Menterra Social Impact Report

A vision for delivering meaningful social impact using private capital

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Foreword

In the animated conversations around the buoyancy and progress that India has witnessed since it liberalized in 1991, the remarkable acceleration of the country's Gross Domestic Product in subsequent years, there is no divergence on the prognosis for the continued growth of India's Gross Domestic Product in the years ahead. Besides some debate on the timing of this milestone event, there is consensus that India would rank amongst the top three economies globally, in the foreseeable future.

George Thomas
CEO, Menterra Social Impact Advisors LLP

There is enough evidence on the size of the economy and prolific data to deconstruct growth by sector and source of growth. India meanwhile became the world's most populous country with a population of over 1.45 billion people. India's population will continue to grow and is estimated to reach a population of 1.70 billion people by 2060 before the numbers start to decline.

The growth in GDP that we have seen and anticipate will continue. However when this GDP is divided by a large population denominator has meant that the per capita income of the population will at best bring India to the lower end of the per capita income of middle-income economies of the world. As an impact investor, Menterra's key focus is on what this low average per capita income does not reveal. Our focus is on the disparity in income levels between states in India, between rural and a rapidly urbanizing India, the disparity between men and women, the disparities in access to basics like healthcare, sanitation, water, education, an equal share within value chains and "poverty penalty" - the disparities in outcomes for those who have poorer access to the basics just because they happen to live in low resource settings.

As one of the few managers of dedicated Social Impact funds in India, Menterra's quest is for solutions to bridge and reduce these disparities. We try to direct private, impact focused capital to entrepreneurs who are building commercially viable business models to further the cause of reducing disparities. Where we do not find readily available enterprises to invest into, we build these enterprises in collaboration with like-minded institutions and individuals.

The Menterra Social Impact Report 2024 is a summation of several months of internal discussions and deliberations with the finest minds in the sectors of interest, to highlight those unresolved issues that need resolution, defining what meaningful impact would mean in these circumstances and to identify and support business models that can sustainably resolve the lacunae that exist.

A decade is a short span of time. Since its inception in 2015, Menterra has learnt important lessons on what works, what does not work, and what can be done better. This report will be the template around which we invest and measure our progress as a firm on the journey to direct and apply small amounts of private capital to create a less disparate and a more equal India.

Introduction

In this report we have focused on our continuing agenda of creating pathways to improving economic outcomes for nearly 500 million people in India who are dependent on agriculture eked out of fragmented and small holdings. We explore pathways to provide better opportunities for the billion young people who will be entering the Indian job market over the next two to three decades traversing through the Indian education system. We examine ways to cater to the health needs of nearly 600 million people who are outside the ambit of quality and affordable healthcare in India, a large population that is aging and becoming financially dependent. We are also now exploring neglected areas such as mental health and the use of alternate low-cost therapies for dealing with chronic conditions like diabetes and infertility among others.

This Report is a perspective on areas that would benefit from application of private capital based on the experience of the Menterra team which has been engaged in different ways in understanding and trying to resolve some of the major impact needs in agriculture, healthcare and education in India over the last two to three decades. We understand that there is no one solution to resolve the issues in each of these sectors. However, we have the courage to explore the myriad possibilities for possible resolution and the perseverance to commercialize these solutions to sustainably address these issues. Our role is to deploy private capital in engineering enduring change. Our experience shows that collaborating with other private investment firms, aligning with public spending and efforts, makes our efforts more catalytic. A theme that you will find in our work is the recognition that despite our small investment corpus, we are committed to leverage the capital that we can deploy to provide pathways to improve outcomes for public spending- doing more with what is being spent by the government and to illustrate to larger pools of impact capital that this journey can be financially sustainable.

Landscape for Impact Investments in India

Menterra's choice of sectors to focus upon has been driven by our understanding of the magnitude of the human issues in our chosen sectors and the opportunities presented by emerging technologies and entrepreneurs who have the technical competence and imagination to challenge the status quo. In creating new sustainable pathways to address problems that have persisted for decades, using new technologies, lies the ability to generate sustainable business models and returns to investors in such enterprises. In creating sustainable pathways using new technologies to address problems that have persisted for decades, lies the ability to generate sustainable business models and returns to investors in such enterprises.

Agriculture

Agriculture is a source of economic sustenance for over 500 million people in India. It is a sector that has a rapidly diminishing contribution to the country's overall GDP pie. Today, agriculture makes up less than 15% of the US$3 trillion Indian economy. This is a largely rural population. Their aspirations are not dissimilar to those not dependent on agriculture and living in urban India. Their needs for education and healthcare not very different from those in urban India. Their vulnerability being at the cusp of poverty is nowhere more evident than in the daily statistics of farmer suicides in India, the poor learning outcomes of their children in rural schools, poor employability of the children from these families, and their higher mortality rates.

"Agriculture contributes a diminishing percentage of our overall GDP and Gross Value Added. Public spending into agriculture as a percentage of the total spending has declined over the years."

In the "Agriculture Landscape in India" section we explore the changes in Indian agriculture since India's independence and illuminate the key areas where impact investments could provide commercially viable resolution. At Menterra, we try to disentangle poverty from sub-scale agriculture as these two are linked and intertwined in a way that both become indistinguishable. Is the farmer poor because he is a small land holder? Is it that the poor have no opportunity to discard their subsistence on agriculture? The recent increase in agriculture as a source of livelihood, post the covid pandemic demonstrates that the when the labor force for industry and services coming from rural areas faces unemployment, they revert to their dependence on agriculture for sustenance.

We highlight the changing dynamics influencing Indian agriculture especially as demographic changes shift the public policy narrative to a more urban centric management of food inflation (the other side of the coin is called fair remunerative prices for farmers). We highlight the deleterious effect of climate change on small holder farmers as water, the lifeblood of a monsoon dependent agriculture system becomes unpredictable and unreliable. As we write this Report, the Assam tea crop is down 80 million kilograms due to poor rains. In Udalguri district, in this peak monsoon season we have seen 5 days of rain in the past 57 days!

We highlight the need to invest into creating rural livelihood opportunities so that there is a localized alternative for small farmers and landless agricultural labor other than the option to migrating to cities and urban slums for low paying jobs. 60% of our population is dependent on agriculture.

Agriculture contributes a diminishing percentage of India's GDP and Gross Value Added. Public budgetary allocations and spends into agriculture as a percentage of the total spend has declined over the years. The dynamics of state versus central financing of the agriculture sector linked to the sharing of total tax revenue between the centre and the states, the increasing trend towards financialization of the budgetary spends by way of direct benefit transfers and interest subventions within the overall allocation lead to less capacity creating government spends. The post-independence investments into dams, the creation of simple storage facilities for grains linked to the "Green Revolution" (self sufficiency in foodgrains) and the White Revolution (growth in milk output), the indirect support of the extended rail network for food grain movement, the cold chain for milk developed by the co-operative sector are very good examples of well-directed and capacity enhancing public spending.

The inadequate public spending and policy initiatives to address the gigantic task of re-deploying surplus manpower from agriculture and dealing with the issues emerging from climate change, cannot realistically be met by the roughly 9% of overall annual central government budgetary allocations (2% of GDP). An example of the shrinking public spending is the reduction in spends on public sector water management (dams and canals). The private sector participation in water management has meant over exploitation of ground water resources for irrigation by individual farmers through privately financed borewells, powered by cheap energy provided by the government. In the 70's nearly 60% of irrigation needs came from the public sector and 20% from private investments. These numbers have inverted now, with private sector contributing over 55% of irrigation needs of agriculture in India.

Against this background, we explore and ascertain the role of private capital, especially the role of impact capital in Indian agriculture.

Indian Agriculture

History, Sociology and Political Economy

1947 - 1980 (Post Independence Era)

• Period dominated by vulnerability in food security and dependence on food aid.

• No clear articulation of an agricultural policy to address food security.

• 1965 and 1971 wars highlighted the pernicious dependence on food aid.

• "Green Revolution" successful in creating food security. Mainly a carbohydrate supply chain facilitated by abundant water and a public procurement policy.

• Some extension of irrigation around "Big Dams", monsoons still control agricultural activity.

119m	299m	21m	$83
hectares of area under cultivation (42%)	rural population (83%)	hectare irrigated land	GDP per capita (rank 122)

1980 - 2000 (Post Liberalization Era)

• GDP propels away from agriculture to services sector. Agriculture continues to be primary source of employment.

• Liberalized trade provides access to global supply chains for ag commodities

• Early-stage food processing led by large multinationals starts but growth is hindered by constrained logistics and infrastructure.

• Per capital income increase leads to carbohydrate centric food habits to change.

• Mis-alignment of agriculture with changing consumption driven by increased demand for proteins and fats becomes evident. "White Revolution" and "Pink Revolution" with improvement in logistics and infrastructure.

141m	743m	46m	$442
hectares of area under cultivation (46%)	rural population (72%)	hectare irrigated land	GDP per capita (rank 124)

2001+ (Current Period)

• Climate change palpable, era of abundant water is over; higher avg temperatures, change of rainfall patterns increases pestilence leading to higher use of chemicals.

• Indian agricultural output faces rejection in global markets.

• Post-covid, emergence of food ecommerce, democratizing distribution access to food processors and strengthening of food supply chains.

• Sustained food inflation and pressure on agriculture raises demand and supply side challenges and the need for reformulating agricultural policies.

140m	908m	75m	$2411
hectares of area under cultivation (46%)	rural population (64%)	hectare irrigated land	GDP per capita (rank 115)

Indian Agriculture

Diversity Of Impact Opportunities In Agriculture

"Largest opportunity is creating alternatives to cultivation as a livelihood source"

Impact Need	Impact Scope
Resolve unviable land holding structure	100 MM households cultivating at subsistence levels
Address water scarcity and climate change	65 MM Ha monsoon dependent ~ 102 MM Ha under climate related stress
Improve market access especially for the small farmer	6% of agri products exported and 15% processed
Develop low-cost infrastructure from farm to market	Total capacity for storage (Fresh produce packhouses) - 0.4%, 15% for transportation (cold chain)

- $ 2.9 Bn invested into Indian agriculture since 2019 (IIC Reports).

- Largest opportunity lies in providing alternate sources of income to those currently engaged in cultivation; investments anchored around collectivized small farms and primary agri-processing through rural enterprises are significant opportunities to help decongest agriculture.

- Emerging issues from climate will seriously impact agriculture and emphasis on managing productivity despite resource constrains a serious gap.

- Emphasis on quality and safety have proven pathways for benefiting small farmers, rather than increasing yield. High yield usually depresses prices.

- In the subsequent slides we explore the areas that Menterra is investigating investment opportunities in.

Sustainably Improving the Livelihood of Small Farmers

Equitable Sharing of Outcomes in a Mature Agri Eco-system

Fig 1. Mature agri eco-system

Tea Production (Tons)   **Annual Turnover (Rs. MM)**   **Price Premium to Bought Leaf Factories (%)**
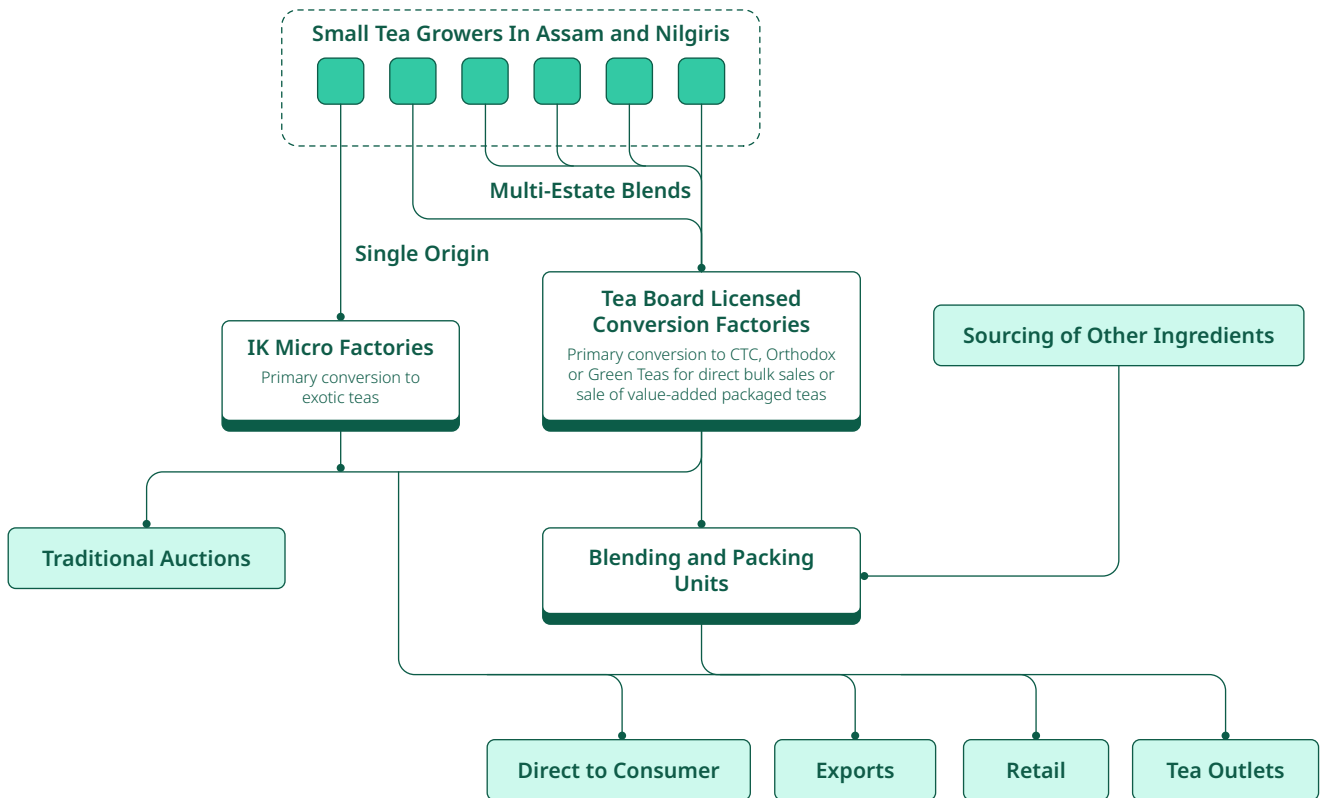
Fig 2. Iron Kettle tea production metrics
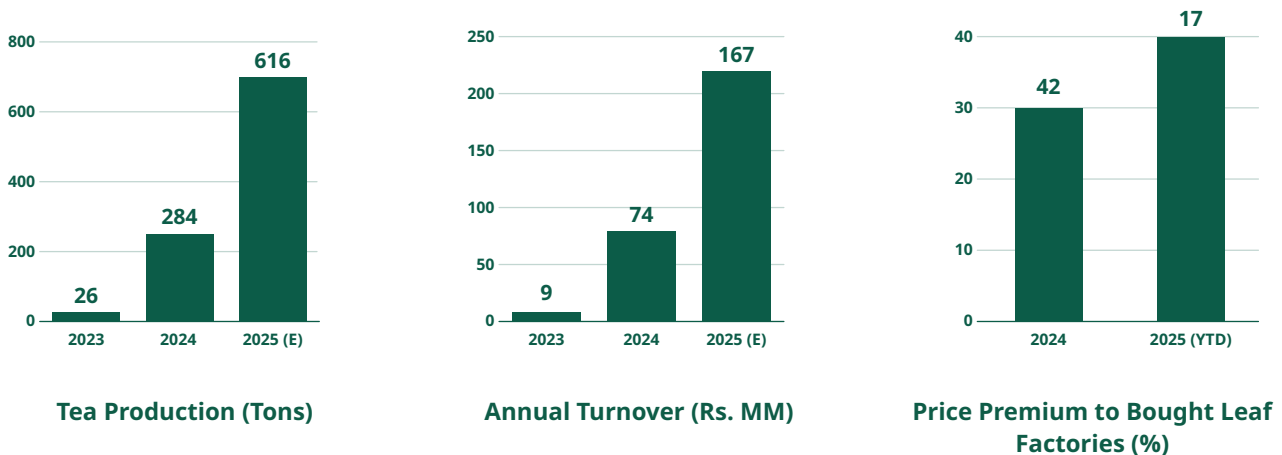
155 small farmers cultivating 700 Ha earned INR 35 per kg of green leaf sold to Iron Kettle. All batches produced by Iron Kettle were safe and conformed to Indian standards. Each lot of tea is traceable to a small grower. IK's STGs are the first to be certified by Rainforest Alliance in the world. Model being replicated in Nilgiris / Assam. See case study in Menterra Impact Report 2024.

Sustainably Improving the Livelihood of Small Farmers

Deriving Incremental Value in an Integrated Fruit Value Chain
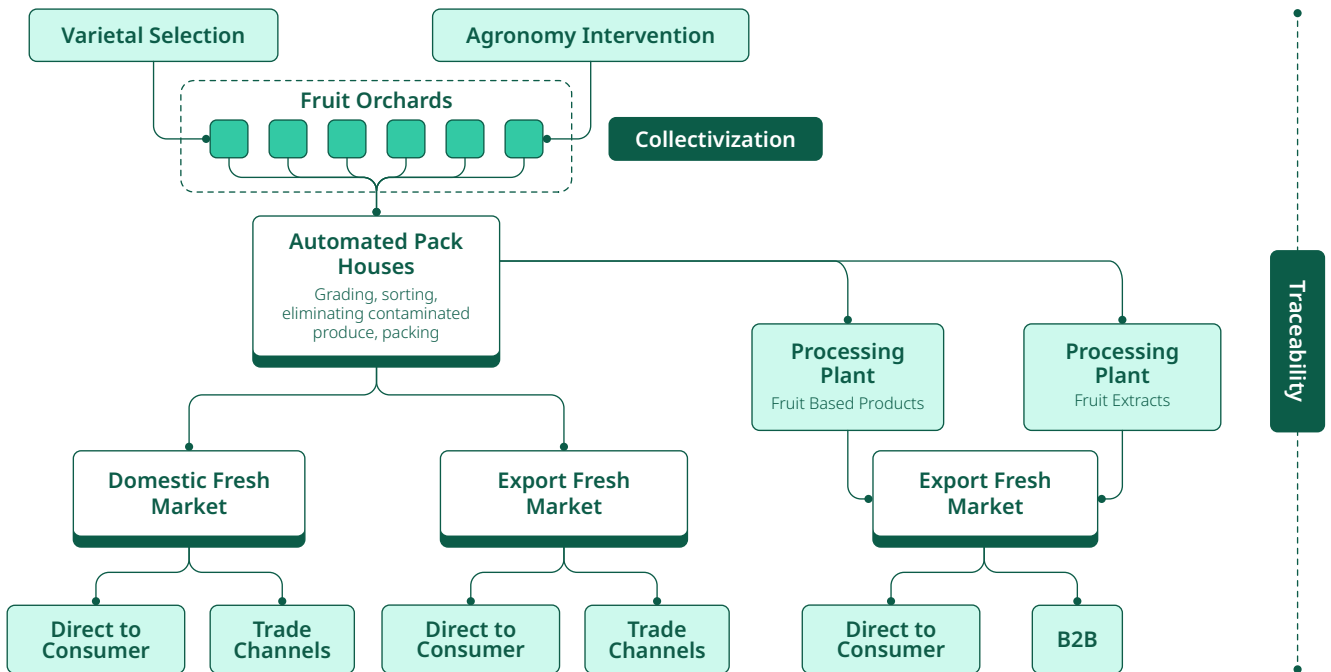
Fig 3. Integrated fruit value chain

Fruits have short shelf-life and are usually seasonal with low acceptance in international markets due to quality issues. Despite very distinguished taste most Indian fruits continue to be a locally traded commodity unable to compete with Latin American and African products. Pomegranate and banana have demonstrated the potential for high quality Indian fruits in international markets. Processing of fruits into intermediate products is the other large opportunity.

Sustainably Improving the Livelihood of Small Farmers

Deriving Incremental Value in an Integrated Goat Meat Value Chain
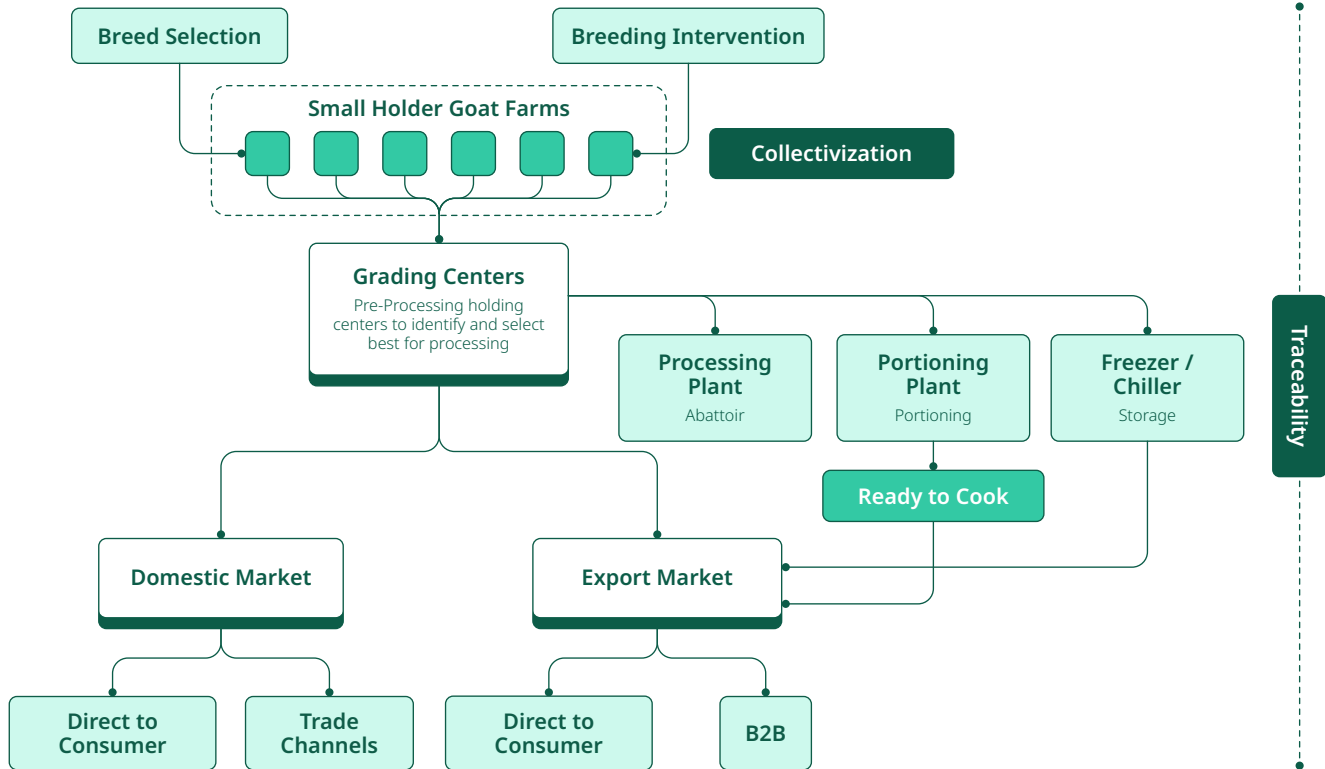
Fig 4. Integrated goat meat value chain

Connecting small holder goat farmer to high value urban chilled/frozen meats markets provide an opportunity to significantly improve financial outcomes from goat rearing. The market for high quality Indian goat meat is growing strongly in domestically and abroad.

Environmental Rejuvenation Through Agriculture

Creating a Circular Economy for Restoring Soil Health
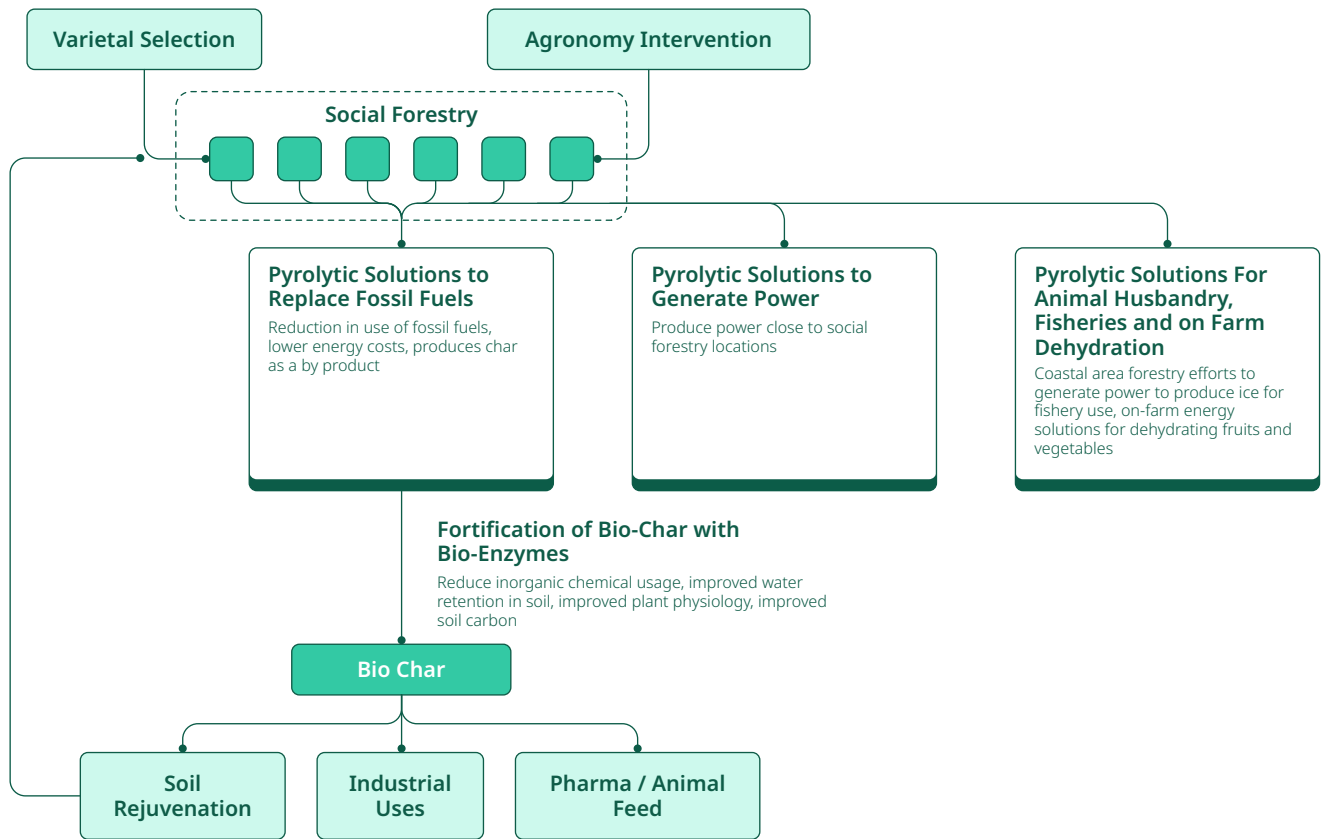
Fig 5. Circular economy for restoring soil health

Indian soil has poor carbon levels (0.3 - 0.4% versus threshold level of 3 - 4%) which is detrimental to water retention and increases inorganic input requirement. Converting current energy needs fuelled by fossil fuels to renewable wood-based energy solutions eliminates CO_2 emissions, generates char to rejuvenate carbon depleted soil and provides commercial social forestry opportunity for small farmers. Trials on biochar application are ongoing.

Environmental Rejuvenation Through Agriculture

Creating Value from Agri-Waste

Agri Waste

Collection Systems
Localized collection systems which remunerate collection of agri waste and provide value to generators of agri waste

Carbon Credits
Secure carbon credits where available to subsidize the cost of setting up systems

Compressed Bio-Gas
Use of advanced technologies to extract biogas for release to the gas grid or conversion to meet energy needs

Bio Gas

Sludge for Soil Rejuvenation

Gas Grid

Local Energy Demand

Fig 6. Creating value from agri-waste

Apart from resolving the issue of agri waste and its disposal in rural India, the Government of India is committed to generating 500 GW of power from renewable energy sources by 2030. Menterra's primary area of interest is to look at developing models for localized CNG manufacturing completing the above chain, and supporting the commercialization of agri waste for local employment and benefit.

Environmental Rejuvenation Through Agriculture

Reducing Wastage in the Agri Value Chain

Technology Choices

Agronomy Interventions

Farming / Animal Husbandry / Fishing

Localized Shelf-Life Extension Technologies
Deployment of low cost and localized technologies for extending shelf life

Preservation Technologies

Deployment of low-cost solutions for existing modes of preservation / shelf-life extension such as dehydration, refrigeration and improved physiological performance of the agricultural produce.

· Localized production of low-cost ice / alternate refrigerants

· Solar dehydration

· Improvement of plant characteristics

· Storage and transportation solutions

On-Farm / Shore and Near Farm / Shore Processing

Complete primary value addition immediately after harvesting

Branding and Marketing of Farm Sourced Preserved Produce

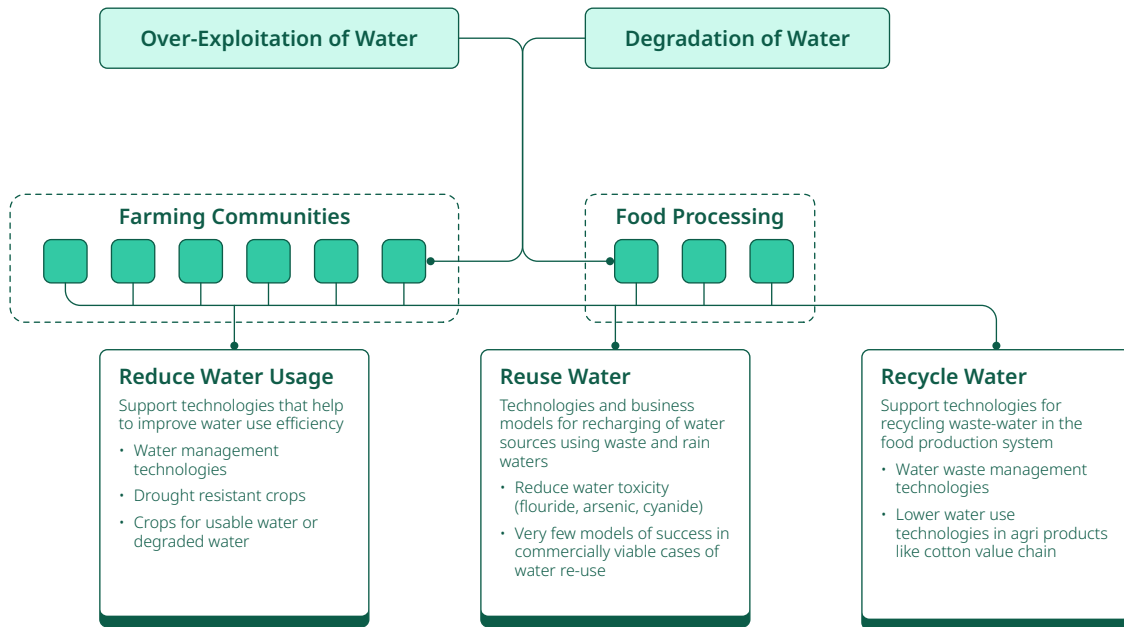Catering to urban and export markets for safe farm processed food materials

Fig 7. Reducing wastage in the agri value chain

Substantial opportunity exists for reducing the high levels of wastage of farm and fisheries output in India. Menterra is focused on technologies that can resolve or mitigate these losses at scale.

Environmental Rejuvenation Through Agriculture

Managing Water

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┌──────────────────────────┐        ┌──────────────────────────┐
│  Over-Exploitation of Water │        │   Degradation of Water     │
└──────────────────────────┘        └──────────────────────────┘

  ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐      ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
     Farming Communities              Food Processing
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Reduce Water Usage

Support technologies that help to improve water use efficiency

- Water management technologies
- Drought resistant crops
- Crops for usable water or degraded water

Reuse Water

Technologies and business models for recharging of water sources using waste and rain waters

- Reduce water toxicity (flouride, arsenic, cyanide)
- Very few models of success in commercially viable cases of water re-use

Recycle Water

Support technologies for recycling waste-water in the food production system

- Water waste management technologies
- Lower water use technologies in agri products like cotton value chain

Fig 8. Managing water

Water availability is forecasted to reduce dramatically due to climate change over the next few decades. As India urbanizes at a rapid pace, existing sources of water are coming under duress. The monsoon - the main irrigation source for agriculture in river irrigated locations, is turning erratic. Evaporation losses due to extreme heat is increasing. Menterra is looking for solutions to mitigate water stress in the agri value chain.

Creating Value Added Opportunities in the Food Chain
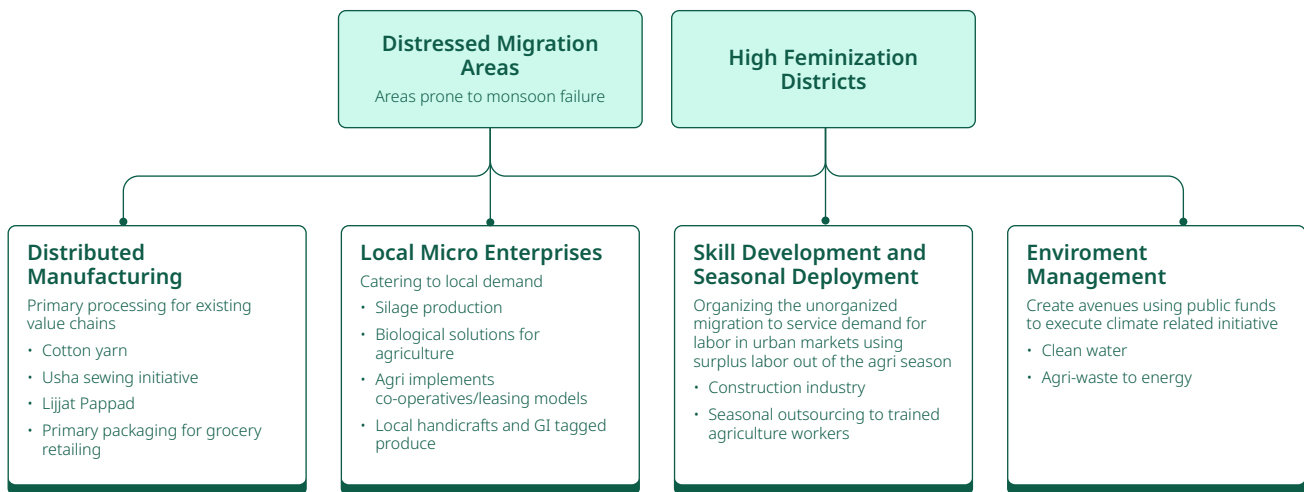
Food as Medicine
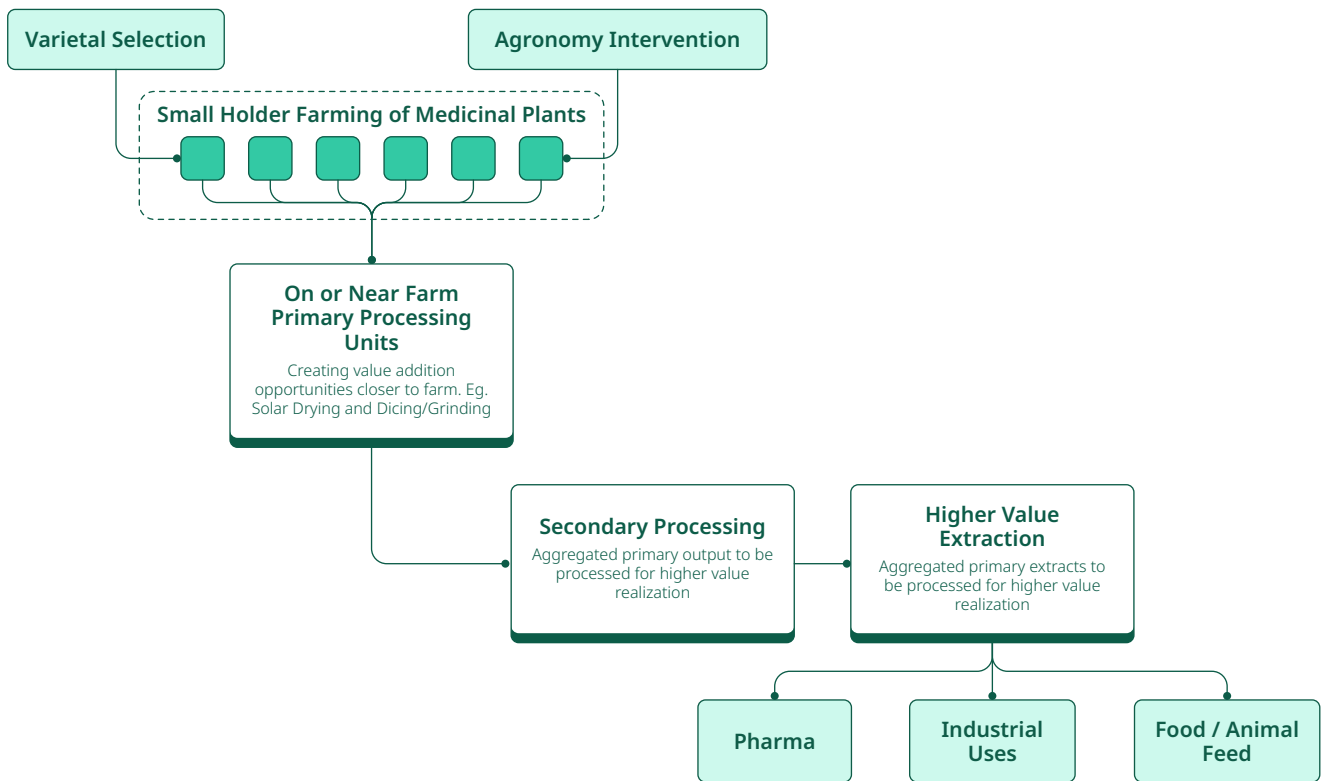
Fig 9. Food as medicine

One of the best examples to support this illustration is Indian turmeric. Several tribal and low-income parts of agrarian India grow curcumin rich turmeric. There are usually grown by small holders who realise very low value from sale of the turmeric rhizomes to local traders as a primary ingredient for producing turmeric powder.

Creating Value Added Opportunities in the Food Chain

Creating Off Farm Employment in Agrarian Areas

Surplus and Over-Deployed Labor

Identify areas where there is high 'feminization' of agriculture, high seasonal migration to urban areas

Distressed Migration Areas

Areas prone to monsoon failure

High Feminization Districts

Distributed Manufacturing

Primary processing for existing value chains
- Cotton yarn
- Usha sewing initiative
- Lijjat Pappad
- Primary packaging for grocery retailing

Local Micro Enterprises

Catering to local demand
- Silage production
- Biological solutions for agriculture
- Agri implements co-operatives/leasing models
- Local handicrafts and GI tagged produce

Skill Development and Seasonal Deployment

Organizing the unorganized migration to service demand for labor in urban markets using surplus labor out of the agri season
- Construction industry
- Seasonal outsourcing to trained agriculture workers

Enviroment Management

Create avenues using public funds to execute climate related initiative
- Clean water
- Agri-waste to energy

Fig 10. Creating off farm employment in agrarian areas

These initiative and the deployment of technology solutions to redeploy surplus manpower that is currently dependent on agriculture as their main source of income would have the most beneficial impact in alleviating the issue of low incomes in rural areas. This is a high priority investment area for Menterra.

Summary

Big Opportunity for Targeted Impact Delivery in Agriculture

- As the Indian economy transitions to a service sector driven economy, it has not found a solution for re-deploying most of the over 700 million people continuing to depend on agriculture for sustenance.

- This is one of the root cause of India's low per-capita income (arising from under-employment in rural areas).

- A rapidly urbanizing India increases urban representation in legislature – a strong constituency that reacts adversely to food inflation (food inflation = increased prices for agricultural produce).

- This coincides with the peaking of climate change impact on India. Water is now scarce. Percentage of irrigated land is saturated. Monsoon has become very unpredictable. Duration of seasons has changed.

- Migration from primary agriculture to food processing on or near farm can address redeployment of agri dependent labor, reduce post harvest losses and increase value capture in rural areas.

- The role of patient impact-oriented private capital is most required today to patiently create sustainable solutions in addressing the big issues facing Indian agriculture.

- All investments in agriculture are not impact investments; need to distinguish ag-impact investments from ag investments.

- Ag-tech investments address some of the problem facing agriculture, they usually do not resolve the structural issues in an agricultural value chain.

- The gestational period for returns in impact agri-investments is longer than in conventional investments.

- Like healthcare and education, which saw public spending being replaced by private capital, agriculture offers myriad opportunities for private technology and business model innovation.

- Menterra is at the forefront of identifying and creating meaningful examples of sustainable, course changing impact investments in Indian agriculture.

Healthcare

The healthcare sector presents the greatest opportunity for innovation and transformation to address the core issue that besets India's growing population. The renaissance of technology and innovation that we are seeing during the last decade augurs well for developing new and frugal solutions to the core issue of diminished healthcare access away from the large cities of India. The private sector has driven capacity creation for healthcare. The facilities and the capabilities available to an Indian living in a large metropolitan city in India is comparable to what is available in the developed world. These healthcare facilities are networked into the latest technological advances and tap into a paying customer base, increasingly funded by insurance, to avail high quality healthcare. As one moves away from the large cities, the picture changes and the private sector presence fades away, to be almost absent in the small villages.

"As one moves away from the large cities, the picture changes and the private sector presence fades away, to be almost absent in the small villages."

In the "Healthcare Landscape in India" section, we explore the evolution and urban centricity of India's healthcare system. We examine the re-emergence of public emphasis on healthcare led by progressive governments in certain states in India like Delhi and Rajasthan, who recognize the adverse financial impact of healthcare spends on the family budgets, already under strain from inflationary pressures and the loss of livelihood from health events and the impact on public finances of a population that is not in good health. We explore the "tyranny of geography" – the gaps in healthcare facilities in low resource settings and the ways to break this tyranny by investing into opportunities for frugal engineering, new technologies and creating employment opportunities for para medical personnel in these areas.

We are cognizant of an added dimension of the ageing of the Indian population. Besides the need for elder care and dealing with the changing disease burden profile of a changed age demographic of the population, we are cognizant of the need to address changes that are a consequence of increased per capita income. As the consumption behavior of the population changes towards a richer and less localized food basket, there is a consequent health impact on this population. Diabetes surfacing in an epidemic in areas where there are significant dietary shifts or replacement of carbohydrates in India is well documented. Cardiac issues arising from reduced physical activity and a fat rich diet are also more evident. The silent scourge of mental health at schools and at the workplace need to be addressed. Menterra is exploring the need to address awareness, capacity, capability and efficacy of solutions for low resource settings at costs that are compatible with the paying capacity of this population to address these new challenges facing the Indian healthcare system.

Finally, in this section, we explore possible investment opportunities emanating from climate change its impact on the population. We highlight some of the possible investment opportunities in enterprises that are developing commercially viable solutions for problems arising out of long exposure to the sun, poor access to clean water, poor air quality and increased levels of stress and anxiety.

History, Sociology and Political Economy

1947 - 1980 (Post Independence Era)

- Period characterized by focus on infection control and national programs for the eradication of Malaria, small pox, TB, for water-sanitation, and for family planning.
- In the early years after independence private sector capital accumulation occurred in building infrastructure and industry particularly capital goods and financial services instead of healthcare.
- Center and state responsibilities carved out. This period also marked the inception of the PHC system and the Primary-Secondary-Tertiary model of healthcare in India.

0.24	**0.1**	**299m**	**$83**
beds per 1000	doctors per 1000	rural population (83%)	GDP per capita (rank 122)

1980 - 2000 (Post Liberalization Era)

- 1982-83 marked the year for the first National Health Policy by the Centre, 35 years Post Independence. Simultaneous increase in number of PHCs (from 5,500 to 20,536) and decrease in the spend on disease control and allocation of funds for PHCs (from 17% to 4%) affected healthcare delivery and quality(1980 to 1990).
- Period witnessed a push for private sector hospitalization to deliver to international standards. It marked the beginning of rising healthcare costs in India and centralization in metros and tier 1 cities.
- Healthcare primarily delivered via private practitioners across allopathic, unani, ayurveda, siddha and homeopathy.

0.7	**0.5**	**743m**	**$442**
beds per 1000	doctors per 1000	rural population (72%)	GDP per capita (rank 124)

2001+ (Current Period)

- Change in disease burden from communicable to non-communicable diseases that are more chronic, expensive to treat, require specialized healthcare expertise and infrastructure. (1 in 4 Indians are at high risk of death from NCD's.)
- Schemes like Ayushman Bharat afford the middle and base of the pyramid access to healthcare, OOPE (Out of pocket expenditure) continues to be high.
- Private infrastructure rapidly scaling, concentrated in metros. Large and sophisticated players emerge at par with global standards, medical tourism picks up in India owing to the lower relative costs of procedures. Healthcare continues to remain unaffordable and inaccessible.

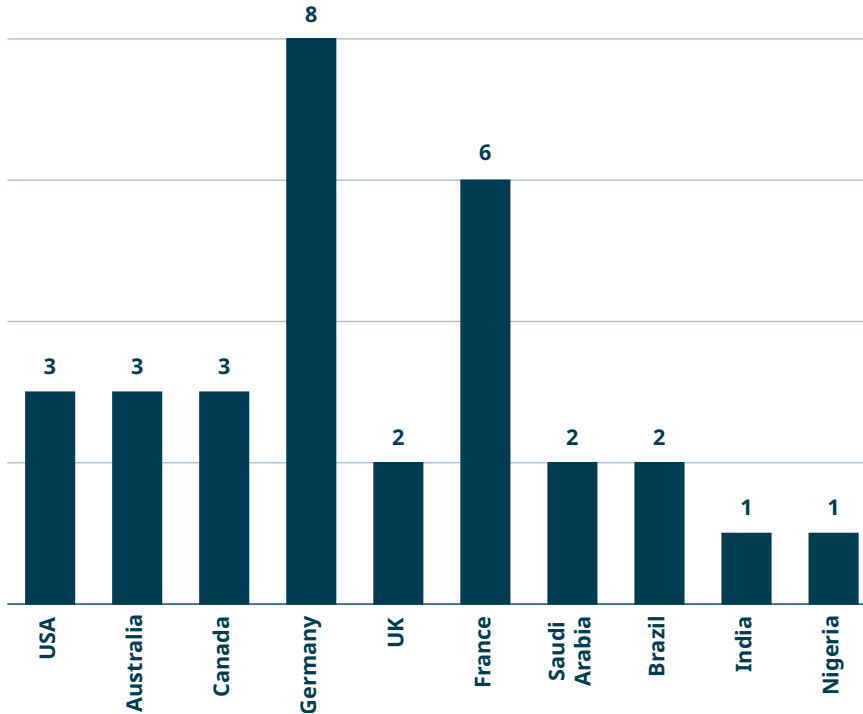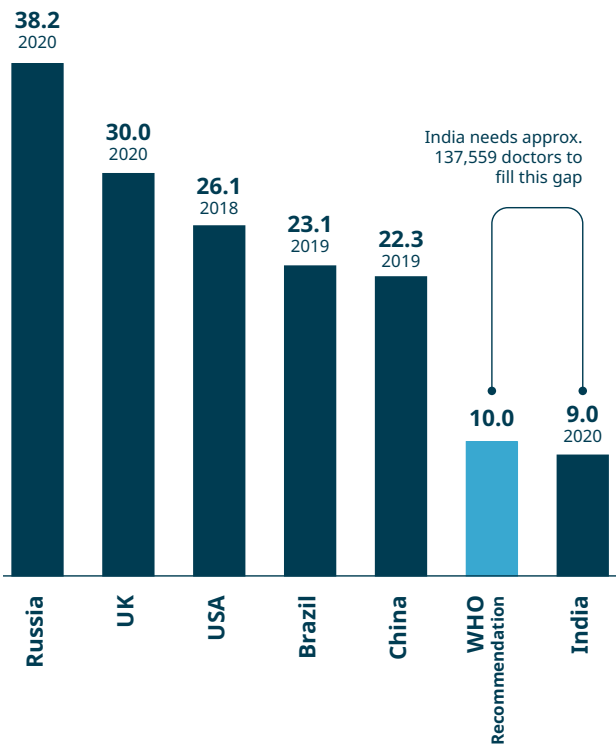| **1.3**	**0.8**	**908m**	**$2411**
beds per 1000	doctors per 1000	rural population (64%)	GDP per capita (rank 115)

State of Healthcare in India

Continuing Shortage of Infrastructure and Resources for Healthcare Delivery
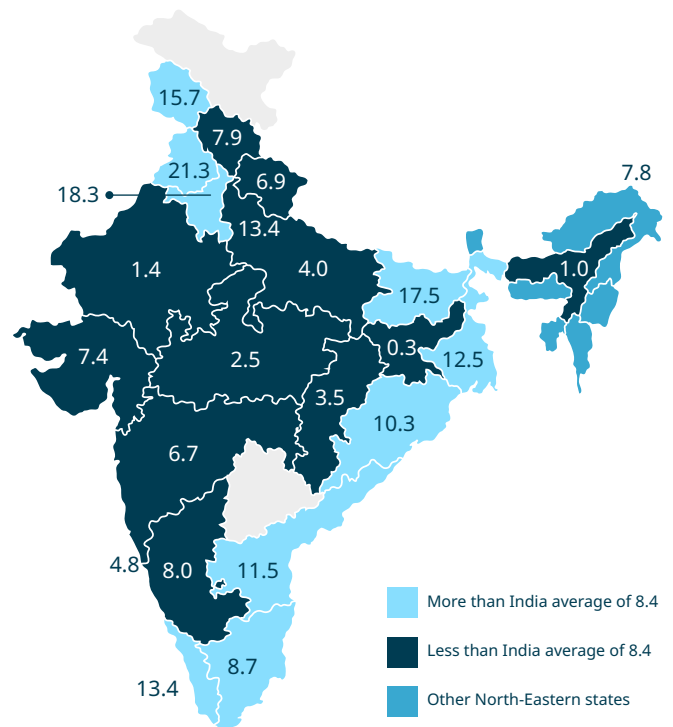

Shortages exist in critical elements of the healthcare delivery: 57% lower hospital beds per 1,000 (1.3 vs 3 required), 137,559 fewer doctors than required, and a shortage of 6 million allied health professionals (Technicians, Phlebotomists etc.)*

Fig 11. Healthcare delivery penetration (# hospital beds per '000 population, CY21)^

India needs approx. 137,559 doctors to fill this gap

Fig 12. Doctors per 10,000 population in India vs other nations*

More than India average of 8.4

Less than India average of 8.4

Other North-Eastern states

Fig 13. Allied healthcare professionals per 10,000 in India*

Note:
^ Defining the Future of Diagnostics Report by Praxis Alliance
*KPMG –FICCI - Strengthening healthcare workforce in India: the 2047 agenda

State of Healthcare in India

Concentration in Metros

Equipment	X-Ray	MRI	Biochemisty Analyser	Laparoscope	Linear Accelerator	PCR Machine	Cath Lab
Disease Area	Multiple	Multiple	Multiple	Surgery	Cancer	Multiple	Cardiac Care
Cost of Equipment (INR L)*	7	625	13	50	1,000	12	150
Price per report / amortization per procedure (INR)*	500	5,000	500	10,000	5,000	500	10,000
Break even nos. required	**1,400**	**12,500**	**2,634**	**500**	**20,000**	**2,500**	**1,500**

- Our significant dependence on imports for medical equipment (80% imported) is reflected in high infrastructure setup costs (INR 47L to 140L per bed^).

- High setup costs in turn necessitate high volumes of procedures/tests for providers to realize reasonable payback periods (of < 18 months) thereby leading to concentration in high-density metro cities. The table above provides a simple illustration of break even volumes required for basic medical equipment.

- 75 percent of healthcare related infrastructure, medical workforce, and other health resources are concentrated in urban areas, where only ~30 percent of the population resides[#]. This is largely skewed towards metro cities (For example: Pune possesses 3.5 beds per 1,000[&] population vs the national average of 1.3 beds per 1,000).

Note:
*Multiple internet sources and industry conversations
^IIFL India Healthcare Update
Bridging India's urban-rural healthcare divide: Health Radius
Pune ranks first, Delhi-NCR at bottom among top 8 cities in health infra: Report (mint article)

State of Healthcare in India

Significant Disparities in Access and Outcomes – Regional and Economic

Particulars#	Niti Aayog Health Index Rank (of 35)	Death Rate per 1,000	% of Population below Poverty Line	GDP per Capita (USD 2022)	PHCs per Million Population	Govt Hosp. Beds per 1,000 Population	OOPE per Hospitalization as % of GDP Per Capita^
India	-	6	21.9	2,366*	22	0.6	10
Uttar Pradesh	35	6.5	29.4	901	15	0.3	35
Bihar	34	5.4	33.7	629	16	0.2	25
Madhya Pradesh	32	6.5	31.6	1,547	18	0.4	12
Odisha	31	7.3	32.6	1,640	30	0.4	9
Chhattisgarh	26	7.9	39.9	1,536	27	0.3	19
Jharkhand	23	5.2	37	1,001	9	0.4	23
Maharashtra	5	5.5	17.4	2,738	20	0.3	11
Tamil Nadu	4	6.1	11.3	3,068	25	0.7	7
Chandigarh	3	3.9	21.8	4,445	34	3.3	11
Mizoram	2	4.2	20.4	2,403	55	1.5	2
Kerala	1	7	7.1	2,911	26	1.1	8

Low per capita incomes and high poverty levels correlate strongly with poor health outcomes and higher death rates. Additionally, regions possessing these economic characteristics suffer from lower than average penetration of the public health infrastructure, higher dependence on private healthcare, and thereby higher Out of Pocket Expenses (OOPE).

Note:
Data collected from multiple sources – including National Health Profile 2022 by Central Bureau of Health Intelligence
*GDP per capita for 2022 has been considered for comparison across state data
^ Wt. Average OOPE across rural and urban populations has been considered

State of Healthcare in India

Significant Disparities in Access and Outcomes – Sharp Urban-Rural Divide

Particulars	Rural	Urban	Rural vs Urban (%)
Distribution	**64%**	**36%**	
Death Rate (per 1,000)	**6.4**	**5.1**	**+25**
Male	7.0	5.7	+23
Female	5.8	4.5	+29
Infant Mortality Rate	31	19	+63
Neo-natal Moratality Rate	23	12	+92
Post-natal Mortality Rate	8	7	+14
No. of Govt. Hospital Beds per 1,000	**0.3**	**1.3**	**-74**
Borrowing as a Source of Funding Hospitalization (% cases)	**13.4**	**8.5**	**+58**
Distribution of Pathology Labs (%)	**33%**	**67%**	
Distribution of Clinical Chemistry Equipment (%)	**34%**	**66%**	
Distribution of MRI Machines (Nos.)	**1,850**	**3,150**	**-41**
Distribution of Healthcare Workforce (%)^	**35%**	**65%**	
Allopathic Doctors	26%	74%	
Nurses and Midwives	43%	57%	
Dentists	11%	89%	
AYUSH Practitioners	37%	63%	
Health Associates (Includes Pharmacists)	37%	63%	

Rural health outcomes are significantly poor when compared to urban India; this reflects the gaps in healthcare in rural India across components (infrastructure, equipment, and workforce).
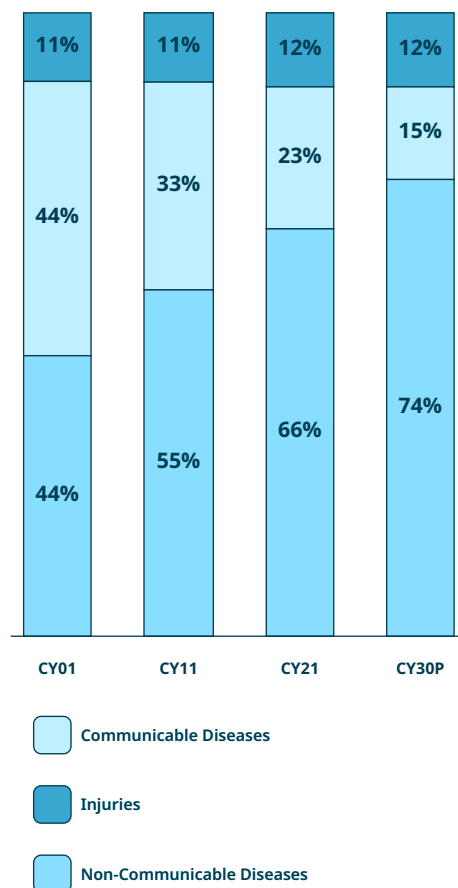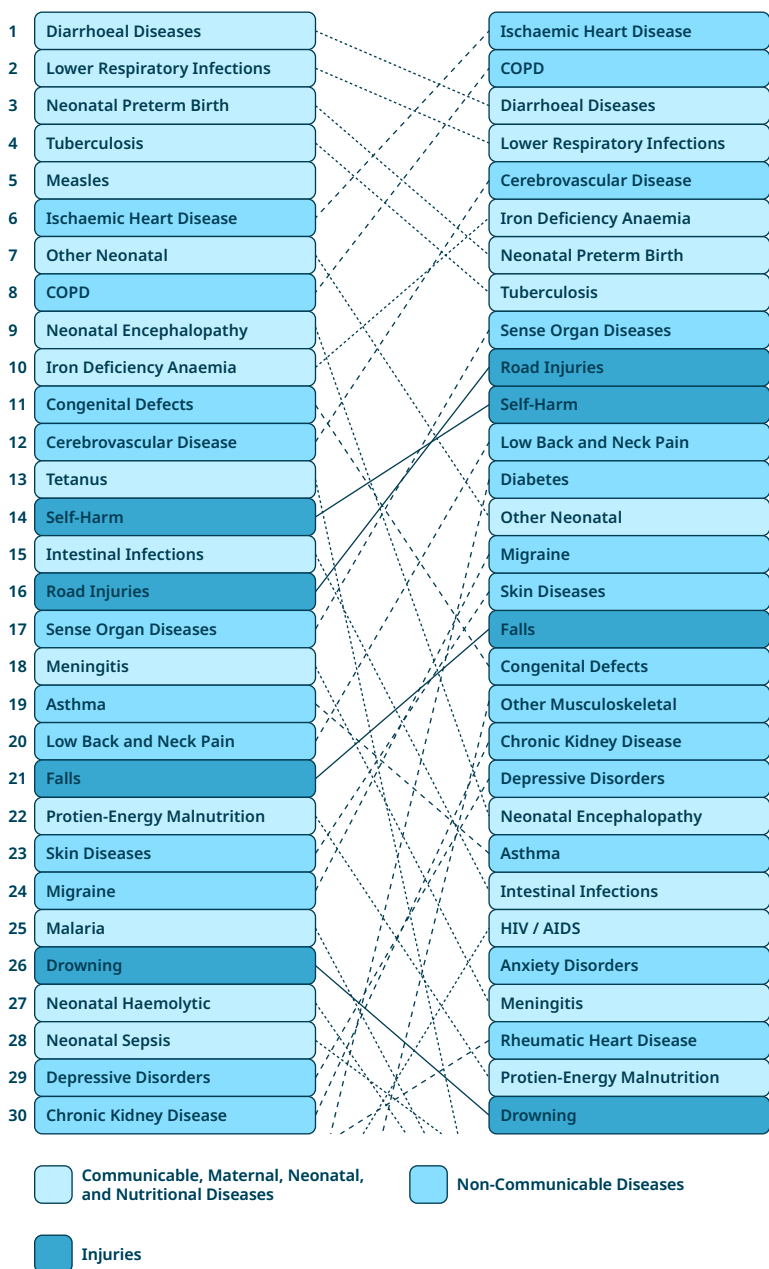
Note:
Data collected from Defining the Future of Diagnostics Report by Praxis Alliance – Tier 3+ numbers considered as Rural for comparability
^Composition and distribution of the health workforce in India: estimates based on data from the National Sample Survey

State of Healthcare in India

Significant Changes in the Disease Burden and Population Demographics are Underway

#			
1	Diarrhoeal Diseases	Ischaemic Heart Disease	
2	Lower Respiratory Infections	COPD	
3	Neonatal Preterm Birth	Diarrhoeal Diseases	
4	Tuberculosis	Lower Respiratory Infections	
5	Measles	Cerebrovascular Disease	
6	Ischaemic Heart Disease	Iron Deficiency Anaemia	
7	Other Neonatal	Neonatal Preterm Birth	
8	COPD	Tuberculosis	
9	Neonatal Encephalopathy	Sense Organ Diseases	
10	Iron Deficiency Anaemia	Road Injuries	
11	Congenital Defects	Self-Harm	
12	Cerebrovascular Disease	Low Back and Neck Pain	
13	Tetanus	Diabetes	
14	Self-Harm	Other Neonatal	
15	Intestinal Infections	Migraine	
16	Road Injuries	Skin Diseases	
17	Sense Organ Diseases	Falls	
18	Meningitis	Congenital Defects	
19	Asthma	Other Musculoskeletal	
20	Low Back and Neck Pain	Chronic Kidney Disease	
21	Falls	Depressive Disorders	
22	Protien-Energy Malnutrition	Neonatal Encephalopathy	
23	Skin Diseases	Asthma	
24	Migraine	Intestinal Infections	
25	Malaria	HIV / AIDS	
26	Drowning	Anxiety Disorders	
27	Neonatal Haemolytic	Meningitis	
28	Neonatal Sepsis	Rheumatic Heart Disease	
29	Depressive Disorders	Protien-Energy Malnutrition	
30	Chronic Kidney Disease	Drowning	

Legend:
- Communicable, Maternal, Neonatal, and Nutritional Diseases
- Non-Communicable Diseases
- Injuries

Fig 14. Doctors per 10,000 population in India vs other nations*

	CY01	CY11	CY21	CY30P
Injuries	11%	11%	12%	12%
Communicable	44%	33%	23%	15%
Non-Communicable	44%	55%	66%	74%

- Communicable Diseases
- Injuries
- Non-Communicable Diseases

Fig 15. Share of non-communicable diseases in causes of death is expected to increase from ~66% in CY21 to ~74% by CY30^

India is witnessing a significant shift in its disease burden. Cases and deaths for NCD's like heart disease, diabetes and cancer are rising sharply. These changes warrant significant shifts from the way treatment is delivered for communicable diseases (acute to chronic, treatment/cure to management etc.).
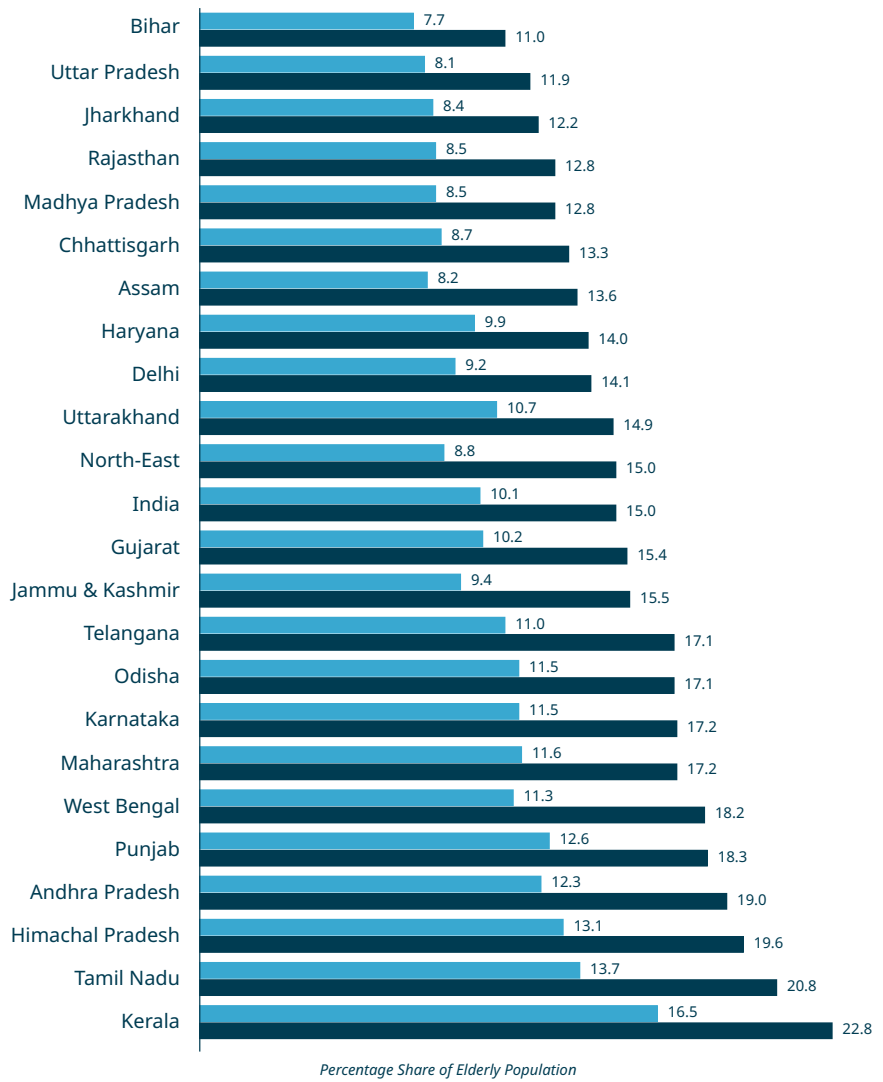
Note:
Data collected from Defining the Future of Diagnostics Report by Praxis Alliance – Tier 3+ numbers considered as Rural for comparability
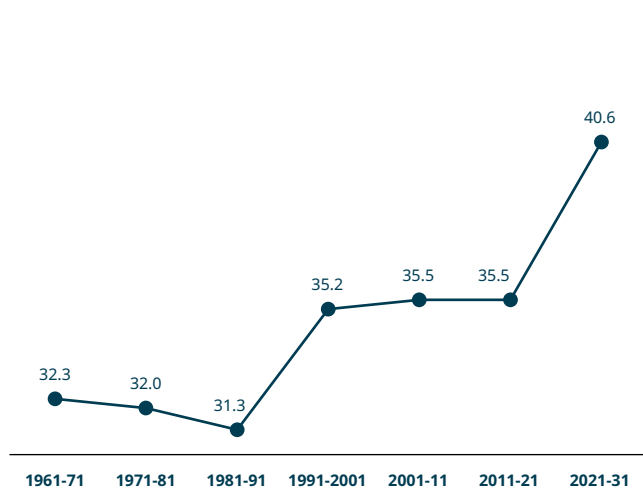^Composition and distribution of the health workforce in India: estimates based on data from the National Sample Survey
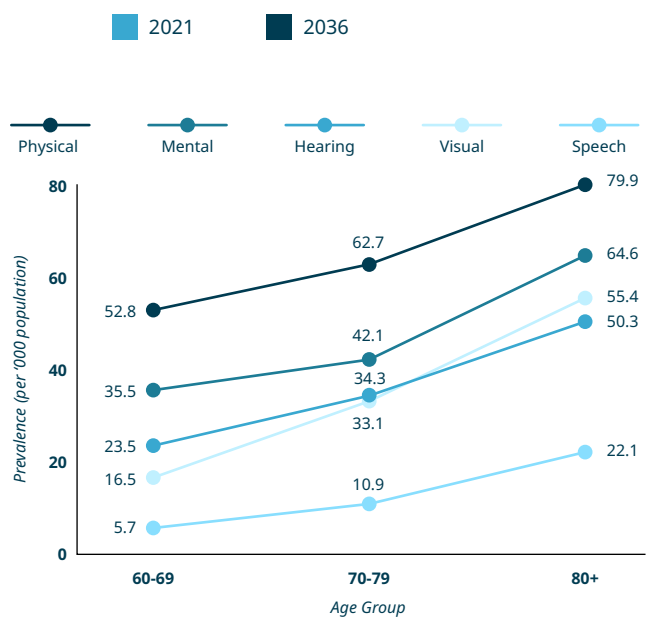
State of Healthcare in India

Significant Changes in the Disease Burden and Population Demographics are Underway

**Fig 16. Projected share of the elderly population, India and states, 2021 versus 2036^**

State	2021	2036
Bihar	7.7	11.0
Uttar Pradesh	8.1	11.9
Jharkhand	8.4	12.2
Rajasthan	8.5	12.8
Madhya Pradesh	8.5	12.8
Chhattisgarh	8.7	13.3
Assam	8.2	13.6
Haryana	9.9	14.0
Delhi	9.2	14.1
Uttarakhand	10.7	14.9
North-East	8.8	15.0
India	10.1	15.0
Gujarat	10.2	15.4
Jammu & Kashmir	9.4	15.5
Telangana	11.0	17.1
Odisha	11.5	17.1
Karnataka	11.5	17.2
Maharashtra	11.6	17.2
West Bengal	11.3	18.2
Punjab	12.6	18.3
Andhra Pradesh	12.3	19.0
Himachal Pradesh	13.1	19.6
Tamil Nadu	13.7	20.8
Kerala	16.5	22.8

Percentage Share of Elderly Population

■ 2021   ■ 2036

Fig 17. Decadal growth (%) of the elderly population, 1961–2031^

Decade	Growth (%)
1961-71	32.3
1971-81	32.0
1981-91	31.3
1991-2001	35.2
2001-11	35.5
2011-21	35.5
2021-31	40.6

Fig 18. Impairment by type and age group (per '000 population)^

Physical · Mental · Hearing · Visual · Speech

Prevalence (per '000 population)

Age Group	Physical	Mental	Hearing	Visual	Speech
60-69	52.8	35.5	23.5	16.5	5.7
70-79	62.7	42.1	34.3	33.1	10.9
80+	79.9	64.6	50.3	55.4	22.1

Age Group

State of Healthcare in India

Significant Changes in the Disease Burden and Population Demographics are Underway
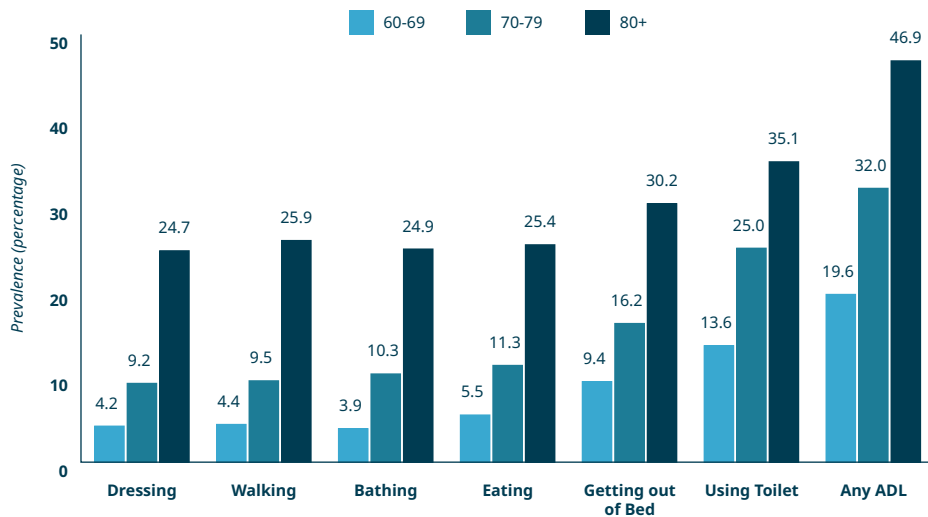
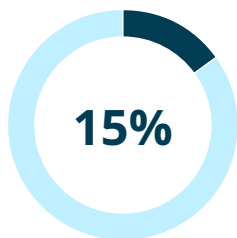**Fig 19. Decadal growth (%) of the Female elderly population, 1961–2031**
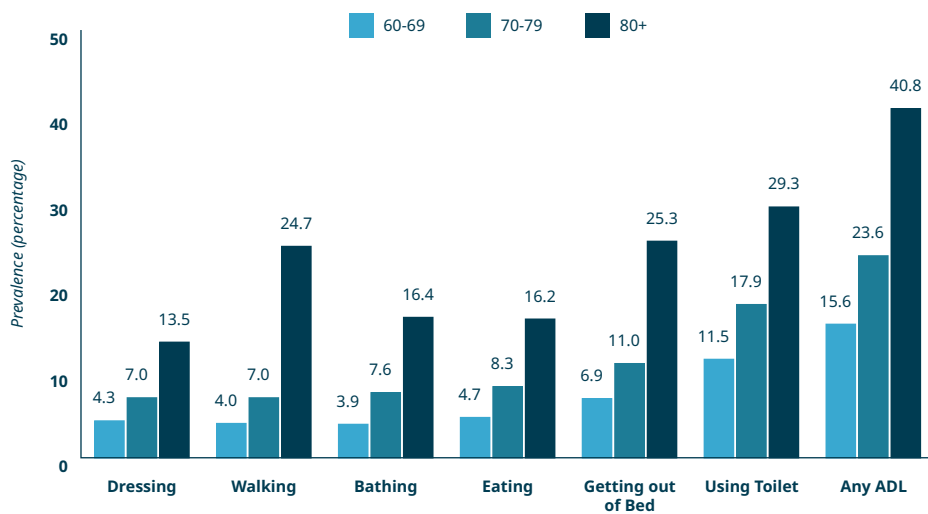
Fig 20. Impairment by type and age group , Male, (per '000 population)^

The elderly population is expected to reach 15% of total population by 2036^ with varying levels of impairment and co-morbidities.

Note:
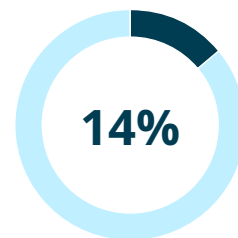^India Ageing Report 2023

State of Healthcare in India

Mental health

15%

15 percent of the global mental health burden is shouldered by India

~200m

Overall mental health burden in India (2017)

14%

14 percent of the country's population is estimated to be suffering from mental disorders

Fig 21. Prevalence of mental health conditions in India#

Treatment Gaps*	Global Median	India
Schizophrenia (including other affective psychosis	32%	75%
Depression	56%	85%
Bipolar Disorder	50.20%	70.40%
General Anxiety Disorder	57.50%	84%
Alcohol Abuse and Dependence	78.10%	86.30%

^Treatment gap is defined as the number of people with active disease who are not on treatment or on inadequate treatment ans is expressed as a precentage of the total number of people with active disease.

Mental Health Professionals (per 100,000)*	Recommended/ Developed Country	India
Psychologists	30	0.07
Psychiatrists	3	0.75

Fig 22. Treatment gaps for select mental health conditions India vs. Global&

Note:
#Mind matters: A perspective on the mental health landscape in India
& National Mental Health Survey of India, 2015-16

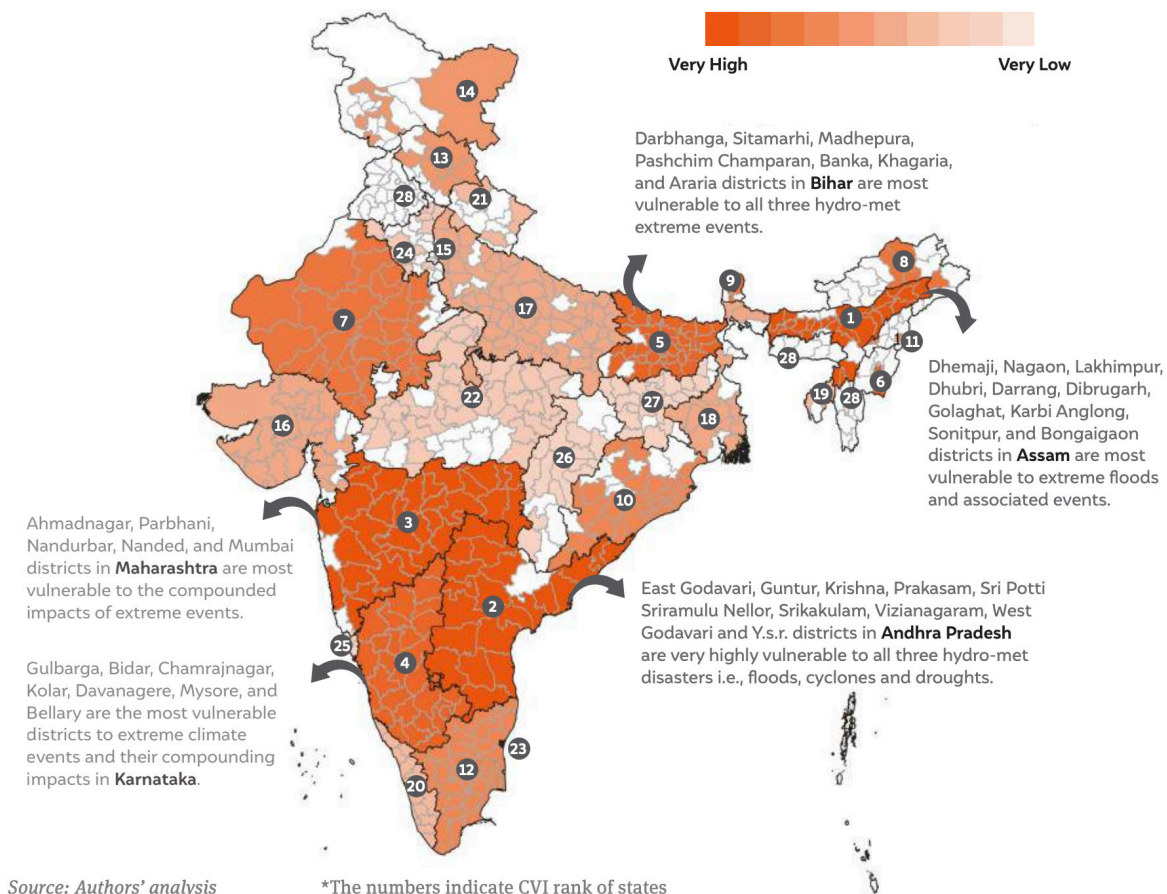# State of Healthcare in India

Mental health

Substance disorders use (F10-F19)

Schizophrenia and other psychotic disorders (F20 -F29)

Mood disorders (F30-F39)

Neurotic & stress related disorders (F40-F48)
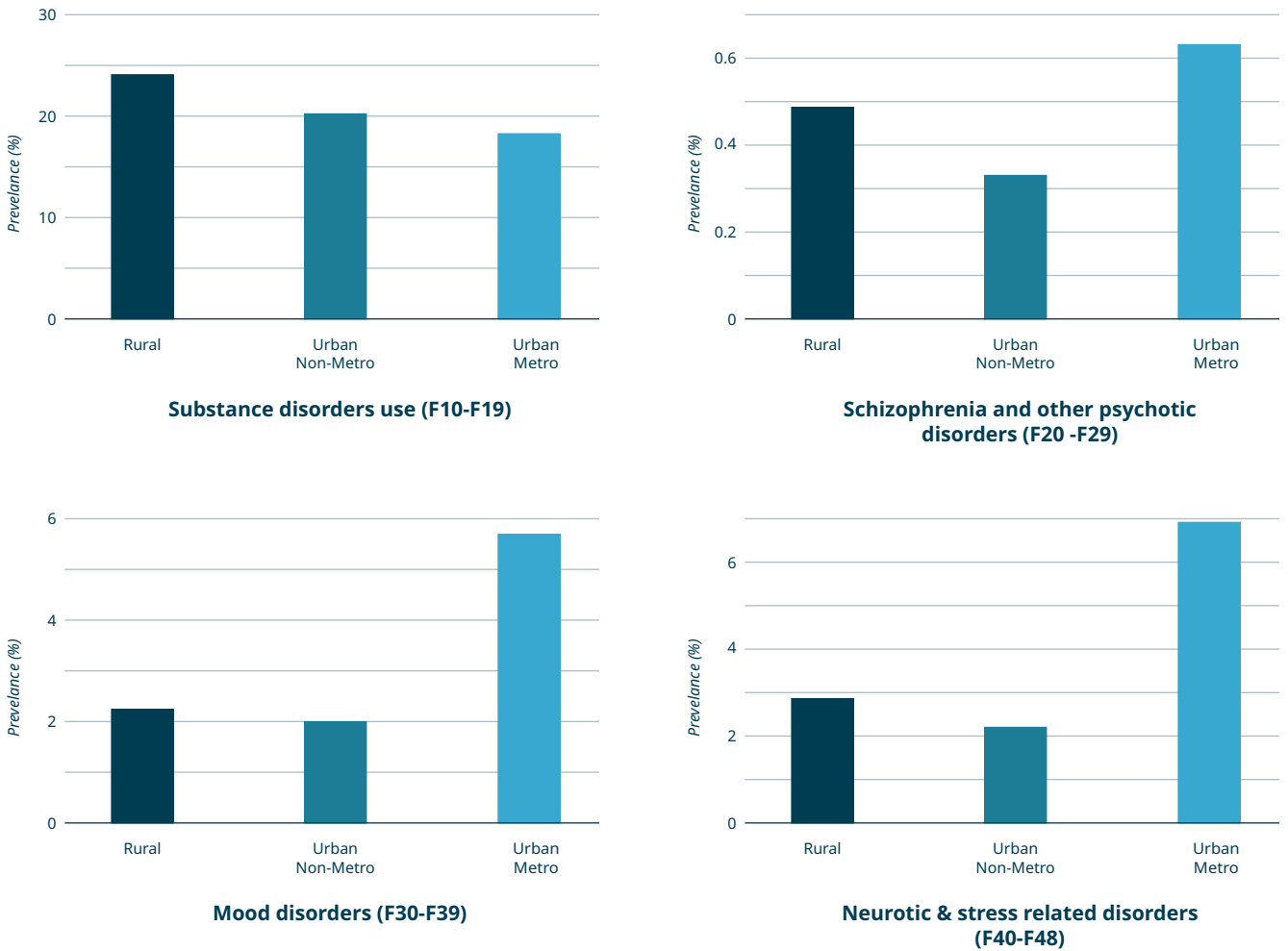
Fig 23. Prevalence of mental health conditions urban vs rural[&]

14%[#] of the country's population suffers from various mental disorders with large gaps in treatment attributable to acute shortage of professionals, awareness, stigma and access[&].

State of Healthcare in India

Climate Change Poses Increased Health Risk for 542 MM Indians

Very High   Very Low

Darbhanga, Sitamarhi, Madhepura, Pashchim Champaran, Banka, Khagaria, and Araria districts in **Bihar** are most vulnerable to all three hydro-met extreme events.

Dhemaji, Nagaon, Lakhimpur, Dhubri, Darrang, Dibrugarh, Golaghat, Karbi Anglong, Sonitpur, and Bongaigaon districts in **Assam** are most vulnerable to extreme floods and associated events.

Ahmadnagar, Parbhani, Nandurbar, Nanded, and Mumbai districts in **Maharashtra** are most vulnerable to the compounded impacts of extreme events.

East Godavari, Guntur, Krishna, Prakasam, Sri Potti Sriramulu Nellor, Srikakulam, Vizianagaram, West Godavari and Y.s.r. districts in **Andhra Pradesh** are very highly vulnerable to all three hydro-met disasters i.e., floods, cyclones and droughts.

Gulbarga, Bidar, Chamrajnagar, Kolar, Davanagere, Mysore, and Bellary are the most vulnerable districts to extreme climate events and their compounding impacts in **Karnataka**.

Source: Authors' analysis   *The numbers indicate CVI rank of states

Fig 24. Assam, Andhra Pradesh, and Maharashtra are the most vulnerable states in India#

State of Healthcare in India

Climate Change Poses Increased Health Risk for 542 MM Indians

CEEW Vulnerability Rank #	Rank	Population (in MM)
Assam	1	36
Andhra Pradesh	2	53
Maharashtra	3	126
Karnataka	4	68
Bihar	5	127
Manipur	6	3
Rajasthan	7	81
Arunachal Pradesh	8	2
Sikkim	9	1
Odisha	10	46
Total		**524**

Climate Change Parameter	Change	Health Impact
Heat	Stress on body's thermal regulation	Heat and kidney strain, heat strokes, multiple organ injury
Water	Contamination due to flooding	Infections (Multiple)
Air	Changing temperature and precipitation patterns	Acute and chronic cardiovascular and respiratory illnesses
Combination	Change in seasonal patterns affecting vectors (lyme, mosquitoes, etc.)	Increased occurrence of vector borne diseases

- Select groups - young children and infants, elderly population, outdoor workers and socially displaced groups are most vulnerable.*

- Regions with temperatures >40 degrees Celsius are particularly prone to heat related illnesses and increased risk of cardiovascular diseases (ischemia, infarction and collapse) and kidney fibrosis.*

Note:
#Mapping India's Climate Vulnerability - Council on Energy, Environment and Water (CEEW)
^Climate Change and Human Health - National Institute of Environmental Health Sciences
* Deccan Herald – When the heat is on…. [July 21, 2024]

State of Healthcare in India

The Rise of AMR through the Food-Animal Production Chain in India

Type	Select Instance of AMR in Animals
Pig	In the Nort-East region, P. multocida isolates (n=72) from swine showed 70% resistance to Amikacin, Streptomycin, Penicillin-G and Vancomycin
Eggs	Salmonella in 7.7% of total 492 eggs in South India with 100% resistance to Ampicillin, Neomycin, Polymyxin-B and Tetracycline
Poultry	A study conducted in various districts of Chhattisgarh evaluated the prevalence of Salmonella(7%) in 200 chicken meat samples reported to be 96.8% to Gentamicin and 93.7% resistant to Erythromycin
Milk	20-30% isolates of S. Aureus from milk samples from cow and buffalo affected with mastitis were found to be resistant to Gentamicin, Tetracycline, Erythromycin and Lincomycin
Aquaculture	Vibiro harveyi isolates from shrimp in Tamil Nadu were reported to be resistant to Ciprofloxacin, Penicillin, Rifampicin and Vancomycin.

- India has a population of cattle (191 million), buffalo (109 million), sheep (65 million), goats (135 million), pigs (10 million) and more than 700 million poultry that produce almost 75 billion eggs every year[#].

- Antibiotics are used in animals for treating infections, as prophylaxis treatment (preventive) and as growth promoters for weight gain. (Anti-microbial quantity used per kg of production: 45mg in beef, 148mg in chicken and 172mg in pork).

- India is also among the top 5 countries globally for largest share of antimicrobial consumption in food-animal production[^].

Note:
#Kamini Walia, Monica Sharma, Sonam Vijay, and Bibek R. Shome. Understanding policy dilemmas around antibiotic use in food animals & offering potential solutions
^ReAct - Antibiotic Use in Food Animals: India Overview

Delivering Affordable Healthcare

Frugal Engineering of Low-cost Devices, Kits and Medical Equipment for India

Current state

The changing disease burden requires advanced technology across diagnosis and treatment. 80 per cent of the medical devices across all specializations of medicine used in the country are imported and thereby are highly priced. This high price is amortized over each procedure and passed onto the patient driving up prices of treatments (Example: High-end laparoscopes costing 45L+ can lead to an added INR 10-20K per surgery). This is pushed up further if the healthcare provider seeks to recover the cost faster (payback periods of <2 years).

Impact Investment Opportunity

- Indigenously developed medical devices focused on considerably reducing the costs of disease specific treatment pathways (Examples: Cancer - screening and diagnostics (mammography), therapy(linear accelerator), in-surgery decision making (frozen section alternatives for cancer margin detection); Liver disease – regenerative therapy as a bridge to transplant/ alternative to transplant).

- Low cost medical technology used across disease areas: low cost PCR machines, low cost MRI machines and low cost diagnostic kits.

- Low cost components that are used in medical devices/equipment (Example: antennas and lasers for photonics based solutions, advanced materials manufacturing and semiconductor chips for biosensors etc.).

Menterra Fund 1 and Fund 2 investments in low-cost solutions:

Improving Access to Healthcare

Technology and Community-based Approach To Disease Detection and Resolution

Current state

Screening and diagnostics infrastructure for diseases areas like Tuberculosis and HPV in India is inadequate or absent at a district level (246 /740 for TB and none for HPV). Despite large programs for TB screening, screening coverage is 11 districts' equivalent per year. This is owing to the unavailability of trained manpower in rural settings, indiscriminate testing, use of expensive testing infrastructure and kits (INR 1,200 per test). Beyond testing, rural patients incur expenses for long distance travel and stay in addition to loss of daily wages for diagnosis, consultations and treatment.

Impact Investment Opportunity

- Use of data modelling, statistics and tech solutions to identify the populations at risk and then perform confirmatory diagnostics at the point of screening reducing the overall financial burden.

- Use of technology to empower ASHA and Anganwadi workers to undertake initial screening and data collection (enabling livelihood and also penetration at a community level – prevents delays in testing and also travel and other accompanied expenditure). Use this data for improvement in screening (Self learning) and for improvement in medical interventions.

- Set up technology first telemedicine centers equipped to transfer relevant vitals and other health information for complete initial virtual consultations.

- Connect identified patients with lowest cost resolution pathways in public or private healthcare systems (Example: Use of telemedicine for consultations, sample collection at point of care and generic medicines for treatment).

Menterra Fund 1 and Fund 2 investments in low-cost solutions:

Improving Quality of Care

Deliver Continuous and Personalized Elderly Care

Current state

Elderly care in India suffers from poor quality services rendered largely through an unorganized service provider base (96%). These are usually uncertified fee-for service provides utilizing unqualified caregivers. This unqualified nature of caregivers is limited mostly to bed-side assistance and basic tasks. The elderly population is at a increasing risk of mental health issues (1 in 45 to have Alzheimer's). Currently 7 MM elderly patients have some form of dementia of which 4 MM have Alzheimer's. Elderly persons are also likely to have other impairments and comorbidities that require closer monitoring and holistic care.

Impact Investment Opportunity:

• Subscription based continuous care covering routine testing, consultations and medicines.

• Service delivery based on international best practices specific to clinical diagnoses (Example: Mental state based care for Dementia patients).

• Use of technology for continuous health and risk monitoring including fall detection.

Diversity Of Impact Opportunities In Healthcare

"Largest Opportunity is in Low-cost Population Screening and Providing a Pathway to Resolution"

Impact Need	Impact Scope
Affordable Healthcare Make healthcare affordable by addressing high costs and inflation, enabling healthcare financing, and insurance coverage.	224 MM households (76% of total) belonging to the low-income and lower-middle income categories spread across urban and rural India lack the resources to utilize expensive existing healthcare; inflation for which is 14%.
Access to Healthcare Improve access to healthcare for geographically disadvantaged populations and groups vulnerable to climate change related illnesses.	69% of the country's population lives in rural areas that are inadequately equipped to handle healthcare demands from the changing disease burden requiring travel and loss of income for diagnosis, consultations, and treatment.
Improvement in Quality of Care Shift to regular and personalized (impairment and comorbidity specific) care.	10.5% of India's population(elderly) is serviced by highly-unorganized players(96% of market) characterized by poor quality of training and lack of disease specific caregiving knowledge to provide adequate care.

- US$ 3 Billion invested into Indian Healthcare since 2019 (IIC Reports)

- Ensuring affordable accurate diagnosis and enabling a low cost pathway to resolution and management of disease provides a large opportunity.

- Rising healthcare costs (at 14%) and lagging wage growth (2-3%) will continue to keep quality healthcare unaffordable.

- Poor availability of healthcare infrastructure and resources in rural India exacerbates the financial burden from accessing diagnosis and treatment.

Education

Chrysalis provides content and curriculum focused on improving critical thinking

iDream Career provides career guidance to first-generation learners

Math Buddy offers Math kits for improving learning outcomes through hands-on activities

Stones2Milestones empowers children to become fluent English readers by Grade 3

If there is any one sector in India where the unfulfilled impact agenda is greatest, it is the education sector. While primary education in India is free and compulsory, reflected in high enrolment rates into primary education, the quality of the infrastructure and the outcomes at the primary school level are very poor. This poor foundation gets compounded by the sharp drop out at the secondary school stage and even more sharply at the graduate and professional degree level. The growing levels of unemployment, under employment and continuing pressure on agriculture to absorb this growing workforce is both reflective of the weaknesses of the education system and indicating the areas that need improvement. The years of the Covid epidemic gave impetus to several technology led initiatives that could address the need for de-schooling the education system. However, the primacy of the brick and mortar school in wholistic learning under the agency of the teacher were reaffirmed, as the deficiencies in a tech only learning system have been clear.

Education, like healthcare, continues to remain propelled by private investments in urban areas where the paying capacity exists, leaving the non-urban areas to be addressed by public spending. The issues are deeper than the most manifest issue of access to education. Like healthcare, where the shortage of healthcare professionals is apparent, in education the availability of teachers at all levels of the education system and across the country, is poor. Teacher competence is not keeping pace with the pace of change in knowledge especially in the sciences. India is lagging in producing a qualified workforce for the new age technology driven industries that are shaping the future. This misalignment between curriculum and careers is widening. This misalignment is likely to intensify as the gap between the technology superpowers like China, US, Japan. Singapore, Israel and Korea and the lagging states like India. The super-powers of technology are intensifying their advantage in basic sciences to make big strides in deep science and then use the foundation of deep science to make rapid strides in deep technology. The examples of deploying deep technology solution such as AI and other deep technology initiatives to address unresolved problems for commercial gain are now proliferating in knowledge driven economies.

Any measurement of education infrastructure, such as schools per thousands of children in the target age group at primary, secondary and university education, or teachers per thousand students, or the capacity for higher and technical education, will highlight deficiencies that far exceeds the capacity of government finances. These are all issues that need private capital. However, the greater challenge is the poor scholastic outcomes from the current education system. On a measured basis, learning outcomes in India are very poor. Without emphasis on quality of outcomes from education, India will continue to create a large pool of unemployable youth. The focus of our section on Education is employability and employment. Looked at from this lens, upgrading capacity and creating new capacity for schools, colleges and laboratories is important, but equally important is the need for better teachers, improved teaching efficacy and measured improvement in learning outcomes at the primary and secondary school levels.

Education, like healthcare faces the same challenge of diminishing public spending. Similar to healthcare, the private sector has created space for itself in education and is the larger service delivery platform in urban areas compared to the government.

Time is not with us in India. If we do not direct scare resources, both public and private to address the disparity in learning outcomes in low resources settings, the issues of unemployment will remain unaddressed. The demographic dividend can then morph into a demographic penalty.

On the positive side, literacy, especially female literacy has shown substantial improvement. Female enrolment levels in primary education and through the education continuum are improving. The growth of the economy and the growth in government revenues has provided the financial space for policy formulations to address the lacunae in education witnessed over the past few decades. The Government of India is cognizant of its role and several initiatives such as the New Education Policy are testament to the recognition of the need for change. Progressive state governments recognize the need for change in education and examples of improving access and outcomes funded by the governments are emerging in states like Delhi, Kerala, Tamil Nadu and Rajasthan. The increase in filing of patents and the increasing number of doctorates in sciences are some indicators of the realignment in education. But given the size of the Indian population much more needs to be done, and more quickly to catch up with the leading countries, while fixing the basics that are in need of strengthening.

In the "Education Landscape in India" section, we explore the changes that are needed at various levels of education in India, provide an objective assessment of the current situations and gaps that need to be addressed by private capital.

"On a measured basis, learning outcomes in India are very poor. Without emphasis on quality of outcomes from education, India will continue to create a large pool of unemployable youth."

Evolution of Education in India

A Challenging Trinity of Access, Affordability, Quality

Early Development and Expansion (1947-1985)

- **Access:** Post-independence, India focused on building an educational infrastructure prioritizing primary education to increase literacy. Despite progress, rural areas lagged behind urban centers. This era marked the first major push to make education accessible to the masses.

- **Affordability:** Government-funded education minimized financial burdens on families but limited budgets around 0.6% of GDP initially, stretched resources thin.

- **Quality:** Rapid expansion often compromised quality. Schools lacked trained teachers and adequate infrastructure, resulting in uneven education quality.

Policy Reform and Modernization (1986-2010)

- **Access:** Policies like Sarva Shiksha Abhiyan aimed at universal primary education boosted enrollment. Government and NGOs worked to bridge educational gaps but attendance and dropout issues persisted.

- **Affordability:** The private sector's involvement increased during this period offering alternative perceived higher-quality education options, though financial constraints limited access for many.

- **Quality:** Initiatives like Op. Blackboard improved basic infrastructure but without focused teacher training and curriculum development quality remained uneven and significant disparities between private and public schools persisted.
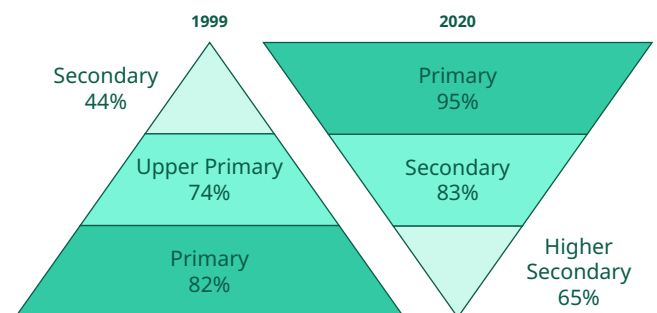

Fig 25. Education spending (% of GDP)

Fig 26. Enrolment Rates

Fig 27. Attendance Rate

Digital Literacy and New Education Policy Era (2011-present)

- **Access:** The Right to Education Act mandated free education for children. NEP 2020 proposed significant reforms to overhaul the education system but implementation has been slow and uneven.

- **Affordability:** Digital initiatives have created a digital divide benefiting urban and wealthier populations more. The government's increased funding commitments are yet to fully materialize.

- **Quality:** NEP 2020 focuses on holistic, multidisciplinary education but outcomes remain to be seen due to slow rollout. Digital tools like SWAYAM (self-paced online courses and certifications) have seen limited adoption. Public schools still struggle with basic literacy and numeracy. Only 43% of Class V students could read a Class II level text, and 26% could solve a simple division problem (ASER 2022).

State of Education in India

Significant Disparities in Education Quality Across Different Parts of India

- **Economic Disparity:** High costs and lost income opportunities drive higher dropout among poorer families. The dropout rate for the poorest households is 16%, compared to 4% for the richest, deepening inequalities and further entrenching the poor in the cycle of poverty.

- **Regional Disparity:** Regional disparities in education are stark with underdeveloped regions suffering from poor infrastructure and educational quality leading to lower attendance. States like Bihar and UP show much lower attendance (55-75%) compared to Kerala and Tamil Nadu (80-90%).

- **Rural Disparity:** Rural areas lack basic school facilities and transportation leading to lower enrollment with only 58% of 14-18-year-olds attending school compared to 69% in urban areas.

- **Gender Disparity:** The Gender Parity Index is nearing parity at primary levels and has improved to 0.9 for higher education but remains low at 0.8 in some states. However, cultural norms and safety concerns reduce girls' attendance. Differential encouragement from parents and teachers results in boys outperforming girls in mathematics and science. Societal biases lead to lower STEM enrollment for girls: only 39% in higher secondary science and 28% in engineering.
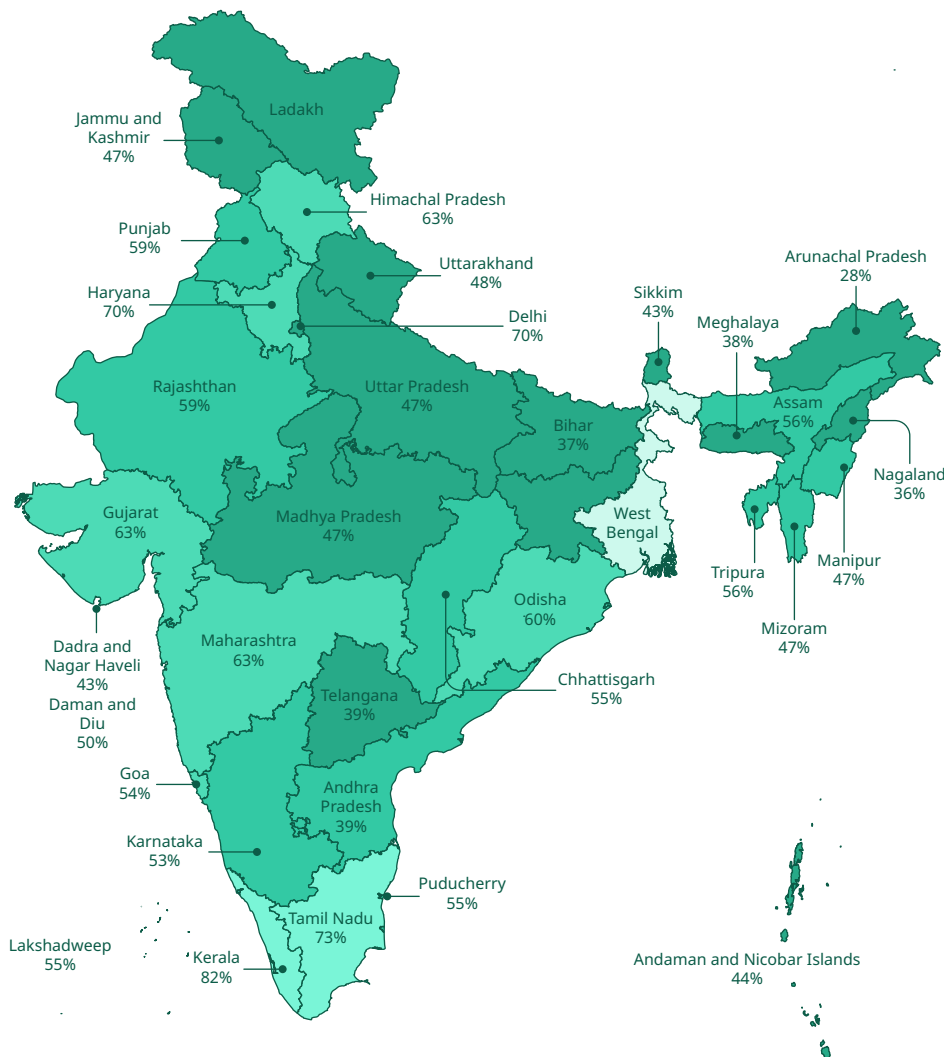

Fig 28. India School Quality Education Index

Indian Education
Shift to Private Schooling

Impact Opportunity - Addressing the Challenges of Access, Affordability, and Quality

Education in India is traditionally seen as a fundamental right and public good, with society expecting the government to educate citizens to promote welfare and reduce inequality.

Despite these ideals, many students now prefer private schools for their perceived superior quality and infrastructure, better facilities and extracurricular activities, stricter teacher accountability, and English medium instruction.

While private schools often provide enhanced education and better teacher performance, high fees make them inaccessible to low-income families fostering social segregation and worsening inequality.

Social enterprises and impact investors are uniquely positioned to tackle the challenges of access, affordability, and quality, bridging the divide created by inadequate public spending and the high costs of private education.
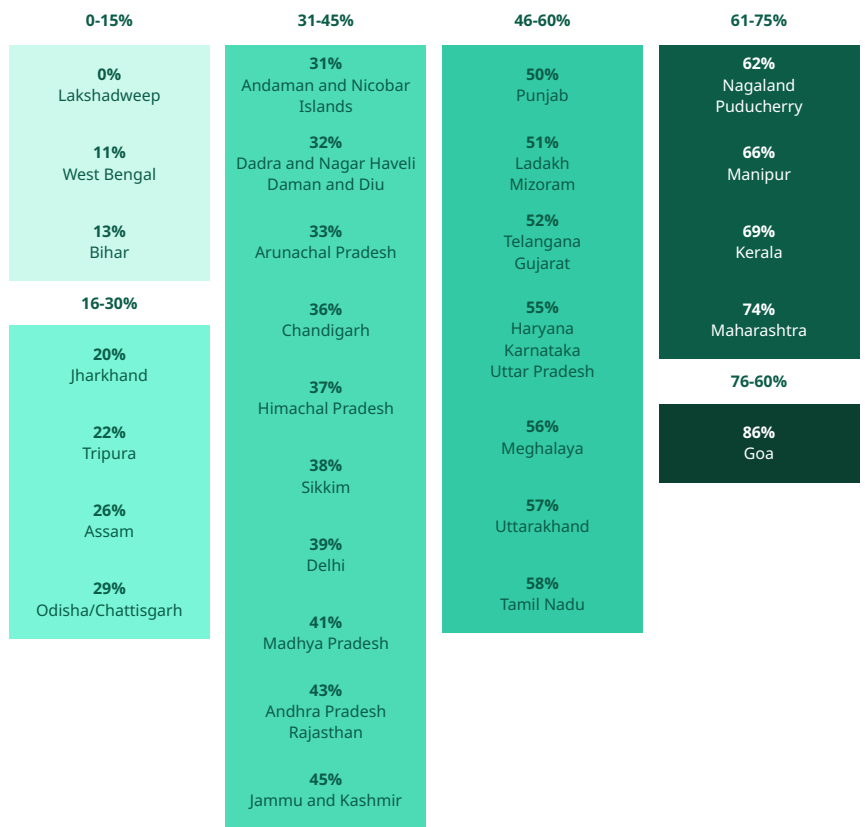
0-15%

0%
Lakshadweep
11%
West Bengal
13%
Bihar

16-30%

20%
Jharkhand
22%
Tripura
26%
Assam
29%
Odisha/Chattisgarh

31-45%

31%
Andaman and Nicobar Islands
32%
Dadra and Nagar Haveli Daman and Diu
33%
Arunachal Pradesh
36%
Chandigarh
37%
Himachal Pradesh
38%
Sikkim
39%
Delhi
41%
Madhya Pradesh
43%
Andhra Pradesh Rajasthan
45%
Jammu and Kashmir

46-60%

50%
Punjab
51%
Ladakh Mizoram
52%
Telangana Gujarat
55%
Haryana Karnataka Uttar Pradesh
56%
Meghalaya
57%
Uttarakhand
58%
Tamil Nadu

61-75%

62%
Nagaland Puducherry
66%
Manipur
69%
Kerala
74%
Maharashtra

76-60%

86%
Goa

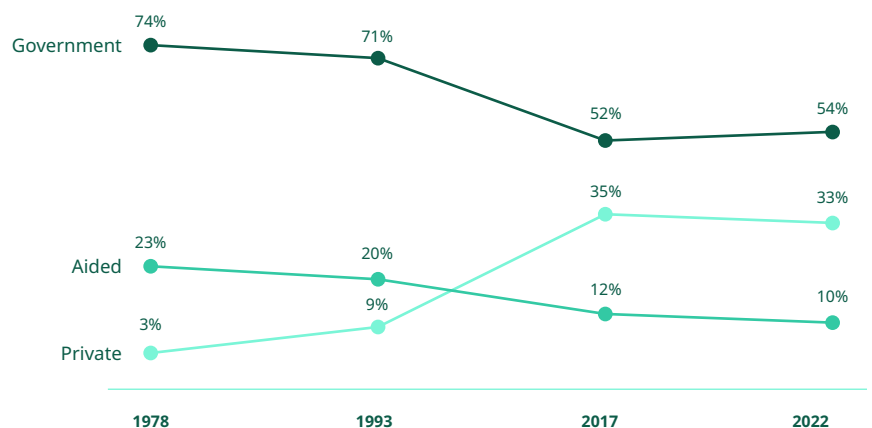**Fig 29. Private school enrolment share by state**

Fig 30. Enrolment share by category

Delivering Affordable Education

De-Templating and Inflation-Proofing the Mass Education Delivery Model

Current state

The traditional school models fail to address the affordability issue leaving out a significant portion of the population. 75% of the population earning below the average per capita income of ₹172,000 cannot access schools, with overall costs ranging between ₹100,000 to ₹300,000 annually in Tier-1 cities and ₹50,000 to ₹100,000 in Tier-2 cities. The average increase in school fees (8-12%) far outpaces the income growth of low-income families (2-3%), making quality education increasingly unaffordable.

Impact Investment Opportunity:

- **Redefining Roles and Pedagogy:** Teachers act as facilitators and mentors, focusing on personalized, project-based, and competency-based education.

- **Flexible Curriculum and Classes:** A student-centered curriculum fosters a more engaging and relevant learning experience. Classrooms accommodate diverse needs promoting peer learning and individualized pacing through mixed-age grouping.

- **Advanced Technology Integration:** Implement adaptive learning tools that tailor educational content to each student's learning pace and style. Use AI tutors to provide personalized assistance, helping students understand complex concepts and keeping them engaged.

- **Data Analytics:** Leverage data analytics for continuous monitoring of student and teacher performance. Utilize baseline assessments, ongoing progress tracking, and end-line evaluations to ensure learning effectiveness and improvement.
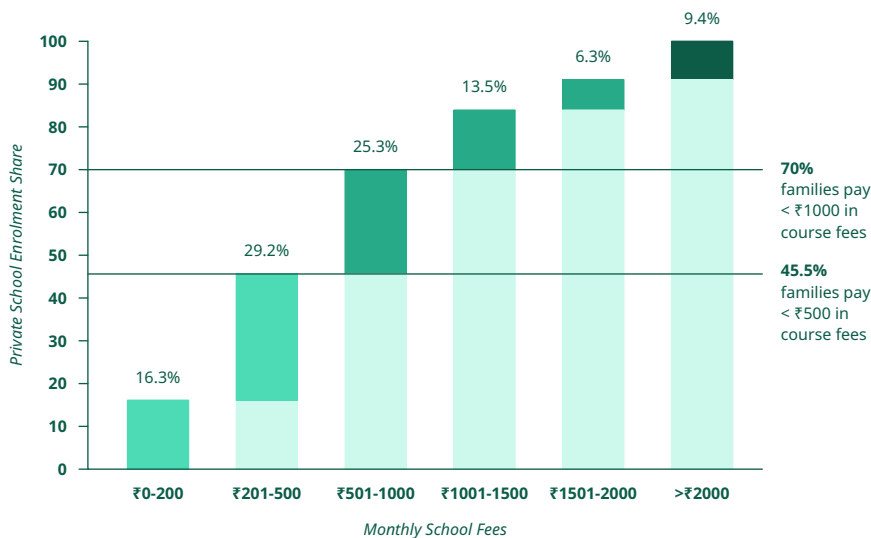

Fig 31. Proportion of enrolment at various fee tiers

Improving Teaching Quality

Improving Quality of Teachers and Teaching to Transform Education in India

Current state

With over 9 million teachers, India faces significant challenges due to low salaries, inadequate professional development, and unstructured career progression, leading to low motivation and high turnover. The pay disparity between private and public school teachers, as well as compared to other professions like doctors, further exacerbates this issue. Additionally, the lack of effective monitoring of teaching efficacy results in sustained subpar teaching quality.

Impact Investment Opportunity:

• **Integrate the Science of Teaching:** Incorporate structured training on pedagogical content knowledge, teaching strategies, and educational psychology into teacher education programs to ensure teachers are equipped with effective methodologies.

• **Stratified Career Progression:** Establish clear career pathways allowing teachers to progress from beginner to expert levels.

• **Comprehensive Professional Development:** Develop accredited training programs for continuous upskilling and mentorship.

• **Enhanced Income Opportunities:** Introduce digital platforms for consulting, tutoring, and entrepreneurial activities to supplement teacher incomes.

• **Effective Monitoring and Evaluation:** Implement ongoing assessments and data-driven evaluations to measure teaching efficacy and student outcomes.

Improving Learning Outcomes

Develop and Implement Student-Centered Curriculum and Content

Current state

Poor learning outcomes in India, especially among the bottom half of the population, result from educational inequality and rote learning. Children from low-income families attend under-resourced schools, limiting their access to quality education. Focusing on memorising facts rather than understanding concepts stifles critical thinking and creativity. This leaves students unprepared for higher education and jobs. The stress from competitive exams further harms their academic performance and mental health. Additionally, many experiential learning programs fail because they are not integrated into the curriculum and lack support from schools and teachers, reducing their effectiveness and engagement.

Impact Investment Opportunity:

- Personalized Learning: Implement student-centered approaches that tailor education to individual learning styles and paces.

- Engaging Curriculum: Develop a curriculum that encourages critical thinking, creativity, and exploration over rote memorisation.

- Project-Based Learning: Use real-world projects to make learning relevant and engaging, helping students apply concepts in practical settings. Design solutions that enable students to debate, explore, and learn together.

- Curriculum Integration: Embed experiential learning tools into the school curriculum to ensure consistent use. Train and support teachers to use new learning tools effectively, maintain student engagement, and enhance learning outcomes.

Menterra Fund 1 investments to improve learning outcomes

Aligning Education with the Future of Work

Implement Industry-Linked Micro Degrees and Long-Term Skilling Programs

Current state

The gap between industry needs and education in India is due to outdated curricula that focus on memorisation rather than practical skills. Limited collaboration between schools and companies means students miss out on real-world learning. Career counselling is often inadequate, leaving students unaware of job market demands. Internships often fail because companies are unwilling to invest in training, resulting in unprepared graduates.

Impact Investment Opportunity:

- Micro-Degrees and Long-Term Learning: Introduce credible micro-degrees with ample online material that offers personalized, flexible learning tailored to student needs and industry demands. Implement a model where students are enrolled long-term and can take courses anytime to foster continuous education and gain relevant skills while working.

- Industry Partnerships: Collaborate with companies to design and deliver micro-degrees, providing practical experience and ensuring students are job-ready.

- Career Counseling and Mentorship: Provide robust career guidance and mentorship to help students make informed career choices and stay aware of job market trends.

- Structured Internships: Develop structured internship programs that help students understand job roles and expectations, improving job readiness and satisfaction.

Menterra Fund 1 and 2 investment to improve career awareness

Indian Education

Impact Opportunities in the Indian Education Sector

"The Largest Impact Opportunity is in Delivering High-Quality and Affordable Education to Low-Income Segments"

Impact Need	Impact Need	Impact Scope
Affordable Education Make education affordable and accessible by addressing high costs and inflation.	Over 250 million students in India, with 75% from below-average income families. Many lack access to or cannot afford quality education.	Implement innovative approaches to reduce costs and resources, while inflation-proofing the model, making education more accessible and affordable.
Quality Teaching Enhance teacher pay, training, and career paths to improve teaching quality.	Low teacher salaries, inadequate professional development, and limited career progression for over 9 million teachers lead to low motivation and high turnover rates.	Implement comprehensive teacher development programs, provide better earning opportunities, and use tools to monitor teaching effectiveness.
Improved Learning Outcomes Shift from rote learning to critical thinking, core skills, and concepts.	Heavy reliance on rote learning results in disengagement and a secondary school dropout rate of approximately 17%.	Shift to inquiry-based, student-centered, and experiential learning methods to foster critical thinking and engagement, reducing dropout rates and improving student outcomes.
Alignment with Job Market Ensure students gain skills needed for success in the future economy and job market.	Less than 50% of graduates are considered employable due to a disconnect between education and market needs.	Align educational programs with industry needs, emphasizing STEM, digital literacy, and soft skills to enhance employability.

- The Indian education sector has attracted US$ 2.5 billion in investments (2019-2023), with over $2 billion directed towards the top 12 companies.

- Despite substantial investments, issues of access, affordability, and quality remain largely unaddressed.

- While technology has shown potential, it has yet to bridge gaps across geographical, demographic, and linguistic barriers.

- With approximately 250 million students, 1.5 million schools, and 10 million teachers, there is a significant opportunity to reduce education costs, enhance access, and improve learning outcomes.

"Our Constitution fathers did not intend that we just set up hovels, put students there, give untrained teachers, give them bad textbooks, no playgrounds, and say, we have complied with Article 45 and primary education is expanding... They meant that real education should be given to our children between the ages of 6 and 14"

M. C. Chagla
Education Minister
(1963-1966)

Almost 8 Decades Ago, We Made a Tryst with Destiny ......
Now, We Must Redeem Our Pledge Substantially, if not fully!

Despite constitutional guarantees like Article 21A, Article 45, and Article 46 ensuring free education, early childhood care, and support for marginalized groups, implementation remains inconsistent. Poor infrastructure, inadequate teacher training, and insufficient funding persist. Many public schools struggle with quality education, highlighting the need to shift focus from enrollment numbers to learning outcomes. Addressing these critical issues is essential for fulfilling the educational promises made to India's children.

SECTOR
Climate

In Menterra Fund I and for a considerable part of deploying its second fund, we have remained sector focused. All our investments have been on the three core sectors of healthcare, education and agriculture. Dramatic changes in climate that are being witnessed the last few years are impacting our investee companies. We see the recognition of climate change on business and find a new receptiveness to deploy knowledge and technology for better management of the impact of climate change. The emergence of climate focused venture capital funds, the strengthening deployment of serious R&D budgets on solutions to address and reverse climate change and the focus from academia on the reality of climate change, create the necessary environment for change.

We see the impact of climate change most acutely in agriculture. This year, input costs for Iron Kettle have gone up by 30% driven by drought in Assam. The price of green leaf has gone up, but production yields have dropped sharply, leaving the grower with lower income per acre.

"We see the impact of climate change most acutely in agriculture. This year, input costs for Iron Kettle have gone up by 30% driven by drought in Assam. The price of green leaf has gone up, but production yields have dropped sharply, leaving the grower with lower income per acre. "

Indian agriculture has been premised on free and abundant water availability. Over the years, farm yields were improved by stepping up use of subsidized nutrients and chemical agronomy inputs. These assumptions are not holding any more.

The first challenge is water availability. Erratic monsoons, overuse of ground water and the focus on water intensive crops supported by a government procurement system have exacerbated the problems of Indian farmers. The rampant use of harsh chemicals, often at levels beyond those permitted in law, at the farm has led to stringent enforcement of laws governing residue levels of chemicals in food. While welcome and needed to bring back consumer confidence in Indian farm produce, the technologies, and solutions for addressing poor soil health, impact of climate on plant physiology are creating new investment opportunities for tech innovations in this field.

In August 2024, Menterra's investee company commenced mass screening for oral cancer in a less developed district of the state of Rajasthan. While developing the criteria for pre-screening persons at public health centers, our team was guided by the local health authorities to include nature of work as a key criterion for identifying persons at enhanced risk of oral cancer. On probing them further, they indicated that they are seeing higher incidence of lip cancers in men and women working in the fields during the long and scorching summer months.
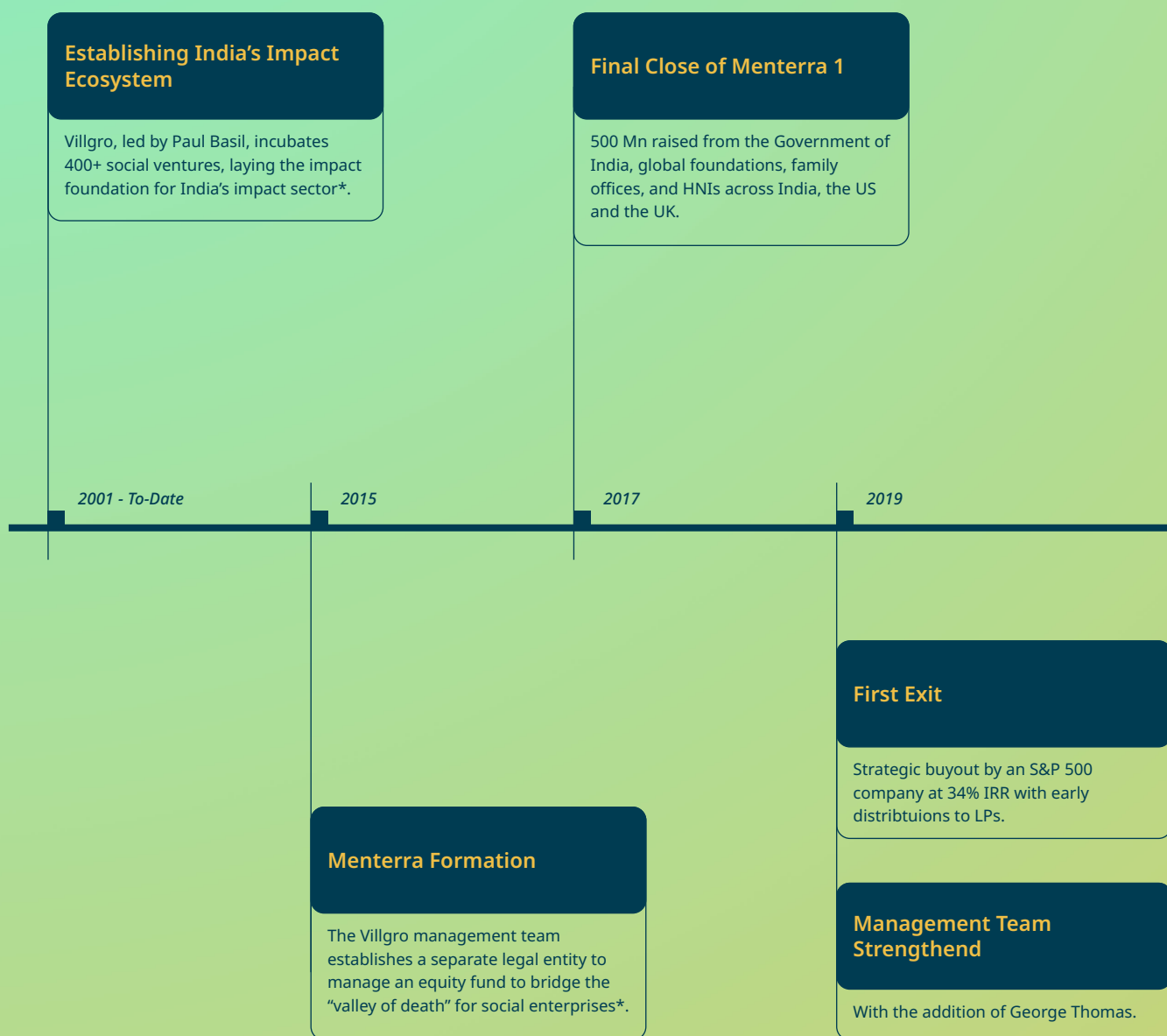
Menterra is actively engaged with the best technology institutions to discover emerging solutions and contribute towards successfully commercializing these pioneering enterprises. We are using our discretionary allocations from Menterra Fund II to explore climate related investments that would overlap with our focus on healthcare and agriculture.

Menterra Investments

A two decade journey that has established the first institutional solution to develop technologies and first-generation enterprises that address the most pressing social issues in India.

Establishing India's Impact Ecosystem

Villgro, led by Paul Basil, incubates 400+ social ventures, laying the impact foundation for India's impact sector*.

Final Close of Menterra 1

500 Mn raised from the Government of India, global foundations, family offices, and HNIs across India, the US and the UK.

2001 - To-Date **2015** **2017** **2019**

First Exit

Strategic buyout by an S&P 500 company at 34% IRR with early distribtuions to LPs.

Menterra Formation

The Villgro management team establishes a separate legal entity to manage an equity fund to bridge the "valley of death" for social enterprises*.

Management Team Strengthend

With the addition of George Thomas.

* Menterra and Villgro operate as distinct legal entities with separate governance structures, investment commies and execution teams.

Second Exit

Achieved 30% IRR. Recycled capital to increase the investment ration from the first fund to 85%+.

Developed Pathways for Exits and Mark-ups in Multiple Investee Companies

Nearing commitment of 70%+ from Menterra 2.

2021 *2023* *2024* *2025*

Final Close of Menterra 2

1.6 Bn committed by impact -first families, foundations, and the Indian government entities.

Focus sharpened on solving big problems through incubating cutting-edge tech, ventures buildout and financial sustainability.

Targeted Launch of Menterra 3

Leveraging the strong foundation and experience of Menterra 1 and 2 to build a larger platform for delivery of a purposeful and sustainable impact.

Case Studies

Agriculture -
Iron Kettle Pvt Ltd

Re-imagining Tea

The Tea Industry since its inception in Assam in the 19th century and its gradual spread to South India has been a journey of the colonization of forest lands for tea plantations, the plantations being consolidated into large tea plantation companies who became large mass production units feeding the requirement of local traders, exporters and branded tea businesses. This supply chain has not been disrupted other than changes that came with Indian independence and changes in ownership patterns of the tea plantation companies. In both North and South India, the process of atomization of tea estate ownership has been driven by various factors, such as re-habilitation of insurgents into small holder tea gardens and the transfer of lease rights on lands to estate labor. On the demand side, packaged tea in leaf or tea bags continue to be the dominant mode of consumption. Over the last few decades, the therapeutic linkages of wellness and tea are being explored and combinations of tea with other ingredients containing valuable molecules to promote health are being increasingly accepted by consumers. This almost linear and systematic growth of the tea industry has commoditized the industry.

Iron Kettle seeks to disrupt this equilibrium to improve the value accretion in tea from sourcing to consumption.

While looking for a value chain approach to invest in the diverse agriculture sector, to improve the condition of the small farmer, despite all the constraints of small land holding we narrowed our focus on the tea industry in India. The tea industry provided a well-developed and well-integrated value chain with very high small farmer participation. The industry also provided the perfect illustration of the principle of "Fair Value for All" being out of sync. The small tea grower today accounts for over 50% of the production of green leaf in India. Green leaf is the base agricultural material for tea production.

Looking closely at the tea value chain we observed a pattern that repeats across several agri-food value chains. The originator (farmer) has the lowest value capture in the tea value chain. The small tea grower remains un-incentivized to produce more or better-quality leaf. With his principal factor cost of production being labour costs, the small tea grower is under pressure to manage his earnings and has progressively done that by compromising on quality to increase output per acre. The simplest way to achieve negative spiral is to increase the harvesting cycle from an ideal 6 days to often 15-18 days. In South India, the harvesting cycle has been driven up to 21—30 days. The result is poor quality of leaf unsuited for producing quality tea. At a global level this has meant the loss of pre-eminence that GI tags like Assam and Nilgiris commanded.

Menterra invested into Iron Kettle to redistribute value in this seemingly inequitable value distribution. We chose to develop our hypothesis in Udalguri district, a low salience low quality region of Assam and started our work mid-season in 2022 with 35 farmers. Our aim was to see if we could influence small tea grower agronomy behavior from an output orientation to a high-quality orientation. The farmer base has since expanded to 155 farmers who supply tea at our leased factory at Bornoi.

It is only the second season of our endeavor. The results are emerging. We see it in the extensions to the homes of the small farmers. The color televisions in their homes. Their children applying for the national entrance examinations for higher education. All driven by their commitment to producing fine leaf at short harvesting cycle and Iron Kettle's ability to rise above the poor average quality of manufactured tea characteristic of "bought leaf factories'. We are integrated into the small tea grower base at Bornoi and learn every day about the challenges they face and with each new challenge, we strive to build solutions that work for them. In the process, Iron Kettle is confident of achieving its goal of "re-imagine tea" and creating a business model that can serve as a model to be replicated in other agriculture value chains that have similar inequalities in value distribution.

As we succeed in this agri-value chain, we have started work on replicating this model in other inequitable value chains like the meat protein value chain.

The Tea Value Chain

Statement of Opportunity – The Time is Now

- The global tea value chain is mature and characterized by an inherent stability that has not undergone significant disruption over decades.

- This may be a characteristic of several agricultural produce in the food value chain, but tea remains perhaps the most un-disrupted category.

- Multiple reasons explain this stability ranging from the sociology of tea consumption, low rate of innovation in manufacturing and product outcomes.

- Advances in technologies, democratization of the marketplace for tea, changes in tea consumption behavior and climate change provide a strong rationale for re-imagining tea.

- Iron Kettle is an experiment by a social impact venture fund to challenge the status quo that has defined the global tea market and seeks partnership with investors and strategic players in the tea value chain to accomplish this disruption.

- **Our approach is to create a different value paradigm for tea that addresses the growing demand from a new generation of tea drinkers who are not limited by the conventions that have defined tea till date, but to look at new avenues to rejuvenate the value paradigm.**
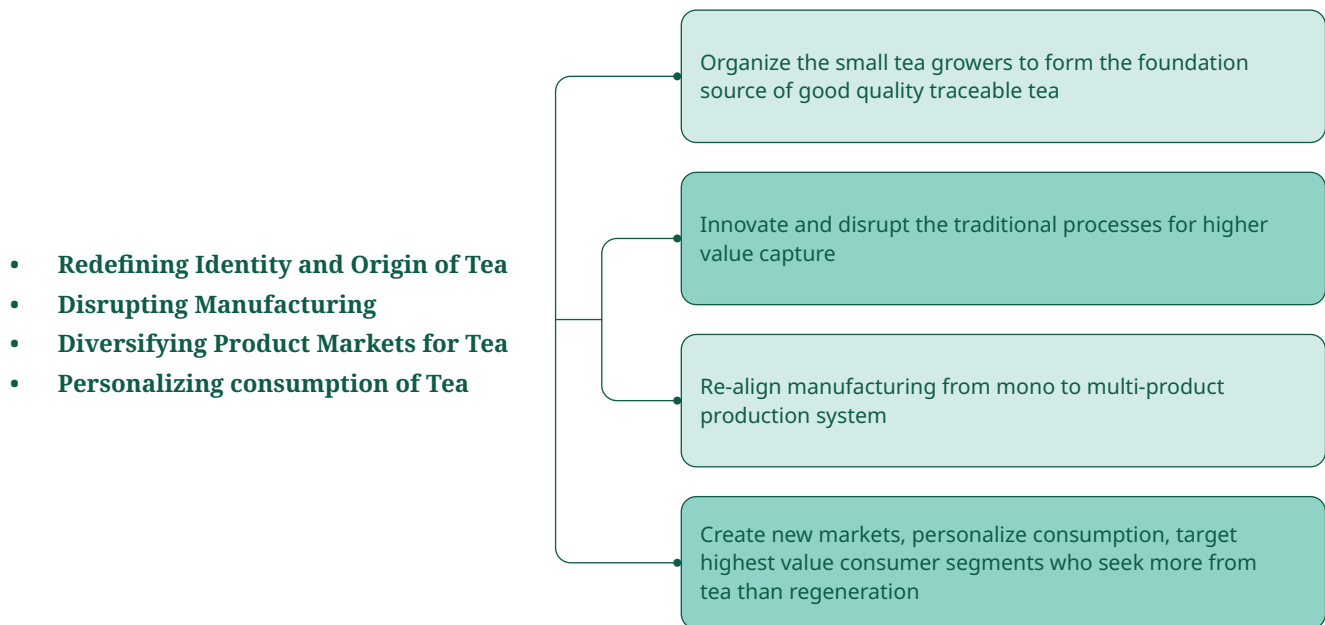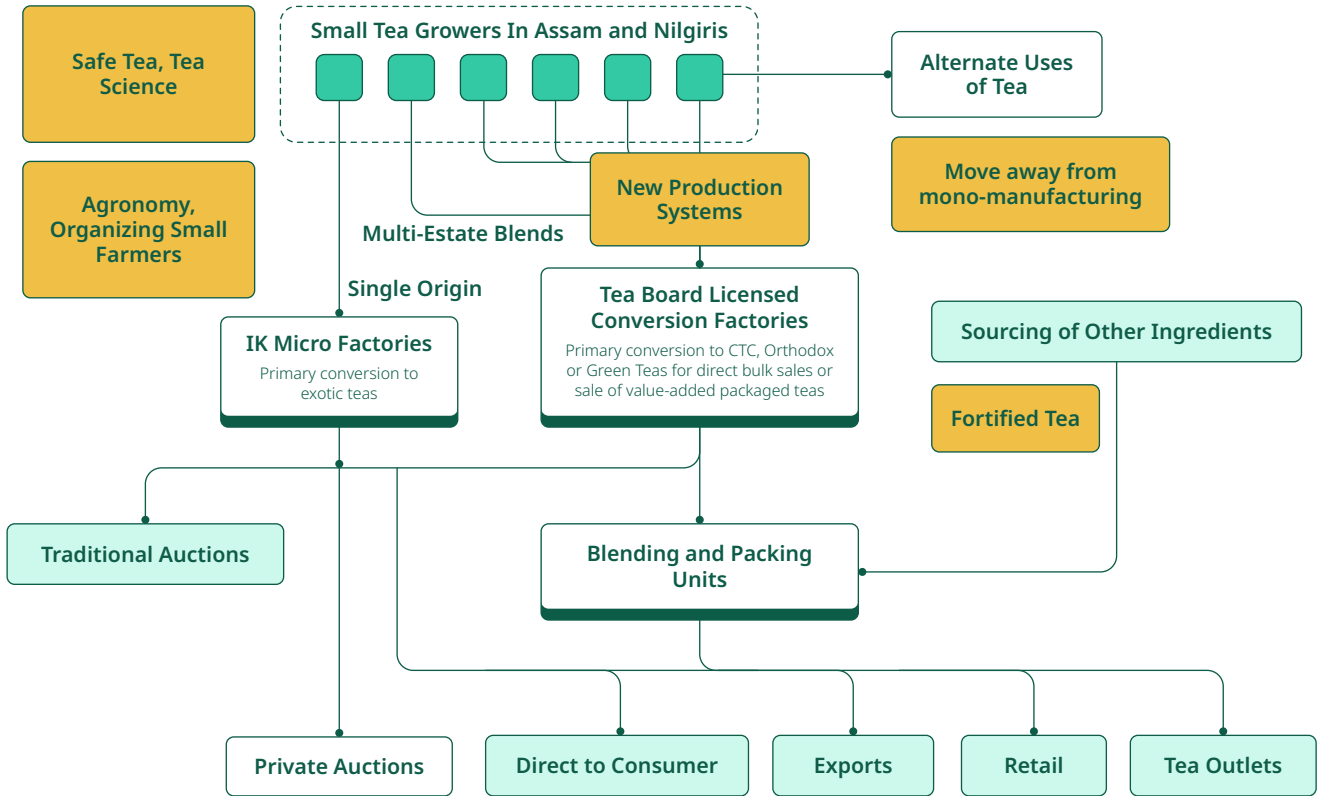
Pathways to a New Tea Model

- **Redefining Identity and Origin of Tea**
- **Disrupting Manufacturing**
- **Diversifying Product Markets for Tea**
- **Personalizing consumption of Tea**

Organize the small tea growers to form the foundation source of good quality traceable tea

Innovate and disrupt the traditional processes for higher value capture

Re-align manufacturing from mono to multi-product production system

Create new markets, personalize consumption, target highest value consumer segments who seek more from tea than regeneration

Fig 32. New tea model

The Tea Value Chain

Iron Kettle Model

Fig 33. Re-imagining Iron Kettle tea value chain

The Iron Kettle World View

A Return to the Quality of the 20th Century

Fig 34. Biku Das's tea garden in Bornoi catchment area.

Small Tea Growers have low participation in the tea value chain, restricted mainly to supplying green leaf to large plantation run factories in the vicinity of their small holding farms. The dis-economies of scale can be inverted for significant enhancement of value for these small holders. Iron Kettle, an Indian start-up is following a two-step approach to significantly enhance the realization of small tea growers from the global tea value chain. First, Iron Kettle helps the STGs to improve their yield and quality of output through targeted and holistic agronomy interventions. Next, Iron Kettle will link their high-quality green leaf output to selected processing plants to make teas for the most sophisticated and discerning global consumers of tea to realize significantly higher value. This in turn will help these small farmers to improve the quality of life of their families through improved earnings.

At the core of our proposition is the belief that a small grower, toiling to produce exceptional tea should be rewarded with significantly improved and beneficial economic outcomes. This is not a call to be charitable to the "small guy". This is about re-positioning the small guy as a source of the finest teas in the world, based on the knowledge that exceptional teas are better hand plucked and processed by a small tea grower than churned out from a mass production oriented large tea factory! The starting point for re-imagining tea is the small grower supported by deep-technology in every aspect of the tea value chain to enhance and re-align the distribution of value in a more equitable manner.

"Small is indeed, still beautiful"

Elements of the Iron Kettle Model

Traceability of the Made Tea to Growers

Farmer Registration → **Farm Registration** → **Plant Details** → **Plant Details** → **MRL Inspection**

Drying ← **CFM** ← **CTC / Orthodox / Green** ← **Withering** ← **Green Leaf Receipt**

Sorting & Grading → **Packing** → **Traceability (QR Code)** → **Shipment**

Fig 35. Rain Forest Alliance certificate

Fig 36. Digital traceability through QR code

Each package sold under the Iron Kettle brand name carries a QR code that can identify the green leaf by STG who supplied it for that specific batch. Iron Kettle is the first and only brand that has implemented this level of traceability. Use of this technology for building an origin-based branding plan is now feasible. This also demonstrates capability of the company to intervene and build targeted interventions at the STG level.

Iron Kettle is the first business to secure Rainforest Alliance certification for a STG based tea business.

Elements of the Iron Kettle Model
Aligning with the Carbon Economy

Many tea factories use coal as the processing fuel. It takes 0.85 kgs of coal to produce a kg of tea. Iron Kettle is pioneering the use of wood gasification as the fuel source for its tea manufacturing. The input material is plantation waste wood and wood sourced from renewable social forestry in the local area.

The byproduct of wood gasification is biochar, an essential component for soil rejuvenation and carbon capture. **Fuel cost in production of tea is reduced by 50% and provides additional income to local farmers through social forestry.**
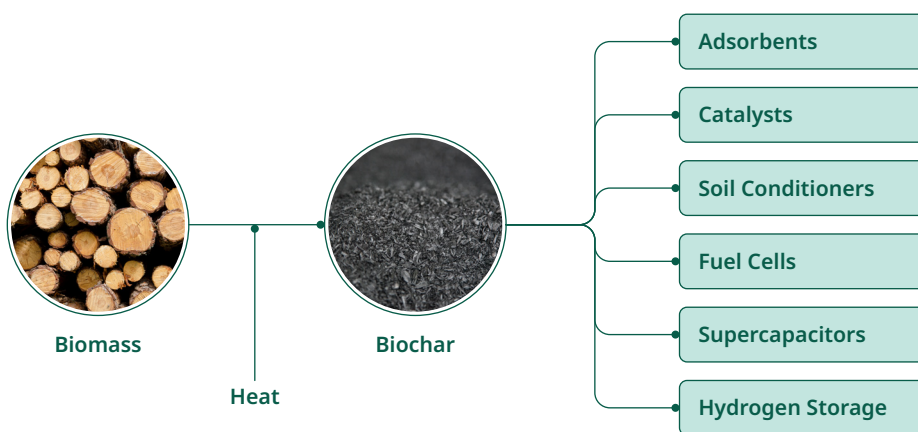
Fig 37. Biochar byproducts

Fig 38. File photo of a wood gasification unit

Biochar application and impact on plant physiology is being studied in field trials in partnership with Plaksha University, Punjab on a paid project. The project is being led by Dr Navjot Kaur a specialist in plant physiology. This trial will help Iron Kettle to integrate char application into tea agronomy.

Fig 39. Bio char field trials at Plaksha University

Elements of the Iron Kettle Model

Introducing New Technologies Into Tea Production

The basic structure of tea manufacturing has remained stable for centuries. Improved and novel technologies have seen limited integration into these existing manufacturing processes. Several advancements in technologies are being explored in the Iron Kettle Tea Science Program that will improve efficiency, safety, and quality of manufactured tea. No other tea company has a well integrated Tea Science Program on the scale at which Iron Kettle is executing.

Elements of the Iron Kettle Model

Tea Science Program - 1

Impact Area	Problem	Envisioned Solutions	Technology	Partners
Small Farms - Compliance with Agronomy and Safety Protocols	At the Small Tea Grower level, there are many reasons to adopt cheaper chemicals and in dosages much beyond the permissible limit. This leads to rejection of leaf and losses to both the farmers and the factories procuring leaf.	1a. A supervised early detection and pesticide spraying program for localized and topical application of approved high quality pesticides in quantities that are efficacious and meet international regulatory safety standards. 1b. A natural bio-tech based control solution to tackle pests and fungi without any side-effects to consumers. 2. A centralized drone-based surveillance program to monitor activities, track progress and provide information on plantation health based on select parameters and improve farm management 3. Digital Farm Diary	1a. Satellite Based Pest Infestation detection 1b. Microbe-based biopesticide developed from novel samples gathered from cave ecosystems in India 2. Drone-based imaging with specialized sensors for detecting plant health parameters	Tech Camelia CCAMP / Coimbatore Company Tech Camelia IK Led
Factory Gate – Tea Leaf – Pesticide Residue	There exists no method today to detect whether banned pesticides have been used or there has been breach in pesticide usage beyond the stipulated limit. This is only done post-production where realization for the manufacturer is severely hampered which feeds back into lower pricing for the farmer.	1. A technology solution that assesses pesticide residue at the factory ingress to provide a rapid, objective decision on acceptance of green leaf	1. NIR based spectroscopy and Raman Spectroscopy are being evaluated for this purpose	Adiuvo Diagnostics Private Limited IISc - Gyroid Photonics

Elements of the Iron Kettle Model

Tea Science Program - 2

Impact Area	Problem	Envisioned Solutions	Technology	Partners
Factory Gate - Tea Leaf - Fair Pricing	The tea industry continues to use a semi-defined green leaf count (%) as a standard measure for leaf quality. This method is fraught with challenges for non-defined leaf types in the remnant part of the sample and does not consider its effects on end tea quality. And leads to inadequate judgement of the quality of leaf and thereby price discrepancy.	1. A technology solution that auto-detects the two leaves and a bud, FLC based on a more refined definition, and the intrinsic value of the leaf - phenolic compounds, antioxidants etc.	1. NIR based spectroscopy is being evaluated to determine the intrinsic properties of tea leaves.	Adiuvo Diagnostics Private Limited.
Manufacturing - Variance in Production and End Tea Quality	End tea quality is dependent on manufacturing parameters like humidity, ambient temperature, moisture content among others. The process is currently run based on knowhow within the industry. The end tea is also measured by a subjective assessment by a tea taster.	1. Technology solutions that assess the intrinsic value of the leaf (see previous) and measurement of process parameters. This data shall be used to establish correlations with end tea outcomes (leaf, liquor, infusion) to enable a predictive response in the manufacturing process to varying tea quality.	1. NIR based spectroscopy for determination of intrinsic properties of tea leaves coupled with an AI solution for predictive information across the manufacturing process. This will be supported by sensors to capture process information.	Adiuvo Diagnostics Private Limited.

Elements of the Iron Kettle Model

Tea Science Program - 3

Impact Area	Problem	Envisioned Solutions	Technology	Partners
Improving tea quality and reducing cost of production	The tea industry is based on technologies of production that were developed almost 100 years ago. Use of new technologies to produce tea at lower costs and to improve quality are essential to keep the category competitive.	1. Low temperature process tea vs heat based processing 2. Linking environment and production variants with end cup quality 3. Reducing fermentation temperature 4. Migration from fossil fuels to renewables	1. 1. Pilot project at Bornoi 2. Setting up local weather station and integrating weather data with agronomy and production 3. Chilled water spray in CFM area 4. Installation of wood gasifier unit at Bornoi	IK led Skymet Paharpur / Voltas Biotherm
Improving Plant Physiology and Cultivars	Increasing climate stress requires a fresh look at the overall agronomy template on which the tea industry has operated till now. The reset will need to be finetuned to micro-climatic conditions as technology enables this now.	1. Drought resistant planting materials 2. Improving soil health 3. Creating infrastructure to localize agronomy interventions and assess impact and efficacy 4. Improving water availability to drought stressed areas	1. Identifying new cultivars and developing new cultivars 2. Assess the impact of Biochar to improve soil health, water retention and reduction in fertilizer use 3. Iron Kettle Experimental Farm to do controlled experiments 4. Implementing water retention ponds	Dr Radhakrishnan UPASI Plaksha University IK Led IK

Elements of the Iron Kettle Model

Tea Science Program - 4

Impact Area	Problem	Envisioned Solutions	Technology	Partners
Evaluating intrinsic value of green leaf based on enzyme analysis	The systems of evaluating tea are based on craftmanship of the personnel involved in tea production. Short-hand measures like "two leaves and a bud" as a surrogate for better enzyme concentrations in base raw materials can now be replaced with technologies that were not available earlier.	1. Searching for technologies to replace conventional human intensive interventions	1. Developing an AI based solution to get more accurate 'fine leaf count' and developing the algorithm to equate fine leaf with enzyme and intrinsic value of green leaf	Adiuvo
Alternate uses of tea	Challenging the mono use of tea to only produce the tea beverage. Chemical composition of tea has many beneficial compounds that can be used in medicinal chemistry and in personal care industry. This will allow alternate sources of income to small farmers and setting up of processing capacity on small farms	1. Exploring uses for chemicals derived from tea leaves and tea waste	1. Chemical, solvent based or other extraction systems 2. Use of Tea Waste as a bio residue in renewable plastics	Menterra Investee companies in the extraction space Expect first prototype to be ready in July 2024
Mechanization	Acute shortage of labor has a detrimental effect on tea production cost, green leaf availability and STG profitability.	1. Deployment of high intensity agronomy interventions practiced in Japan using new bush management technologies and mechanization.	1. Changed input management and introduction of management.	IK with Japanese trained agronomist.

The New Tea Value Chain

Leveraging the Three Emerging Consumer Trends

Leveraging investments into traceability, wellness products and tea extracts to create valuable consumer opportunities.
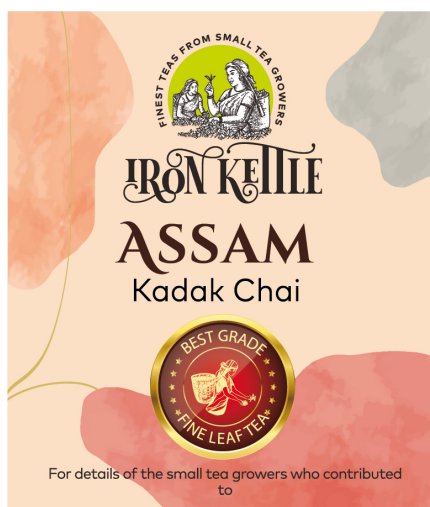

Fig 40. Sanjeevani Wellness Tea

Fig 41. Digital traceability insert in tea packs

Healthcare -
MedInno Technologies Pvt Ltd

MedInno
Technologies Pvt. Ltd.

Improving Diagnostic Care in Low Resource Settings through Innovative, Affordable Technologies

Menterra has focused on early-stage investments in healthcare since inception. Given the size of our demonstrator fund raised in 2016 and our origin from the incubator Villgro, we focused on identifying promising technologies and enterprising entrepreneurs to back.

We encountered two problems. First, the concept to commercialization time frame is long, costly, and uncertain. Second, single product companies struggle to gain revenue traction. These investments taught us to rethink our approach. We went back to our investment and impact thesis for healthcare and restated our focus towards bridging the disparity in access to healthcare and quality of outcomes more sharply. The venture buildout of MedInno Technologies Private Limited is an attempt to straddle the value chain for healthcare access in low resource settings, assimilating and developing medical technologies that compress the total cost of care and creating business models for commercializing these solutions.
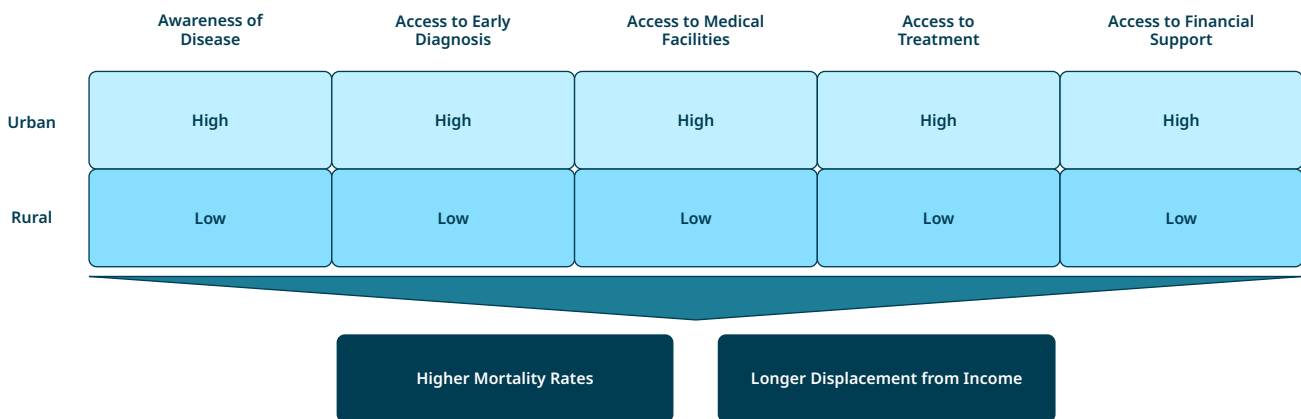
The illustration on MedInno Technologies Private Limited, outlines our theory of change for improved healthcare access in low resource settings.

MedInno Mission

Menterra's Impact Vision

- Menterra has invested into MedInno Technologies to meet its healthcare impact mandate. Specifically, MedInno is an aggregator and developer of diagnostic technologies and solutions, developed frugally by its own efforts or in partnership with tech entrepreneurs.

- MedInno has a multi-pronged approach to achieve its mission of early, accurate and frugal diagnosis to improve survival rates.

- MedInno shall identify and develop low-cost diagnostic solutions for poor resource settings

- It shall provide impetus to health awareness and resolve poor diagnosis rates by conducting mass screening and mass screening solutions for high mortality diseases

- It shall promote entrepreneurship in low resource settings to provide improved access to patients especially for devices and solutions that it develops

- It shall deliver its impact mission in partnership with the local health infrastructure and through CSR support

What are We Trying to Solve

	Awareness of Disease	Access to Early Diagnosis	Access to Medical Facilities	Access to Treatment	Access to Financial Support
Urban	High	High	High	High	High
Rural	Low	Low	Low	Low	Low

Higher Mortality Rates   **Longer Displacement from Income**

Fig 42. MedInno is focused on addressing the "Tyranny of Geography" that those living outside urban India face

MedInno Operating Model

Delivering Affordable Diagnostics in Low Resource Settings

- Embed technology and technology solutions in low resource settings to supplement the local resource capacity

- Train and create sustainable local health entrepreneurship. Localize healthcare and wellness availability and create a viable village level health enterprise to support the primary health care infrastructure

- Develop IT and communication networking to strengthen delivery capability at the local level

- Continuously indigenize technologies and develop low-cost solutions spanning device to consumables that can be used by semi-skilled resources

- Use mass screening to drive up awareness for health and wellness to improve early diagnosis

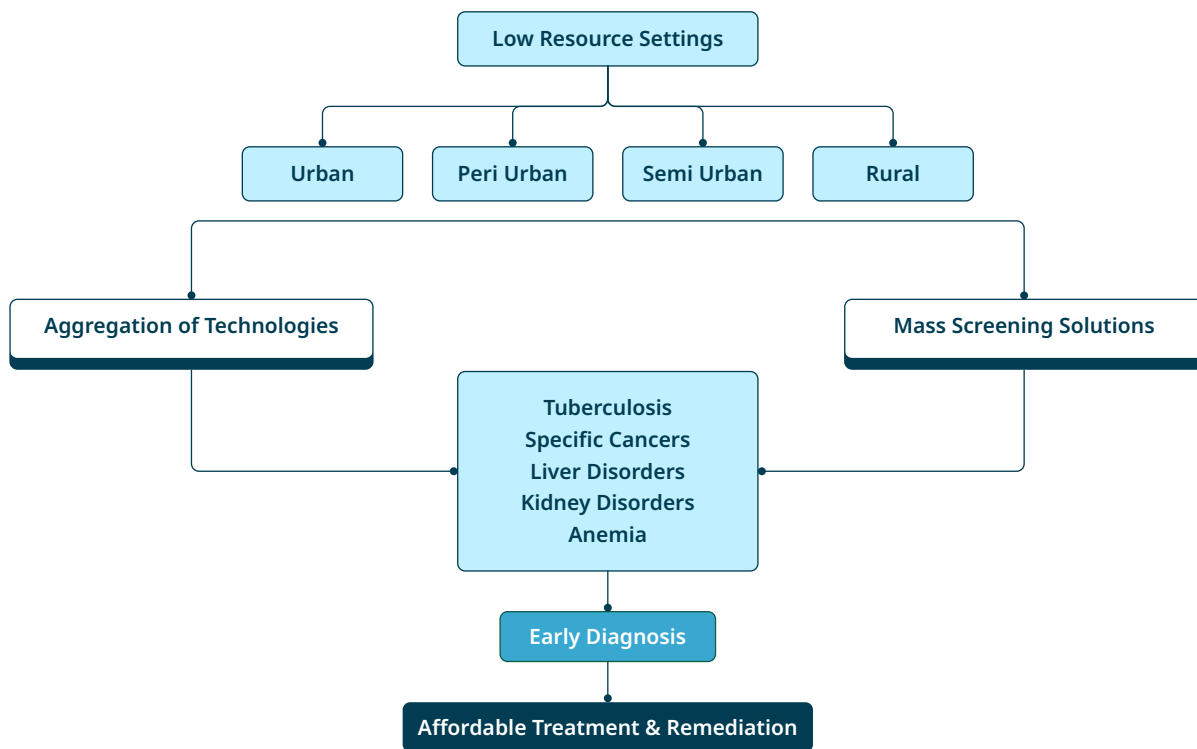- Provide post diagnosis solutions to reduce mortality.

```
                    Low Resource Settings

        Urban      Peri Urban    Semi Urban      Rural

  Aggregation of Technologies              Mass Screening Solutions

                     Tuberculosis
                  Specific Cancers
                   Liver Disorders
                  Kidney Disorders
                      Anemia

                    Early Diagnosis

          Affordable Treatment & Remediation
```

Fig 43. MedInno is focused on addressing the "Tyranny of Geography" that those living outside urban India face

MedInno Mass Screening – Disease Burden

Example - Tuberculosis

Scale of the problem

Number of TB tests carried out each year: 1.97 Crores[1] (<2% of Population) or 11 Districts' Population Equivalent3 (~1% of Total Districts - Coverage Per Year)

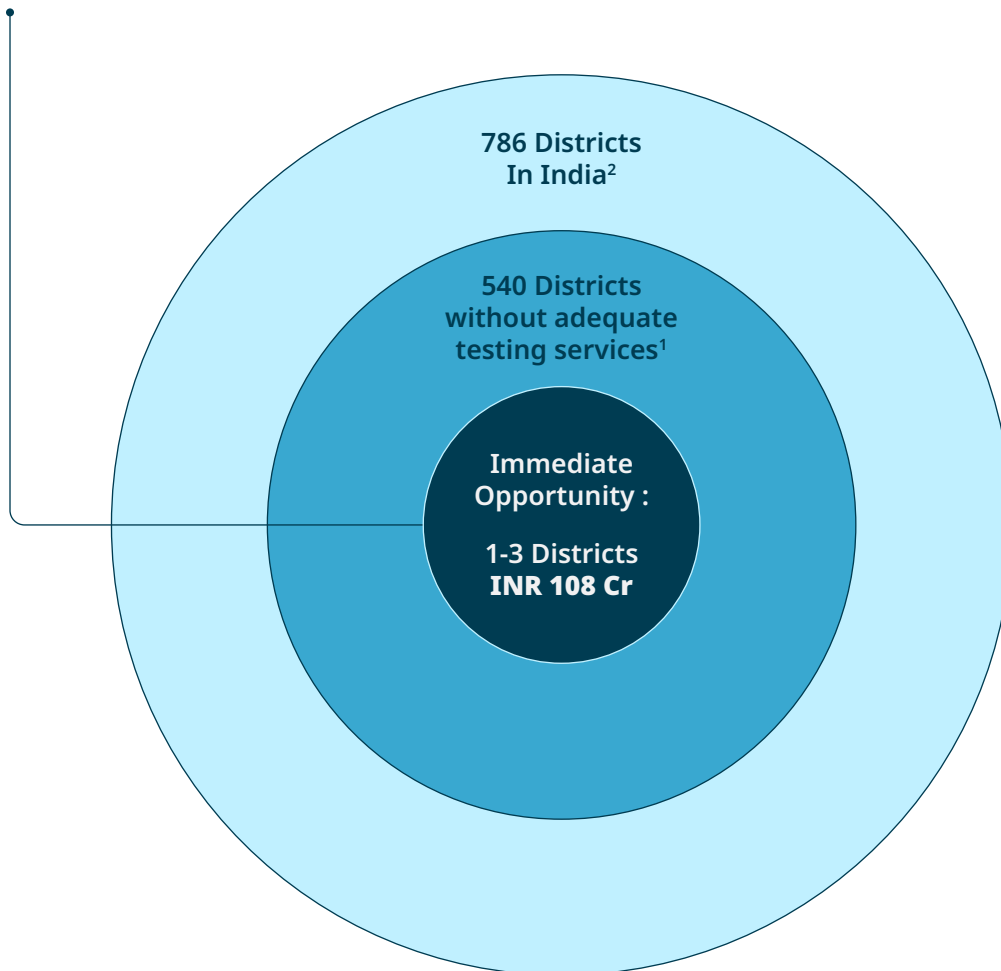246 Districts (32%) have some / any infrastructure for testing[1]

The opportunity is both - participating in existing testing and setting up testing in low resource setting with poor infrastructure (540 districts).

Tailwinds

Pradhan Mantri TB Mukt Bharat Abhiyaan aims to end TB by 2025 (Presumptive Testing rate (per 100,000) up 68% from 762 in 2021 to 1,281 in 2022)[1]

MoHFW has raised USD 400MM from International Bank for Reconstruction and Development (IBRD) for TB Elimination – 30% of the total (USD 1.3 Bn) program spend (GoI to finance the remaining 70%)[1].

Calculation : Number of Districts x Revenue Potential Per District x Avg. Population Per District x Cost Per Test : 3 x 18 Lakh people x INR 200 per test = INR 108 Crores

786 Districts In India[2]

540 Districts without adequate testing services[1]

Immediate Opportunity :

1-3 Districts INR 108 Cr

1. India TB Report 2023 – MoHFW   2. Number of Districts India   3. Population of India (140 Cr) ÷ Number of Districts (786 Districts)

MedInno Mass Screening – Disease Burden

Example - HPV

Scale of the problem

511 MM women at the risk of developing HPV related cancer in India[3]. India witnesses 127,000 cases of cervical cancer per year (21% of Global Cervical Cancer Burden)[1] and 77,000 deaths from it[3].
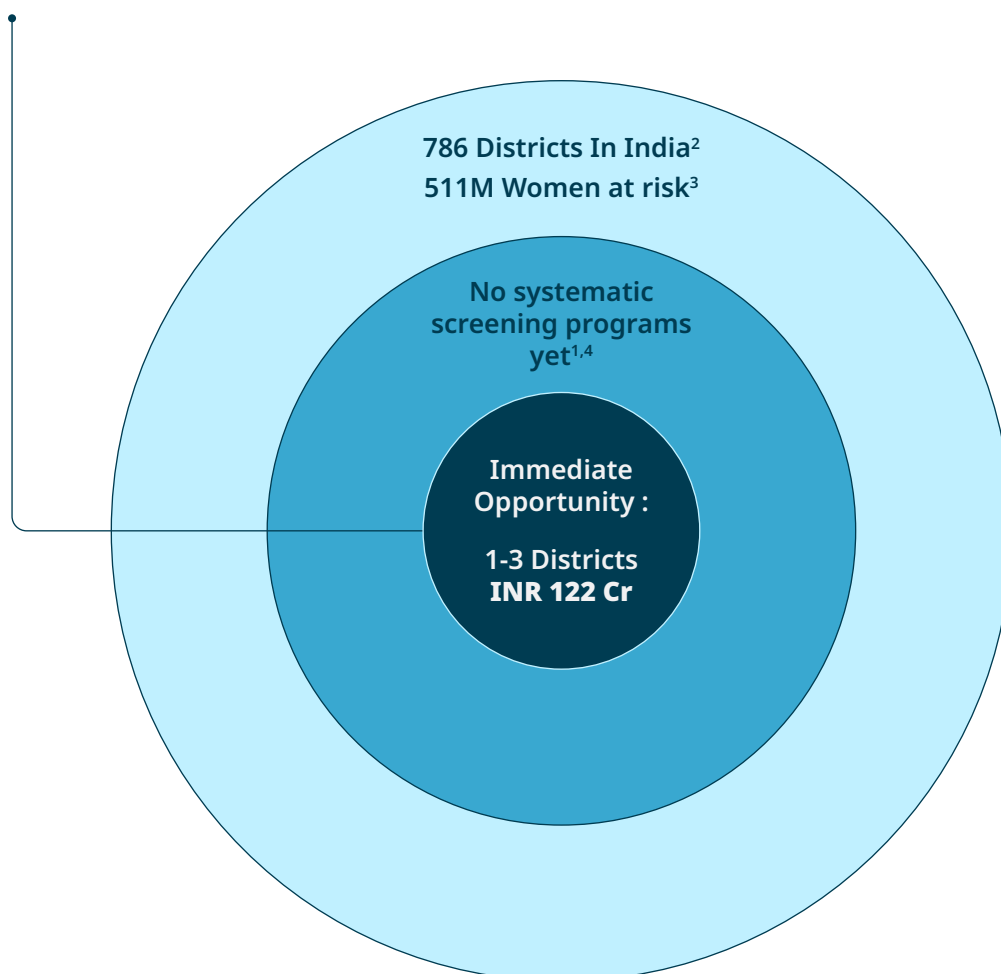
High costs of testing continue to present a challenge (INR 1,500 – 3,000 per test)[1].

The opportunity is in setting up low-cost testing in the low resource settings where HPV Screening infrastructure across the district is absent.

Tailwinds

In 2020 India joined the World Health Organization's "Call For Elimination of Cervical Cancer" as one of the signatories with a vision for a cervical cancer free world. Under the initiative, India has set a target of screening 70% of women by 2030 and vaccinating 90% of the girls. The Union Health Ministry is likely to incorporate HPV (human papillomavirus) testing in the National Cancer Control Program to screen women for cervical cancer[4].

Calculation : Number of Districts x Revenue Potential Per District x Avg. Female Population Per District (50%) x Cost Per Test | 3 x 9 Lakh people x INR 450 Per Test = INR 122 Crores

786 Districts In India[2]
511M Women at risk[3]

No systematic screening programs yet[1,4]

Immediate Opportunity :

**1-3 Districts
INR 122 Cr**

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1. State of HPV in India– MoHFW   2. Number of Districts India   3. HPV and related cancers fact sheet   4. HPV Screening may be added to National Programme

Executing the MedInno Operating Model

1a. Aggregation of Technologies – Targets and Potential Solutions

Disease	Screening Need	Possible Tech Solution	Status
Tuberculosis	Identify a person who is showing symptoms of the disease without conducting a sputum test	Pulmonary sound analysis and co-relating these with TB	Identified a digital stethoscope that can be programmed with AI to detect TB (Lung Cancer)
	Cost effective testing for a family or other identifiable cluster to identify infected individuals in the cluster to reduce cost of testing	Statistical modeling programs	Developing a statistical sampling model for pooling of samples
HPV	Rapid test of a vaginal swab to determine positive or negative	Low cost RTPCR	In-house development
Cancer	Quick identification of early-stage cancer of the cervix, oral cavity	Spectroscopy	Joint development program with Adiuvo Identified an AI based early detection device Identified a portable device using spectrography
	Use of portable ultrasound for detecting breast cancer	Miniature Ultrasound	Search commenced
	Use of vaginal swab or portable ultrasound for detecting uterine cancer	RTPCR equivalent to test vaginal discharge or portable miniature ultrasound	In-house development of swab. Search for portable ultrasound
	Use of breath analysis for detecting cancer related volatiles in human breath	Portable breath analyser	Search for existing entrepreneurs
Anemia	Retinal palor to detect anemia	Retinal screening	Redevelopment of the Biosense product
Chronic Kidney Disease	Retinal reading or urine test	Low cost RTPCR, portable ultrasound	Identified AI based solution providers
Liver Disorders	Retinal reading	Retinal screening, portable ultrasound	Identified AI based solution providers
Delivery	IT Architecture to integrate service delivery	Software / App Development	In-house development
Extension of Scope	Surveillance Systems	Molecular solution for sewage testing	Licensing Agreement signed with CCAMP

Executing the MedInno Operating Model

1b. Internal R&D Program

Idea	Feasibility	Prototyping	Lauch
Development of a closed system like CEPHEID (sample in sample out system)	DNA Extraction from Sputum (Mag Bead and Column)	October 2024	December 2024
	DNA Extraction from Blood (Mag Bead and Column)	October 2024	November 2024
	DNA Extraction from Cervical Swab (Magbead & Column)	November 2024	January 2025
	DNA Extraction Device - 16 Samples - Cartridge Model	November 2024	January 2025
Using Raman spectroscopy for disease diagnostics	HHH	November 2024	January 2025
	TB Detection	November 2024	January 2025
	RIF & INH Resistance	March 2025	May 2025
	HBV Quantitative	March 2025 + Febrauary 2025	May 2025
	HPV 16 & 18 with HR	January 2025	March 2025
	HIV Quantitative	September 2025	Decemeber 2025
	Neonatal Sepsis	September 2025	Decemeber 2025
	HPV Genotyping	October 2025	Decemeber 2025
	HCV Quantitative	Septemeber 2025	November 2025
	HLAB27	September 2025	November 2025
	Development of Quantitative Multiplex RT PCR for Wastewater surveillance (WWS) of Covid, Influenza A & B.	April 2025	June 2025
	Development of Quantitative for Wastewater surveillance (WWS) of RSV		
	Develop a low cost RTPCR in collaboration with Adiuvo & 30M Genomic		
	Detection of Viral or Bacterial Infection		
	Platform for Simultaneous detection & differentiation of S.Typhi and S. Paratyphi & detection of AMR	February 2026	March 2026
	Detection of ESKAPE pathogens & Antimicrobial Resistance in ESKAPE pathogens	February 2026	March 2026

Executing the MedInno Operating Model

1c. Diagnostic Lab to Strengthen R&D Outcomes

MedInno diagnostic labs is created to act as a bridge between research and practical application to enhance the effectiveness and relevance of the company's R&D efforts to improve diagnostics and treatment solutions by:

- Providing real-world data from tests, revealing trends and identifying emerging health issues.

- Providing clinical samples for studies with patient consent..

- Validating new assays on a larger cohort, and in establishing benchmarks for assay performance.

- Creating sample repository to reduce development cycle time for R&D.

- Building databases to provide leads to new markers that can be used for diagnosis of diseases and treatment outcome.

- Supporting the mass screening program where specialized test are needed for confirmatory diagnostics.

- Developing a centralized database enabling healthcare providers to track results, follow up on the disease progression and treatment.

- MedInno's lab is also offering specialized tests for cancer, pharmacogenomics and inherited diseases in the prenatal and postnatal segment.

2. Mass Screening - Objectives

MedInno targets early detection of the targeted diseases amongst vulnerable population with three clear objectives:

- To identify disease in patients who have limited or no access to diagnostic facilities. Early diagnosis has clear linkages to reduced mortality, and helps the healthcare system to conserve resources / apply resources in a more targeted manner.

- To learn from mass screening of about the diseases and to help identify pathways to mitigation and treatment.

- To create a network effect for the devices in low resource settings to develop strong volumes for lower cost manufacturing of devices and assays to facilitate the use of devices and solutions exposed to the low resource environment through mass screening.

MedInno

Low-Cost Screening Solutions

Making the Project Sustainable

Develop a commercially sustainable program to identify target diseases at the earliest in a reliable, low-cost manner, to isolate the afflicted and secure lowest cost resolution through a robust and reliable system.

1. **Pilot Phase**

   - The project pilot covering all stages of the screening activity will be borne by MedInno. This will include cost of market identification, set up of screening camps, logistics costs, manpower costs, cost of kits / devices, cost of report generation and other related costs. MedInno will attempt to secure donor grants to fund this pilot project

   - In this phase the commercial model will be developed, tested and finetuned to determine the cost of running one screening camp and the operating benchmarks and standards for the process.

2. **Pilot Phase funding will be financed by MedInno + Grants; Scale up will be based on Paid Projects of State Governments, Multilateral Agencies, CSR and Corporate Grants. USE THE PILOT TO ESTABLISH COST STRUCTURE FOR THE PILOT TO ENABLE GRANT / CSR FUNDING**

3. **Scale up 1- Same disease to a wider footprint**

   - The development cost for devices and kits will be funded by MedInno who will aim to produce the lowest cost devices and kits for mass screening

   - Devices and kits will be supplied by MedInno. The products will be priced to recover cost plus a margin from supply of these items (this could be on a leased equipment basis or on outright sale) to testing facilities created for the mass screening (mobile unit or static localized)

   - A self-sustaining deployment plan using Asha or Anganwadi workers will be developed in each screening location to complete the entire project from start to finish and on completion to undertake similar projects for other disease areas as well as patient management post diagnosis

4. **Scale up 2 - Addition of Screening for other diseases**

5. **Develop a self-sustaining model for those who are healthy to have permanent access to primary health care focused on wellness delivered through a local entrepreneur trained and equipped at the local (village / village cluster) level.**

MedInno Mass Screening Model

Sampling Approach to Reduce Total Cost – Non-Communicable Diseases

1. **Identify the screening geography (Pilots – Jhalawar, Rajasthan India**

   • Detailed district mapping and digitizing of population and demographic and econometric data for this geography. Compare with State and National data.

2. **Map the screening universe and identify high vulnerability population**

   • Secure health issues in the population and causative factors that could be co-related to incidence level for diseases in this area. Specifically, tobacco usage and other known causative factors for diseases such as TB and Oral Cancer.

   • Objective is 2 stage screening. Using technology to isolate high probability / latency population from within target universe and only do full testing of those determined to have high probability. Establish device efficiency.

3. **Develop screening protocol for the specific disease / diseases for which the screening is being planned including documentation and data base management**

   • First screening to establish the protocols and processes for conducting a screening at scale of 5800 persons. Secure confidence in ability to execute single screening and develop First Draft Standard Operating Procedures for conducting of mass screening.

   • Subsequent screening to increase scale and add multiple diseases.

   • Establish network and credentials with local health infrastructure.

   • Target is to complete the Mass Screening Protocol at scale in Pilot area during the current year and be ready for scale in 2025.

4. **Regulatory clearances for the Preliminary Screening Devices and protocols**

   • Establish commercial understanding with device providers.

   • Create data registry for the disease.

   • Use data analytics to sharpen selection for screening.

   • Understand the linkage between patient selection and diagnostic results for AI based improvement in selection and targeting of vulnerable populations.

   • Use diagnostic output and other data for developing improved understanding of the disease and to develop improved pathways to resolution e.g., medicinal chemistry, vaccine development, improvement of device efficiency, sample handling.

   • Reduce the cost of diagnosis and treatment by reducing the absolute level of full testing. Reduce the cost of testing by use of low-cost devices and consumables. Reduce cost by making the devices usable by untrained personnel.

MedInno
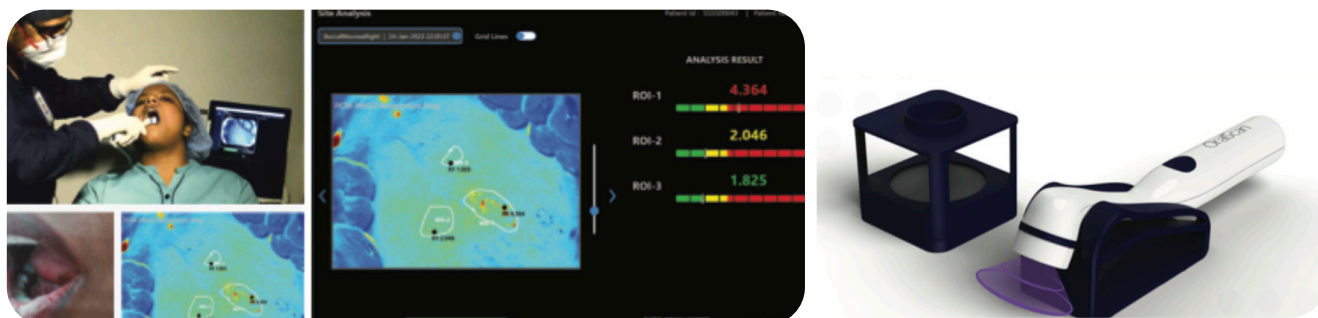
Jhalawar Pilot

1. District Overview
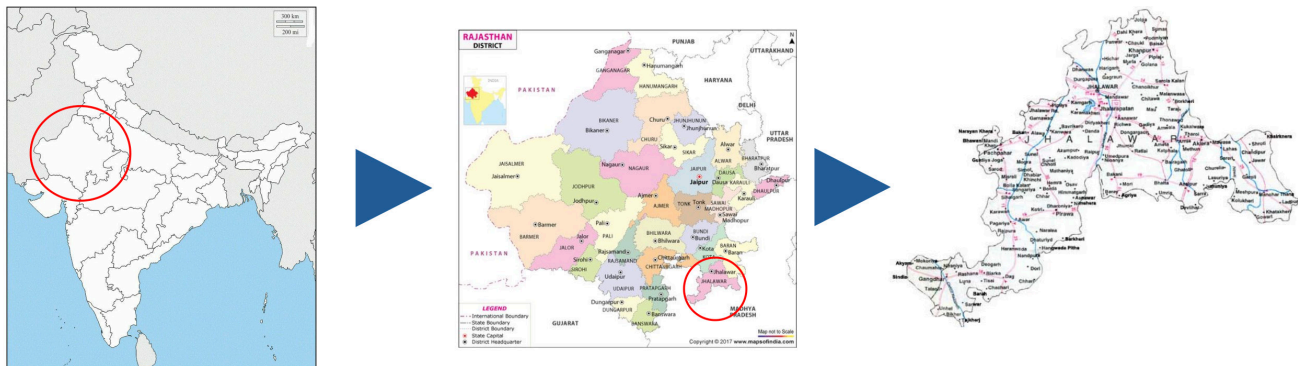
Fig 44. Jhalawar district map

- Area 6219 Sq kms, Population (2011) – 14,11,327
- 12 Tehsils and 1 sub-Tehsil
- PHCs – 21

- Tertiary Hospitals – 5
- Low ranking in Health District Ranking in the state of Rajasthan (2018 – Rank 32)

2. Oral Cancer – Screening Device

OralScan captures multispectral images of the OPML (Oral Pre-Malignant Lesions) using a monochrome camera on illumination with violet, green and red LEDs. The LEDs are triggered sequentially to capture multispectral images of tissue flourescence and diffuse reflectance. The captured images are processed in real time to provide information on the disease status at the point of care with the help of a cloud-based machine learning algorithm. The device is controlled using proprietary software installed on a tablet or laptop.

Fig 45. Multispectral images of the OPML

Jhalawar Pilot

3. Oral Cancer – Device Specifications

Specifications

- An intraoral camera for oral cancer screening and biopsy guidance utilizing multispectral imaging technology.

- Tissue illumination with 3 wavelength LEDs (405 nm, 545 nm, and 610 nm).

- Screens and detects oral squamous cell carcinoma (OSCC) with a 5 MPx monochrome camera.

- Detects oral cancer by mapping changes in the autofluorescence of Protoporphyrin IX (PpIX) and the oxygenated hemoglobin (HbO2) absorption in the oral cavity.

- Provides Quantitative and real-time user feedback on tissue status using proprietary software and a cloud-based ML algorithm.

- Locates the most malignant site for tissue biopsy, avoiding multiple/unwanted biopsies and false negatives.

- A portable device that can also be used in remote locations without electricity or internet access.

- Quick and pain-free screening.

- Suitable for periodic monitoring/reviews.

- No drugs, harmful radiation or side effects used.

Certifications

- CE Certification

- ISO 13485:2016 Certification

- IEC 60601-1 Certification

- CDSCO (Drug Controller, GoI) Approval

- Patented Technology: Indian Patent No. 303949 dt 04/12/2018

4. Oral Cancer – Operating Principles

- OralScan is an optical imaging multimodal device for the early detection of (pre-) cancerous lesions of the oral cavity. The device operates on the principle of diffuse reflectance and tissue autofluorescence wherein light undergoes multiple absorption and scattering events before emerging from the tissue surface.

- Tumour tissues undergo biochemical and morphological changes during the process of carcinogenesis, which is reflected in the optical signals emanating from the tissue. The device uses an optical system with custom-built software and algorithms for tissue analysis. OralScan enables the physician to visualize and discriminate between healthy and potentially malignant sites of the oral cavity before a biopsy is performed.

- The diagnostic advantages of OralScan include non-invasive in vivo procedures and services, wide-field imaging of the oral cavity, utilization of a cloud-based machine learning algorithm for real-time feedback on tissue status, and application of oxygenated haemoglobin (HbO2) absorption maps for biopsy guidance.
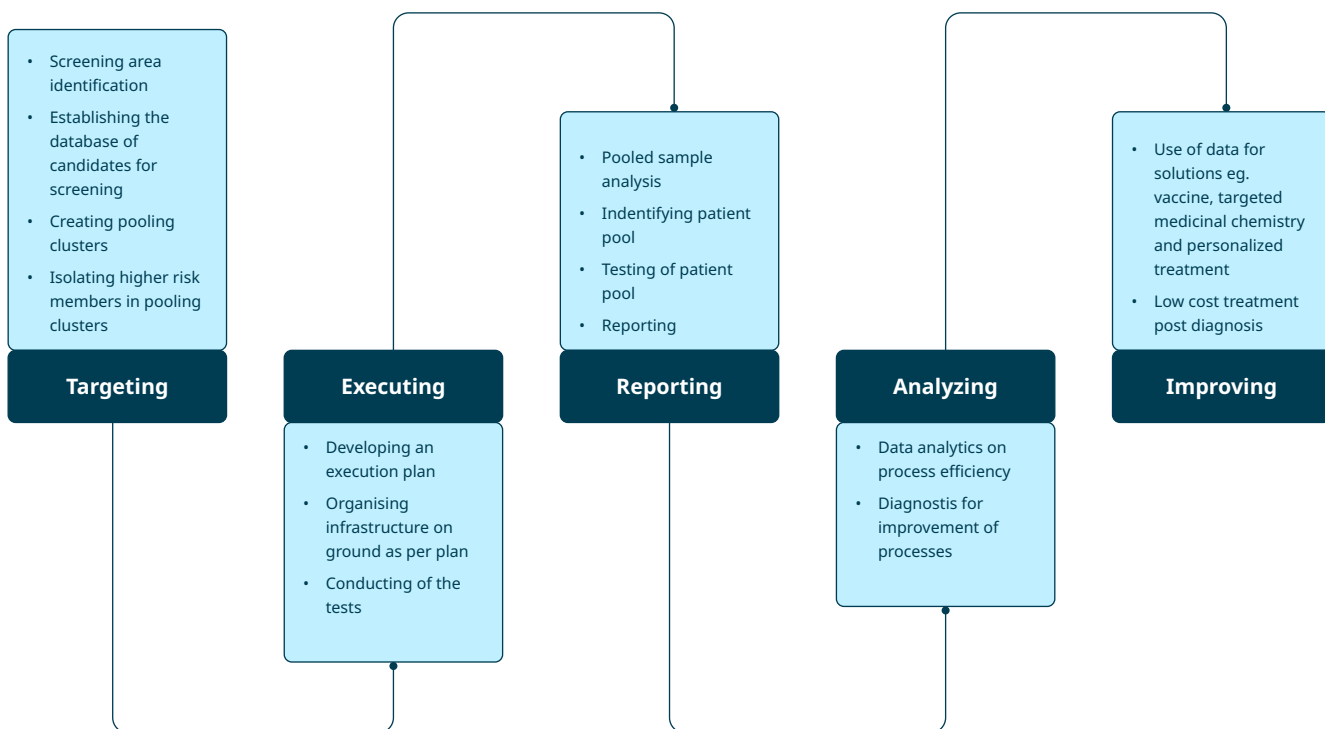
Low-Cost Screening Solutions

1. Process Flow

Targeting
- Screening area identification
- Establishing the database of candidates for screening
- Creating pooling clusters
- Isolating higher risk members in pooling clusters

Executing
- Developing an execution plan
- Organising infrastructure on ground as per plan
- Conducting of the tests

Reporting
- Pooled sample analysis
- Indentifying patient pool
- Testing of patient pool
- Reporting

Analyzing
- Data analytics on process efficiency
- Diagnostis for improvement of processes

Improving
- Use of data for solutions eg. vaccine, targeted medicinal chemistry and personalized treatment
- Low cost treatment post diagnosis

Fig 48. Process flow

Jhalawar Pilot

Oral Cancer Screening – Early Results

- The plan is to do targeted screening of 5800 persons.

- Since commencement of the mass screening in September 2024, 300 screenings have been completed.

- Detection rate of high probability oral cancer cases is 5% vs random detection levels of ~2%.
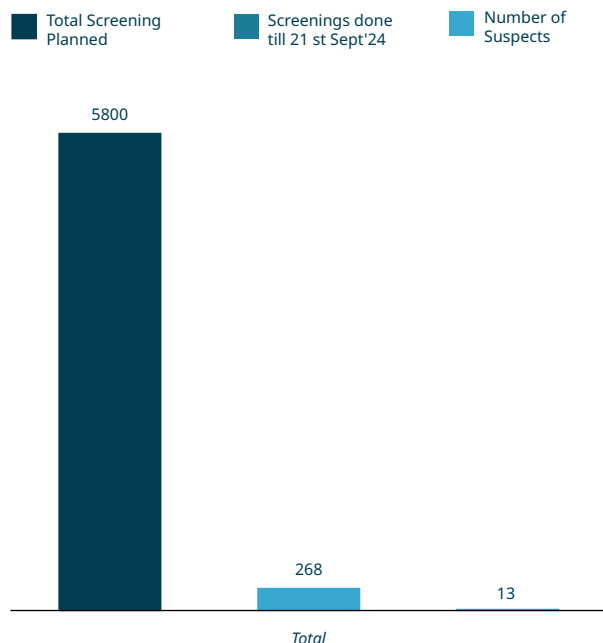

Legend:
- Total Screening Planned
- Screenings done till 21 st Sept'24
- Number of Suspects

5800

268

13

Total

Fig 49. Screening results

Executing the MedInno Operating Model

Commercial Business Model

- MedInno will build a sales infrastructure for device sales and sale of kits / assays to low resource settings aligned with R&D outcomes and the deployment of devices as per the mass screening program.

- Starting with one region in India the target is to map each market and create a network of distributors to serve diagnostic facilities and other facilities that need MedInno's range of low-cost devices and assays / kits.

- Identify and partner with government and multilateral agencies to strengthen the PHC system for early detection of identified diseases addressed by MedInno; partnered with CCAMP to develop a low-cost waste-water analysis system for early detection of communities at risk.

- Use R&D facility, Diagnostic Lab and Data Science capabilities in Bangalore to provide high end specialized molecular diagnostics solutions.

- Fine tune and improve the development of devices and kits for deployment in the low resource settings.

- Provide structured data from lab and mass screening for drug discovery and vaccine development.

- Provide support for mass diagnostic testing for government health projects.

- MedInno is exploring the possibility a partnership with an entrepreneur who has successfully built a frugal engineering business for low cost devices to accelerate the growth of the company.

- Revenue estimates and financial projections do not include the scale that will be available through this partnership.

Summary

- The MedInno project is an ambitious project that targets removing the hiatus between patients with access to facilities that allow early diagnosis and those that do not. This has a direct relationship with reducing mortality rates.

- Early diagnosis must be accompanied by the ability to provide affordable, efficient treatment pathways without compromising quality of treatment and better outcomes. MedInno is working on post-diagnosis support to identified patients. It also uses the data it generates through diagnostics to further the cause of medicinal chemistry and disease management.

- The MedInno project aims to create a sustainable healthcare network in rural and low resource settings manned by local resources to strengthen the primary healthcare infrastructure and capacity.

Education -
Medhavi Professional Services Pvt Ltd

Improving access to career counseling and navigation

Choosing a career is a difficult process for Indian students, and the challenges they face can greatly affect their education and future jobs. Only a small number of students have access to paid counseling services, and with just 1 counselor for every 3,000 students, India's current support system falls short of global standards. This gap shows a clear need for more accessible and effective career guidance, especially for students from smaller towns and lower-income families.

The 2023 and 2024 Bharat Career Aspiration Reports—initiated by iDream Career—highlight this lack of career awareness. The reports show that many students still depend on outdated or biased advice from family and friends. They often struggle to make informed decisions about which subjects, streams, colleges, and career options to pursue due to limited access to quality counselors and comprehensive information. These problems are even more severe for female students and those from disadvantaged backgrounds, who face extra cultural and financial challenges.

Medhavi Technologies Pvt Ltd

The Current State of Career Navigation

India's education system does not meet the needs of today's job market, making these challenges even worse. Career counseling is mostly available in big cities and serves wealthier students. For most students, counseling is either out of reach or not very effective, often focusing only on traditional paths like engineering, medicine, or commerce. As a result, students are not well-prepared to explore the growing number of career options available in newer fields.

Many students also struggle to identify their strengths and interests early enough to make smart decisions about their studies. They often spend years preparing for competitive exams with only a few making it to preferred colleges. This leads to mental health issues and, tragically, a rise in student suicides. There is an urgent need for solutions that provide students with the tools and guidance to explore a wider range of career options and make choices that fit their goals and abilities.

Key Pillars of a Potential Solution

A complete, technology-based approach is needed to help students take charge of their career choices. Based on our research, the solution should include these key elements:

Self-Guided Career Awareness: Develop a platform similar to a "Google Map for careers," where students can explore different career paths at their own pace. This platform would give detailed information about various career options, the qualifications needed, and possible career paths, helping students see the full range of possibilities.

Access to High-Quality Counselors: Increase access to well-trained career counselors who can provide personalized advice. These counselors would help students narrow down their choices and give expert guidance on subjects, streams, colleges, and career paths. This service could be part of the technology platform, allowing students to connect with counselors when needed.

Comprehensive College and Career Database: Create and maintain a large, up-to-date database of colleges, vocational schools, and career options. This resource would include information about admissions, scholarships, and career outcomes, helping students make well-informed decisions.

Vocational Career Options and Roadmap: Focus on vocational careers, which are often overlooked in traditional counseling. The platform should offer clear guidance on pursuing these careers, including details on relevant courses, certifications, and job prospects.

Funding Assistance for Higher Education: Provide resources to help students understand and access funding for higher education, including scholarships, grants, and loans. This is crucial to making sure that financial barriers don't stop students from following their chosen career paths.

Medhavi Technologies Pvt Ltd

Menterra's Impact Vision

Our investment in iDream Career addresses these critical gaps in career guidance. iDream Career offers tools like psychometric assessments, a career directory, and access to experienced counselors who help students choose the right streams and subjects, and create a list of colleges that match their interests and financial situation. Menterra's support has enabled iDream Career to expand its services beyond big cities, reaching students from aspirational and lower-middle-class families who were previously underserved. The platform is changing the career guidance landscape in India, giving thousands of students the information and support they need to make confident, informed decisions about their futures.

Looking ahead, we plan to build on this success by expanding iDream Career's reach and services. This includes improving the platform's technology to offer more personalized guidance, increasing the number of counselors, and further developing the database of colleges and vocational options. These efforts will ensure that every student in India has the tools and support they need to navigate their educational and career paths successfully.

This initiative marks the start of a broader, more complete solution that will not only address current gaps in career guidance but also empower students to take control of their futures in an increasingly complex world.

Outlook

Our journey at Menterra to find solutions for the most pressing problems in agriculture, healthcare and education has just begun. Our focus gets sharper as we learn while executing and evaluating opportunities and investing into these opportunities. We realise that the impact thesis that we had articulates some years ago for our sectors of interest remain very valid even today. We have become more confident to deploy more private capital to create commercially viable solutions that generate good returns to discerning investors who are keen to find solutions for the problems that we have identified and persevere to resolve.

In conclusion, and perhaps the most striking endorsement of the winds of change that are sweeping India, here is a small collage of the entrepreneurs we have backed over the last decade:

Jyotirmayee Dash
Director & CEO, TeraLumen

Bharathy Bharadwaj
Co-Founder & Director, Math Buddy

Sudeshna Adak
CEO & Founder, OmiX Research and Diagnostics Laboratories

Geethanjali Radhakrishnan
Founder, CEO, Managing Director, Adiuvo

"The journey of a thousand miles starts with the first step."

Lao Tzu

Chitra Ravi
Founder & CEO, Chrysalis

Kavish (Sarawgi) Gadia
Founder Stones2Milestones

Ayush Bansal
Co-Founder & CEO, I Dream Career

Abhishek Sen
Co-Founder, Biosense