

JULAPALYA DECENTRALISED BUSINESS UNIT (DBU)

A BUSINESS PLAN

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1. Introduction

It began with denial and a numbed feeling of disbelief at what was happening to society, the world and to nations states. Cherished values were overnight discarded, institutions started getting hijacked, rational thinking disappeared, critical intelligentsia was first scorned and then dismissed. Finally, all questioning and reflection were outlawed. The churn happened almost overnight...

45 years back, ADATS started with accepting that we did not have answers. In mid-1985, after 7½ years, we gleaned our experiential learning with Coolie struggles to articulate our take on the political economy of Bagepalli. This was quickly followed by spelling out a strategy for our involvement – the Coolie Sangha model of development. Subsequent revisions, position papers, formulations on various facets of the socioeconomic fabric of society, and bottom-up strategic plans held us in good stead for more than three decades. We instituted the annual practice of weeklong effects monitoring exercises to critically review these strategic plans in every single Gram Panchayat. This is how we stayed relevant to the needs of the people we intimately worked with.

For quite a while ADATS had already started questioning the relevance of our work in an altered post-feudal political economy. Now that small and poor peasants had come out of feudal clutches, would the Coolie Sangha get fossilised into an institution that limped on, simply because it could afford to do so?

Had ADATS now finally run out of steam in this new ugly and unrecognisable reality? We knew that the answer lay in once again developing an applicable understanding of what was happening around us. But, as we already admitted, we were numbed and perplexed. Just then, out of the blue, came COVID-19. In spite of being heavily engaged during the pandemic, those terrible months offered us the time and space to critically introspect.

In May 2022, when the all-clear whistles were finally blown, ADATS started to articulate our take on the current political economy and the raison d'être behind acclaiming decentralised solutions in a decentralised economy as the only sustainable way forward for society, the world, and our country.

In our 45 year history, ADATS has never embarked on any serious venture without first exploring the broader reasons for the undertaking. And we have always done this in serious, non-perfunctory exercises with the people we work with.

From the very start, we have steadfastly held the conviction that only a total and exception-free transparency can give us a true and applicable understanding of the reality; where neither we nor the people we work with pretend to know all the answers. We believe that no effort will succeed without such a grounding. To this day this continues to be our understanding of the relationship between the people and the critical intelligentsia; the two-organisations policy we propound.

- The Coolie Sangha model itself was developed after we, together with landed and landless agricultural labourers, arrived at a critical analysis of the then prevailing peasant economy.
- Mahila meetings after understanding patriarchy; control of village schools and children's schooling in response to mothers' longing to express parenthood; pre-primary health care after analysing the health delivery system.
- Dry land development in response to Coolies' attempt to alter their caste-class identity.
- Decentralised village level alternate credit structure (CCFs) after a thorough grasp on usury.

- Biogas, farm forestry and climate projects after learning climate science and developing a holistic understanding of climate change, *et al.*

So too with this venture to set up a state-of-the-art mechanised unit owned and managed by the Coolie Sangha to service marginal farmers who can add value to their produce and get a better price.

Over six long months, ADATS leadership shared this framework with more than 2,000 elected Coolie Sangha representatives and village functionaries in 25-30 densely attended and overcrowded monthly Taluk Coolie Sangha meetings and initiated discussions. They, in turn, refined the framework in several hundred special meetings in many of the 437 villages with functioning Coolie Sangha Units (CSUs). Thousands of non-CSU people also heard and contributed to these discussions where, in the end, they felt they could finally “name the rapidly changing world”.

In the first section of this Business Plan we will share how ADATS and the Coolie Sangha contextualise the proposed venture in the prevailing political economy. What follows in the next heading is a synthesis of ADATS domain knowledge and the experiential learning of CSU member families.

2. The Political Economy

2.1. *Classic Capitalism*

We traced the transition from feudalism to capitalism, with the creation of an enterprising middle class and democratic institutions as a liberating force. It freed an entire population from the dominion of landlords and, to a limited extent, the stranglehold of feudal social structures.

The pursuit of efficiency and higher rents, along with advancement of technology, mechanisation, digitization and automation, soon led to a phenomenal increase in the volume of production. Raw materials (natural resources) were rapidly gobbled up. Correspondingly, the volume of capital needed for competitive enterprises also increased manifold. This wiped out many small and medium scale enterprises, oftentimes entire sectors of the informal economy. Unprecedented unemployment and loss of income, hardly ever before seen in industrial societies, followed. Today, every advanced as well as emerging economy is grappling with this issue.

An archaic form of capitalism has developed, where a microscopic minority enterprise, create direct, indirect and ancillary employment to produce goods, services and incomes for the entire population. Capitalism has morphed into feudalism; an easy transition since both are based on a caste-class social fabric, in the North as well as the South. Enterprise ceases to be the economic activity of everyone at large. In spite of steadily increasing GDP and creating global brands and billionaires, we term this as archaic and outdated since it is an emulation of the feudal logic where landlords alone owned the means of production to keep village society afloat. Along with a depletion of natural resources, this socioeconomic order is doomed to the same fate as the antiquated one of yesteryears.

2.2. *Democratic Institutions*

In its classical course, capitalism took several centuries to create a sizeable Middle Class from the salaried classes as well as small entrepreneurs. Eventually, this middle class had respectable income and a comfortable living standard. When it grew to be a force to be reckoned with, it created institutions to protect broader worker rights as well as petty entrepreneurial interests. The middle

class forced the State to enact legislation, establish democratic institutions, and make sure that they stayed agile and representative to ensure equity in economic growth and distribution.

Checks and balances that regulated as well as safeguarded capitalism were not a product of enlightened benevolence; capitalists knew that they acted as a firewall to protect the system as a whole.

Over time, with a humungous expansion of capital in advanced economies, and myriad complexity in the holding and operation of wealth designed to conceal concentration, the reach of the middle class steadily weakened.

2.3. *Emerging Economies*

This is not an academic commentary on the development of capitalism only in the Western world. The rest of the world experienced the same, some centuries later, with slight variations. Developing economies have a different trajectory with rapid industrialisation that is not a product of home-grown invention, innovation and technology. Institutions in newly independent societies are, by and large, archaic legacies of those established by previous rulers. Moreover, class characteristics of the middle class is more cosmopolitan than indigenous, making the connect with native sentiments a challenge.

There was no time for a robust middle class to develop in emerging economies. Even the urban metropolis has only a smattering of a middle class with conscience and valour to perform societal obligations; largely a pretentious lot comprising the *nouveau riche* who were suddenly elevated from abject poverty in a single generation. Large chunks of the comfortably placed urban population don't want to inconvenience themselves with playing any brave role. Innate and intertwined linkages between a flourishing economy and functioning democratic institutions, even if they be homegrown, are not fully appreciated. Populism toggles on the verge of the oligarchic. Capitalists are no longer critically checked, monopoly leads to crony capitalism and the capture of the political class.

As a result, skewed indicators are used by the ruling dispensation to comfort itself and ultra-nationalism to explain distortions. Small and medium enterprises that predate post-independence capitalism and constituted a bulk of the economy and employment, are today struggling to stay afloat. The prognosis is therefore the same as for unfettered capitalism everywhere, with the slither more imminent for latecomers.

2.4. *The Economic Rationale*

The primary objective of DBUs is not to create jobs or provide employment. It is to turn on its head the shenanigan that large, centralised mega enterprises will provide pockets of employment to thousands of workers in a select few rural centres. In the arithmetic of these abstract, hidden, and often invisible owners, the countryside is nothing more than a footprint to service their urban consumers.

Our attempt is to reinvent an alternate, decentralised *avant-garde* economic model intrinsically belonging to the rural landscape and her people. The aim is that each DBU will confer ownership and provide a superior caste-class identity to hundreds of CSU Members, even when employment generated at each such unit is for just a few. The vision is to confer a sense of self to thousands of rural poor through a hundred such DBUs in as many Gram Panchayats.

This economic philosophy is not merely *au contraire*, but also inimical to the current form of unfettered capitalism which has not just led to centralised ventures but birthed a polity that imposes centralised prescriptions to standardise every single facet of life and living as universal solutions.

Large and centralised enterprises certainly do have their place in a balanced national economy, but they cannot be unfettered under the guise of “ease of doing business”. A strong participatory democracy should place checks to ensure that an economy doesn’t usurp roles and functions outside the ambit of production. With the caveat that local economies that give everyone an opportunity to enterprise are not destroyed with *faux* arguments of efficiency and productivity.

The next question, then, is who will ensure this?

2.5. *An Audacious Suggestion*

Class identity is not determined by per capita income alone. DBU shareholders will not magically transform themselves into a middle class in money terms. Even if a ₹ 1 crore investment gives a phenomenal 20% return every year, it translates into a monthly increase of just ₹ 1,666 when distributed among 100 shareholders. Hardly enough to climb the numbered ladder.

As Owners, they will have neither the income nor living standards of a conventional middle class. Shareholders alone, and even the wider Coolie Sangha, will not have the reach – population coverage, socio-political presence, *et al* – to play any influencing, let alone transformative role to shape socioeconomic realities.

Capitalism is not like feudalism. It has no ordained path for its development. It need not be only a middle class that ensures democratic functioning of institutions. Coolie Sangha struggles ensured this, to a limited extent, at least to protect small and poor peasant interests. Government schools functioned, PHCs delivered, the public distribution system was largely corruption free, and contract works at the village level were executed with minimum corruption. Admittedly, there has been a slip, due to a let-up in vigilance as well as drop in socio-political presence. But it can be done again, provided the reach of the Coolie Sangha is enlarged.

In our scheme of things, given the style and structure of the DBUs, along with its driving economic rationale, they will have an owner-customer relationship that just cannot be emulated by conventional capitalism, even with clever changes in management nomenclature. DBU owners will share a face to face, intimate and symbiotic relationship with the farmer families they serve. The interdependent nature of localised and value addition services provided by the DBUs also makes this relationship a continuous one.

Provided they forge a socio-political alliance, CSU Members and farmer clients can together play the progressive role that the middle class once played in early capitalism, in another part of the world, vis-à-vis the functioning of democratic institutions.

Way more than providing resources, technology, knowhow and skills, fostering such alliance and expanding the reach of the Coolie Sangha to enable such a transformative role will be the acid test for all of us who have chosen to accompany as a critical intelligentsia.

2.6. *An Economic Response*

Socio-political responses and indignant protestations are aplenty. But here we need to discern a viable economic response. The climate crisis, depletion of natural resources and rapid unemployment

were, till very recently, the concern of only scientists, economists and activists. This has changed in the recent past.

Enlightened thought leaders struggle as they recognise debilitating limitations in the current path of the economy. They see that this model will not work for much longer and are prepared to experiment with environmentally sustainable, decentralised modes without immediately concerning themselves with replicability. A faith akin to the spirit with which the early burghers willy-nilly transformed the funda of the economy in the Middle Ages.

Barely a month after we started reflecting, in June 2022, ADATS along with Sunder Raju and Mahesh Jain, two enlightened business leaders with a futuristic mindset, met to explore the possibility of setting up Decentralised Business Units at the Gram Panchayat level. These DBUs would be owned and managed by Coolie Sangha families to serve the needs of farmer families in a 5-10 km radius in an environmentally sustainable and commercially viable manner. In order to contextualise the concept, we initially suggested the setting up of small cold storages, provision of clean drinking water, and the like as examples of the kind of services that could be provided.

3. Market Survey

A month later, we decided to obtain the services of someone well versed in both, contemporary business practices as well as the rural economy, proficient in the local vernacular, and experienced in setting up farmer production ventures. Sandeep Loya, a colleague who had earlier worked with the Fair Climate Network, was contracted to assist ADATS Field Staff and Coolie Sangha functionaries together undertake market surveys, identify a viable product/service, and prepare a business plan for the first such DBU.

3.1. ADATS Field Staff Trained

5 ADATS Field Workers, each responsible for all and every activity in about 30 village CSUs, were oriented on steps to be taken and information needed to make business plans.

Together with the consultant, they first visited main villages in 6 Gram Panchayats to explore the economic rationale behind decentralised units, owned and managed by CSU Members, to provide products and services to an immediate vicinity of a 5-10 km radius. It was quickly found that provision of drinking water was not a feasible option since the government was supplying it free and heavily subsidised. Though very many of these “water ATMs” were not maintained and were non-functional, the concept of paying for drinking water was effectively expunged from popular acceptance.

The focus shifted to studying cropping patterns, yields and marketing, especially of Irrigated Dryland (ID) crops. Data on the extent of irrigated lands was collected from government offices and this was cross-checked with BESCO records on the number of (free; meter-less) borewell connections in each village.

3.2. Survey

An exhaustive questionnaire was prepared to study cropping details of a chunk of farmer families with some irrigation who also raised dryland crops, in every single village in 7 Gram Panchayats in Bagepalli. Cropping pattern on 17,345 acres belonging to 7,817 farmer families in 75 villages was studied. This exercise was carried out by the respective Field Worker and Coolie Sangha

functionaries, more in the style of individual interviews than merely filling out questionnaires and forms. This exhaustive and time-consuming exercise took 4-5 months. It was a very revealing experience since ADATS predominantly works with landed and landless agricultural labourers, and the vast majority of farmers with irrigation are not Coolie Sangha members.

Entering the data into MS Excel was painstaking. It was not a conventional “data entry” exercise clerically carried out by others. Field Workers found inconsistencies and anomalies that wanted to be immediately addressed. Many revisits were needed to correct exaggerations and get a better picture. In between, ADATS Field Staff and the consultant together visited 2 cold storages in the district, an onion grading machine, 2 units for washing root crops like potatoes, beetroot and carrots, and also a food processing factory.

They studied the functioning of 2 Agricultural Produce Marketing Committee (APMC) yards – a huge one for tomatoes and another for all other vegetables. They held in-depth discussions with farmers as well as APMC licensed Agents. A former Director of the Bagepalli APMC gave an in-depth account of overall finance, functioning and malfunctions.

3.3. Selection of Julapalya GP

After this exhaustive survey of 7 Gram Panchayats, we finally selected Julapalya GP as most suitable due to a mix of irrigated (vegetables) cropping as well as dryland (cereals, millets and groundnut) in this and neighbouring GPs comprising 47 villages in a 5-10 km radius. Having harvests and volumes for 8-9 months would allow a value addition DBU to operate for about 200+ days a year. Operational consistency is a vital parameter to break even. Julapalya also offered access to major markets.

4,770 farmer families from these 47 villages, grow irrigated as well as dryland crops on 15,097 acres of cropping in all three seasons, allowed us to study 11 crops in some detail. We found that there was a potential to add value to about 40,000 tonnes of various vegetables.

Crop	Farmers			Acres			Total Output (Kgs)			Sum Total	
	S	R	W	S	R	W	S	R	W	Kgs	Tonnes
Tomato	431	4	206	917	6	456	1,50,93,010	1,07,143	72,48,263	2,24,48,415	22,448
Brinjal	45	9	21	87	17	44	9,63,850	1,62,683	1,09,921	12,36,455	1,236
Potatoes	139	-	17	379	-	46	31,39,788	-	4,85,417	36,25,204	3,625
Onions	246	25	98	611	72	184	61,81,734	5,46,000	15,33,964	82,61,698	8,262
Carrot	83	24	36	155	48	77	8,70,636	2,86,786	6,03,807	17,61,229	1,761
Beet	69	5	14	149	15	29	9,20,777	68,500	2,49,768	12,39,045	1,239
Cabbage	103	-	44	179	-	96	8,87,880	-	2,95,529	11,83,409	1,183
Pulses	-	2,407	-	-	4,857	-	-	2,79,933	-	2,79,933	280
Maize	320	978	31	579	1,954	74	12,73,295	24,88,434	87,839	38,49,568	3,850
Millets	88	309	-	105	592	-	1,07,894	2,81,837	-	3,89,731	390
Ground Nuts	44	1,599	-	76	3,293	-	38,645	16,47,063	-	16,85,708	1,686
	1,568	5,360	467	3,237	10,854	1,006	2,94,77,509	58,68,379	1,06,14,508	4,59,60,395	45,960

T = Trees; S = Summer; R = Rains; W = Winter

3.4. Gram Panchayat Profile

Julapalya GP has 37 villages and a population of 2,954 families. There are 583 member families in 19 functioning village CSUs:

- 317 (54%) of them adhere to the Coolie Sangha discipline, decisions and way of life, having missed out renewing their annual membership for just a couple of years in the past 28 years.
- 126 (22%) are not quite as serious.

There is a 33% coverage in these functioning villages, and an overall population coverage of 20% in the entire Gram Panchayat. Combined with various other factors used in a complex algorithm, we arrive at a socio-political presence of 30% in the Gram Panchayat – i.e. a little under one-third effectivity.

4. Current Cultivation & Marketing Practices

Farmer families with some irrigation decide to grow a particular vegetable of 45 to 100 days duration. This is not an informed choice based on anticipated market price. It is influenced by season, surrounding farmers, and *ad hoc* advice received from Local Traders on tenuous market forecasts. Truth be told, families with some water sources are enticed by temptation more than any other factor. They have invested heavily on irrigation and are desperate to put the capital to work. They know that growing vegetables requires additional investment, continuous presence, intensive care, and a big market risk, as opposed to field crops that need only limited interventions and occasional visits to their fields. Nevertheless, even if one out of three tomato, beans, carrot, or beetroot crop

finally fetches a good price, it more than makes up for two losses. In monetary terms, it is lakhs versus hundreds and thousands.

These are the very same middle peasants against whom the Coolie Sangha relentlessly struggled to rid themselves of feudal oppression. They are the ones who, a few decades back, pretended to be landlords, kept indentured labour, paid low wages, practiced untouchability, hogged all and every public works contract, and dipped into state benefit meant for poverty eradication. By and large they belong to middle castes, and own 10-15 acres of rainfed dry land 3-4 acres of irrigated dry land. Perhaps it is because they themselves were caught in the throes of a failing peasant economy that they were so violent and vicious in their opposition to the Coolie Sangha.

Be that as it may, they were the “enemies” of yesteryears who are today clientele for the DBUs.

4.1. Women & Growing Vegetables

Unlike traditional dryland farming where women are merely the workforce, growing vegetables is a family enterprise where womenfolk participate as equals. They have total authority from choice to growing to selling. In financial and other dealings with Local Traders, women are involved as equals along with menfolk. Among those who directly take their harvest to sell in the APMC market yard, many women go by themselves to engage in heated bargaining and strong verbal exchanges.

There are also families without traditional irrigation sources. Women raise small patches of greens like spinach, coriander leaves, mint and herbs using runoff from village drains, small ponds, etc. These are harvested every few days, tied into small bundles and taken on headloads to sell directly to households in surrounding villages.

Sometimes, groups of such women pool their produce and together take to the many weekly markets. Every single vegetable grower says that she finds this exciting, exhilarating and, at the same time, exhausting. Of course, they aim to make money. But they claim that they count profit in a totally different manner. They claim to have shattered their sex determined roles. They are no longer slaves and unpaid servants. The pleasure in telling her husband, early in the morning, to cook breakfast, bathe, dress and send the children to school on time, because she is taking off to the weekly market is quite indescribable. Especially the look on the man’s face, the very first time he is ordered to do so!

4.2. Raising an Irrigated Dryland (ID) Vegetable Crop

Some farmers scout the nurseries to themselves choose a variety and buy seedlings and support stalks to hold up tomato and beans plants. Others ask Local Traders to supply the seedlings and stalks directly to their farms.

These Local Traders own a small two tonne truck or goods auto and are colloquially known as “Tempo Owners”. They have the contacts and act as intermediary between farmers, suppliers and the market. They do not have an adversarial relationship with the farmers; they are schooled enterprising youth from the same caste-class, often distantly related. Even money transactions between them are more in the form of advances and payable-when-able hand loans.

Farmers meet a major part of the cultivation cost by themselves, and the rest through borrowings from various sources. They diligently raise the crops – prepare their fields, plant, fertilize, irrigate, de-

weed, protect and raise the crop till it is ready for harvest. By then, a physical exhaustion sets in, and this determines the next steps – harvesting and sale.

4.3. *Harvesting*

Harvesting takes place in 2 ways:

- When the crop is almost ready to be harvested, the farmer calls a Local Trader who comes and checks out for himself. He assesses how many more days it would take to be just right for the market, anticipates the rate it would then fetch, how many other nearby farmers are also ready to sell, and works out an itinerary to pick up from several neighbouring farmers to get a full tempo-load.

By 5 am, the tempo arrives with a skilled work gang to harvest, pack into crates (tomatoes) and netted bags (carrots, beans, beetroot, etc.). He then transports the crates and netted bags to reach the APMC yard by noon.

- Half the farmers themselves harvest, pack and transport to the APMC yard without calling the Local Trader. When volumes are sufficiently big, the wholesale Trader (licensed APMC Agent) sends his own crates and tempo.

In both cases, after purchase, licensed Agents manually sort/grade the vegetables at the APMC yard using their own work gangs. These big wholesale Traders are genuinely excited with our plans to automate sorting/grading with an optical sorter and assure us that they will give the farmers a much better price.

Apart from a physical exhaustion after raising the crop, harvesting choice is also influenced by the type of vegetable and volume.

- Large quantities of a soft produce like tomatoes, for example, are difficult for some farmers to themselves harvest, crate and transport, especially when elderly couples do not have young hands at home. Moreover, tomatoes need multiple harvests at several intervals.
- Hardier vegetables like carrots, beetroot and beans, for instance, can be netted and stacked, one on top of another without any damage and transported to the APMC yard in a rented truck or auto, often provided by the licensed APMC Agent.
- But the harvesting of root vegetables like carrots, beetroot and potatoes needs specialised skills since they can very easily be damaged while digging out from the soil. Even a small scratch can lead to spoilage/wastage.

Often times the specialised work gangs are “attached” to Local Traders in ways that we will explain further down.

4.4. *Price*

And finally, the price:

- Based on quantity and a highly subjective, heavily skewed, and hotly argued assessment of quality, the “pickup rate” is determined. Even then, it is conditional to what the Local Trader thinks he will get in the APMC yard. He gives about half that estimated amount to the farmer and the remaining is paid after a few days, once again amidst frayed tempers and seriously flawed accounting.

- Others take the gamble to try for the best possible price directly from the wholesale licensed Agents at the APMC yard.

5. Potential Business Interventions

5.1. Potential

The current practice of selling at the farm gate has to change:

- i. Harvesting needs to be done by the farmer families themselves, perhaps by directly hiring skilled workers and themselves upgrading skills.
- ii. The flat “pickup rate” practice has to be replaced with negotiating differentiated rates for different qualities – e.g. good, average, bad; ripe, semi-ripe, misshapen, etc.
- iii. They have to themselves transport their produce to the DBU, get them sorted/graded and then take to the APMC yard.

5.2. Challenges

There are also accompanying challenges:

- i. The presumption that farmers will be able to engage work gangs who are specialised in harvesting root crops is not quite as simple as it sounds.

While these workers are not exactly bonded or tenured, they are beholden to the Tempo Owners through an intricate mutuality that is difficult to emulate. The Tempo Owner picks them up very early in the morning, give them a substantial breakfast in an all-night roadside *Dhaba*, packs their lunch, and takes them to the plots that need to be harvested. There he not only gives them an above average contract wage per acre/tempo load, but also provides “refreshments” in the form of a bottle of hard liquor.

It is difficult to imagine that individual vegetable growers would be able to do any of these. A more realistic expectation is that family members of the farmer, and also other labourers from the same village, work alongside the specialised work gangs and, over time, pick up the necessary skills.

- ii. The transport ecosystem has to improve with goods autos and small tempos plying in remote and cut-off villages. For this to happen, the vegetable growers should develop contact and relationships with non-trader tempo owners in nearby towns.
- iii. Packing material like crates and netted bags have to be readily available in the villages and also near the DBU so that the sorted/graded produce is not once again mixed and muddled.
- iv. Informal borrowing from private sources has to be replaced with more formal credit arrangements with government institutions and cooperatives which are more accessible, speedier, farmer friendly, and less cumbersome than banks.
- v. Farmers overextend themselves to raise a crop. By harvest time they are severely cash strapped. The universal refrain is about a *pañṭa vēsina tarvāta vaccē kāsula karuvu* (the cash drought that follows a crop). Demand for credit will be at its peak when they bring the vegetables to the DBU. Even ₹ 40 per bag for size sorting and ₹ 20 per crate for optical sorting will be unaffordable.

Unless the management heartlessly demands that payments are made *in advance, before accepting the load*, the DBU will either be left with an impossible Accounts Receivable in its books of accounts, or with humungous volumes of unclaimed stock.

- vi. Managing the business is not going to be a cakewalk when CSU Members and ADATS alike have zero experience in this field. We will draw heavily on expertise from the supporting corporates. Statutory compliance will not be a challenge since ADATS has the experience to run a company. Operating the state-of-the-art machines, maintenance and upkeep will not be difficult once manuals are memorised and skills learnt.

But while we are prepared to handhold and offer guidance, it has to be the shareholders and directors who have to manage the business.

These are not issues that can be overcome with awareness building, education campaigns or, in business parlance, publicity and advertisement. Sorting and grading, for example, are fairly common parlance. Many farmers do practice some basic manual separation, even when they sell at the farm gate to Local Traders. It is a lack of proximate access to a mechanised unit that prevents them from doing a thorough job. Only time and native innovation will enhance farmer capabilities to operate in altered ecosystems.

On balance it is likely that, along with some farmers, the highly adaptive and enterprising Local Traders will use the sorting/grading facility and perhaps even the cold storage in the initial months of the DBU functioning.

Over time, we expect three things to happen:

- More and more farmers from Julapalya GP and neighbouring Gram Panchayats will themselves bring their produce to the DBU, sort/grade and either take them straight to the APMC yard or decide to store for a week or month, waiting for a better price.
- Local Traders will buy their graded products at differentiated (better) prices from the farmers at the DBU, transforming it into a decentralised village marketplace.
- Eventually, the APMC licensed Agents and even the bigger non-APMC traders/aggregators will come to the newly created marketplace, offering even better prices for graded produce.

6. The Decentralised Business Unit (DBU)

6.1. *Multi-commodity Cleaning, Sorting & Optical Grading*

An infrastructure, owned and managed by the village CSU Members, to be set up on 3 acres of land for sheds and machinery to add post-harvest value through cleaning, sorting and optical grading of tomatoes, carrots, beetroots, potatoes and onions grown in a 10 km radius covering 47 villages in 4 Gram Panchayats surrounding Julapalya GP.

This unit will run for approximately 250 days a year by catering to diversified crops grown throughout the year.

6.2. *Solar plant & Refrigerated Storage*

A 100 KW Solar PV plant to be installed on 1 acre of land, close to a substation, to power a refrigerated storage unit, as well as the sorting and grading machines, and feed excess electricity to

the grid. This storage unit will cater to farmers who clean, sort and grade seasonal vegetables in the DBU and want to store for short periods and cope with temporary price fluctuations.

The DBU will evolve into a decentralised village marketplace for locally produced and value-added ID crops and cope with emerging requirements of aggregation and quality.

7. Why these Crops?

7.1. Tomatoes

Among irrigated dry lands, Tomato has the highest area with spread of 1,379 cropping acres in all 3 seasons. Pricing is based on size, colour and consumer markets. There are only 2 major markets for the farmers from the surveyed area – Chintamani APMC & Bagepalli APMC, both about 50 km each from Julapalya. In APMC, traders charge a flat 10% as commission along with rental for crates. Farmers have to incur their own loading, unloading and transport costs. Traders and agents are willing to pay a higher price for good produce which has equal spread of colour and size.

Modal Price

Market	Max to Min	Max to Modal	Min to Modal
KOLAR	334%	73%	137%
CHINTAMANI	414%	64%	219%
MULBAGAL	478%	107%	165%
SRINIVASPUR	229%	54%	111%
MYSURU	24%	7%	15%
BAGEPALLI	129%	37%	66%

We see here the top 5 markets by arrivals for tomatoes in Karnataka. It is surprising that about 87% of the markets for tomatoes, excluding Mysuru, is within a range of 75 km from the project area. This translates into a volume of almost 76.3 lac quintals of tomatoes.

Difference among top 4 markets, around Bagepalli between maximum to minimum price realisation is seen at an average of more than 350% and the difference between modal and minimum price is seen at more than 150%. This wide difference in price realisation is the key between good and average sorting which will categorize the crop into various grades (small, medium, big sizes; green, red, mixed). With this, farmers now hold the highest quality produce.

For comparative analysis of big 4 markets around Bagepalli focusing on monthly Arrivals & Prices see [Appendix 1](#)

7.2. Onions

Bangalore Rose Onions, as they are popularly known is the 2nd most preferred crop by farmers in this region. In summer the area is around 611 acres by 246 farmers whereas in winter this number drops to with 184 acres by 98 farmers. More than 95% is exclusively grown for export markets as they are small in size and there are hardly any takers in the local markets. Almost the entire harvest heads to Chennai where size sorting, grading & packaging is done for exports. It has 3 size categories:

- 30 mm and above
- 25 mm to 30 mm
- 18 mm to 25 mm
- Less than 18 mm is considered as waste.

Precision sorting is the key to better prices as traders and agents are willing to pay a higher price for good produce which meets standard sizes of 25 mm to 32 mm.

7.3. Potatoes

Potato is the 3rd most preferred crop by farmers. It is predominantly grown during summer on 379 acres by 139 farmers and on just 46 acres by 17 farmers in winter. In the case of potatoes, more than 80% of farmers prefer spot market purchases where middlemen decide the prices – mostly purchased at a discounted price of at least ₹ 1,500 per tonne. Other sources of sales for farmers are Rotational sales (debt pay off with a fixed buyer), APMC markets and retail markets. But the crop has a limited shelf life and loss of weight is a big risk. Farmers face several post-harvest issues like proper cleaning, standardised size sorting, inability to store in case of unfavourable markets and non-availability of middlemen. On top of this they need liquidity. So, they prefer to sell a major portion of the harvest at the farm gate, without looking into size sorting and cleaning. These are carried out by the middlemen and, inversely, the farmer pays for it through a drastically reduced price.

This is where the Multi-Commodity Cleaner & Size sorting machine will add value.

Comparative analysis of big 4 markets around Bagepalli focusing on monthly Arrivals & Prices at [Appendix 1](#)

7.4. Carrots & Beetroots

Carrot and beetroot are the 4th most preferred crop by farmers. These crops are well distributed across all 3 seasons with summer, winter and rainy season as preference order. They see a decent market share with Kolar and Chickballapur ranking 3rd and 4th market among all APMCs in Karnataka. Despite this, a majority of the farmers prefer spot sales at their farm gates where middlemen decide the heavily discounted price. This is because farmers do not have post-harvest infrastructure to clean, sort and store in case of unfavourable prices.

Here again, the Multi-Commodity Cleaner & Size sorting machine will add value. It will not just clean carrots and beetroots but will also sort and grade as per size.

Comparative analysis of big 4 markets around Bagepalli focusing on monthly Arrivals & Prices: [Appendix 1](#)

8. Which Machines?

After visiting and discussing with the below 6 manufacturers, we have decided on 3 vendors.

Company Name	Purpose	Location
Agrosaw Industries	Multi-Commodity Clean & Size Sorter Multi-Grain Cleaner & Silos Storage	Ambala, Haryana
Zentron Labs	Optical sorter - size, weight, colour	Bengaluru, Karnataka
Ecozen Solution (Eco-Frost)	Mini Solar Refrigeration Units	Pune, Maharashtra

8.1. Refrigerated Storage

Ecofrost, a Pune based manufacturer promoted by IITians. Their 10 metric tonne fixed unit, needing 7.5 Kw power, will ideally suit our purpose.

The company has installed more than 500 refrigeration units across India and has an app that can monitor all inwards, outwards and accountability on multiple units and locations. Same units can also be used for fruits like Mango, Sapota, etc.



Outer view of a 5MT refrigeration unit at Anekal



Inner view of a 5MT refrigeration unit at Anekal

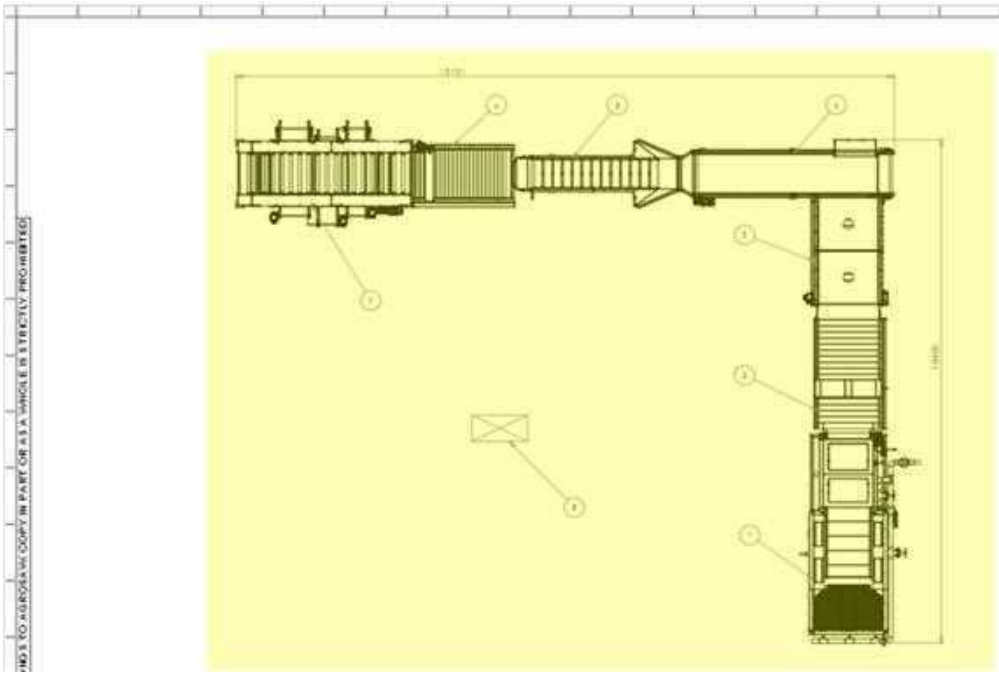
8.2. *Optical Sorter*

Zentron Labs, another Bengaluru based company is also promoted by IITians. They are one of very few in India who manufacture optical sorters which can sort as per size, colour, weight, shape & defect. Capacity of the machine comes at 2MT/Hr and is especially designed for round crops, including tomatoes.



8.3. *Multi-commodity Cleaner & Sorter*

The Multi-Commodity Cleaner & Sorting machine is from Agrosaw Industries with a capacity of 4 to 6 MT/hr. They have shared the layout which has been customised based on our crop requirements. This machine will come with 3 grades of sizes for all 5 commodities and with cleaning machine.



9. Land & Buildings

To set up Multi-Commodity Cleaning, Sorting & Optical Grading machines, we need at least 1.5 acres of land with shed area covering 200' length x 60' width x 30' height surrounded by a 5' brick wall of 6" thickness. The dimensions include unloading, production and loading areas, including temporary open storages. This area will allow vehicles movement, office and staff quarters, etc. The shed area will be erected with ~30 tons steel and ~510 colour coated sheets.

For the Solar & Refrigerated Storage DBU, 1 acre will be enough to install solar panels to generate 100 Kw power and accommodate the 10 MT capacity prefabricated refrigerated container covering 20' x 10' x 10'.

10. Workers

The primary objective of the DBU is not to create jobs and provide employment.

Being a highly mechanised state of the art venture, the Julapalya DBU will provide full time employment to only 16 persons. Daily labour will be need based.

10.1. Manager

The Manager will promote and propagate services offered to small and marginal farmers, ensure demand with plant functioning at optimal level with adequate volumes, oversee machine maintenance, manages employees and workers, monitor inventory and stock movement, maintain financial and statutory records, ensure compliances, and generally ensure hassle free operations.

10.2. Employees

Permanent staff required for both DBUs include:

- 1 Supervisor at the production floor when machines are operated. Ensure crop based technical changes are proper, handle daily labourers, helpers, security guards and drivers.

- 2 round-the-clock security guards.
- 10 trained workers – 8 to operate the Multi-commodity machine, and 2 for Optical Sorting.

10.3. Daily Labour

Daily labour will be called in from the surrounding villages as per need. Over time, a cohort of semi-trained workers will be on call.

11. Financials

11.1. Investments

JULAPALYA DBU: Multi-commodity Sorter, Optical Sorter & Refrigeration						
Description	Qty		Units	Cost/Unit	Cost	
LAND						
Land Cost	3	Acres	1	12,00,000	36,00,000	
Registration			0		3,60,000	
DC Conversion to Non Agr.					2,00,000	41,60,000 16%
BUILDING						
Shed Material - Steel	30,000	Kgs	1	73	21,90,000	
Shed Material - Sheets	11,079	Kgs	1	100	11,07,900	
Shed Fabrication & Erection	41,079	Kgs	1	20	8,21,580	
Flooring	10,800	Sq. Ft	1	100	10,80,000	
Prefab Office Rooms	600	Sq. Ft	600	2	7,20,000	
Prefab Quarters	400	Sq. Ft	600	5	12,00,000	71,19,480 28%
COMPOUND						
Ground Levelling	600	Loads	1	500	3,00,000	
Rock Levelling (JCB)	1,100	Hr	50	1	55,000	
Road Roller	2	Days	1	50,000	1,00,000	
6"Boundary Wall - 5 feet (H)	3,000	Sq. Ft	1	180	5,40,000	
Gate	250	Kgs	1	100	25,000	10,20,000 4%
MACHINERY						
Multi-commodity Sorter	5	Tons/Hr			40,00,000	
Optical Sorter (Single Line)	1.5	Tons/Hr			45,00,000	
Cold Refrigeration	10	MT			16,00,000	1,01,00,000 40%
Miscellaneous						
AMC – All Machines					3,00,000	
Crates & Other Packaging		Pieces			4,50,000	
Office Equipment					1,50,000	9,00,000 3%
STAFFING & LABOUR						
Loading	3	Workers	12	10,000	3,60,000	
Unloading	3	Workers	12	10,000	3,60,000	
Inspection Tray	4	Workers	12	10,000	4,80,000	
Goods Movement	4	Workers	12	10,000	4,80,000	
Peak Load Labour	6	Workers	2.5	10,000	1,50,000	
Admin & Finance	2	Staff	12	18,000	4,32,000	22,62,000 9%

ENERGY		
100 KW SPV Plant	???	0%
TOTAL		2,55,61,480

11.2. Cost Breakup

Infrastructure Costs	1,22,99,480	48%
Machinery	1,01,00,000	40%
Miscellaneous	9,00,000	3%
Labour	22,62,000	9%
Total	2,55,61,480	100%

11.3. Consolidated Crop Availability, Est. Market Share & Operations

In the first year we expect 30% of the total vegetable production to be brought to the DBU for value addition through sorting and grading. This will increase to 35% and 40% in the second and third years, respectively. Over 3 years of operations, we expect that 40,316 tonnes (35%) of the total vegetable production of 1,15,557 tonnes will be brought to the DBU.

Of the total vegetable production, tomatoes account for 67,345 tonnes (58%) in these 47 villages. Correspondingly, tomato will contribute 65% of DBU business – 58% through multi-commodity size sorting and 42% through far superior optical sorting.

Since, over the seasons, farmers will opt for superior sorting of their tomato crop, we have projected a 20% growth rate for Optical and 5% for Multi-commodity size sorter.

Crops	YEAR 1 : Seasonal Survey Availability (Kgs)			Brought to DBU			YEAR 1 : Units Processed (Kgs)			
	Summer	Rains	Winter	Summer	Rains	Winter	Summer	Rains	Winter	Total
Tomatoes (Optical)	1,50,93,010	1,07,143	72,48,263	10%	12%	20%	15,09,301	12,857	14,49,653	29,71,811
Tomatoes (Multi Com)	1,50,93,010	1,07,143	72,48,263	20%	10%	25%	30,18,602	10,714	18,12,066	48,41,382
Potatoes	31,39,788	-	4,85,417	20%	0%	30%	6,27,958	-	1,45,625	7,73,583
Onions	61,81,734	5,46,000	15,33,964	25%	10%	35%	15,45,434	54,600	5,36,887	21,36,921
Carrots	8,70,636	2,86,786	6,03,807	25%	10%	35%	2,17,659	28,679	2,11,333	4,57,670
Beetroots	9,20,777	68,500	2,49,768	20%	10%	30%	1,84,155	6,850	74,930	2,65,936
Cabbage	8,87,880	-	2,95,529	20%	0%	30%	1,77,576	-	88,659	2,66,235
	2,70,93,825	10,08,429	1,04,16,748	20%	7%	29%	72,80,684	1,13,700	43,19,152	1,17,13,537

Crops	YEAR 2 : Seasonal Survey Availability (Kgs)			Brought to DBU			YEAR 2 : Units Processed (Kgs)			
	Summer	Rains	Winter	Summer	Rains	Winter	Summer	Rains	Winter	Total
Tomatoes (Optical)	1,50,93,010	1,07,143	72,48,263	12%	14%	24%	18,11,161	15,429	17,39,583	35,66,173
Tomatoes (Multi Com)	1,50,93,010	1,07,143	72,48,263	21%	11%	26%	31,69,532	11,250	19,02,669	50,83,451
Potatoes	31,39,788	-	4,85,417	25%	0%	35%	7,84,947	-	1,69,896	9,54,843
Onions	61,81,734	5,46,000	15,33,964	30%	12%	40%	18,54,520	65,520	6,13,586	25,33,626
Carrots	8,70,636	2,86,786	6,03,807	30%	12%	40%	2,61,191	34,414	2,41,523	5,37,128
Beetroots	9,20,777	68,500	2,49,768	25%	12%	35%	2,30,194	8,220	87,419	3,25,833
Cabbage	8,87,880	-	2,95,529	25%	0%	35%	2,21,970	-	1,03,435	3,25,405
	2,70,93,825	10,08,429	1,04,16,748	24%	9%	34%	83,33,516	1,34,833	48,58,110	1,33,26,459

Crops	YEAR 3 : Seasonal Survey Availability (Kgs)			Brought to DBU			YEAR 3 : Units Processed (Kgs)			
	Summer	Rains	Winter	Summer	Rains	Winter	Summer	Rains	Winter	Total
Tomatoes (Optical)	1,50,93,010	1,07,143	72,48,263	15%	18%	30%	22,63,951	19,286	21,74,479	44,57,716
Tomatoes (Multi Com)	1,50,93,010	1,07,143	72,48,263	22%	11%	28%	33,20,462	11,813	20,29,514	53,61,788
Potatoes	31,39,788	-	4,85,417	30%	0%	40%	9,41,936	-	1,94,167	11,36,103
Onions	61,81,734	5,46,000	15,33,964	35%	14%	45%	21,63,607	78,624	6,90,284	29,32,515
Carrots	8,70,636	2,86,786	6,03,807	35%	14%	45%	3,04,723	41,297	2,71,713	6,17,733
Beetroots	9,20,777	68,500	2,49,768	30%	14%	40%	2,76,233	9,864	99,907	3,86,004
Cabbage	8,87,880	-	2,95,529	30%	0%	40%	2,66,364	-	1,18,212	3,84,576
	2,70,93,825	10,08,429	1,04,16,748	28%	10%	38%	95,37,277	1,60,883	55,78,275	1,52,76,435

11.4. Consolidated Revenues

We have projected the rate for size sorting of all vegetables at ₹ 0.80 per kg. Farmers bring their produce in 50 kg netted bags and would therefore be charged ₹ 40 per bag for multi-commodity size sorting.

Except for tomatoes and onions where the charge will be ₹ 1 for multi-commodity size sorting, and ₹ 1.33 for optical sorting. Since tomatoes are brought in 15 kg crates, this works out to ₹ 15 and ₹ 20 per crate, respectively.

These rates have been conservatively calculated taking into account how much the farmers/Local Traders pay for manual cleaning and sorting. For the purpose of this projection, we have studied carrots and beetroots.

- Carrots are neither washed nor sorted before selling to APMC licensed Agents.
- The Agents send the produce for washing at 2 local machines who charge ₹ 30 per 50 kg bag. This works out to ₹ 0.60 per kg.
- They then manually sort with their own work-gangs and pay a wage of ₹ 400 per head to 3 persons to sort 40 bags (2,000 kgs). This works out to another ₹ 0.60 per kg.

Against this current expenditure of ₹ 1.20 per kg, we have taken a rate of ₹ 0.80 (66%) for the below calculations.

YEAR 1 : REVENUE

Crops	Processed (Kgs)	Rate/Kg	Revenue (Rupees)				Revenue Share %
			Summer	Rains	Winter	Total	
Tomatoes (Optical)	29,71,811	1.33	20,07,370	17,100	19,28,038	39,52,508	37%
Tomatoes (Multi Com)	48,41,382	1.00	30,18,602	10,714	18,12,066	48,41,382	36%
Potatoes	7,73,583	0.80	5,02,366	-	1,16,500	6,18,866	6%
Onions	21,36,921	1.00	15,45,434	54,600	5,36,887	21,36,921	16%
Carrots	4,57,670	0.80	1,74,127	22,943	1,69,066	3,66,136	3%
Beetroots	2,65,936	0.80	1,47,324	5,480	59,944	2,12,749	2%
Cabbage	2,66,235	0.60	1,06,546	-	53,195	1,59,741	1%
	1,17,13,537		75,01,769	1,10,837	46,75,697	1,22,88,303	100%

YEAR 2 : REVENUE

Crops	Processed (Kgs)	Rate/Kg	Revenue (Rupees)				Revenue Share %
			Summer	Rains	Winter	Total	
Tomatoes (Optical)	35,66,173	1.33	24,08,844	20,520	23,13,645	47,43,010	39%
Tomatoes (Multi Com)	50,83,451	1.00	31,69,532	11,250	19,02,669	50,83,451	33%
Potatoes	9,54,843	0.80	6,27,958	-	1,35,917	7,63,874	6%
Onions	25,33,626	1.00	18,54,520	65,520	6,13,586	25,33,626	17%
Carrots	5,37,128	0.80	2,08,953	27,531	1,93,218	4,29,702	3%
Beetroots	3,25,833	0.80	1,84,155	6,576	69,935	2,60,666	2%
Cabbage	3,25,405	0.60	1,33,182	-	62,061	1,95,243	1%
	1,33,26,459		85,87,144	1,31,397	52,91,031	1,40,09,573	100%

YEAR 3 : REVENUE

Crops	Processed (Kgs)	Rate/Kg	Revenue (Rupees)				Revenue Share %
			Summer	Rains	Winter	Total	
Tomatoes (Optical)	44,57,716	1.33	30,11,055	25,650	28,92,057	59,28,762	41%
Tomatoes (Multi Com)	53,61,788	1.00	33,20,462	11,813	20,29,514	53,61,788	30%
Potatoes	11,36,103	0.80	7,53,549	-	1,55,333	9,08,882	6%
Onions	29,32,515	1.00	21,63,607	78,624	6,90,284	29,32,515	17%
Carrots	6,17,733	0.80	2,43,778	33,038	2,17,371	4,94,186	3%
Beetroots	3,86,004	0.80	2,20,986	7,891	79,926	3,08,803	2%
Cabbage	3,84,576	0.60	1,59,818	-	70,927	2,30,745	1%
	1,52,76,435		98,73,257	1,57,015	61,35,411	1,61,65,683	100%

12. Anticipated Benefits

12.1. Returns for DBU Shareholders

INVESTMENTS	Year 1	Year 2	Year 3
Land with conversion & registration	41,60,000		
Building	71,19,480		
Compound Wall	10,20,000		
Machinery			
<i>Multi-commodity Sorter</i>	40,00,000		
<i>Optical Sorter (Single Line)</i>	45,00,000		
<i>Cold Refrigeration</i>	16,00,000		
Solar Power 100 KWA	??		
<i>Optical Sorter (Additional Line)</i>		30,00,000	
<i>Automated Packaging Line</i>		20,00,000	
<i>Crates and other packaging material</i>	4,50,000	10,00,000	12,50,000
Office Equipment	1,50,000		
Total Investments (A)	2,29,99,480	60,00,000	12,50,000

EXPENSES	Year 1	Year 2	Year 3
Staffing	21,12,000	23,23,200	25,55,520
Peak Load Labour	1,50,000	2,50,000	2,75,000
Maintenance (AMC)	3,00,000	3,30,000	3,63,000
Total Expenses (B)	25,62,000	29,03,200	31,93,520

REVENUE	Year 1	Year 2	Year 3
Optical Sort	39,52,508	47,43,010	59,28,762
Multi Sort	83,35,795	92,66,563	1,02,36,921
Refrigeration	5,00,000	5,00,000	5,00,000
Sale of Solar Power to Grid			
Total Revenues (C)	1,27,88,303	1,45,09,573	1,66,65,683

Investments (A) + Expenses (B)	2,55,61,480	89,03,200	44,43,520
Cost of Money (D)	25,56,148	15,79,221	-
Gross Position	2,81,17,628	1,04,82,421	44,43,520

Cash Flow Position (A+B+D)-C	-1,53,29,325	56,06,373	1,22,22,163
Net Position	-1,53,29,325	-97,22,952	24,99,211

Earnings Per Share (EPS: 200 Shareholders)

12,496

12.2. Returns for Marginal Farmer (Customers)

In our understanding, the impact and financial benefits that marginal farmers will earn is expressed as forgone earnings. The calculation has been done considering the modal price: the offer price that frequently takes place in the market for the commodity and the difference between the average minimum prices:

Modal Price – Minimum Prices = Foregone earnings

This is because the farm gate price offered by Local Traders is assumed to be much lesser compared to prevailing market prices. One of the primary objectives for DBU will be to guide farmers to earn at least modal price based on the quality output and eventually move towards best prices offered by the market.

Foregone earnings are calculated as per the Chintamani APMC market yard; a market preferred by farmers from the surveyed area. Month wise calculations are done for tomatoes, potatoes and carrots and we can see that tomatoes have higher variation when compared to root crops. Earnings for all crops are taken into consideration by including the cost of transportation that marginal farmers will incur per quintal from farm to DBU and the cost of sorting, cleaning and grading per quintal at the DBU.

Machinery: Optical Sort Market & Crop: Chintamani, Tomatoes (All values in Qtls)						
Months	Min Price	Modal Price	Max Price	Farmer Cost (Logistics + Sort)	Foregone earnings Modal to Min price	Foregone earnings (%)
Jan	380	1123	1819	203	540	142%
Feb	216	581	919	203	162	75%
Mar	164	389	638	203	22	13%
Apr	420	1503	2140	203	880	210%
May	1033	3205	4622	203	1969	191%
Jun	671	2379	3541	203	1505	224%
Jul	356	887	1393	203	328	92%
Aug	330	1083	1706	203	550	167%
Sept	552	1609	3045	203	854	155%
Oct	562	1521	3129	203	756	135%
Nov	999	3219	5116	203	2017	202%
Dec	697	3184	4817	203	2284	328%

Machinery: Multi-commodity Sorter						
Market & Crop: Chintamani, Tomatoes						
(All values in Qtls)						
Months	Min Price	Modal Price	Max Price	Farmer Cost (Logistics + Sort)	Foregone earnings Modal to Min price	Foregone earnings (%)
Jan	380	1123	1819	170	573	151%
Feb	216	581	919	170	195	90%
Mar	164	389	638	170	55	34%
Apr	420	1503	2140	170	913	217%
May	1033	3205	4622	170	2002	194%
Jun	671	2379	3541	170	1538	229%
Jul	356	887	1393	170	361	101%
Aug	330	1083	1706	170	583	177%
Sept	552	1609	3045	170	887	161%
Oct	562	1521	3129	170	789	140%
Nov	999	3219	5116	170	2050	205%
Dec	697	3184	4817	170	2317	332%

Machinery: Multi-commodity Sorter						
Market & Crop: Chintamani, Potatoes						
(All values in Qtls)						
Months	Min Price	Modal Price	Max Price	Farmer Cost (Logistics + Sort)	Foregone earnings Modal to Min price	Foregone earnings (%)
Jan	1273	1705	2136	150	282	22%
Feb	1200	1700	2200	150	350	29%
Mar	1909	2409	2909	150	350	18%
Apr	1590	1962	2333	150	222	14%
May	1533	1983	2433	150	300	20%
Jun	1850	2500	3000	150	500	27%
Jul	2000	2450	2900	150	300	15%
Aug	2038	2500	2885	150	312	15%
Sept	2200	2593	2985	150	243	11%
Oct	2333	2733	3167	150	250	11%
Nov	1300	1850	2400	150	400	31%
Dec	1955	2409	2864	150	304	16%

Machinery: Multi-commodity Sorter Market & Crop: Chintamani, Carrots (All values in Qtls)						
Months	Min Price	Modal Price	Max Price	Farmer Cost (Logistics + Sort)	Foregone earnings Modal to Min price	Foregone earnings (%)
Jan	3640	4160	4680	150	370	10%
Feb	2857	3357	3857	150	350	12%
Mar	1750	2250	2750	150	350	20%
Apr	1885	2365	2846	150	330	18%
May	1750	2170	2591	150	270	15%
Jun	1969	2422	2875	150	303	15%
Jul	2405	2833	3262	150	278	12%
Aug	2190	2643	3095	150	303	14%
Sept	2727	3216	3750	150	339	12%
Oct	2375	2763	3150	150	238	10%
Nov	3000	3525	4150	150	375	13%
Dec	4667	5167	5667	150	350	7%

12.3. Future Ready

The actual operation of APMCs which were intended to be controlled by and assist farmers are, in reality, beyond the reach of small and marginal cultivators. Dealing primarily with agents, traders and middlemen, they are caught in a vicious cycle of debt and apprehension. Price discovery through digital platforms is beyond their grasp and they are still victims of fragmented produce, zero value addition and market fluctuations.

Moreover, we are on the verge of corporate finance and private marketplaces entering the countryside. These will soon replace APMC yards which, at least in intent, were farmer friendly.

The setting up of this DBU will get small and marginal farmers future ready to deal with this emerging market reality.

13. The Business Entity

13.1. Statutory Registration

With the aforementioned economic rationale, we suggest that the Julapalya DBU be registered under the Companies Act, 2013. It will give shareholders the very same socio-statutory identity as in any business entity; not quite the same as being a member of a cooperative society or farmer producer organisation which are anchored in a patronising model. The difference being between exercising authority to shape outcomes like in any self-managed venture, and merely performing determined roles to receive preordained benefits.

13.2. Ownership

For the past 3 months, ADATS leadership has been explaining this proposed structure and a holistic concept of “ownership” to Coolie Sangha functionaries and elected representatives in all 5 taluks – i.e. not just to the 200 shareholders. In turn, Field Staff and functionaries are continuing to hold in-depth discussions in all Gram Panchayats with Coolie Sangha presence.

For a people who have, in just a single generation, altered their caste-class identity from feudal servitude to small cultivators (*Ryots*) and moved onto undertaking petty businesses, ownership of a state-of-the-art mechanised venture is a big thing. Ownership is far more than the conferring of statutory title, and very different from taking responsibilities. It is a new class identity that bestows pride, dignity, freedoms and authority. It places one on par with, and even above, the local rich.

Ownership, far more than the promise of pecuniary reward, is that mindset which will provide grit and determination to ensure the venture’s success. On the one hand, it will drive every single one of the 200 shareholders to perform assigned tasks for the smooth functioning of the DBU. On the other hand, through answerability to a large audience, it will provide moral pressure for the venture to succeed.

14. The Market Survey, Value Chain & Points of Intervention

14.1. Tomatoes

As per Government of Karnataka, about 41 APMC markets have seen Tomato markets and all APMC together have seen arrivals for 2021-2022 were at 87,41,225 Quintals and the average modal price was 2069/Quintal.

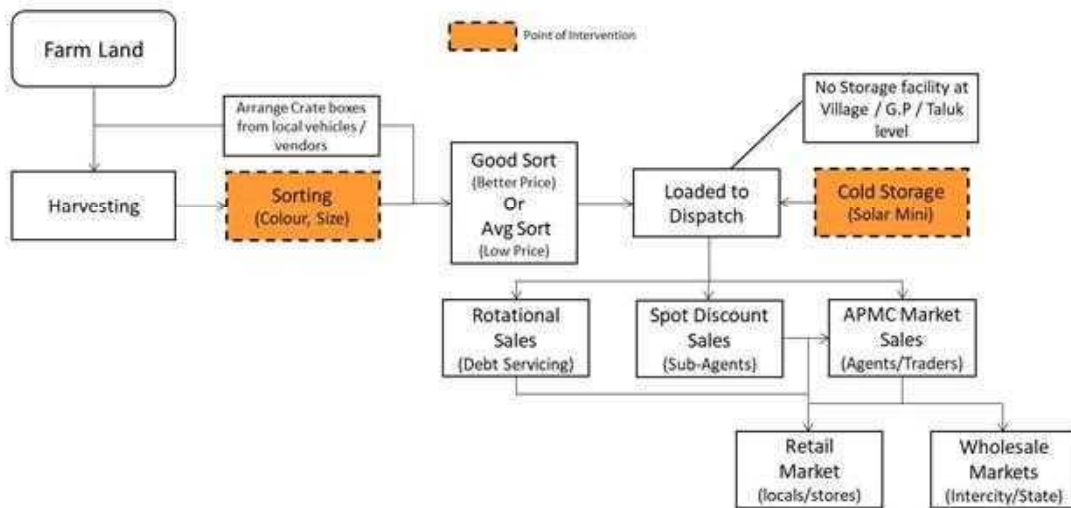


Comparative analysis of big 4 markets around Bagepalli focusing on monthly Arrivals & Prices:

[Appendix 1 \(I\)](#)

Quality of sorting has critical role in what a farmer can earn. Labour is a big challenge, normally the same group which does harvesting also does sorting in the last 2 hours of their shift. The result is either average or poor. The farmer has no choice as they are fearful of labour and have no control on market pricing due to quality. Farmers have a right to get at least the Modal price if not the maximum. This is possible with the Multi-Commodity Cleaner & Size Grader along with Colour Sorter, as farmers would not hesitate to pay extra/quintal to gain more/quintal.

Tomatoes: Value Chain & Point of Intervention

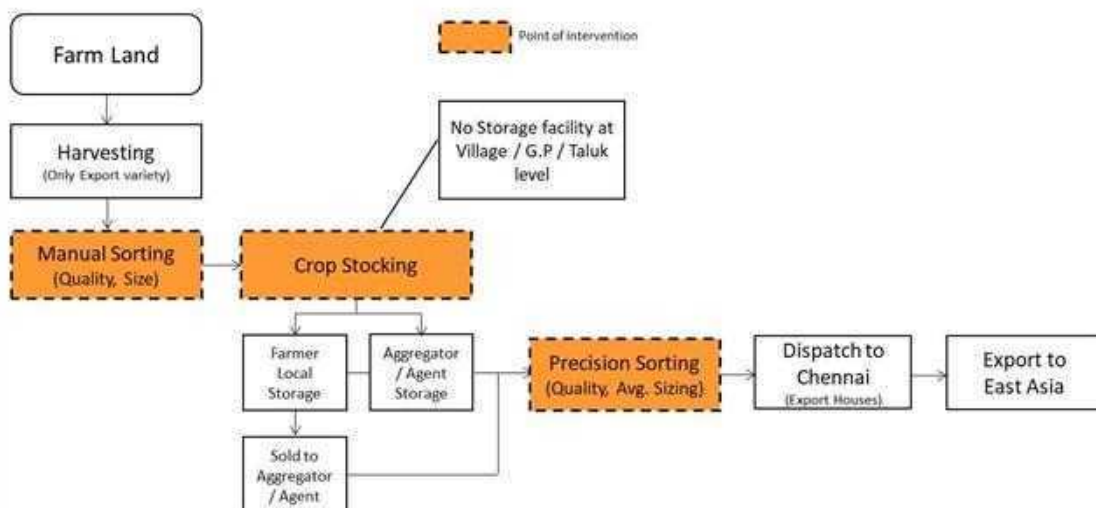


14.2. Onions

There is no data for this crop from the APMC markets. As per secondary data, about 6,00,000 quintals is grown covering 5000 acres in and around Bangalore.

Precision sorting plays a critical role in earnings. There is no specialised labour which is engaged in sorting. It is the same group which does harvesting as well as sorting. For farmers, it is just to ensure that entire harvested crop is packed 50 kgs bags and wait for Middlemen to come and value their 4 months of efforts. Farmers are over-dependent as there are no alternate markets. Due to lack of storage facilities, farmers many times sell the crop to sub-agents who are based in villages and liquidate the position as there is no post-harvest infrastructure like storage facilities and sorting of crop as per sizes.


Onions: Value Chain & Point of Intervention



14.3. Potatoes

As per Government of Karnataka, cumulative arrivals for Potatoes in 2021-22 were recorded at 43,07,481 Quintals and average modal price was 2173/Quintal. Highest arrivals were registered at Bengaluru whereas the 2nd biggest arrivals were seen at Belagavi – huge difference not just in quantities between Bengaluru & Belagavi but also in geographies. This shows the importance of Cold storage.

Top 5 APMC Markets for Potatoes by Arrivals in comparison to Bagepalli			
Market	Quintals	% Share	Avg. Modal Price
BENGALURU	29,15,551	68%	1800
BELAGAVI	4,09,422	10%	1667
HUBBALLI	3,97,956	9%	1775
HASSAN	2,94,487	7%	1574
MYSURU	1,54,224	4%	1936
BAGEPALLI	739	0.02%	2094
TOTAL	43,07,481	100%	

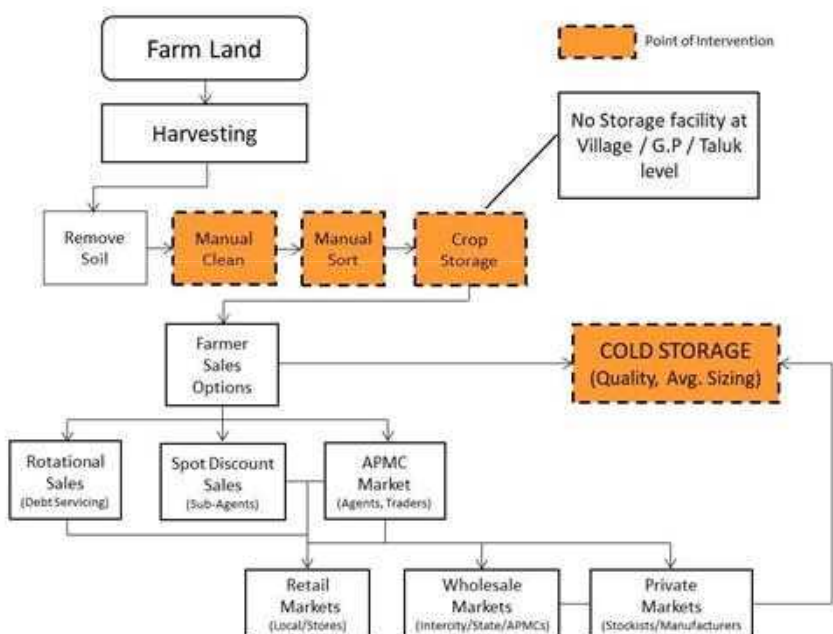


Comparative analysis of big 4 markets around Bagepalli focusing on monthly Arrivals & Prices:

[Appendix 1 \(II\)](#)

Cleaning, Size sorting & Moisture plays a critical role in earnings. Normally for Potatoes, the labour group which does harvesting also does manual sorting. This does not result in even distribution of size, cleaning & moisture. Middlemen takes advantage of this and starts deducting 2% for every quintal as standard towards bag weight and wastage. The farmer has no choice but to sell as they need liquidity to manage domestic needs, no infrastructure is available for storage in case they want to negotiate with other middlemen, and they have no control on market pricing due to quality and accessibility. As a result, Farmer's pain is Middlemen's gain – they dominate locally as the only source and procure from farms at lesser prices comparatively. This is possible with the Multi-Commodity Cleaner & Size Grader.

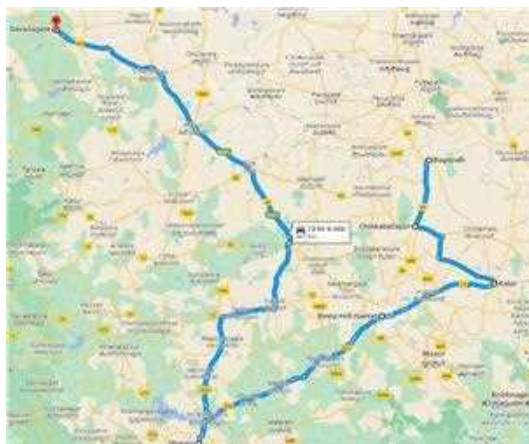
Potatoes: Value Chain & Point of Intervention



14.4. Carrots

As per Government of Karnataka, about 29 APMC markets have seen Carrot markets and all APMC together have seen arrivals for 2021-22 were at 3,05,769 Quintals and average modal price was 4,168/Quintal.

Market	Quintals	% Share	Avg. Modal Price
BINNY MILL (F&V)	119394	39%	3634
MYSURU	70979	23%	1781
KOLAR	28252	9%	2036
CHICKBALLAPUR	21191	7%	1734
DAVANAGERE	11383	4%	2630
BAGEPALLI	754	0.25%	2823
TOTAL	305769	100%	



Comparative analysis of big 4 markets around Bagepalli focusing on monthly Arrivals & Prices: [Appendix 1 \(III\)](#)

14.5. Beetroots

As per Government of Karnataka, about 29 APMC markets have seen Beetroot markets and all APMC together have seen arrivals for 2021-22 were at 2,02,027 Quintals and average modal price was 2155/Quintal.

Top 5 APMC Markets for Beetroots by Arrivals in comparison to Bagepalli			
Market	Quintals	% Share	Avg. Modal Price
BINNY MILL (F&V)	57,738	29%	3634
MYSURU	50,281	25%	1781
KOLAR	23,957	12%	2036
CHICKBALLAPUR	15,414	8%	1734
UDIPI	10,310	5%	2630
BAGEPALLI	38	0.02%	1220
TOTAL	2,02,027	100%	

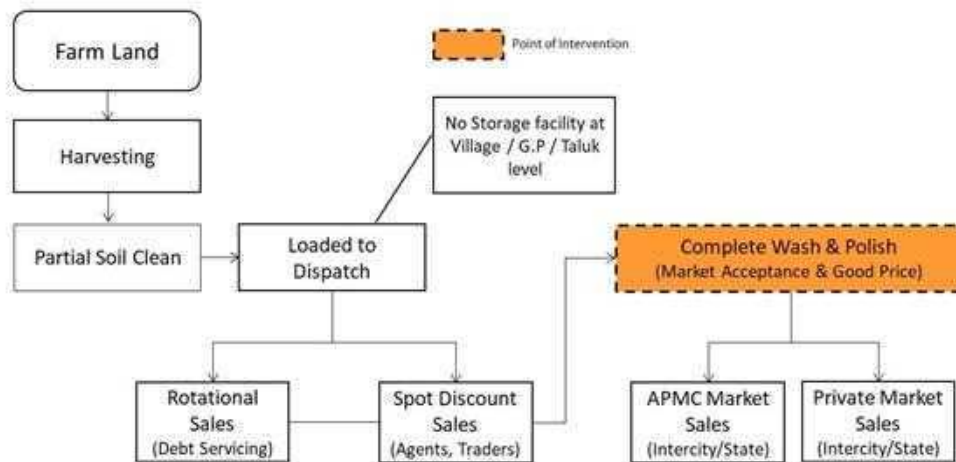


Comparative analysis of big 4 markets around Bagepalli focusing on monthly Arrivals & Prices:

[Appendix 1 \(III\)](#)

A Multi-commodity Cleaner & Size sorter – here cleaning section was added especially for Carrots. The speciality of this machinery is it will sort as per width for carrots and as per diameter for remaining crops. One of the carrot cleaning sites that we visited was only into cleaning and was charging Rs. 25/ bag of 50kgs. Every carrot that gets picked from farms has to get cleaned before it reaches the market. This is where middlemen take a jibe at farmers and convince them to agree for lower prices.

Carrots & Beetroots: Value Chain with Point of Intervention

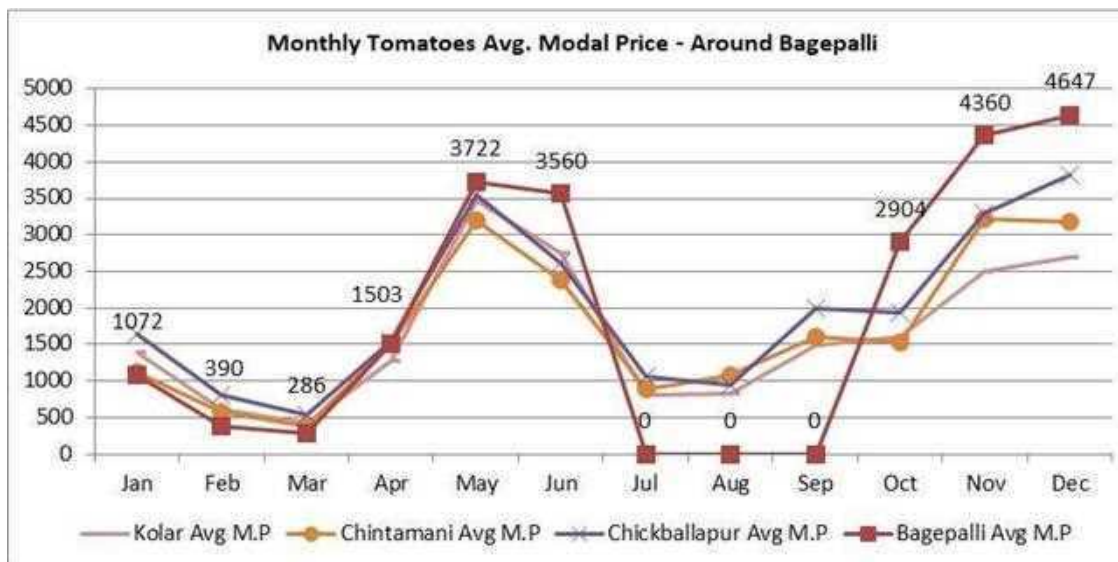
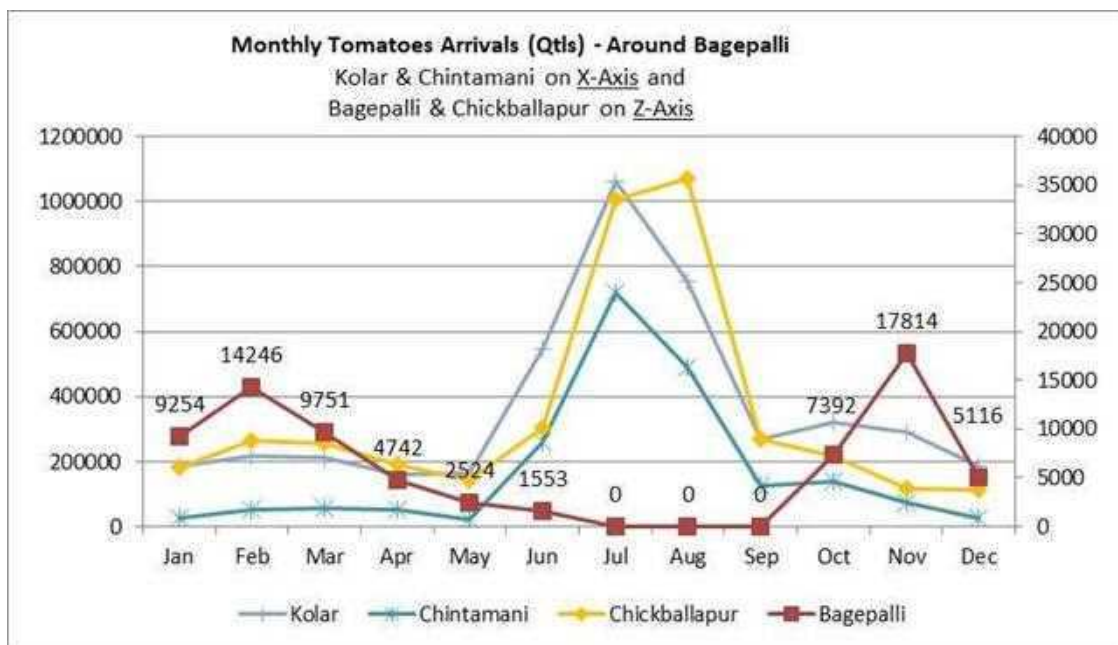


15. Appendix 1

15.1. Tomatoes

Arrivals and price realisation trends for markets around Bagepalli

Let's understand as per the chart below the arrivals and price realisation for APMC markets around Bagepalli like Kolar, Chintamani and Chickballapur.



The 1st chart - The Monthly Tomatoes Arrivals (Quintals) – around Bagepalli shows major markets like Kolar & Chintamani on X axis. While Kolar market gets arrivals in over a lakh quintal every month, stands 1st in Karnataka whereas Chintamani APMC stands 2nd in Karnataka for Tomatoes. On the Z-axis, we can see Bagepalli & Chickballapur. From data perspective, though Chickballapur market has few months seen lesser arrivals than Bagepalli but it is interesting that Chickballapur has the capacity

to absorb much higher volumes than compared to Bagepalli markets which deal on low volumes, marginally better prices but definitely not a dependable market from volume point of view.

The 2nd chart: Monthly Tomatoes Avg. Modal Price – Around Bagepalli

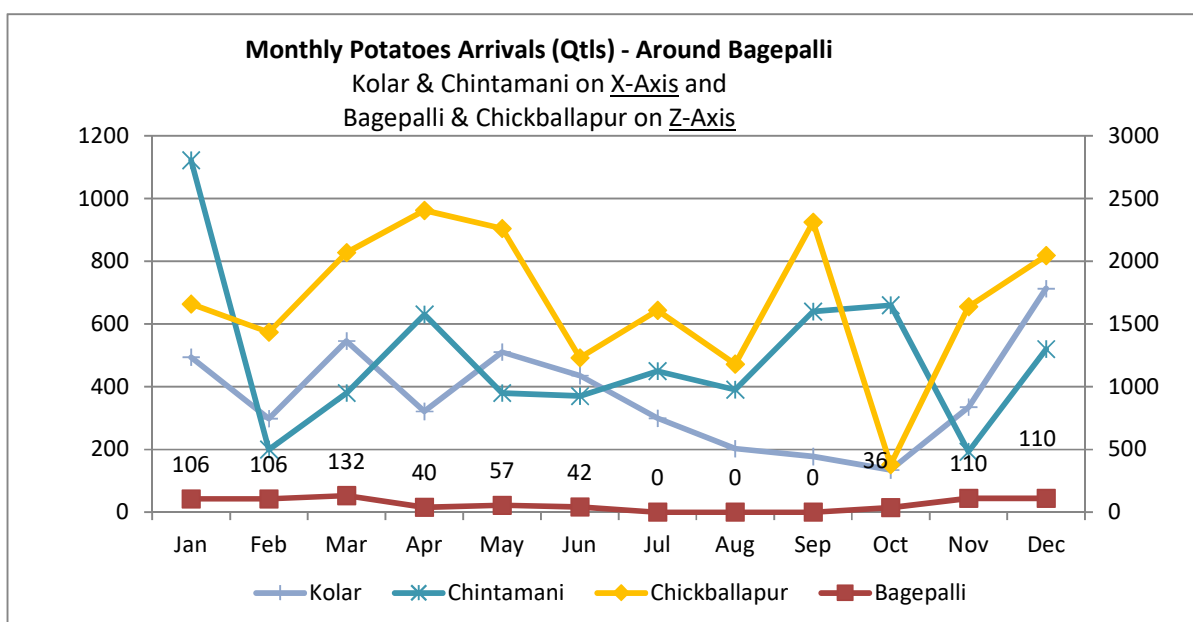
- Price trends dip from January to March. Rise from March to May, dip seen in June & July and again rising from August to December.
- We see dip in prices for 5 months whereas least prices are seen in February and March all across the markets irrespective of volumes.
- No arrivals are seen in Bagepalli APMC from July to September – this speaks about the market depth & participation. This market seems to cater more as a re-distribution and interior markets which manage to get at times higher prices from low volume as a benefit.
- Interesting fact about arrivals and prices is that Bagepalli market operated for just 169 days whereas Kolar (365), Chintamani (327) & Chickballapur (303) has seen arrivals for more than 300 days.

15.2. Potatoes

Arrivals and price realisation trends for markets around Bagepalli

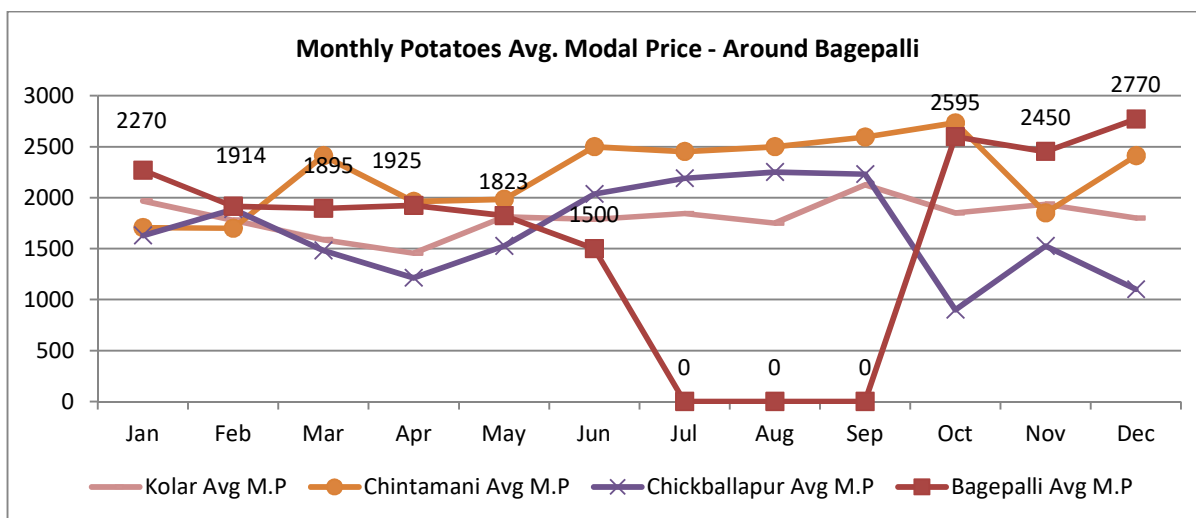
Potatoes are the favourites of Cold chain warehouses. Though the crop is cultivated in Summer & Winter, the preferred crop to land in warehouses is only from Winter which sees arrivals from February. Cold storages host potatoes for a period of only 6 months at the rate of Rs.100/50kgs bag. The difference between Summer and Winter crop is the wetness / moisture content. Therefore, the summer crop gets consumed immediately whereas winter crop mostly lands up in cold storages.

Let's understand APMC arrivals around Bagepalli, including markets of Kolar, Chintamani and Chickballapur.



Monthly Potatoes Arrivals (Quintals) – Around Bagepalli chart shows Kolar & Chintamani on X-axis whereas Chickballapur & Bagepalli on Z-axis. None of the surrounding 4 APMC markets have any significant market share on aggregate basis. Of the 4, Chickballapur stands 1st with a market share of 0.5% with 20,221 quintals in arrivals over a year. It is interesting to see that Kolar & Chintamani which had a market share of more than 73% in tomatoes has negligible presence of less than 0.25% overall market share with average of just 150 days of business. From data perspective, Chickballapur does more business when compared to Kolar + Chintamani + Bagepalli in lesser business days. This may be because of its proximity to Bengaluru and cold storages infrastructure. Potatoes see highest arrivals between Feb end to May & from Nov to Jan.

Monthly Potatoes Avg. Modal Price – Around Bagepalli chart reflects the following:



- Price trends remain sluggish from March to May and marginal dip observed again in November. The rising trend is seen from June to October and again from December to February.
- We see dip in prices for 4 months and this dip is marginal. This is because of the access to storage infrastructure which feeds market regularly throughout the year.
- Arrivals seen in Bagepalli APMC is less than 0.02% market share with arrivals mainly coming from summer crop which lands up with consumer markets at APMC. Total arrivals seen at 739 quintals over 25 business days in a year.
- Around Bagepalli, Chintamani markets stands out with consistency of price realisation even though it handles 1/3 lesser volumes when compare with Chickballapur.
- Interesting fact about Potatoes markets is that this commodity is dominated by western side of the APMC markets in Karnataka with Bengaluru as market leader in arrivals and price realisation. Apart from Bengaluru, other market leaders by arrivals are Belagavi, Hubballi, Hassan & Mysuru.

Market	Max to Min	Max to Modal	Min to Modal
BENGALURU	26%	11%	13%
BELAGAVI	99%	24%	62%
HUBBALLI	91%	38%	40%
HASSAN	119%	35%	60%
MYSURU	48%	17%	25%
BAGEPALLI	48%	15%	29%

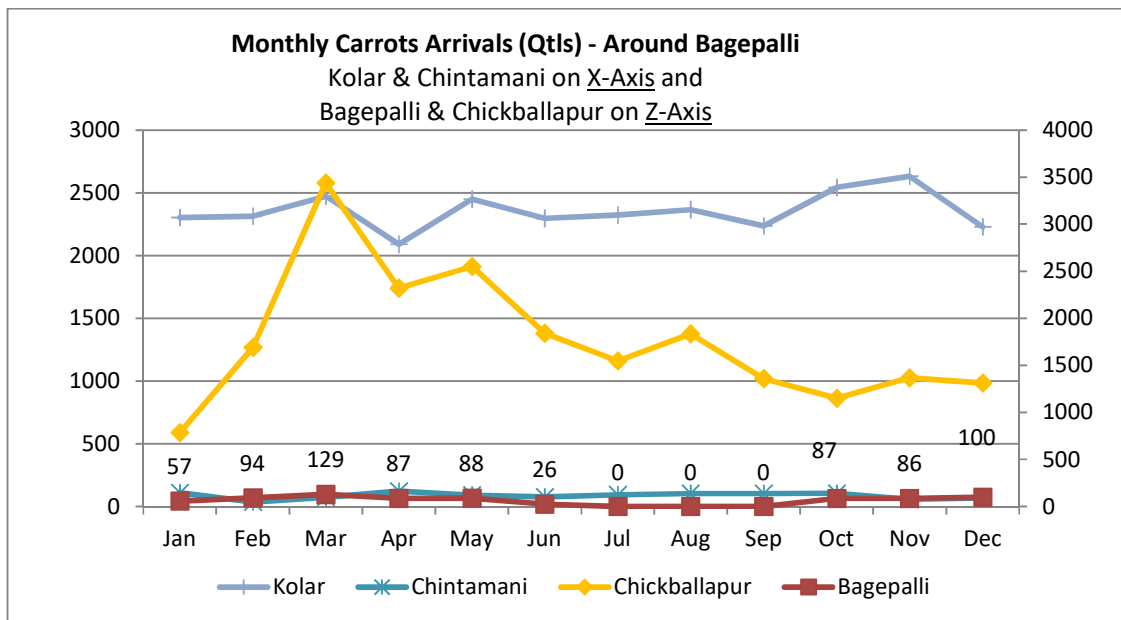
We see here the top 5 markets by arrivals vis-a-vis Bagepalli for potatoes in Karnataka. It is surprising that 68% of the markets is with Bengaluru whereas 2nd best Belagavi has just 10%. This explains market consolidation & importance of cold storages to feed markets in all seasons.

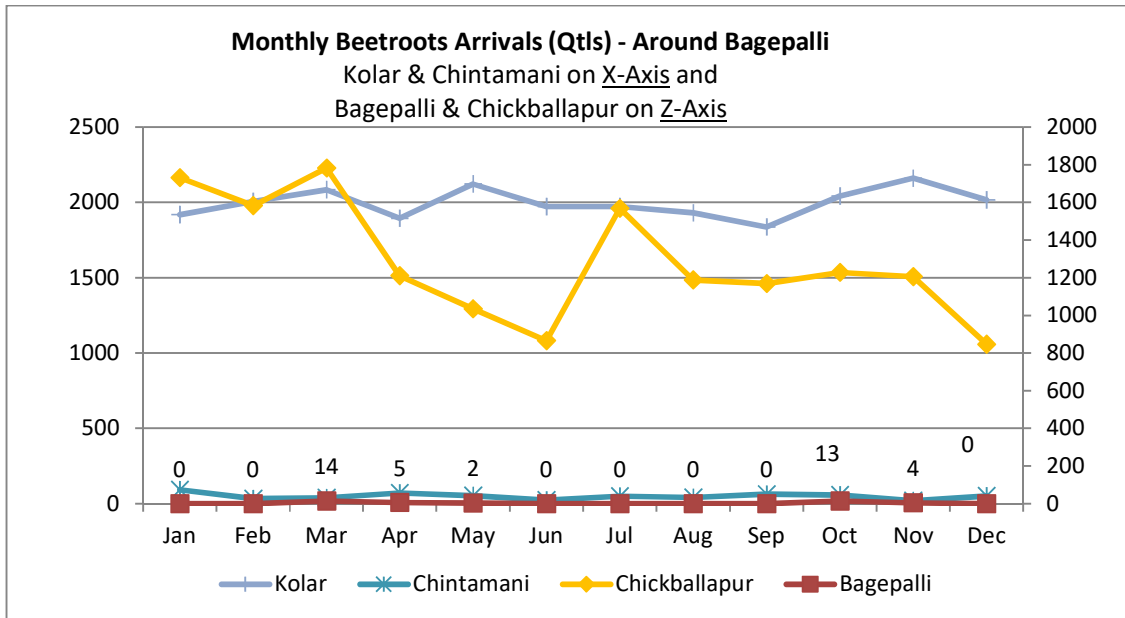
- As per the above table, except for Bengaluru the difference between maximum and minimum price realisation is obvious and wide, around 90% whereas the difference between modal price and minimum price on average is around 45%.

15.3. Carrots & Beetroots

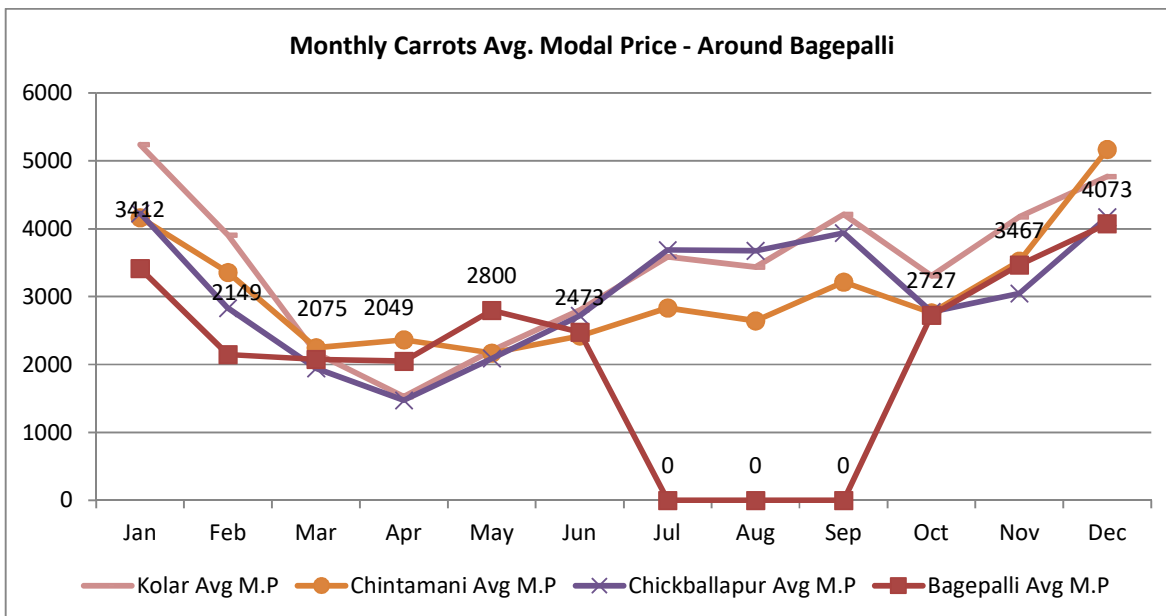
Arrivals and price realisation trends for markets around Bagepalli

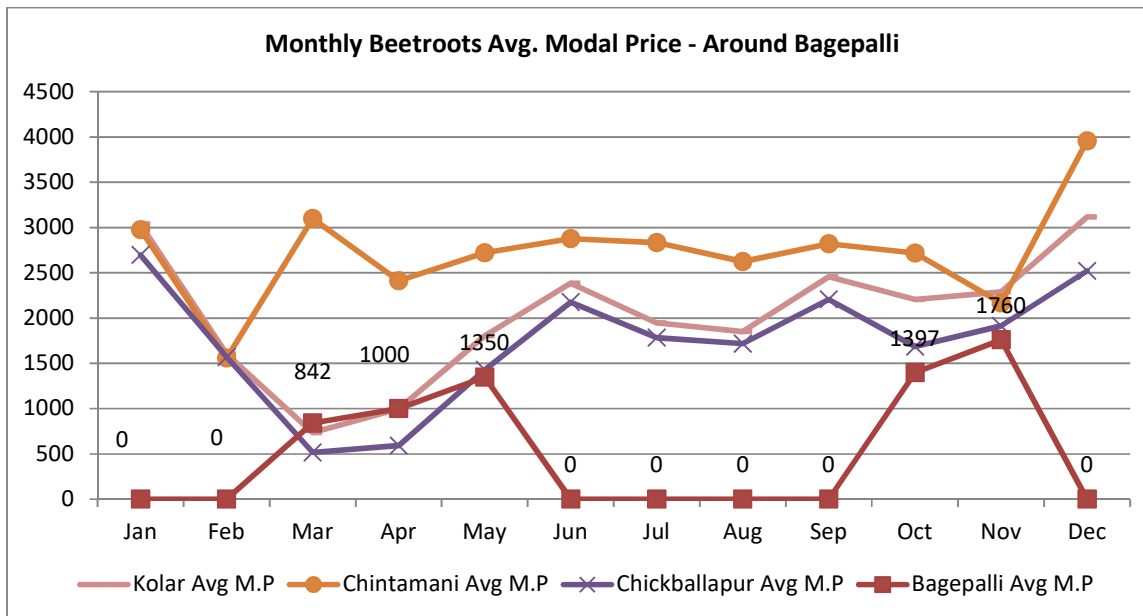
Let's understand as per the chart below the arrivals and price realisation in APMC markets around Bagepalli like Kolar, Chintamani and Chickballapur.





Based on the above charts for Carrots & Beetroots - The Monthly Arrivals (Quintals) – Around Bagepalli it is clear that Kolar & Chickballapur are the major markets. None of the mentioned surrounding 4 APMC markets have any significant market share on aggregate basis. Of the 4, Kolar stands 1st with a market share of 9.2% with 28,252 quintals in arrivals over a year whereas standing next to Kolar is Chickballapur with market share of 6.9%. Both these markets have a market share of 16.2% with an average of over 280 days of business whereas Bagepalli has business days of just 60 days a year. After tomatoes, Kolar has good market share in carrots & beetroots.





The 2nd chart for Carrots & Beetroots: Monthly Avg. Modal Price – Around Bagepalli is summarized as:

Carrots	Beetroots
<ul style="list-style-type: none"> Price trends dip from Jan & Apr, rise from May to Sep, again dipping in Oct with rise from Nov. Compared top Beetroot, dip in prices appears sharp but recovers in quick time. May be this could be effect of excess supplies from Nigiris, which is a hub for Carrots. We see here the top 5 markets by arrivals for tomatoes in Karnataka. Kolar & Chickballapur contributes about 16.2% of overall arrivals in Karnataka which is within range of 70kms from the project area. This translates into a volume of almost 50k quintals of carrots. 	<ul style="list-style-type: none"> Price trends dip from January & February, rise from March to June, remain constant from June to October with a slight dip in November followed with a rise again in December. We hardly see any wide fluctuation or gaps in prices across the seasons irrespective of volumes. We see here the top 5 markets by arrivals for tomatoes in Karnataka. Kolar & Chickballapur contributes about 19.5% of overall arrivals in Karnataka which is within range of 70kms from the project area. This translates into a volume of almost 40k quintals of beetroots.