholder conversations reveal that up to 90% of start-ups do not survive the first year These early stage enterprises get less visibility than their mature peers and service providers are either expensive or provide rather generic support. Impact enterprises providing solutions in sectors such as energy, healthcare, water, sanitation or agriculture face challenges in accessing targeted support in their early days of their life cycle.

Networks

While there is an increasing number of service providers and initiatives that support enterprises, the ecosystem remains fragmented and information on support opportunities is difficult to access. Networks such as platforms for peer-to-peer exchange, learning and access to mentors can help entrepreneurs grow. Intellecap's Sankalp forum is one such network bringing together enterprises and ecosystem players from early stage to growth.

As such, entrepreneurship as a means of achieving the SDG in Africa has great potential. Both philanthropy and impact investing have their role to play. It is only with a strong ecosystem where entrepreneurs have access to capital, support and networks will they be able to scale and actualize the SDGs.

This article first appeared in *Next Billion*

LIVELIHOOD

Rural Inroads- What It Takes!

By Yoshita Arora

Rural markets seem interesting to the business world given the sheer size of the population that resides in villages of India. As of March 2015 183,439 thousand rural households incurred an aggregate annual expenditure of a whooping INR 14,788 billion across segments such as food, cosmetics, power, entertainment, healthcare, and education. So logically it makes sense for the corporates to tap into the large consumer base, multiply the sales and revenues and profits! Further improved infrastructure, increased aspirations of rural customers across income groups along with the impact of media strengthens the belief that there is a demand in rural areas. Demand for solutions that are not sub optimal or the ones that the people can make do with. There is a demand for products ranging from the luxury cars to the branded baby products. So why is it that most organizations are not successful in carving inroads for themselves in this attractive business segment?

Lack of deep insights related to customer requirements is one of the key reasons for this shortfall. Consumers in the same income brackets can have varying priorities even for a few basic products given the family composition and awareness levels. For instance, a customer may invest INR 630 a month in a non- grid connected area to provide himself with exactly 3 lights and 1 fan worthy in a remote village of Naurangabad in Uttar Pradesh. Whereas another customer in a similar income bracket may want to invest more money in agriculture irrigation and do away with getting energy supply at home. Assessing the value proposition of the solution in customer's- need vs aspiration hierarchy plays a critical role.

Further various organizations often end up miscalculating the effort and resources required to enter the rural markets. They are often oblivious to the estimated time and resources required to seed the market, achieve break even and start making profits. Some of the leading brands selling daily products such as soaps and tea that have made a successful foray into the rural markets, have borne losses for up to 12-24 months before breaking even.

Despite having the demand some of the bigger corporates do not deepen their channels, given the prohibitively high cost for developing the distribution channels. For instance, running pilot in a new rural geography to increase awareness levels and distribute products through alternate mediums can result in an increase in variable costs by up to 10-30% when compared to the traditional channels. Often these FMCG companies may not have a formal channel to reach the sparsely populated villages, but the informal retailers procure stock from the nearest towns and make the products available based on demand.

However, despite the challenges it is critical for businesses to establish themselves in the rural markets to sustain their own growth plans. As the urban markets would stagnate, the corporates would have to channel their efforts towards mining the rural markets.

As the income, awareness and aspirational levels of the rural consumers increase, it is imperative for the corporates to provide the solutions and choices to consumers and leverage the new rural demand wave to grow their businesses.

So the key question here is what an organization should do to tap into the existing and latent demand in rural markets. Rural strategy can vary based on the product type, stage of the product and organization, corporate vision and customer type. Some of the must haves to deepen the rural markets are:

Improving the distribution channel: Various options are available to the corporates including:

- Investing in their own sales force
- Partnering with the rural market experts such as the Project Dharma or Rural Relations

- Partnering with the village level entrepreneur channels of self-help groups, NGOs and Microfinance institutions

Leveraging existing and established channels can reduce the breakeven cycle significantly. However, most of these channels are ideal to seed the rural markets and then progress towards using the tradition distribution channels.

Some of the critical decision making points here include assessing the geography in which the partnerships are being made. The analysis should take into consideration the need, customers' demography and organization's strengths and weaknesses in a given geography.

Re-designing the solution to meet rural market's needs: One of the key success factors especially in the low income consumer segment is the 'value' that the product provides. Re-design the packaging, change the SKU size and mix, bundle the product with complementary products. Do whatever it takes to ensure providing the value for the buck to the consumers.

Invest in behavior change: Usage patterns, buying behavior and awareness levels of customers is just as critical as the availability of a product in a given region. Investing in inculcating behavior on frequency of purchase, point of purchase, usage of the product and expected benefits change can go a long way in helping corporates develop a relationship with its customers, thereby strengthening the customer belief and loyalty. These investments can also help the corporates in understanding the consumer needs better.

So while the rural markets seem attractive, it is imperative that corporates invest to assess the rural markets to understand the critical customer needs and also work with relevant partners to optimize their investments.

This article first appeared in *LinkedIn*

Meet The Private Sector Startups Leading The Drive For Better Solid Waste Management In India

By Vineeth Menon, Amar Gokhale and Shreejit Borthakur

As the world's population continues to increase beyond 7.4 billion, the challenge of efficiently managing the resultant municipal solid waste (MSW) continues to grow.

In simple words, municipal solid waste (MSW) refers to waste in the form of organic material, paper, plastic, glass, metals, and other refuse collected by municipal authorities from the public (homes, offices, institutions, and commercial establishments). According to the World Bank, in 2009–2010, 1.3 billion tons of MSW was generated globally. This translates into an alarming 0.5-0.6 kg of waste per capita per day. This rate is much higher for urban areas, at around 1.2 kg per capita per day[1].

Representational Image (Source: Pixabay)

Consequently, the challenge of managing MSW is the most acute in urban agglomerates of the world. The scale of the challenge can be gauged from the fact the more than half of the world's population today is urban, and the share is expected to grow as people migrate from rural to urban centers, especially across the developing world.

Improper disposal of MSW has a wide range of adverse implications, including climate change and urban water crisis.

Uncollected waste and indiscriminate dumping often clogs wastewater drains and pollutes the available surface and ground water. In addition, blocked drains lead to urban flooding and stagnation of water, providing a congenial environment for the propagation of water-borne diseases. In developing countries, the practice of segregating waste into organic waste and inorganic waste is often not followed, and post-collection, MSW is typically transported to landfills and dumping yards. Anaerobic decomposition of mixed waste in dumping yards results in emission of large amounts of methane. The global warming potential of methane is 23 times as the same amount of carbon dioxide.[2]

It is interesting to note that improper solid waste management has an adverse multiplier effect on urban sustainability by contributing to climate change and the ongoing urban water crisis. Hence, efficient waste management should form a critical component of long-run sustainable urbanization in a bid to mitigate climate change.

The per capita urban waste generation in India is around 0.5-0.6 kgs per day, which implies that the total MSW generated in urban India could be as much as 68.8 million tons every year[3].

Representational Image (Source: Pexels)

Given the scale, traditional approaches to MSW need to be refined to meet the present context.

Considering rapid urbanization in India, the Central Pollution Control Board (CPCB) has observed that Urban Local Bodies (ULBs) have not been able to upgrade or scale up their facilities to sustain the increasing amounts of MSW generated. Consequently, waste is often seen lying along streets, remote areas and river beds[4].

The health hazards accompanying waste aggregation and related problems such as flooding during monsoon and contamination of drinking water significantly compromise the standard of living of low-income urban communities. In addition to creating the problems associated with MSW, such waste disposal practices limit the outreach of formal waste collection mechanisms.

According to the CPCB, as much as 30 % of the total urban MSW generated in India is not collected, and less than 15 % of the MSW generated is processed or treated. There are numerous issues plaguing efficient waste management in India, ranging from lack of proper planning on the part of authorities and poor operation of collection and treatment mechanisms to low awareness among citizens.

A critical first step towards efficient waste management would be to segregate household waste into organic and inorganic components at source, and ensure that each component is handled appropriately. While there have been numerous attempts from both ULBs and private stakeholders to educate citizens about the importance of segregation at source, such attempts are typically limited to a few wards, and hence, their impact is minimal.

Representational Image (Source: Pixabay)

The more commonly followed process involves the segregation of mixed waste at a secondary site by waste pickers. However, this approach is time-consuming and tedious. It also exposes waste-pickers to direct contact and injury from potentially hazardous items. Segregated waste is often mixed again at the time of transportation and disposal.

Improper management of waste is often observed across the waste disposal chain. For example, even after the accumulated waste reaches dumping yards, it is not properly managed. There are definitely better alternate modes for MSW disposal which are slowly gaining popularity. Composting, biogas, and pelletization are some of these methods. Waste-to-energy plants have also been proposed.

In recent years, a number of Private Sector Enterprises have designed innovative interventions to address challenges related to Solid Waste Management in India.

Initiatives and interventions for Solid Waste Management (SWM) require significant investment in terms of money, time, and effort. Hence, people, almost perennially, saw undertaking initiatives in this space to be the Government's responsibility. However, in recent years, a number of private sector enterprises have observed a business opportunity in the various challenges related to SWM.

Besides creating a positive environmental impact, these enterprises also target socio-economic impact by partnering with the low-income population involved in the SWM value chain. A number of these enterprises, for example, have partnered with waste-pickers or rag-pickers. Waste-pickers arguably receive the lowest wages in the SWM value chain, while also facing exposure to potentially hazardous waste. While working with the grassroots, enterprises in this space have tailored their business models to streamline the collection process and create both environmental and socio-economic impact.

Below, this article highlights few of the very innovative private sector initiatives which are making a difference with respect to SWM in India:

From waste to 3D Printing: Protoprint, Pune

Protoprint is an enterprise based in Pune which partners with waste pickers to convert plastic waste into filaments for 3D printing. 3D printing is an additive manufacturing technique in which one can create, or "print", objects layer by layer using raw material powder or filament as feedstock. Although 3D printing is still at the nascent stage in India, it has appeal as the technology of the future, and is increasingly seeing use to manufacture intricate geometries which are difficult to cast.

Founded in 2013 by Siddhant Pai, Protoprint has partnered with SWaCH (Solid Waste Collection and Handling, or SWaCH Seva Sahakari Sanstha Maryadit), which is a wholly-owned

Source: Protoprint

cooperative of self-employed waste pickers from Pune who provide front-end waste management services to the citizens of Pune[5]. Protoprint has set up 'Filament Labs' at dumpsites. They process High-Density Polythene (HDPE), such as shampoo and detergent bottles. At the Filament Lab, the bottles are converted into flakes which are then melted and extruded into HDPE filaments[6].

Waste plastic costs less than US$0.30 (₹20) per kg., whereas one can sell 3D filament for more than US$15.27 (₹1,000) per kg. This significant value added has the potential of making the setup commercially viable in a matter of months. While having a strong business case, the intervention also provides an opportunity for waste pickers to become micro-entrepreneurs. Once they have perfected the filament manufacturing process, the waste pickers can scale up the concept and take it to multiple cities by partnering with other waste-picker collectives and NGOs.

A solution to bio-degradable waste: GPS Renewables, Bangalore

GPS Renewables is a Bangalore enterprise that focusses on setting up compact waste-to-energy plants that convert bio-degradable kitchen waste into biogas, usable for cooking.

The idea of using kitchen and other organic waste to produce biogas has been around in India for a long time. However, installations have traditionally not taken off because of poor awareness and lackluster monitoring. Additionally, such setups typically require a steady inflow of bio-degradable waste to be sustainable and produce an output in usable quantities. If we overcome these hurdles, biogas plants hold immense potential to effectively manage bio-degradable waste in urban areas, especially in restaurants, community kitchens, housing societies, and other areas with a high volume of waste generation and aggregation.

It is with this context that Mainak Chakraborty and Sreekrishna Sankar set up GPS Renewables in 2011. They developed a prototype of a modular biogas system, christened BioUrja. BioUrja is a compact plug-and-play system that users can install anywhere with minimal civil work, and is perfect for bulk generators of bio-degradable waste.

GPS Renewables ran a pilot point for a year before setting up a system at Akshay Patra Foundation, a non-profit organization that supplies mid-day meals to schools. The system has been operational since 2013 and processes roughly 600 kgs. of kitchen waste every day. This represents mitigation of more than 300 tons of carbon dioxide[7]. Subsequently, GPS Renewables has installed similar systems at various other locations such as hotels, corporate offices, and universities.

The company has been profitable since inception, receiving recognition from the World Wildlife Fund and the Sankalp Forum, among others. It has expanded beyond India into Bangladesh, Malaysia, and Sri Lanka. It plans to foray into gas bottling in the future.

Recycling the new type of waste: Karma Recycling, New Delhi

The nature of solid waste generated in urban areas is changing with changing time and technology. While paper and plastic waste continues to grow, people are also discarding an increasing number of laptops and mobile phones. Such products contain lead and other hazardous chemicals, which pose an additional threat to those handling it unscientifically.

An 'extended producer responsibility' (EPR) rule mandates electrical and electronic equipment manufacturers manage it after the end of its life. However, the success of enforcing this concept needs testing. Consequently, India generates more than 13 lakh metric tons of e-waste every year, recycling less than 2 % of it.[8]

Akshat Ghiya and Aamir Jariwala started the e-waste recycling business called Karma Recycling in 2013. Karma Recycling


Representational Image (Source: Flickr)

buys old electronic devices from individuals and refurbishes or recycles them according to their condition.

With increasing income and rising aspirations, there exists a large market for pre-owned refurbished electronics devices. However, this market is not apparent to individuals, who tend to retain their old and unused electronic devices. Karma recycling is changing this status quo in two ways. Firstly, it has tied up with physical stores across the country where individuals can sell off their unused gadgets. Secondly, it operates an online platform where individuals can get a quote for the device they need to sell. They can arrange the logistics thereafter for the transaction.

Source: Karma Recycling

The company has purchased over 2 lakh devices so far[9]. Karma Recycling has caught the eye of investors and has successfully raised seed and Series A funding for their venture.

Technology for Change: I Got Garbage, Bangalore

Bangalore, one of the key urban agglomerations in India, generates more than 4,000 metric tons of solid waste daily. Around 90 % of this waste ends up in landfills. The government spends more than US$68 million (₹450 crores) only transporting this waste.

On the other hand, informal workers divert around 600-800 metric tons of recyclable waste daily from these landfills. I Got Garbage (IGG), a Mindtree Consulting initiative, saw these rag pickers as a critical resource for SWM in Bangalore. IGG envisioned them as micro-entrepreneurs who could create employment if waste collection and recycling value chains became more predictable.

Given this context, IGG created an IT-based cloud platform. It connects rag-pickers to potential sources of MSW, and to potential scrap buyers interested in procuring the collected waste. Besides providing access to the platform, IGG has recently also started training rag-pickers to help them operate more efficiently. The average monthly incomes of the partner rag-pickers have almost doubled from US$73 (₹4,828), to US$134 (₹8,834).[10]

Representational Image: (Source: By Bijay chaurasia (Own work) [CC BY-SA 4.0], via Wikimedia Commons)

Currently, IGG works with more than 8,000 rag pickers directly, and has recycled more than 5,000 tons of MSW.[11] The use of technology in its value chain has helped IGG streamline operations, and the organization is looking to scale in cities outside Bangalore now.

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(The Asian Cities Climate Change Resilience Network (ACCCRN) is supported by the Rockefeller Foundation. It now reaches more than 50 cities in Bangladesh, India, Indonesia, the Philippines, Thailand, and Vietnam. It also helps these cities improve capacity to prepare for, withstand, and recover from the impacts of climate change. Intellecap is supporting these private-sector interventions and mapping pilot project results across various sectors. This article is a part of a series on Intellecap's learnings while working with enterprises in the Sanitation sector.)

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Unemployment At 17.8 Million: India Needs To Look At Skills Development Through Multiple Lenses

By Yoshita Arora

There is a constant demand to create jobs and improve skill sets across developing nations. As per a UN report, unemployment in India is estimated to be 17.8 million in 2017. Further, there is a need to upgrade the skill sets of people significantly. There is a need for 10 crore additional skilled personnel by 2022 in the country whereas 30 crore of the existing workforce requires further skilling. Governments and the non-profit sectors across countries (including India) are designing interventions to bridge these gaps. Employment and livelihoods generation is critical for nations as they are being directly linked to socio- economic development.

However livelihoods generation is not just about helping an individual or communities earn some income.

The perception of wealth and well-being are critical to livelihood generation to ensure that the individuals especially in the bottom of the pyramid can achieve the kind of lives that give them reason enough to value.

Kenya as a country is also battling with the same issue- unemployment rate in the country has touched a whopping 40%. A recent experience of engaging with a pastoralist community in Kenya highlighted the need to look at skills development and livelihoods creation through multiple lenses instead of a linear approach.

The Maasai community constituted of over 1000 members that were rehabilitated due to infrastructure development. The relocation led to increase in their expenses and redundancy in skill sets resulting in low levels of employment. Effort to increase their access to livelihoods generation opportunities led to four key learnings:

a. **Understand the context of livelihood generation:** There is a need to assess a community and individual's background, socioeconomic preferences, existing resource maps. For instance, in the small village about 100 kms away from Nairobi, the Maasai men have been able to secure the jobs of security guards in some of the factories that have emerged in the region. While it does help them put a square meal a day on the table for the family, they do not value the job and would rather engage in trade of livestock (an activity that they have engaged in traditionally).

b. **Identify the existing skill sets at community and individual level:** Further there is a need to understand the existing skills sets of individuals, at a personal as well as a community level, while designing livelihood generation programs. Understanding the level of formal education, trainings received, past work experience helps in identifying skill sets for individuals. Assessing the level of experience in any activity- subsistence vs. commercial, helps in gauging the existing capabilities. Assessing the skills sets at the community level helps in identifying skills that are inherited by the individuals through social and traditional practices. For instance, nearly every family in the village of Raghurajpur in Odisha is involved in making traditional handicraft. Therefore providing access to market linkages will be more important for this community instead of providing only technical skills.

c. **Identify relevant opportunities:** Relevant opportunities for any community should be based on parameters such as

   i. Preference and aspirations of individuals/ community: Asking questions like- Will the community value engaging in this activity? Will it help them perceive themselves as successful? Will they want to engage in this activity on a long term basis?

ii. Existing skills sets: Things that need to reflect under this category are; Does the community/individual have the required skill sets currently? Is there a potential to enhance their capacities on short term basis?

iii. Existing resources-physical, natural, social, human and financial capital: Asking which resources do they currently possess? How can they leverage these assets to create steady streams of income

iv. Existing demand of the market: Answering questions such as-Does the market value their products/service? Are there any differentiating factors?

v. Requirements of the partners: Understanding what skills and qualities do the employers seek? What are the key parameters used by partners to provide market linkages or capacity building services?

Answering these questions helps in designing interventions which have a higher potential to sustain themselves. For instance, Nairobi is a large consumer of meat and requires consistent supply of quality products. At the same time the Maasai community owns substantial livestock which has not been utilized for income generation. So, there is potential to provide support to the community to engage in livestock related businesses (in an activity they prefer to engage in) to create a steady flow of income. Social enterprises such as Mara Beef (sells beef) or Cow Soko (online livestock trading platform) could provide the required training and market linkages to such communities.

d. **Design relevant methods to unlock the opportunities:** Unlocking the opportunity constitutes of identifying skills gaps, bridging them through training, creating the linkages and hand holding the community to roll out the programs. Detailed plans can be outlined to roll out the programs which might include entrepreneurial support, technical capacity building and setting up of cooperatives/CBOs if required. In case of jobs creation, the programs can connect the individuals with relevant training centres, academic institutes and in parallel provide assistance to identify relevant job opportunities. Further, the individuals and communities can be connected with relevant financiers and enablers. Long term hand holding support may also be required to ensure successful implementation of such programs.

It is critical to ensure that the relationship with the partners is symbiotic and the partners also benefit from the engagement; this would ensure sustainability of projects. Some of the other success factors in designing relevant livelihoods generation programs include identifying core design principles for each program, using human centred and participatory approaches and gaining buy-in from the community. Further while prioritizing various livelihoods generation options, there needs to be a balance between initiating flow of income on short term basis and creating skill sets on long term basis.

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