



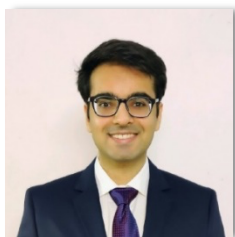
**An initiative aimed at poverty reduction in India
via agricultural empowerment**

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Our team



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Samridh Nangia is an MBA student at ISB. Prior to ISB, he completed his under-graduation in business and commerce from India's foremost commerce institute – Shri Ram College of Commerce. Since then, he has worked at Deloitte as a management consultant where he led projects in corporate strategy, M&A, and organization restructuring. He then worked at Unitus Ventures, an impact venture fund with a strong Agri focus. Besides work, Samridh plays the guitar and has performed at 3 concerts.



Nikita Sekhon is an MBA student at ISB. Prior to ISB, she completed her B.Tech in computer science engineering from Punjab Engineering College. Since then, she has worked at J.P.Morgan as an investment banking analyst aligned to the technology, media and telecom sector in Southeast Asia. She has facilitated fundraising and strategic investments of several firms working towards financial inclusion in emerging economies. Besides work, Nikita likes parliamentary debating, running and trekking in the Himalayas.



Aalakhshaya Hira is an MBA student at ISB. Prior to ISB, he completed his under-graduation in accounting and economics from the University of Delhi and subsequently worked as a Data Analyst at KPMG, where he led transformational projects in the public sector, investment banking, and retail domains. Besides work, Aalakhshaya enjoys poetry, and has won 12 national level spoken word poetry competitions besides receiving an offer to be featured in the in-room magazine of one of the biggest hotel chains globally.



Kanika Verma is an MBA student at ISB. She is a Chemistry graduate from Delhi's St. Stephen's College and a Young India Fellow (Post Graduate Diploma in Liberal Studies from Ashoka University). On the professional front, Kanika has about 5 years of work experience in Indian Banking sector. She has mainly worked on Digital Banking and FinTech projects as a Product Manager. A thorough extrovert, Kanika likes meeting and engaging with like-minded people on topics such as business, Product Management, scientific discoveries, and start-ups.



Abstract

12%ⁱ of the global population below poverty line resides in India. 29% of the country's population is below the poverty line and a majority of it lives in the rural area. While India's population working in agriculture has reduced over the years, 55% of the population is still working in agriculture.

We used primary and secondary research methodologies and identified that Indian farmers face several issues, from low yields to an inefficient distribution supply chain.

In designing a solution to these problems, we analysed the current players in the market and realised that they have not been able to address the farmers at scale, primarily because they are acquiring and helping farmers at an individual level. To address these problems, we propose using a co-operative farming model, which has already seen massive success in sporadic cases across India. Our solution offers to solve the primary issue of this model, by training farmer co-operatives to run like a professional organisations. We have put together a detailed plan around how the organisation should be structured and phase wise execution plan for each co-operative structure. Towards the end, we explain how this model can be scaled and illustrate how our solution can help increase farmer income by ~120%.

1. INTRODUCTION

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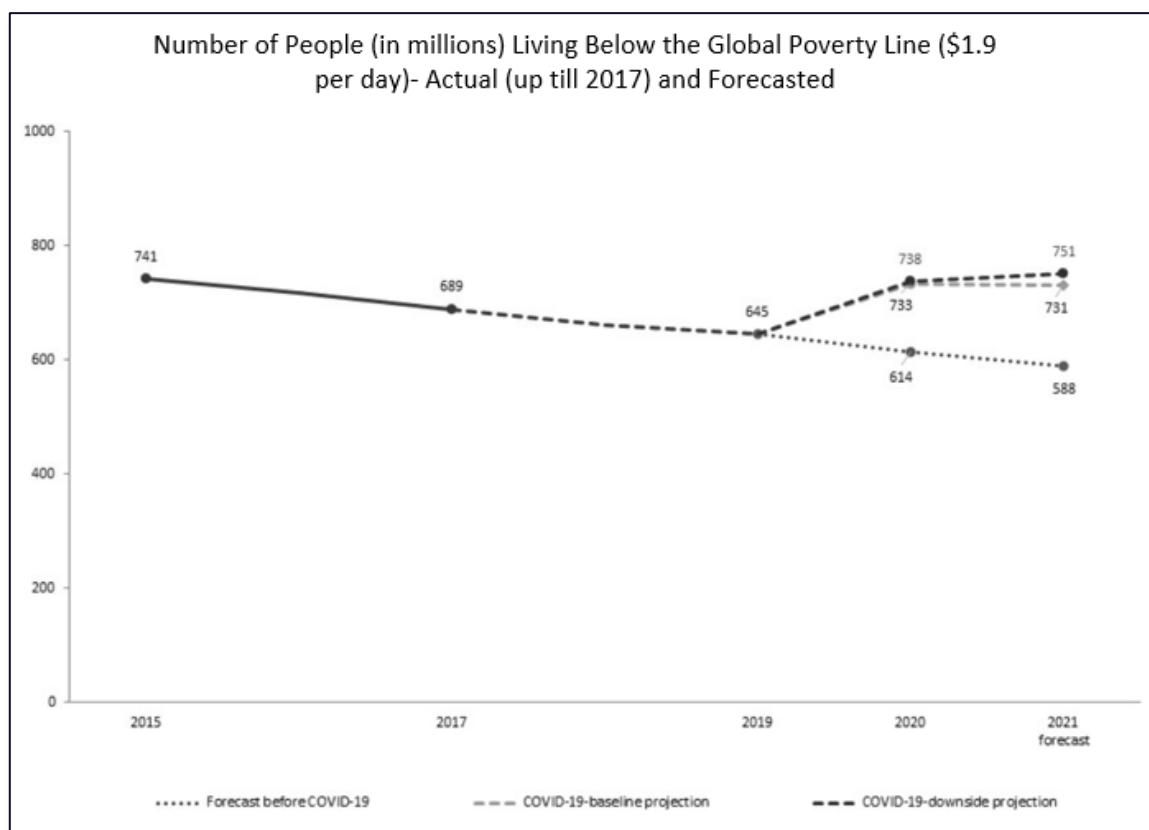
7. REFERENCES

1. INTRODUCTION

As per the United Nations, 689 million people were living in extreme poverty (with daily earnings <\$1.9) in 2017, when the last estimate of global poverty was conducted. This number is expected to rise by 6-9% per a down-side and baseline expectation of the impact of COVID-19, respectively. Out of the estimated 750 million people living in extreme poverty in 2021, 97 million (13%) are expected to hail from India- accounting for the largest share by a country of people struck with extreme poverty.

Despite the above metric, India had a total factor of productivity (a measure of productive efficiency of inputs) of 1.02 in 2019, an increase of 20% from 2011. Such improvement is at the higher end of the developing world. It shows that despite the stark poverty numbers, the nation has developed an ecosystem supporting scalable solutions over the years.

The factors mentioned above demonstrate that India is not only a significant but also a conducive economy to support poverty alleviation programs. Thus, the proposed analysis subsequently addresses the critical strategic and implementational challenges to addressing India's poverty issue.



2. RESEARCH METHODOLOGY

To understand the issue of poverty in India, we have analysed macro-level data per the latest censusⁱⁱ. The concerned census data showed a high correlation between dependence on agricultural income and poverty. We looked at agricultural surveysⁱⁱⁱ conducted in India, a focal area of our research. Our data is mainly attributed to post-2010, which makes it reasonably reflective of the status quo after accounting for constraints related to the frequency and accuracy of data collection in India, and the average historical frequency of census across the world (10 years). We also accessed primary data attributable to 500 farmers to derive micro-level estimates and assess the validity of our unit economics.

Per NITI Aayog, a think tank sponsored by the Government of India, poverty is measured by defining a threshold level of expenditure (or income) required to purchase goods and services necessary to satisfy basic needs at the minimum socially acceptable level. In the Indian context, the budget allocation for state-sponsored poverty alleviation programs such as “Antyodaya Anna Yojana”, aimed at providing subsidised food grains to below poverty line (BPL) households, and the “Rashtriya Swasthya Bima Yojana”, a national health insurance programme for BPL households, have historically been based on the following measures for gauging the poverty numbers:

1. **Suresh Tendulkar Committee’s Poverty Line**^{iv} - Aimed primarily at identifying households in abject poverty, the Tendulkar Committee computed the poverty line as a daily household income of less than INR 27 and 33 for rural and urban populations, respectively in purchasing power parity terms. Per this estimate, 21.9% of the Indian population fell below the poverty line in 2011-12, when the latest nationwide census was conducted.
2. **World Bank Global Poverty Line**^v - Per the estimate by the World Bank, the global poverty line has been revised from USD 1.9 to USD 2.15 in 2022 on 2017 price levels in PPP terms. Considering the former poverty line on which real-time poverty data for the nation is available, as of 2022, almost 83 million people fall below the poverty line, which comprises 9% of the rural population (approximately 79 million) and 0.8% of the urban population (approximately 4 million)^{vi}.

We have used the Tendulkar methodology across the report, given its relevance to the Indian context and considering the poverty-related data collection norms of the Government of India, which also uses the same methodology.

We have also relied on the World Bank’s poverty estimates for international comparisons where relevant.

3. POVERTY AND AGRICULTURE

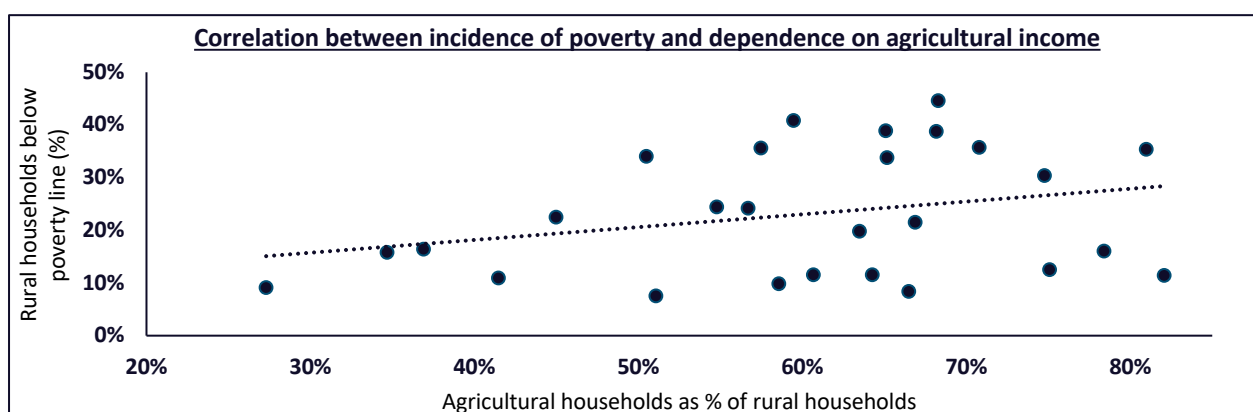
3.1 Poverty in India

Per the Tendulkar methodology, the percentage of rural and urban households below the poverty line as of 2011 was 25.7 and 13.7, respectively^{vii}. Rural households are more likely to fall below the poverty line when compared to urban households. Furthermore, because of the national income divide, COVID-19 has lopsidedly impacted the marginal farmers in India^{viii}; our analysis would prioritise eradicating poverty among rural households in India. With over 54.6% of the total population and over 70% of the country's rural population engaged in the agrarian economy^{ix}, we believe that developing a scalable model that solves the agricultural inequity and ineffectiveness would significantly reduce the overall poverty numbers in India and any other developing economy. Thus, the solution proposed in the forthcoming sections of the report is aimed at:

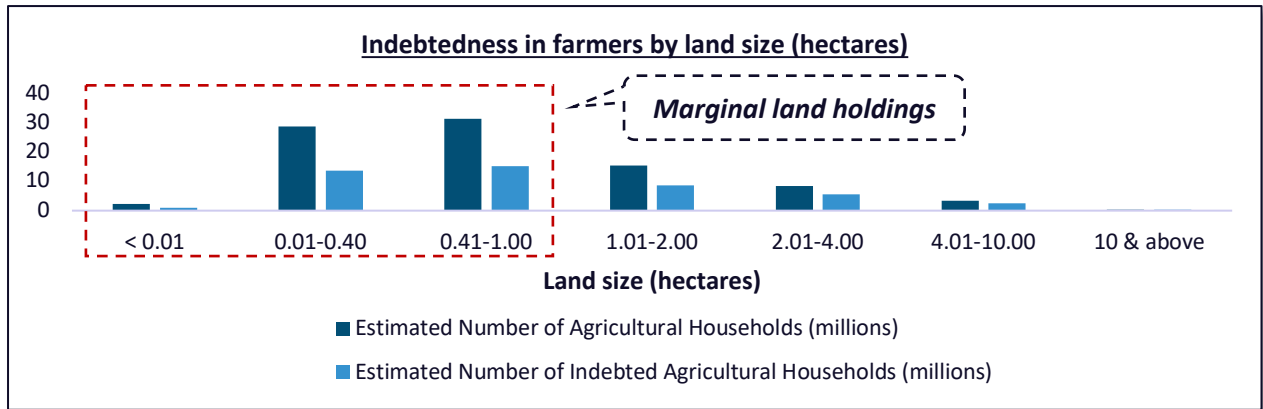
- Characterising poverty in the agricultural sector in India
- Performing a root cause analysis of the status quo
- Developing a sustainable and scalable solution to solve the problem
- Calling out KPIs to ensure adequate enforcement of the model; and
- Sharing insights on how the model proposed can be scaled up in other developing and under-developed economies of the world.

3.2 Poverty and agriculture

Delving deeper into the critical factors for the alarming poverty statistics attributable to India's agrarian economy, we observed a positive correlation between the dependence on agriculture income and the incidence of poverty. Referring to the scatterplot below^x, which analyses data related to 27 Indian states, the incidence of rural poverty exists more prevalently in states with a higher composition of agricultural households in the rural population.



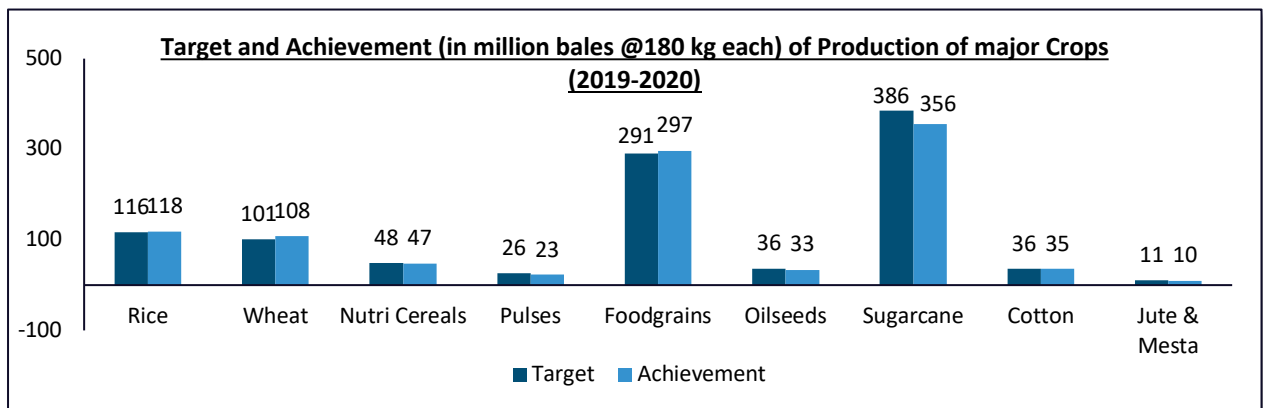
Furthermore, considering the below result for an agricultural survey conducted in 2013, we noted that the incidence of indebtedness, which is a good proxy for propensity to land up below the poverty line, among farmers who have less than 1 hectare of land was more than twice as prevalent as for those who had over 1 hectare of land.



3.3 Issues with agriculture today^{xi}

Agriculture in India is plagued with several issues impacting marginal farmers more. Lack of scale or ability to extract substantial output provides them virtually no bargaining power when dealing with middlemen and credit lenders. Additionally, systemic problems such as erratic rainfall impact these farmers more, pushing them into debt traps. A more elaborate explanation of the challenges faced by marginal Indian farmers is as follows:

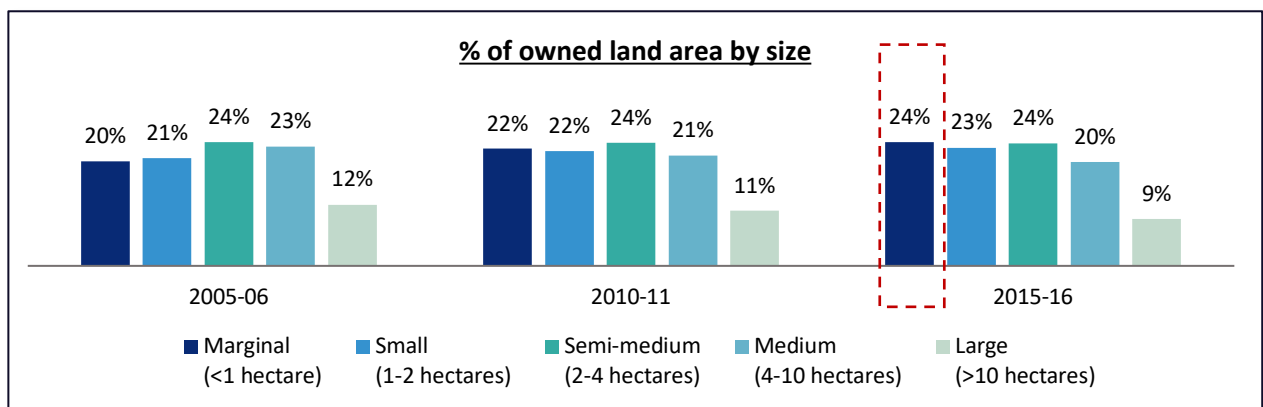
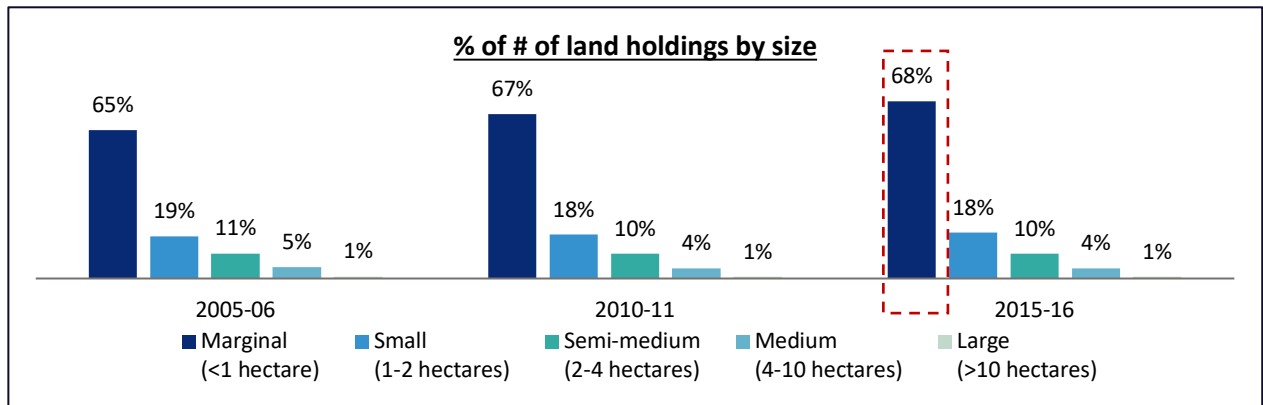
- **Production Inefficiencies:** As of 2020, among India's 9 most widely produced crops, there was an absolute difference of 53.07 million bales of 180 kgs each between the national target and actual production output. Furthermore, a significant chunk of this number is offsetting. For instance, sugarcane is underproduced by almost 29.8 million bales. At the same time, rice, wheat, and foodgrains are cumulatively overproduced by 15.07 million bales, potentially reflecting a demand-related informational asymmetry in the production cycle.



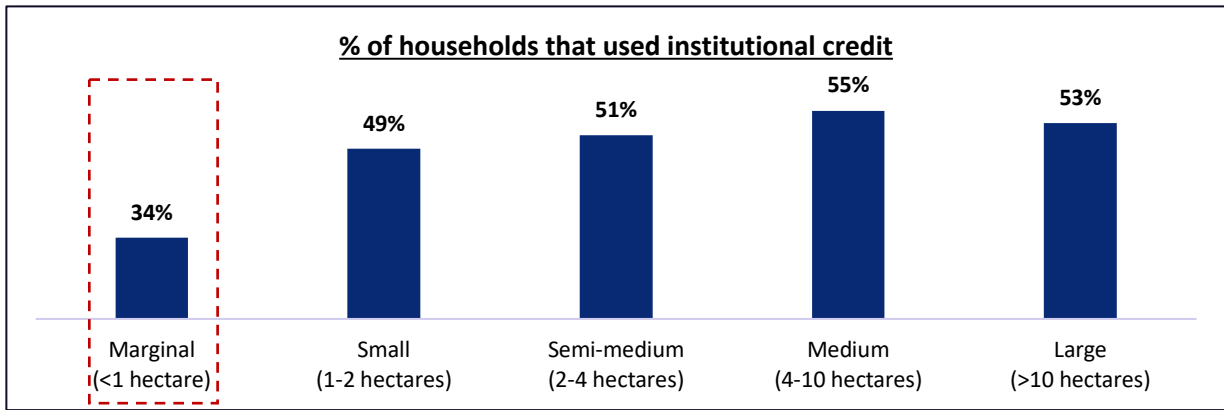
- **Fragmented land holdings:** India has a gross cropped area of ~200 million hectares^{xii}. However, ~68% of these holdings are <1 hectare in size, making them economically unviable. Small plots of land usually cater to the farmer's family's direct needs. To sell commercially, they need to invest in infrastructure. However, due to a lack of scale and credit, the return on investment is often not enough for sustenance. Furthermore, measures to increase income often require scale/credit:
 - o scale production and achieve economies of scale
 - o invest in cash-rich crops, which may require sizeable investment

- take up practices such as livestock farming, inter-cropping, and commercial plantation. Due to low incomes, the farmer must take up other odd jobs or take up excessive debt. Indebtedness becomes a huge reason these marginal farmers cannot get out of the debt and poverty trap.

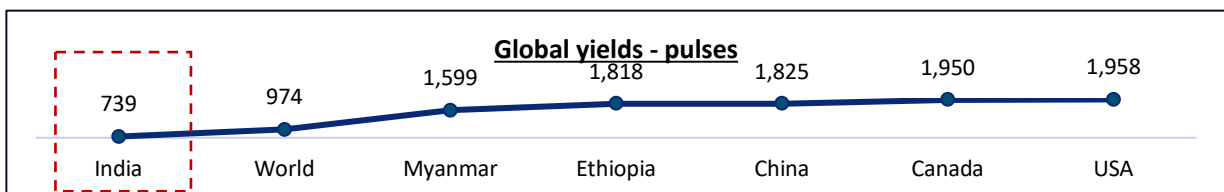
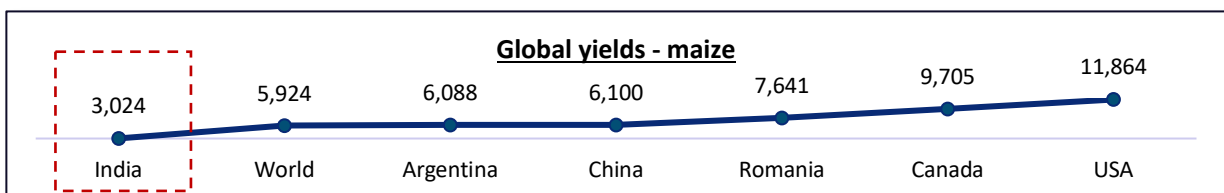
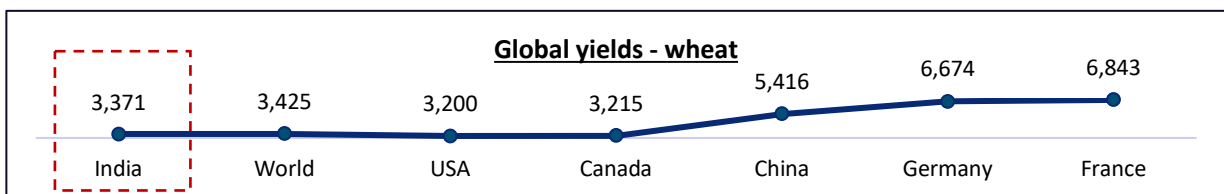
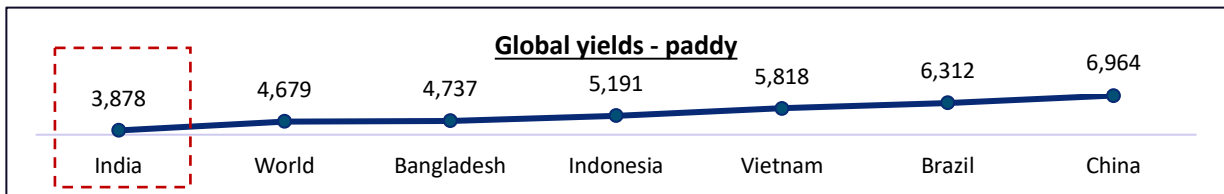
The recent trend shows that the problem of land segmentation is only going to increase. The % of total agrarian land owned by marginal farmers increased to 68% in 2016 from 65% in 2005. Despite the sizeable number of holdings held by marginal farmers, they hold only 24% of the total land area. This highlights the disparity between the average land sizes between marginal farmers and the other landowners.



- **Lack of access to institutional credit/capital:** Credit is essential to farmers since the period between sowing the crop and income realisation is exceptionally long (an average crop cycle of 6 months). At the beginning of the period, farmers require significant capital investment in seeds, fertilisers, and insecticides. Institutional creditors like banks need cash flow records, land records, etc., to provide credit to farmers; these documents are often unavailable. If institutional credit is unavailable, marginal farmers resort to borrowing money from the unorganised sector (moneylenders), who use unfavourable terms to keep the marginal farmer in a cycle of debt and extort more money than is required. Since marginal farmers are more likely to have un-irrigated land, they are also more susceptible to irregular rainfall. As seen below, while >50% of farmers with semi-medium, medium, and large landholdings access institutional credit for their purposes, <30% of marginal farmers do so. The credit requirement for marginal farmers is higher than the others, given their low incomes and low margins. However, their access to institutionalised credit is much lower.



- **Low yields:** India is one of the largest producers of paddy, wheat, and pulses. However, in terms of yield (output per hectare), it is drastically lower than not only countries that lead in yield but also the world averages. India has immense scope to improve productivity across most food grains. For paddy to reach China's levels, it would have to improve productivity 1.8x. India also lags the World average in Maize, with the World average yield being 2x our current yield. This shows significant scope for improvement. One of the few reasons behind this low yield is heavy dependence on monsoons. Currently, only slightly more than half of the agricultural land is irrigated. Since marginal farmers are less likely to have the means to engage in enhanced solutions to increase productivity and yields, it is likely that their yields are worse and pulling India's average down.

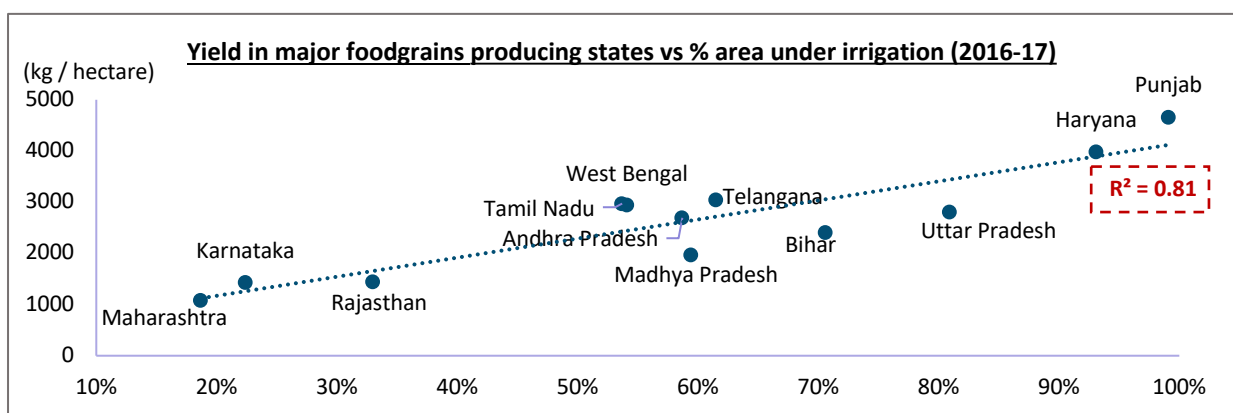


- **Lack of irrigated land:** India relies too heavily on monsoon for its agriculture. Due to this, there is volatility in production that can impact marginal farmers more. Increasing climate change,

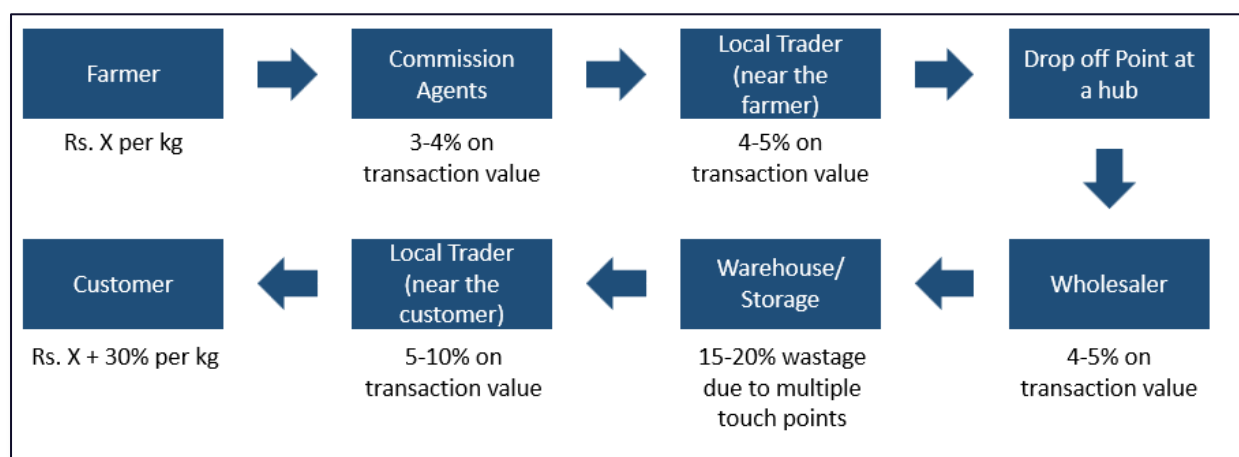
rising temperatures, and erratic rainfall can increase the effects of this on agriculture in India. Marginal farmers are highly likely to be impacted by this because they are the ones who will least likely have access to proper irrigation infrastructure / robust seeds that can survive such swings in weather.

As shown below, there is a strong correlation between % of irrigated land across major foodgrain-producing Indian states and grain yield. The R^2 of 0.81 indicates that 81% of variability in yield is explained by the variability in % of irrigated land. In states like Punjab, almost 99% of the land is irrigated, and farmers are far more aware of farming requirements. Thus, the yield over there is highest. In other states like Maharashtra, where only ~20% of the land is irrigated, the yield is 1/5th of Punjab's. Maharashtra also has an extremely high incidence of suicide rates (~2,500 farmers in 2021 in Maharashtra alone) among farmers due to crop failure and badgering by loan sharks and banks.

Currently, only ~50% of the total agricultural land all over India is irrigated.



- **Distribution Inefficiencies:** The typical outbound agriculture supply chain in India is extremely complex, with multiple touch points and players. This leads to ~30%^{xiii} loss in value to farmers since this amount needs to be paid to middlemen as commissions or is lost to wastage due to multiple loading/unloading and transport points.



Definition of the players in the supply chain:





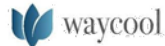

- **Farmer:** producers of the crop. We are not accounting for the supply chain involved in transporting the inputs to the farmers.
- **Commission agents:** local persons at the village level who help farmers find buyers (local traders) for their output. These players are pure market-making agents and don't actually purchase the output from farmers.
- **Local traders:** traders purchase the produce from farmers (after being connected to farmers through commission agents). They usually hire local truckers to transport the produce to a collection point where the produce from multiple local traders is collated and sold to Wholesalers. (Think a hub a spoke model where the local traders are spokes and the collection centre is the hub).
- **Wholesalers:** players purchase the produce from local traders and transport them to the consumption hubs. Here the crop is stored at warehouses before being sold to local traders.
- **Local traders:** players purchase from wholesalers and sell the produce at the final point of consumption, including small HORECA players. Azadpur mandi in Delhi is the biggest consumption hub in all of Asia.

It is important to note that at each point where the produce moves hands, there is some level of sorting and grading (either physically or through machines). Further, loading and unloading imply exposure to heat. All these mean that ~15-20% of the produce is lost to wastage – this cost is incorporated into the total price that customers pay/ the price that is paid to the farmers, i.e., consumers overpay, and farmers are underpaid.

By streamlining the supply chain and controlling touchpoints, there is an opportunity to provide farmers with 30-45% higher prices on their produce.

While there are quite a few government initiatives to make the lives of farmers easier (such as minimum support price, and mandi system), these marginal farmers are still exposed to exploitation by creditors and middlemen. Several private players in the system have tried to attack these issues. However, they haven't been able to create a long-term sustainable solution for these marginal farmers to support themselves in the long term. The following section provides a brief overview of the services offered by these players.

4. CURRENT SOLUTIONS & GAP ANALYSIS

Player	Description	Focus	Services accessible to marginal farmers
	^{xiv} B2B fresh produce supply chain that connects farmers, food-processors, and brands to retailers directly. Equipped to move 1400 tonnes of perishables from farms to businesses in <12 hours.	Supply chain management	None: Services focused on large farmers / traders that have access to technology
	^{xv} Provider of easy-to-use tech-enabled advisory solutions and input delivery with a last-mile delivery network of >300 partners. ^{xvi}	Farm advisory, input delivery	Farm advisory: easy-to-use apps for advisory solutions and advisory centres. No solutions for co-operative farming.
	^{xvii} Supply chain management provider that supports farmers and provides businesses with freshest produce in the most efficient manner.	Supply chain management	None: Services tailored to large farmers that have access to technology and are literate. Website is too advanced for marginal farmers.
	^{xviii} Provider of advisory / consultation solutions for crop requirements. Also provides options to order inputs through an App and sell output directly to Dehaat at mandi price.	Farm advisory, input delivery, marketplace	Farm advisory: easy-to-use app for advisory solutions. No solutions for co-operative farming.
	^{xix} Agri-commerce platform that handles 900+ tonnes of food products per day, across 100,000 clients, and from a network of 85000+ farmers in >50 regions. Adopted a tech-enabled supply chain approach, and utilized robotic process automation, AI / ML to provide value to suppliers and clients.	Supply chain management	None: Services tailored to large farmers that have access to technology and are literate. Farmers in Waycool's network are likely to be large scale farmers that can produce large quantities efficiently.
	^{xx} Global ag-ecosystem intelligence provider. Uses AI / ML and remote sensing, to create an intelligent, interconnected data platform. Helps organizations digitize operations	Smart farming, farm management, supply chain management	None: Services tailored to large farmers that have access to technology and are literate.

fork and leverage real-time farm data to

make effective decisions.
Partnered with >250+ organizations globally to digitize >16 million acres of farmland.



^{xxii}Provider of demand-backed supply chain for perishables that is focused on quality, consistency, traceability and high degree of predictability.

Farm management, Supply chain management

None: Services tailored to large farmers that have access to technology and are literate.



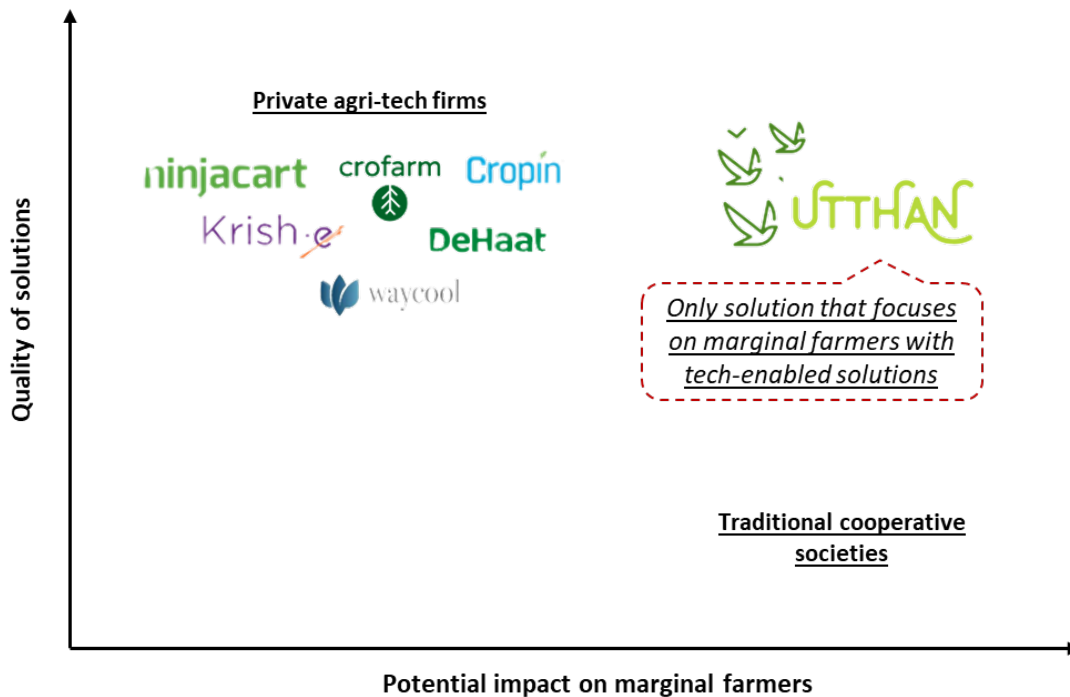
^{xxiii}Provider of advisory and consultation services to help farmers unravel productive opportunities, across each stage of the crop cycle - from seed treatment to harvesting.

Consulting services

Farm consultation: Fairly accessible services for marginal farmers.

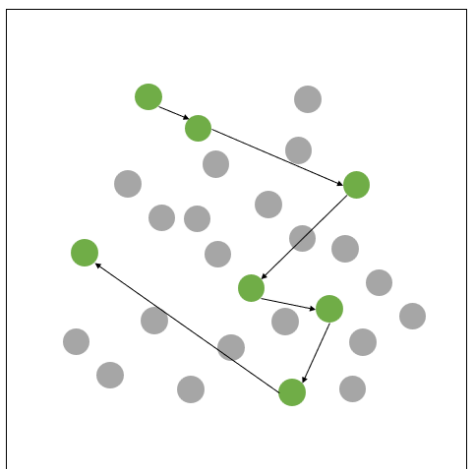
Help guide and assist farmers to use equipment, technology and modern processes on their farm.

No solutions for co-operative farming.



Gap analysis of current solutions: Not scalable and don't attack the issue of poverty

Current players in the market require huge scale to make their unit economics work. i.e., the companies need to acquire all / most of the farmers in any given geography to ensure that the unit cost of collection/delivery of the produce/inputs is positive. A highly dispersed farmer base (refer to the image)



would render **higher cost to transport, greater time load/unload, and higher chance of spoilage**. This implies that current players will spend a significant amount on acquiring farmers since building that initial supply will guarantee them economies of scale.

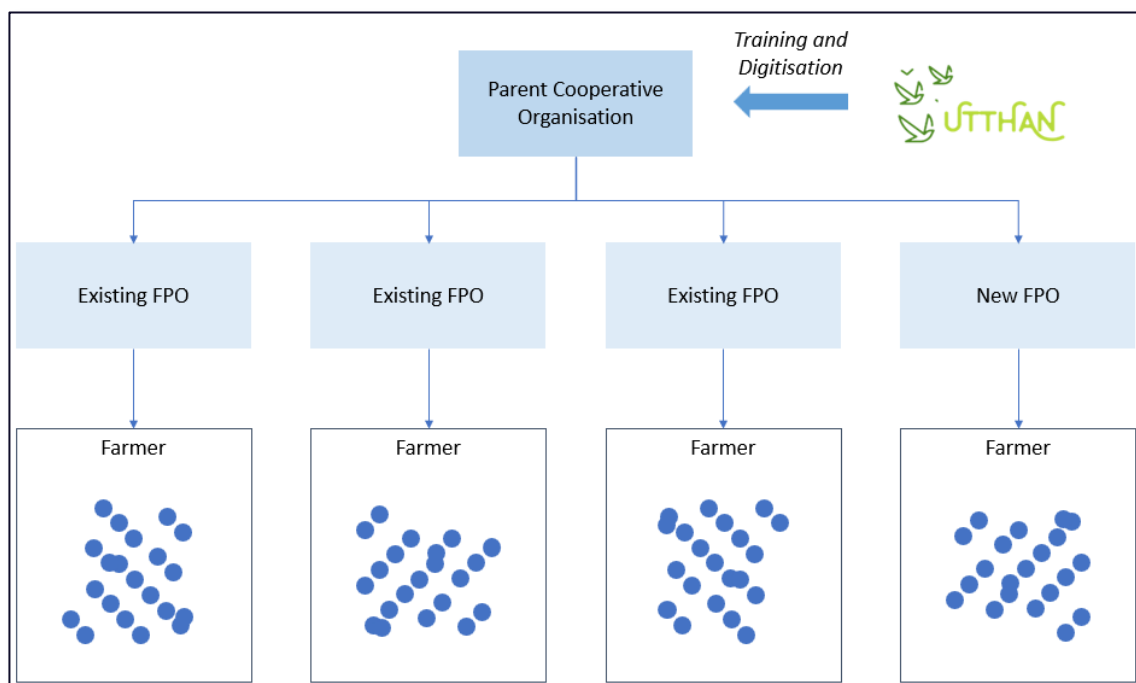
However, these companies have **little incentive** to provide these farmers with additional income since they need to **recover the cost of acquiring the farmers** and the fixed cost of setting up their logistics and warehousing operations. Therefore, there is **little welfare motive** for these companies. Moreover, farmers have little incentive to stick to a particular company, making their unit

economics of collection worse due to defection. For any company working on the distribution issue in the Agri value chain, the company would need to acquire all/most farmers and play on economies of scale.

Furthermore, current players are small despite having raised large sums of money and can therefore not create a meaningful impact on a large scale – for example, Ninjacart's scale is ~1400^{xxiii} tons per day, while the Azadpur Mandi in Delhi alone moves ~8000^{xxiv} tons per day. Further, organised players are focused on selling to organised players like HORECA or the export market. The organised market accounts for <25% of total Agri produce sold in India – therefore, creating an impact on the marginal farmer necessitates dealing with unorganised sales channels.

5. OUR SOLUTION

We have formulated a solution, “**Utthan**”, derived from the Sanskrit word “**Utthana**”, meaning “**upliftment**”. Utthan will help farmers create co-operatives and solve the challenges of such models by equipping and training farmers to run co-operatives like a professional organisation.



5.1 What is a farmer co-operative?

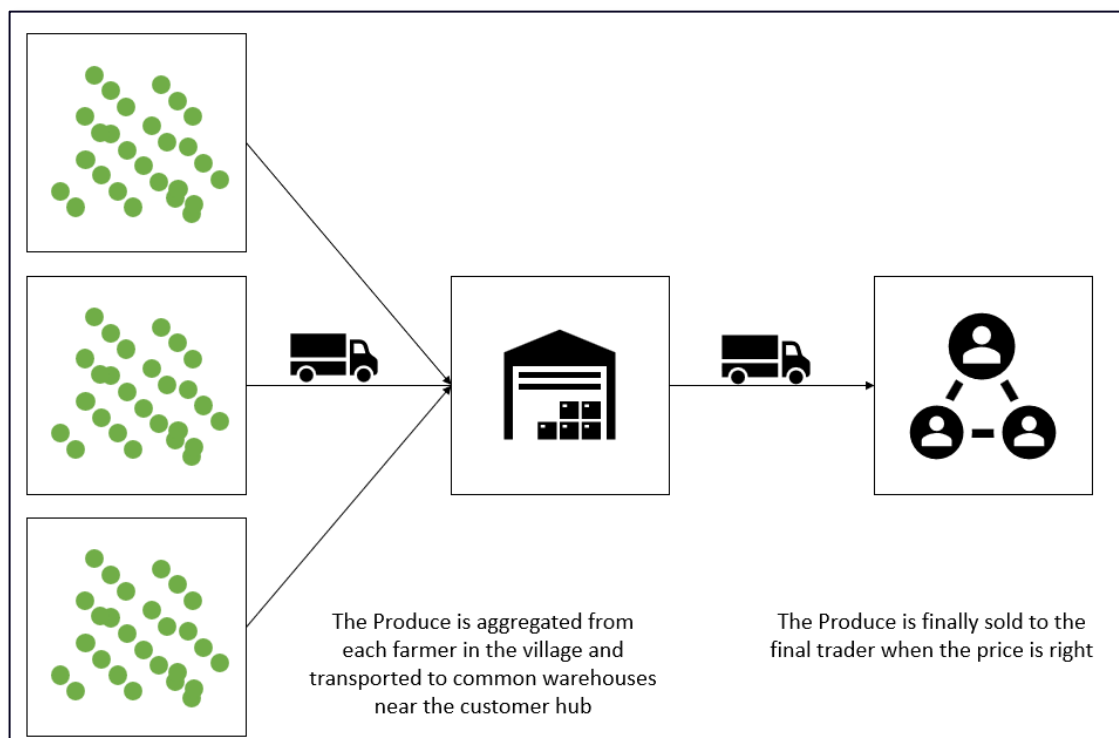
A farmer co-operative is a model where farmers come together to build a farmer-led organisation. All these farmers become shareholders of the co-operative. The selected members of the co-operative are responsible for taking care of managing resources, finances, and operations of the co-operative enterprise.

Advantages of a co-operative are:

1. **Gain negotiating power:** Farmer co-operatives can negotiate jointly with inputs sellers and output buyers and can negotiate better commercial terms
2. **Consolidate land holdings:** As mentioned above, land holdings in India are highly fragmented; hence it gets difficult for small and marginal farmers to apply the latest technologies on their farms. In co-operatives, farm equipment and labour can be sourced at a collective level and then shared across multiple farmers. Further, marginal farmers can consolidate their landholdings and produce different crops together, thereby diversifying risk and benefiting from economies in producing on more extensive land holdings – since a co-operative solves for trust deficit between farmers, this is possible.
3. **Financing:** Co-operatives can approach and iron out better deals with the banks since they can essentially make deals for all the member farmers. Banks also are more comfortable loaning to farmers because of the following reasons:

- a. co-operative organisations are responsible for redistribution of income from selling output, thus can help the repayment of loans in case of default from member farmers
 - b. Farmers are socially responsible to fellow farmers of the co-operative, because a default would affect their social reputation in the village.
 - c. Since the co-operative collects produce from each farmer (refer point 5 - distribution), they have farmer-level data on total produce and sales; therefore, detailed cash flow data can be provided to banks, reducing their hesitance in lending to farmers.
4. **Aligning the incentive of large and marginal farmers:** A co-operative also helps align the interests of large and marginal farmers since better prices, and lower interest costs, as explained above, would benefit all the farmers of the co-operative.
 5. **Distribution:** The co-operative model solves for aggregation of supply from different farmers so that there are economies of scale in collection and warehousing. Further, aggregation allows for higher bargaining power by the co-operative, in turn the farmer can extract higher value from the supply chain.

How will distribution work under the co-operative model:



- Farmers in an entire village are aggregated and produce from all these farmers is collated through collection centers.
- The co-operative will hire truckers to collect this produce and transport it to a common warehouse.
 - In the current supply chain, there are multiple local truckers who transport the produce from the farm to the local traders. These truckers are typically hired by local traders. Therefore, the co-operative can hire the same truckers without having to invest in new trucking capacity.
 - The co-operative model provides a **unit economics advantage** since there is aggregation at the village level itself. Whereas a company like Dehaat would need

to convince every single farmer in a village to hop onto the platform since adoption by only a few farmers would render the unit economics of collecting the crop ineffective.

- Produce is further transported to a common warehouse near the customer hub where sorting and grading will take place.
 - Like trucking, there is pre-existing warehousing capacity for storage of agriculture products. For example, there is ~34 million sq ft of warehousing capacity in Delhi (the location of the Azadpur Mandi).
 - Through the co-operative distribution model, ~4 touch points can be reduced to 1 touch point – thereby reducing the amount and cost of wastage.
 - Warehousing produce will also enable the co-operative to decide when to sell the produce. Today, the price of products changes in real-time at the ‘mandi’ and farmers are forced to sell at the current price. However, warehousing enables farmers to hold produce until the price is right (i.e. demand is greater than the current supply).
- Finally, the produce is directly sold to the end retailer at market prices.
- Through aggregation and economies, the co-operative can save on up to 30% of the margin currently eaten by middlemen.

5.2 Prior successful implementation

- **AMUL^{xxv}**: This model has already worked out in India; a highly successful case study is for Anand Milk Union Limited or AMUL^{xxvi}. Amul started from a small village in Anand where most farmers were marginal and could produce only 1-2 litres daily. These farmers formed a co-operative for milk producers. These member farmers elect representatives to manage the co-operative. These co-operatives then take care of processing and selling the milk to Milk Federations at the state level. Over the years, Amul has expanded from just 247 litres production to annual revenue of \$5.5 billion. Under the Amul model, more than 80% of the co-operative’s income goes directly to farmers, and the co-operative has been able to quadruple farmer income in just seven years from 2010 to 2017^{xxvii}
- **Co-operative sugar factories in Maharashtra^{xxviii}**: Another successful example is the co-operative sugar factories of western India (Maharashtra). These factories successfully resolved the longstanding problem of a consistent supply of cane. Traditionally sugar factories in Maharashtra were separate from the farmers and thus tried to get the sugarcane at the minimum price from the farmers; this meant that farmers were not incentivised enough to grow sugarcane year on year and as a result, overall production reduced. Co-operative factories try to do the opposite, paying the best price possible to farmers; thus net income is mostly distributed to the shareholders in the form of high cane prices instead of being distributed in the form of dividends. So if the factory can run efficiently, then, the farmers have a strong incentive to keep growing cane and selling it to the factory. As a result, more than 75 percent of the sugarcane in MH is processed by sugar factories as opposed to 25% in the north and even though the overall production of sugar from MH was lower from counterparts in the north, these measures helped double the output for Maharashtra farmers.

5.3 Why has the co-operative model not scaled in India?

The key problem facing the co-operatives in India is that the farmers in charge often do not have the know how to run an organisation efficiently. Farmers have not been trained properly in organisation and co-operative management. Once they are made aware of the ways it can be managed, they can create a self-sustaining co-operative.

Secondly there are hurdles because of legal policies, as co-operatives registered under the state government, must get approvals from government bureaucrats to make capital investments or making decisions for expansion. These elaborate and time-consuming processes mean that decisions get delayed and ultimately it got difficult for these co-operatives to efficiently function

What has changed?

Over the years, the Indian government has also taken cognizance of the power of the co-operative movement and the problems plaguing the model. As a result, the government announced the formation of a separate Union Ministry of Cooperation, a subject that till date was looked after by the Ministry of Agriculture. In the Cabinet reshuffle of July 7, Home Minister Amit Shah was given charge of the new Ministry. Ministry of Cooperation will provide a separate administrative legal and policy framework to promote ease of doing business for the co-operatives.

5.4 Our solution

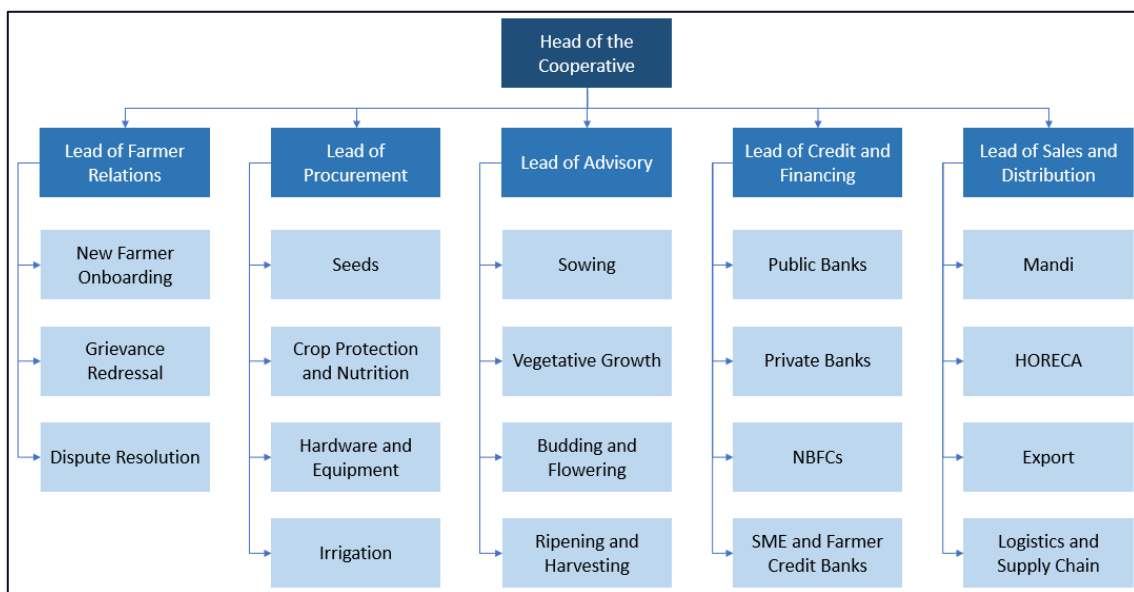
Utthan will help farmers and co-operatives in the following ways:

1. Onboarding and creation of co-operatives

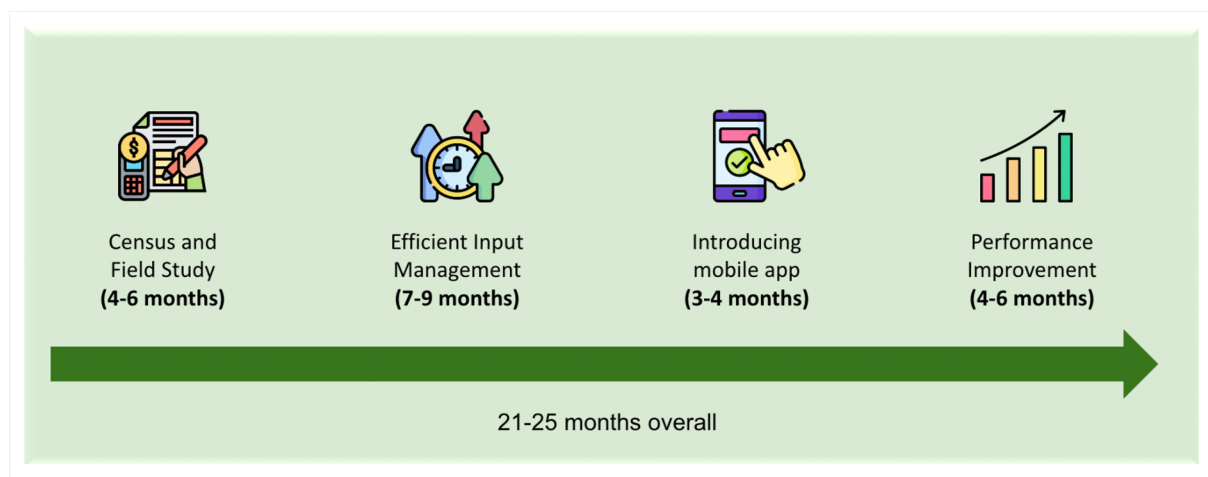
We will have two types of field agents: One team will primarily be responsible for onboarding existing co-operatives across India, and the second team will mobilise farmers to create new farmer co-operatives. As we mentioned in the section “Poverty In Agriculture”, Our initial focus states would be West Bengal, Bihar, Odisha, and Uttar Pradesh.

2. Creating an organisation structure for Co-operatives:

Once a farmer co-operative is onboarded. Our team will help restructure the organisation to mirror a professional organisation structure. Below is how the org structure of the co-operative can look like:



Utthan's internal structure will mirror the above corporate structure, and it will have professionals with prior experience in each function. These professionals will be responsible for training the leadership of farmer co-operatives with the best practices from their practical experiences and helping the farmers with problems faced on ground. We propose the following roadmap to equip and train the co-operative leadership team:



Phase 1 (4-6 months)

Phase 1 will cover three broad areas with respect to organizing farming processes in rural India

- Assigning a team of 20-25 Utthan volunteers per rural district. This team shall be responsible for all farms in their district
- Complete census of all the farms located in their district and collation of information such as identity of landowners, labours working under them, size of the farmland, crops grown on farm, farming equipment ownership, etc shall be completed. Once this data is collated and stored, land ownership proof (physical documents at this stage) shall be provided to all farmland owners
- During these in-person interactions, a field study will also be conducted to understand current issues faced by farmers, largely from the point of income generation. We will introduce our program to the farmers and ensure all support and handholding needed for the next few months

Phase 2: (7-9 months)

- By the end of phase 1, with the help of the co-operative management team, we aim to have all farmers mapped to our database. Phase 2 will largely focus on inputs needed for efficient farming practices. These will include—seeds, manures, fertilizers, biocides, irrigation and equipment.
- Help farmers utilize the co-operative framework to utilize microfinancing and credit options. Based on our primary research, we have designed the below solution, around some key issues faced by farmers around inputs and financing:
 - As far as seeds are concerned, farmers have difficulty procuring high quality seeds at affordable prices. Moreover, we can help map seeds with climate and soil type of a

given area for effective yields. In phase 2, training on these aspects and a catalogue of all sources of good quality seeds shall be shared with the farmers

- Constant farming practices renders soil infertile. Fertilizers, Manure and Biocides help in replenishing lost nutrients of the soil and keeps it healthy for more farming cycles. How, when and how much of these materials to be used will be included in this part of the training
- Detail the use cases for automation equipment and help negotiate the deals with equipment manufacturers
- Microfinance and Credit: Inform them on various forms of financial instruments and financing schemes provided by government institutions

Phase 3: (3-4 months)

By phase 3, as farmers adapt and get more comfortable with operating in the co-operative model. We propose introducing an easy-to-use mobile app mobile app, this app would largely solve the information symmetry in three ways

- **Videos on scientific advisory:** The app will have videos available across sections the lifecycle of a crop from preparing the land to harvesting. These videos will serve as ready reckoners for farmers to access at the click of a button. The content will be delivered in local languages and can also be accessed via a voice bot.
- **Latest news and developments:** The app will serve as an effective communication channel among farmers on ground, leaders of the co-operative, and government bodies
- **Social community of fellow members:** As explained above one major issue realized in Indian farming practices today is that of fragmentation. It is seen that several farmers, skilled in their own set of processes, are harvesting different crops on small pieces of land. The APP would serve as a repository of all farmers in a particular area, detailing their crop expertise, land size, labors employed, seed availability and equipment owned. This information would help in knowledge as well as resource sharing amongst farmers



Training Categories



Community Feature

Salient Features of the APP

- Content delivered in the form of short videos, in local languages, across 5 broad categories: Land, Seeds, Chemicals and Equipment, Irrigation, and Harvest
- By clicking the Lands tab, farmers will be able to access the following information about their land
 - Land location
 - Land Size
 - Land ownership proof/documents
- Seeds, Chemicals, and Equipment Tab shall convey information regarding right sowing practices basis the crop to be harvested, type of fertilizers and pesticides to be used, and ideal equipment for these processes. Tweaks required in these basis certain unforeseen weather conditions would also be detailed
- The Irrigation tab will have videos around the best irrigation practices basis crop sown and soil type. The harvest tab, as the name suggests, will talk about ways and time to harvest so that yield is maximum. We'll also suggest storage measures and flag certain warnings for this stage
- Community features give a platform to the farmers to connect with other farmers in their area for knowledge and resource sharing. Collaboration can be on something as small as equipment and seed sharing, or on something big such as collective farming—a type of agricultural production in which multiple farmers run their holdings as a joint enterprise

Phase 4: (4-6 months)

- Setting up controls, governance practices and KPI's to make sure learnings over the past 2 years is continually applied by the leadership team
- Set up quarterly results calls with co-operatives to check in and make sure co-operatives are running smoothly

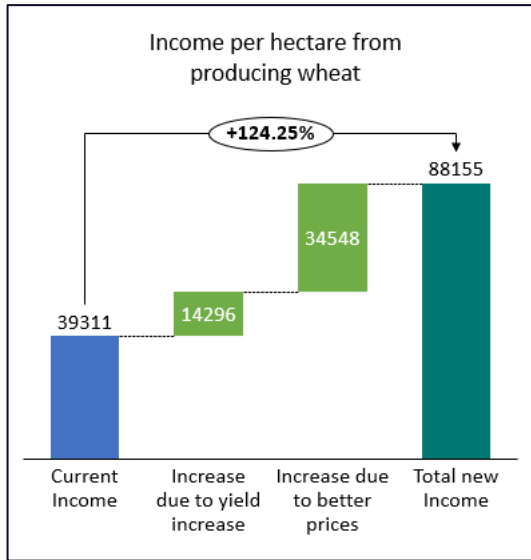
5.5 Is the model scalable?

- The co-operative model allows for more significant economies of scale by aggregating all farmers in geography. This enables higher unit economies since the cost of collection, distribution, and storage is distributed over a higher base of produce.
- The model also allows for network effects. As more farmers and FPOs sign up with the co-operative, there are more significant economies of scale in distribution, leading to better pricing, enticing more farmers to sign up, and so on.
- There is also an element of virality since farmers live in proximity to their communities. Therefore any farmer earning a higher income is likely to talk to other farmers, thereby spreading the word about the co-operative.

Most farmers in India are already connected through FPOs, and therefore, onboarding is quick. Since we are providing a low-cost solution to increase farmer resistance, there is likely to be a high willingness to adopt the solution.

6. IMPACT AND CONCLUSION

6.1 Impact on farmers' income



We believe that the solutions proposed in this document can be scaled extensively and can provide the marginal farmer with up to ~120% additional income.

Taking the example of a marginal farmer producing wheat, currently, the farmer can produce ~31 quintals of wheat per hectare, which can increase by ~30% through advisory. Further, by controlling distribution, the price to end farmers can be increased by ~70% from INR 1270 per quintal to INR 2200 per quintal.

We believe that this model can be scaled across all crop categories and other developing nations as well.

The issues surrounding farmers in India are similar to those surrounding farmers in developing countries worldwide, especially agrarian economies such as Ethiopia, Guinea, Bangladesh, etc. There is immense scope for this co-operative model to scale quickly and increase farmer income levels.

Given the nature of the Indian context and the presence of pre-existing co-operatives (FPOs), we believe the model proposed can scale in India within 25 months. Further, through our education and training initiatives, there is an opportunity to leverage new-age farming techniques in the long term to improve farmers' outlook further.

6.2 KPIs to measure success

1. Number of co-operatives onboarded on the Utthan platform
2. Increase in output per farmer per landholding
3. Increase in Income per farmer per landholding

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