



Innovations in Agri-Value Chain: Indian Experiences

Compiled By: Dr. Shuchi Mathur



**CCS National Institute of Agricultural Marketing
(A Government of India Organisation,
Ministry of Agriculture and Farmers' Welfare)
Bambala, Kota Road, Jaipur-302033, Rajasthan (India)
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The publisher and the compiler do not claim any responsibility for the accuracy of data, statement made and opinion expressed by the authors of case studies.

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Dr. P. Chandra Shekara,

Director General,
CCS NIAM

Forward

Land available for Agriculture is shrinking. Farmers are treating Agriculture as a loss making business. Government programs are working hard to uplift the spirit of farmers. "Doubling Farmers Income" programme is seen as great ray of hope for the farmers. In this context, farmer to farmer extension is turning out to be very effective tool in extension. It is cost and time effective tool too.

This book is compilation six such case studies highlighting the success of individual farmers, Farmer Producer Companies and markets benefiting the farmers. I hope this case study would inspire the farmers and extension functionaries to achieve the mega task of "Doubling Farmers Income".

I would like to thank all the authors and CCS NIAM faculty who contributed for this publication.

A handwritten signature in black ink, appearing to read 'P. Chandra Shekara', with a horizontal line underneath.

(Dr. P. Chandra Shekara)

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The Seat of Farmers Trust :
Agriculture Produce Market Committee, Baroda
Dr. Ramesh Mittal

This is the story of the most successful APMC at Baroda in the Gujarat State. The teams management and the administration worked hand in hand in order to build the trust of the farmers as well as the traders by re-establishing a huge market yard with all the infrastructural and logistical facilities required for hassle-free and stress-less transaction by the farmers and the traders. The vision, the plan, the maintenance and the execution activities of the APMC, Baroda are commendable and worth reading its developmental story.

Brief History

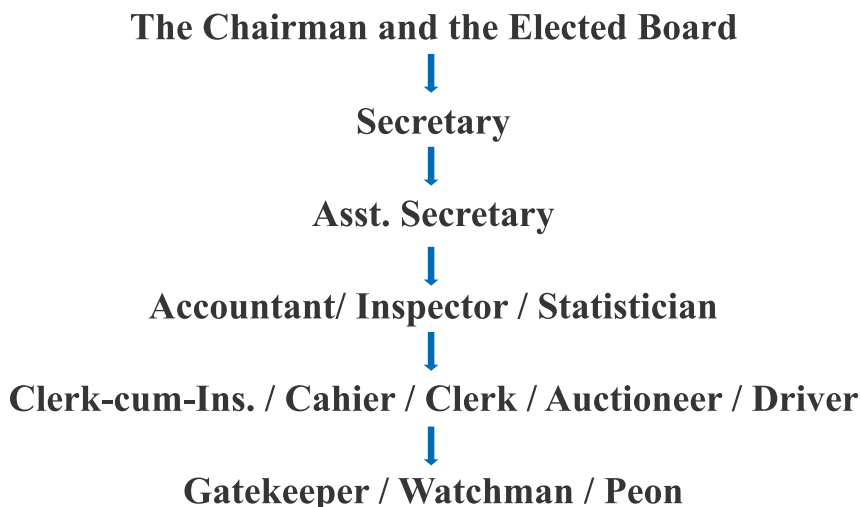
What is now known as The Gujarat State Agricultural Produce Market Act 1963, was the Bombay Agricultural Produce Market Act before the reorganization of the Indian States and under this Act, the Agriculture Produce Market Committee (APMC), Baroda, Gujarat was established on 14.01.1958. The APMC, Baroda has been very popular for its cattle trading since its establishment at the Hathikhana Market. Being of the biggest markets in India for cattle trading, traders from all over the country came to the APMC of Baroda's Hahikhana Market with their cattle for trading. During 1970 grain trading was also started at this market. However, with the gradual spread of technology, the utility of the cattle in the farm began declining and they were being traded mostly for slaughtering. This continued till the year 2000. During the year 2000 APMC, Baroda began the process denotification of cattle as its notified commodity and in year 2003, the cattle were denotified. Now the APMC, Baroda has two markets: one for vegetable trading at Kewdabaug and another for cattle and grain trading at Hathikhana. After the denotification of the cattle at the Hathikhana Market, Grain trading continues to be the only activity.

In year 2000 APMC, Baroda decided to develop a new market for grain and vegetable trading. The Sayajipura Market Yard was constructed where all the regulated commodities could be traded. In Year 2005 Kewdabaug Market Yard was shifted to Sayajipura where vegetable trading is started.

Job and Duties of officials

Duties of secretary of APMCs in Gujarat are describe in The Gujarat

Agricultural Produce Market Act. According to the Section 10 of the Act, APMC is the local authority autonomous body and the APMC can appoint its own staff as and when required. Under the Rule 41 and Section 22 of the Act, the Secretary and the other staff are appointed, respectively. Generally Hierarchy is as below:



Every staff member has to perform his/her duties according to the instructions of the hierarchical authority. The Secretary has to perform his duties as stipulated in the Act.

Management Process

As per the Section 11 of The Gujarat Agricultural Produce Market Act, 8 farmers, 4 traders and 2 Co-operative Society members are elected.

As per Rule 36 of the APMC Act, every market committee has to maintain a Minutes-Book and record all the proceedings of all the committee meetings. The Secretary of market committee is responsible for maintaining the Minutes-Book. The Secretary of the market committee is the key person for the administration of the market committee.

Innovation and Initiatives

In October 2016, the APMC, Baroda joined the eNAM, a pan-India electronic trading portal which networks with the existing APMCs to create a

unified national market for agricultural commodities. The APMC, Baroda is one of 40 APMC's of Gujarat which joined this project National Agriculture Market (eNAM), one of the dream projects of Hon. Prime Minister of India.

The eNAM provides a single window service for all APMC related information and services. This includes commodity arrivals and prices, buy and sell trade offers, provision to respond to trade offers, among other services. While the flow of the agriculture produce continues to happen through markets, the online market reduces transaction costs and paucity of information.

Agricultural marketing is administered by the States as per their agri-marketing regulations, under which, the State is divided into several market areas, each of which is administered by a separate Agricultural Produce Marketing Committee (APMC) which imposes its own marketing regulation, including fees. This fragmentation of markets, even within the State, hinders free flow of agri commodities from one market area to another and multiple handling of agri-produce and multiple levels of mandi charges ends up escalating the prices for the consumers without commensurate benefit to the farmer.

eNAM addresses these challenges by creating a unified market through online trading platform, both, at State and National level and promotes uniformity, streamlining of procedures across the integrated markets, removes information asymmetry between buyers and sellers and promotes real time price discovery, based on actual demand and supply, promotes transparency in auction process, and access to a nationwide market for the farmer, with prices commensurate with quality of his produce and online payment and availability of better quality produce and at more reasonable prices to the consumer.

Gradual changes through innovations & efficiency

The changes and development in the APMC, Baroda began in the year 2000 and it has become vibrant in the new Market Yard at Sayajipura. At the Sayajipura Market, the vegetable trading began in the year 2005. New technologies like digitisation and other developmental activities are being adopted by the management.

Initially, at Sayajipura Market, the main problem was maintaining of the data

of arrival of vegetables and other commodities. To overcome this difficulty, new software was developed where all data entered and vegetable wise arrival and other reports available in new software. The APMC, Baroda is one among the few markets who use such an advanced software technology.

Another unwieldy problem was handling of the vegetable waste. Sayajipura Market is on National Highway-8 which is out of the Municipal Corporation limit. Because of this, the Municipal Corporation would not provide any support for handling the waste. Therefore, earlier, the waste was collected in hired tractors and was dumped at the dumping sites of different areas of the corporation or here and there.

In year 2008 EXCEL industries introduced a machine known as the Organic Waste Converter. APMC, Baroda purchased the same. The process for handling the waste in that machine took a period of lengthy 11 days to convert the waste into manure. Secondly, the rancid smell it generated due to the lengthy period. Thirdly, vegetables, especially tomato, contain a lot of moisture and to reduce the moisture, we have to add sawdust and collection of was difficult. On the whole, the entire process was cumbersome and ungainly.

In year 2011, the management decided to establish a BIOGAS plant to convert the bio-waste into electricity and the slurry of the same is used for preparing manure. The BIOGAS plant was started in 2013 and it is still in process.

Waste Management at APMC Baroda

During March 2005, APMC, Baroda shifted its vegetable market from the city area to the outskirts of Baroda i.e. on NH8, Baroda Bypass road. As the yard was out of the Municipal Corporation limit, it had to transport the vegetable waste to the waste dumping site which was more than 20 kms away from the market yard. To solve the transportation issue the APMC dug a huge compost pit, 15 feet wide, 10 feet deep and 100 feet long. The pit was layered everyday with the vegetable waste in this compost pit and bacterial culture powder was sprinkled to facilitate decomposition of vegetable waste. But soon the rancid smell became an issue in the yard and considering complaints of the traders, it was levelled..

However, unwilling to give up on the valuable waste, the APMC approached

the Siddhivinayak Temple, Mumbai where organic fertiliser was produced from the flowers and other biodegradable waste of the temple. The APMC got in touch with Excel Industries which developed Organic Waste Converter (OWC) machine in different sizes considering the waste to be treated. It also visited Cricket Club of India's Brabourne Stadium at Churchgate, Mumbai, where OWC machine was used to convert ground lawn cutting and its club's kitchen waste was converted into manure. The APMC also visit Excel Industry's office, where canteen waste was treated by the same machine. Finally then, the APMC installed the OWC at the Sayajipura Market Yard, where the whole system of racks to treat crushed vegetable waste was set up and it was named, the Bio Fertiliser Unit.

Now, the vegetable waste is collected and transported to the Bio Fertiliser Unit site, where it is crushed uniformly in the OWC machine into small pieces. Crushed waste is put into 25 kgs capacity plastic crates, which are covered with green net to facilitate aeration. The plastic crates are then stacked on the fabricated metal racks, with foggers hanged over the crates to maintain moisture level in the material. The system was automated for minimal human interference and adjusting to varying seasonal temperatures and humidity. Bioculum (bacterial culture) powder @20 gm/ 20-25kgs vegetable waste / crate is sprinkled on it, to maintain uniform decomposition. The material is turned upside down every 6-7 days and the final product in the form of Organic Fertiliser is derived within 12 to 15 days depending upon the prevailing temperature and humidity. Crushed vegetable waste as a raw material i.e. food for bacteria, moisture by fogger and aeration through green net facilitate the bacteria to convert vegetable waste into Organic Manure. The organic manure is sieved and if any coarse particle remained, it is crushed and put into the cycle again. The aerated decomposition method diffuses the foul smell generated by the decomposed vegetable waste.

But the method was laborious and the problem of flies increased at the site. In spite of several request to train our labourers at the site or provide trained staff to handle this project, the company representative neglected it and eventually the APMC dropped this method of waste treatment.

Since 2011, the APMC was considering using the vegetable waste for production of BioGas and electricity and the remaining solids for the production of Organic Fertiliser. This is rather the best way to treat the

vegetable waste because vermicomposting required lot of space to run the project; it is laborious and has the problem of flies. In this whole project of BioGas treatment, production of Methane Gas and its multiple potential of utilisation is an added advantage. Considering the average daily vegetable waste of the market, the APMC installed digester with a 85 Cu.mtr capacity, as a pilot project and made provision for expansion in the available space to treat increased waste volume in the coming years. The timings of vegetable market in operation is from 3 a.m to 8 a.m and 3 p.m to 8 p.m. considering the various types of waste like plastic, glass, metal, jute bags, etc., the traders were provided with individual garbage bins for primary segregation. But somehow, it was mishandled by traders and did not succeed. When this project was set up, an organised system of waste collection and segregation among the traders was established. A group of selected scrap traders and rag pickers were asked to collect all the plastic and metal waste. This helped in the segregation of vegetable waste to some extent. The APMC deployed a trained team of people for housekeeping work of the yard. The traders were instructed not to dispose any vegetable waste once their premise was cleaned around their shop by the sweepers. CCTV's were installed at various locations inside the yard for monitoring any littering or false method of dumping of waste. Traders and visitors were informed of the waste disposal. If anyone found littering, he was warned at first. However, repeat performance attracts heavy penalty!

Looking at the initial 1.5 to 2.5 MT of vegetable waste per day, the APMC, installed 85 Cu.mtr capacity BioGas Plant. Segregated vegetable waste is weighed, crushed and fed into the BioGas digester. Electricity is generated through 100% Bio-Gas based generator using scrubbed BioGas. The electricity is utilised for running the vegetable waste crusher, pumps of water recycling plant and yard's street light at night.

In the past few years, the quantity of waste has already doubled. Therefore, to store the surplus gas, an additional Gas Storage balloon of 100 Cu.mtr capacity was installed. To feed and maintain a balanced ratio of waste along with water into the digester, approximately 3KL water was used daily. To prevent this massive wastage of water in the form of liquid slurry coming out of the BioGas plant, a vibro screening machine was installed, which separates solids and liquid from the slurry. The derived liquid is stored in the underground tank of 40KL storage capacity. The underground slurry tank and

Bio-Gas balloon room is constructed in such a way that the top of UG tank serves as the base for the balloon room, thereby, saving space requirement and construction cost. The waste water or slurry is rich in methanogenic bacteria. Therefore, reusing it not only saves water upto 80% but also increases gas production by 15%. The separated solid from slurry is sundried and enriched with other organic sources to produce Organic Fertiliser which is sold by the APMC brand viz. "Market Organics" in 40kgs bag.

This initiative of the APMC is not solely for profit and should not be the sole motive of any APMC. Farmers grow vegetables in their fields; they put seeds, fertilisers, pesticides, water, labour, time, and money for a better harvest. But, due to situations beyond their control, when their harvest reaches the Mandi, because of glut in the market they may not get remunerative prices and have to dump their produce. Being perishable in nature, vegetables degrade and are thrown away by either farmers or traders. This waste is rich in biomass. Farmers put their money in the form of seeds, fertilisers, etc. If it is simply dumped and treated as other wastes are treated, it is injustice to environment too. Such waste releases harmful methane gas as a major greenhouse gas, emits foul smell, attracts flies, mosquitos, pollutes ground water and other health and environment hazards. It is essential to adopt sustainable disposal methods. The two methods adopted earlier by the APMC were not utilising the thorough potential of such a valuable vegetable waste.

If one considers the transportation and dumping cost of such waste @Rs.1000/MT, (5MT/ day) then, Rs.1.5 lakhs/month could be saved. But the operating cost of the biogas plant like segregating, crushing, feeding and maintaining operations incur expenditure. The by-products like gas, electricity and fertiliser generate additional revenue too. Apart from income generation, the environmental and ecological aspects of it are also taken care of. As a responsible organization, the APMC, Baroda promotes this method of vegetable waste disposal for vegetable markets of the country.

This project of the APMC, Baroda is the first of its kind, in that it operates solely on vegetable waste as a feed. Due to its uniqueness, the operator faced some technical challenges initially, but over a period of time those issues were tackled and the whole system could be refined, fine-tuned for a smooth functioning and better output. It can be standardised in near future for other such markets to follow.

This should be promoted as a part of "Swacch Bharat Abhiyan" and sets an example of disposal of waste at source, which saves environment by reducing vehicular pollution to carry such waste at dumping site. This can be a holistic solution for growing height of heaps of garbage around our cities, which are growing taller than Kutubminar, as quoted by the Apex Court recently.

Facilities at APMC, Baroda

Agricultural Produce Market Committee, Baroda has developed a modern Market Yard in an area of 30 acres called Sayajipura Market Yard on the NH8 near Ajwa Chokdi Baroda. Sayajipura Market Yard has 259 Grain shops, 183 Vegetable Shops, 35 Fruit shops and 42 Sundry Shops. Sayajipura Market Yard has wall to wall RCC road where main road is 100 feet broad and other roads are 80 feet broad which can handle any kind of traffic for three decades. Two weigh bridges of 50 tonnes capacity each for the weighing the agricultural produce brought by the farmers in the market yard at free of cost. The Market Yard has a sump with a capacity of 2 lakhs litre and a overhead tank of 1 lakh litre capacity available for the requirement of market users. The Bio-gas plant is installed to generate electricity from the vegetable waste and slurry of the waste is used to manufacture bio fertilizer. A Soil Testing Laboratory is started for testing soil samples from the farmers. Sewage Water Recycling Plant is installed which is working on electrolysis method to clean the sewage water and reuse it. Rain Water Harvesting System is used for recharging bores in Sayajipura and Hathikhana Market Yards to raise the water table and quality of underground water. A Cold Storage of 3750 MT capacity is available to store all the spices and food grains. To ripen fruits like mango and banana, five Ripening Chambers of 20MT capacity each is available. Besides these, a Guest House of 50 beds capacity is available for the farmers. A fully air-conditioned Farmer Meeting Hall with a capacity of 300 seats is also available at the Market Yard. For the security of the Market Yard, 42 CC cameras are installed and can be monitored from one place. A coupon of Rs. 10 is given to every farmer who visits the market with his produce. Farmers can use the coupon in the canteen of the market. Other facilities such as the Computerised Entry to ensure transparent collection of user charges and speed up the process; Assistance in maintenance/retrieval/analysis of data; a clean Yard; solar roof top; ultra-modern farmer training centre; rest rooms etc., create an impression of

systematic yard management besides a feeling of a different kind of a market yard in the minds of the farmers/traders. Overall these facilities raise the efficiency of APMC staff and of the yard in general. These facilities are the major attraction for its stakeholders in comparison to other nearby APMC markets.

Publications

APMC, Baroda has its own website where all the information is published. Website of APMC, Baroda is the only website in APMC of Gujarath who introduce new concept of 360* tour where virtually everyone can journey through the whole market yard.

Reasons for the preference of APMC, Baroda by Farmers/Traders

Earlier from 1988 to 2005, for about 17 years, the wholesale vegetable market was in the city area in 2.2 acres of land. The traffic congestion in the city as well as within the yard was a routine problem. Traffic rule evasion, pollution and wastage of the time of the farmers, traders and the commission agents were common as loading/unloading used take a long time. Due to less number of shops, monopoly prevailed.

In the year 2005, this market shifted to highway on Baroda bypass road in 30 acre of land with wide roads sufficient parking space and increased number of shops. Entry of new commission agents/traders and loaders created healthy competition which proved beneficial to farmers and traders. Farmers can go home in the same vehicle as their vegetables get sold within 1-2 hours and cash paid to them. A class infrastructure like wall to wall RCC roads, toilet blocks, adequate electricity supply, all electronic weighing scales, proper maintenance of plumbing, electricity, roads and all other yard facilities. APMC practically solves almost all the problems of the farmers/traders and protects and develops the business of the yard by building trust among them. Commission agents/traders of Baroda are honest, well mannered, giving reasonable credit in market and have generated good impression in the State. All vegetables in any quantity can be purchased and sold/loaded at Baroda market. Therefore, farmers with huge harvest trust Baroda Market and loaders can load sufficient quantities to Mumbai, Bhopal, Rajsthan etc.

Opportunity and challenges

Being a Model Market Yard in the State, the APMC, Baroda has the responsibility to support and guide the other APMCs in the State.

District	Name and complete address of APMCs with PINCODE number	Name of Market Secretaries	Landline office number with STD Code	Mobile Number	E-mail address
Vadodara	Agriculture Produce Market Committee. Market Yard, Vadodara Dist, Vadodara	Shri S.K. Chavda	0265 2423831	9879524005	apmcvadodara@nic.in
	Agriculture Produce Market Committee. Market Yard, Chhottaudepur, Dist. Vadodara	Shri S.K. Panchal	02669 232133	9537372505	
	Agriculture Produce Market Committee. Market Yard, Jetpur Pavi, Dist. Vadodara	Shri K.H. Koli	02664 242135	9624666255	
	Agriculture Produce Market Committee. Market Yard, Karjan, Dist. Vadodara	Shri Y.M. Patel	02666 232042	9825765335	
	Agriculture Produce Market Committee. Market Yard, Padra Dist. Vadodara	Shri A.B. Patel	02662 222234	9424757805	
	Agriculture Produce Market Committee. Market Yard, Savli, Dist. Vadodara	Shri G.M. Patel	02667 222224	9825849446	

	Agriculture Produce Market Committee. Market Yard, Bodeli, Dist. Vadodara	Shri A.G. Bhagat	02665 220415	9825855615	
	Agriculture Produce Market Committee. Market Yard, Shinor, Dist. Vadodara 391250	Shri K.C. Patel	02666 241254	9879512026	
	Agriculture Produce Market Committee. Market Yard, Vaghodia, Dist. Vadodara	Shri D.H. Patel	02668 263462	9925709731	
	Agriculture Produce Market Committee. Market Yard, Daboi, Dist Vadodara	Shri M.S. Patel	02663 255108	9909532518	
	Agriculture Produce Market Committee. Market Yard, Kwant, Dist. Vadodara	Shri J.B. Joshi	02669 254146	9427350656	
	Agriculture Produce Market Committee. Market Yard, Naswadi, Dist. Vadodara	Shri Z.B. Chauhan	02661 272208	9427075172	

Farming as an Enterprise :

The Journey of a Landless Farmer

Dr. Shalendra

In Brief

The case reflects the experience of Mahendra Saini practicing farming as an enterprise and his ability to capture opportunity, earn profits and mitigate risk associated with farming through effective decision making and efficient management. The decision making of Mahendra Saini under uncertainties associated with agriculture metamorphosed him to be an effectual entrepreneur. He left the job in an established company dealing in inputs and tried his luck in farming with limited resources and no land. He could establish himself in just three years of initiative and suggested that farming is profitable if conceived and executed as a business. He feel that agriculture is not so much about land, finance and other resources but knowledge, tapping opportunities, decision making, hard-work and perceiving risk in correct perspective.

Background

Mahendra comes from a moderate family from Rajasthan. He is the youngest of the five siblings. He lost his father when he was only one month old. He was bought up by his mother along with his siblings by earning from a small piece of agricultural land and support from her father. In spite of the limited resources available and traditional background, his mother took all the possible efforts to provide the best possible education to her children. Mahendra completed his schooling from the school available at his native village and joined a private college in Jaipur to earn his graduation degree in Biology. After completing his college, he joined a private company as field officer with a responsibility to popularise the input based product of the company among farmers. After gaining some experience there, Mahendra joined Dhanuka with to promote the products of the company. He worked in various districts of Rajasthan like Jaipur, Sikar and Jhunjhunu for three years during his association with Dhanuka. This provided him the opportunity to understand the modern input based agriculture. His stay at the competitive corporate experience made him understand that a graduation degree would not be sufficient for professional growth. This made him join MBA

programme at the Amity University, Jaipur with a specialisation in human resource and marketing. The MBA programme helped him get an assignment at Syngenta. It was the learning and exposure gained during the MBA programme which helped him realise the potential of agriculture. He was clear that soon he would like to start something of his own. Considering, seed production as a potential option he opted to start with the R&D wing of the company at Pune.

His experience at Syngenta helped him understand the product development but his previous assignments dealing with production promotion through demonstration for farmers provided him the opportunity to develop good repute with the farmers. The experience of working with farmers in real field made him understand the importance of quality inputs and efficient management in agriculture and also realise the true potential existing in crop production.

The Idea

During his experience of working with farmers, he realised that there is severe gap between the yield levels achieved by the framers and potential yield of a crop for factors like quality and reliable inputs, technology adoption, knowledge and efficient management. This made him realise the business potential existing in crop production. During this time only he started getting serious about his aspiration to start a venture of his own. He felt that the understanding he gained about agriculture, the realisation of business opportunity existing in agriculture, and the network that he created during his stay with farmers and different inputs companies made him inclined towards starting something of his own.

Still there was something stopping him from taking the final leap. His qualification and established job helped him get married to an educated girl. They were more sort of the weekend couple with Mahendra being placed at Pune and his wife working as lecturer in a private college in Jaipur. He used to visit his family on weekends. But, this time he could not visit his home though his office was closed for three days on the occasion of some festival. Instead he got to visit his office colleague in Indore whose father was a successful horticulture farmer. He was informed by his friend that last season his father earned a profit of 18 lakhs from 3 acre cultivation of marigold practicing poly-house based cultivation of marigold.

These were some astonishing figures forcing him to once again consider his quest to start his own venture. He cross verified the figures for yield, market price and profit calculation and was surprised to see agriculture profitability in contrast to general perception of being a business of high risk with low returns. He was aware about his aspiration to start something of his own but it was his stay at the Syngenta's wing dealing with research and development that helped him consolidate the idea into a business by focusing on its various aspects.

The Start-up Decision

Mahendra was clear by now about what he would like to start with. Some of the challenges he anticipated were to make his family understand about his decision for many reasons like, he already was in a good job, in his family circle a job was considered socially better than farming, limited resources and above all venturing into agriculture without much land. Agriculture, in general, has not been considered profitable even when land is available for free. Mahendra was advocating agriculture on leased land. For most of the farmers, it is not wise to make investment in technology like poly-house and drip irrigation on their own field when you can have extended recovery period. Here, someone is suggesting a model where all this was to be done on land arranged on lease (or other arrangement) within a given period of time. His decision was made further complex by some development at the family front. His responsibilities were going to increase as his wife was on family way to have their second child.

He was convinced with the idea to the extent that he was looking only at the opportunities available in the sector where everybody else was reluctant to take-up due to perceived risk associated.

By the start of 2014 with a saving of just Rs 2.0 lakhs, Mahendra left his well-established job to follow his aspiration to start something of his own. The path was tough ahead but he was convinced and planned for baby steps considering the risk.

Starting-up

The first task was to arrange land for getting things started. His contracts developed during his stay at his job come to his rescue. Shri Babulal, the contact developed while conducting field demonstration, was the Pradhan of a Panchayat and actively involved in local politics. He was finding it tough to

manage the land inherited by him. He was using a small portion of land for cultivation of fodder for the livestock maintained by him but was not sure of the rest of the land. He had always been supportive to Mahendra for organising demonstration for promoting the product of the company Mahendra represented when he was in service.

More than 31 percent households in India are landless having no ownership of land with another 29.82 percent farmers operating on landholding of less than 0.4 hectare (Exhibit 1). On the other hand, about 12 percent of the area is owned by only 0.52 percent of households leading to landholdings of larger size exceeding 10 hectares. This concentration of land, in the absence of efficient management, many times encouraged land being left fallow or operated inefficiently. Improved tenancy law would help in improving rural poor's accessibility to land through leasing, discourage land being kept fallow and increase much needed occupational mobility of the rural people (GoI, 2016).¹ Accordingly, the Ministry of Rural Development has drafted a National Land Reforms Policy to address this menace. There is no legal ban on leasing in Rajasthan, though there are several restrictive clauses and about 8 percent area cultivated in the State is under lease (Exhibit 2).

Shri Babulal once mentioned to Mahendra to suggest something for the fallow land available with him. Mahendra thought of exploring the possibility to get the land to implement his plans. After initial discussion and negotiation, 6 acre land was made available to Mahendra for 3 years at a reasonable charge which was to be paid in instalment after every harvest. The reputation earned by Mahendra, while working for his company, came handy in arranging land and information.

The next challenge was to develop a crop plan. He planned to go for four different crops he already had the knowledge to cultivate. He practiced diversification in terms of crops, variety and sowing time to minimize the risk associated with cultivation. Though the land was available with nothing to be paid up-front, there were requirements for financial resources to pay for expenditure to be made towards land preparation, procuring seeds, chemical and fertiliser, arranging labour and various other items. His stay at input companies made him understand that application of genuine, reliable and quality seeds as one of the most important factors defining the success in production. Though cheap inputs were available and he was struggling with limited availability of cash, he made it a point to use only quality inputs. He

was ready to pay higher prices for quality seeds than for normal seeds available in the market. He always purchased quality seed from the reliable sources with bills.

His first year of experience was about practicing cultivation in most basic manner and was relying only on quality seeds, other inputs, cultivation practise and efficient management of crops. He took four crops namely cucumber, tomato, water-melon and chillies. The total production helped him earn a gross of Rs 4.65 lakhs within five months time. He had a surplus after paying for input cost towards seed, FYM, chemical and fertilisers, labour and other miscellaneous expenditures.

His first crop harvest provided him some profits after repaying the cost and the support of Rs 1.25 lakhs that Mahendra had borrowed from his elder sister. This small step in the right direction helped him feel confident about his capabilities as a manager and farmer.

Risk Economics

Farming teems with risks. The farmer is exposed to various risks and he deploys various risk management tools to minimise them (Exhibit 3 & 4). The experience of Mahendra with farming suggests in contrast to the general perception associated with agriculture about the risks. He revealed that he followed a crop plan to reap 3 harvests every year. He never repeats the same crop on a particular piece of land and positively applies the prescribed doses of FYM and other inputs. So far, he had 7 harvests in last 3 years and has generated profits on 6 occasions being indifferent on one occasion. Mahendra has achieved this when most of his resources are hired like land, labour and investment towards technology.

He feels that the best counter strategy to manage risk is to utilise the resources to their fullest potential like land in terms of taking maximum number of crops possible and crops in terms of yield and market in terms of prices.

It is also important to perceive the risk appropriately. Profits and loss must be analysed for a cycle of one year, at the minimum. Besides, calculation needs to be made taking into consideration the variation in yield and prices.

Normal Day

He says: The experience has been highly involving for me so far. Every day I start my day at around 4.00 am and leave my house after completing my daily

chores at around 5.30 am for visiting my farms.

The farms being operated by Mahendra are spread over an area of 15 kms. He makes it a point to visit every farm daily. The important operations are always undertaken under his supervision like preparation of bed, transplanting, fertilization, chemical treatment and harvest and preparation of crop for the market.

He says: I stay at the farm till evening but will take a break of about 2 hours for which adequate infrastructure has been developed at the farm itself. Agriculture is about involvement and hard work. You have to involve yourself fully in every important operation on regular basis to achieve the desired results.

It is important to plan properly and equally important is to take every measure to ensure true implementation of the plan.

Marketing

Marketing is a very important aspect and leave its influence right from sowing. For Mahindra, sowing design is influenced by two aspects namely risk and market. Same crop or variety is never repeated by Mahendra on two plots. This diversification provided him protection against the risk from insect, pest, diseases and price volatility. Diversification can be a major game changer in agriculture. It can be of three types, viz. product (high value enterprises), process (precision farming), and time diversification (delinking from seasonality).

Mahendra would take a note of the sale of seeds of different crops in the region from seed distributors and market prospects using his linkages developed during his service to reach at a decision on crops to be sown. The sowing pattern followed by fellow farmers is also taken into consideration to diversify in terms of sowing time. Mahendra followed a comprehensive plan to market his produce (Exhibit 5), which consisted of searching the best market in nearby States and taking produce like tomato to market after grading. Appropriate technology is installed at the field for tomato grading.

Technology

Adoption of technology has played an important role in the success of Mahendra. Most of his farms have drip irrigation installed. The area under poly-house and shade-net has also improved over years. Farm level low-cost grading facility with a capacity of 300 crates per day has also been installed with a cost of Rs 12000. Mahendra has also shown innovation in deploying

technology as has been observed in case of drip irrigation. The temporary arrangement for drip irrigation with the facility for reinstallation has also been experimented with, in case the land is not available for longer duration.

Mahendra kept on experimenting with the cropping system as well. He has experimented on his own of cultivating ridge-guard with cucumber. Use of mulching and other basic thing is common on his farms.

Growth

Mahendra has registered an overwhelming growth in terms of area cultivated, technology installed and the number of farmers linked for availing land (Exhibit 6). The number of persons engaged in the farm operations have also increased. But, still following the same model of farming seems to be a centred around Mahendra.

Way Forward

Mahendra has established a reputation for himself by helping to get as much land as he wants. He has also successfully learnt the art of cultivation and experimenting with product, technology and market. His marketing strategy is mainly traditional. However, now he is looking for linkages with bulk buyers. He also wants to diversify towards crops with high value and scope for value addition. All the elements like hiring of labour, technology, finance, marketing and networking are managed by himself. Now he has started feeling the toll of the same and may need to come up with some structured model to sustain the growth and excel further.

Exhibit 1. Distribution of ownership holdings of land, India (NSSO 2003-04)

Category (Hectares)	Proportion of Households (%)	Proportion of Area Owned (%)
Landless	31.12	00.00
> 0.4	29.82	05.11
0.4 - 1	18.97	16.89
1 - 2	10.68	20.47
2 - 3	04.22	13.94
3 - 5	03.06	16.59
5 - 10	01.06	15.21
> 10	00.52	11.77

Source: GoI, 2013

Exhibit 2. Proportion of Leased in Area in Various States

Sr No	States	Leased Land (%)
1	Andhra Pradesh	33.75
2	Assam	4.21
3	Bihar	21.04
4	Chhattisgarh	9.45
5	Gujarat	5.63
6	Haryana	14.90
7	Himachal Pradesh	5.20
8	J&K	0.15
9	Jharkhand	1.90
10	Karnataka	6.71
11	Kerala	8.55
12	Madhya Pradesh	5.05
13	Maharashtra	3.40
14	Manipur	7.58
15	Meghalaya	4.13
16	Mizoram	1.60
17	Nagaland	1.08
18	Orissa	16.61
19	Punjab	24.62
20	Rajasthan	7.76
21	Sikkim	18.21
22	Tamil Nadu	13.87
23	Telangana	13.56
24	Tripura	4.75
25	Uttaranchal	4.08
26	Uttar Pradesh	7.56
27	West Bengal	14.25
28	All India	10.10

Source: GoI, 2016

Exhibit 3. Key Risks Faced by Farmers

RISK	FACTORS	EFFECTS
Weather risks	Rainfall or temperature variability or extreme events	Lower yields, loss of productive assets or income
Biological risks	Pests, disease, contamination	Lower yields, loss of income
Price risks	Low prices, market supply and demand, volatility	Lower prices, loss of income
Labour and health risks	Illness, death, injury	Loss of productivity, loss of income, increased costs
Policy and political risks	Regulatory changes, political upheaval, disruption of markets, unrest	Changes in costs, taxes, market access

Source: https://www.agriskmanagementforum.org/sites/agriskmanagementforum.org/files/Chapter_1_WII_Paper_Nov_2011.pdf

Exhibit 4. Risk Management Tools

Severity of Risk	Potential Risk Management Mechanism			
		Household/ Community	Markets	Governments
	Nonspecific	Sharecropping Farmers SHG Water Resource Management	New technology Improved seed	Irrigation infrastructure Extension Agricultural Research Weather data system
	Low	Crop diversification Saving in livestock Food buffer stock	Formal saving	
	Moderate	Labour diversification Risk pooling Money lenders	Formal lending Risk sharing (input suppliers and wholesalers)	State sponsored lending
	High	Sale of assets Migration	Insurance	Disaster relief State sponsored insurance

Exhibit 5. Marketing

Crop	Market distribution (%)						
	On-field	Jaipur	Punjab	Delhi	Nagpur	Jodhpur	Others
Tomato	--	10	40	20	30	--	--
Onion	40	60	--	--	--	--	--
Cucumber	--	50	--	20	--	30	--
Watermelon	--	100	--	--	--	--	--
Chillies	--	60	--	40	--	--	--
Cauliflower	--	50	20	30	--	--	--
Marigold	10	40		20	--	--	30

Source: Field survey

Exhibit 6: Growth

Year	Area (Acre)	Person Associated	Poly-House (Acre)	Crops Covered
2014-15	06	01	1	Tomato, Cucumber, Watermelon and Chillies
2015-16	15	03	3	Tomato, Cucumber, Onion and Cauliflower
2016-17	80	64	7	Tomato, Cucumber, Cauliflower and Marigold

Source: Field survey

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Note

The case is about a landless farmer but not of a resource poor farmer but holds true for the mismatch being faced by Indian agriculture in terms of land distribution with more than 60 percent household cultivating on just above 5 percent of area and just 1.58 percent households enjoying ownership of more than one-fourth of the area under agriculture.

Farmer Producer Company : A Game Changer

Dr. Shuchi Mathur

We are gradually moving towards resilience against the dependence on rainfall for successful harvest. But there are a few structural challenges which Indian farmers face as barriers between them and the market. The constraints which hinders their growth and market viability are poor market infrastructure, credit unavailability from formal channels, access and knowledge about market, information asymmetries, interlocking of factor and product market, lower bargaining power and holding capacity, higher input costs and output yield due to fragmented buying and selling and competition from other forms of private organisations in the market etc.

When I was on field visit to Odisha, I met a person, Mr. Satish Doni, CEO of Farmer Producer Company, Jharkhand. The man was in bad shape with a depressive thought about the success of his company. While discussing with him, he shared lots of issues / constraints he faced while setting up of the Farmers Company and that made me reflect over the constraints and the hurdles and also as to how the successful FPOs negotiate their path to a telling success!

Issues that Invited FPOs as an alternative

Collectivisation of farmers is a good old strategy which has benefitted many farmers across the world. It helps economies by bringing down the input costs, better bargaining power and magnifies the voices of farmers as a collective voice. The most common form of collectivisation that Indian farmers have adopted in the form of producer organisations over the years are Cooperative Societies, Self Help Group, Farmer Clubs.

While many of these structures are operating in the country, cooperatives as a form of institutional structure have been adopted by most farming and non-farming communities. But over a period of time, the cooperatives have failed miserably due to problems of intense political interference and capturing of management by poor leadership and powerful elite. Apart from facing a lot of bureaucratic control by government in its day to day functioning, they had an issue of not being business oriented. Therefore, there was a constant search and need of creating an institutional structure that can withstand these

challenges and constraints while maintaining the ethos of cooperation for farmers' collectivisation.

Fraught with a need for an institutional structure that consists of the ethos of cooperation on the one side, and the business resilience on the other, the Government of India came up with a new institutional form called 'Producer Companies' in 2003.

Salient Features of a Farmer Producer Company

Corporate body registered under the Indian Companies Act 2013.

Ownership and membership of such companies is held only by 'primary companies' or 'primary producers' or 'Producer Institution'

Member's equity cannot be traded. Can be transferred only on approval of BODs of Producer Company

Minimum 10 producers required to form the company

PC can operate in entire country

Overview of the Ajaymeru Kishan Samruddhi Producer Company Limited

The district of Ajmer falls under Western Dry Region of the agro-climatic zones of the country (Department of Agriculture, 2011). It lies in the transitional plain of the inland drainage zone. Approximately 50 per cent of the land in Ajmer district is under agriculture (4,22,000 hectares out of total 8,43,600 hectares). More than 85 per cent of the agricultural land in Ajmer district is rain-fed. Of the 67000 hectares of land that is under irrigation, the primary source of irrigation is open wells. According to the State Ground Water Department, out of the 8 blocks in Ajmer District, the state of ground

water is over-exploited in 7 blocks and critical in 1 block. The major field crops cultivated in Ajmer District include Sorghum, Pulses, Mustard, Gram, Wheat, Barley and Cotton. Agriculture in the district is prone to regular drought and occasional heat and cold wave, frost and outbreak of pests.

The Ajaymeru Kishan Samruddhi Producer Company Limited was established on February 27, 2013 and registered under Companies Act 1956. The company assimilated about 82 Farmer Interest Groups as part of the company. Each farmer interest group, comprising 10-20 farmers nominates their president, secretary and a treasurer. The president of each farmer interest group represents their group at the Block Level Committee. The Block Level Committee elects the Board of Directors of the Ajaymeru Kishan Samridhi PCL, who reviews the performance and takes strategic decisions for future work of the Producer Company Limited. Ajaymeru currently has 11 elected Board of Directors. The Board of Directors also has two professional members, who are not representatives of the farmers but monitor and mentor the management and business generation for the FPO. In accordance with the reservation policy of the FPO, the board of directors of the FRO consists of representatives from SCs, STs, OBCs and Women.

Ajaymeru Kishan Samruddhi PCL, like other companies, has a Chief Executive Officer. The CEO is a nominated professional member on the Board of Directors. He plans, executes and reviews the progress of the FPO and provides a vision for the future development of the FPO. He guides the Board of Directors on new technologies or inputs that can be adopted or promoted by the Producer Company Limited with the support of his networks of agriculture experts. The CEO is the link for the government agencies and procurement agencies. At present, Mr. O N Sharma is the CEO of the AKSPCL.

Process of Formation and the Success of the AKSPCL

Based on various exercises like focused group discussions for social mapping of farmers, the FPO mobilised farmers from 22 villages in Kekri, Ajmer District.

The Ajaymeru Kishan Samruddhi Producer Company Limited was provided with equity grant of INR 10 lakhs. The equity grant is a cash infusion, equivalent to the amount of shareholder equity in the Farmer Producer

Company (FPC), subject to a capital of INR 10 lakh per FPC. As per the grant scheme, 50 per cent of the amount was collected through contribution from farmers in the form of shared capital.

The SFAC empanelled BASIX as the resource organisation for community mobilisation to identify and form farmer groups that would constitute as members of the Ajaymeru Kishan Samruddhi Producer Company Limited. The SFAC, with its expertise, supported the FPC in the community mobilisation.

Ajaymeru was registered by the SFAC under the National Commodity and Derivative Exchange (NCDEX). It supported in facilitating the procurement possibilities for the Producer Company Limited.

The Objectives of the Ajaymeru Kishan Samruddhi PCL

- 1) To reduce the hoarding and black marketing of agricultural inputs, and to provide access to agricultural inputs at MSP to member farmers.
- 2) To project the company as a brand of trust with the sale of quality agricultural inputs and to provide compensation for its product failure, if any.
- 3) To build a strong balance sheet, i.e. net profits for the company by focusing at building credit in its bank account to increment liquid assets for procurement and buying operations.

The membership fees is Rs. 1000/- for each farmer-member. Over a period of time, as the members increase, the amount of share capital too would increase. Ajaymeru Kishan Samruddhi Producer Company Limited provides following services to the member-farmers:

- 1) Ajaymeru Kishan Samruddhi PCL (AKSPCL) procures agricultural inputs from various government and private companies of fertilizers, pesticides and seeds etc. The AKSPCL sells fertilizers on the MRP, seeds at the minimum profit margin (4%) and pesticides at a margin of 7% of the product price. The company conducts demand mapping by collecting information from all farmer groups and accordingly plans the purchase of the inputs.

- 2) The company aims to provide quality inputs to the farmers. In order to ensure this, AKSPCL utilises services of the network of experts from the local agriculture universities.
- 3) The company carries out procurement for State / Central Government as well as for private retailers in the last five years of its existence. The most promising client for pulses procurement is the State / Central pulses inventory; and for this the company sets up units for procurement. Based on the set benchmarks, standard and quality produce is procured from the member-farmers.

Fiscal Discipline and Strategy Adopted

Considering the enormity of the expenditure on the salary of the managerial and technical staff, the AKSPCL reduced the gross profit of the company. The CEO of the company devised a strategy to reduce the expenditure by conducting capacity building training programmes for other FPOs in the State with his managerial skills, especially to the FPOs developed by government agencies like the SFAC and NABARD.

The AKSPCL had a clear understanding its frail financial strength during the formative years of its establishment and the limited working capital available for its operations of procurement and buying of large-scale agricultural inputs. Therefore, in order to create an internal corpus of funds, the company decided not to share any dividend for the first three years with the members. This enabled the company to utilize the profits to be available as the working capital for its business operations.

Overview of the Financial Status of AKSPCL

1. Revenue Statement

REVENUE STATEMENT	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Sales Account	5669614	13858157	17458734	1385157	58211341
Direct Income	20370	92421	752608	98225	203367
Closing Stock	87695	678374	5803193	270118	2795803
Indirect Income	528658	1212196	60300	1214436	34870

2. Expenses Statement

Cost/Expenses	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Opening Stock	0	87693	678374	590680	5446385
Purchase Account	5518499	14021288	21974273	14021288	59766793
Direct Expenses	155726	258639	203313	634792	729302
Indirect Expenses	591501	946679	729453	270118	606968

3. Net Profit

Particular	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Net Profit	40610	526852	492422	530385	102628

SWOT Analysis of AKSPCL

The AKSPCL is a model producer company limited. At the same time, it has to make concerted efforts to overcome its shortcomings and get prepared to take advantage of the available opportunities.

Strengths

- Procurement of Agri-Produce (Company Produce) by SFAC (Government of India) results in getting 1% additional commission on the total value procured.
- Company provides foundation seeds to its members under the National Seed Corporation's Scheme which assures to buy the seeds from farmers, in return.
- Progressive management and governance system in place.
- Transparent payment system-digital / cheque.

Weakness

- Company lacks managerial and technical support to understand the sentiments and relationship of the market and marketing.

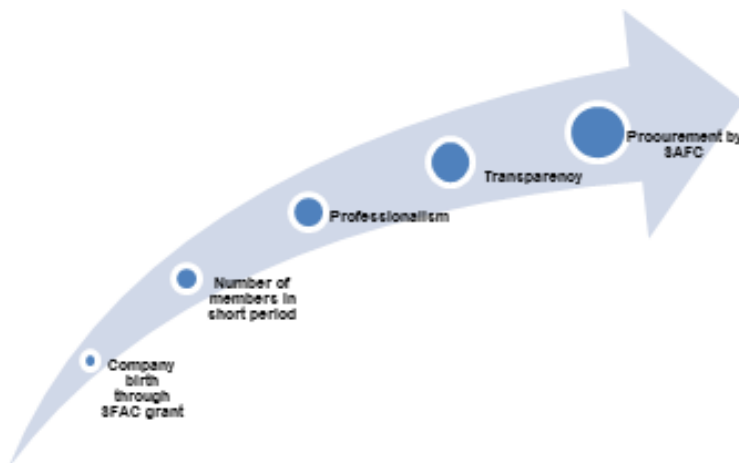
Opportunities

- Company is exploring the niche market of organic agricultural produce and thereby reduce the dependency on government support. This would help in reducing the cost and operation of purchase and supply of fertilizers and pesticides for the member farmers.
- Providing trainings to the other Farmer Producer Organizations.

Threats

- Private input suppliers and traders often spread disinformation amongst the member- farmers. Any failure by the company becomes the game point for them.
- Natural disasters and climate change.
- Price fluctuation of the produce.
- Sometimes differences of opinions and conflicts among the members.

Reasons for replication of Ajaymeru Kishan Samruddhi PCL



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Success Story of Seed Producer

Dr. S.R. Singh

Seed is an important input for growing crops. Growing crops particularly for the purpose of seed production is an optimistic approach to farming because it fetches remunerative prices and helps the fellow-farmers acquire quality seeds for achieving better yields. Apart from the governmental and non-governmental agencies, individuals too whole-heartedly involve themselves in quality seed production. One such individual is Mr. Bajrang Lal Sharma. He produces Notified and Foundation Seeds of different crops on a commercial basis and sells them to his corporate clientele. With a penchant for professionalism, he intends to augment his seed production venture by taking up commercial production of hybrid seeds of a few important crops. A venture of this kind demands specialized infrastructural facilities, technical guidance and expertise. For this purpose, he has approached some experts and a few seed companies for guidance. His entrepreneurial approach to seed production has not only wrought him to be exceedingly professional but also placed his entire family in a financially comfortable position.

Bajrang Lal Sharma, the Seed Grower

The 44 year old youthful farmer, Bajrang Lal Sharma, hails from Etawah Badhal, a village near Chomu, in the district Jaipur Rural. Along with his brother, Mr. Sharma began his livelihood as a farmer with a traditional approach to farming. For a joint family of their kind, where every family member contributes to the parental occupation, the paltry income through their efforts was quite inadequate for their household needs. Therefore, he began producing seeds of different crops on a small scale. The Sharmas own 7 acres of land. Life dragged itself with the mundane demands as has been the usual routine, until 2003.

While other farmers are into traditional and conventional farming, today Mr. Sharma is the only farmer who is into seed production in the Etawah Badhal area. The will to take risks and challenges, unhesitant approach to new ventures, innovative approaches, leadership qualities and communication skills for a better socio-economic status are some of the factors that engendered the study to select Mr. Sharma.

Before travelling through the triumphal-path of Mr Sharma, it is necessary to understand the background of the Indian Seed Industry, in brief.

Indian seed industry

Seed is the basic and most critical input for sustainable agriculture. It is the base for good quality of production of crops. The response of all other inputs depends on the quality of seeds to a large extent and it affects the production of crops. It is estimated that the direct contribution of quality seed alone to the total production is about 15-20% depending upon the crop, and it can be further raised up to 45% with efficient management of other inputs. Hence, we can say that quality seed plays a vital role in the production of crops. The development of the seed industry in India, particularly in the last 30 years, is very significant and a lot of varieties have been developed by various research institutions for the wellbeing of agriculture. Due to the quality seeds, crop production, in our country, has doubled or sometimes it has tripled helping our country meet the demand of food security. A major restructuring of the seed industry by the Government of India through the National Seed Project Phase-I (1977-78), Phase-II (1978-79) and Phase-III (1990-1991), was carried out. This strengthened the seed production infrastructure that was most needed and relevant around those times. This could be termed as the first turning point in the shaping of an organized seed industry in the country. The introduction of the New Seed Development Policy (1988-1989) was yet another significant milestone in the Indian Seed Industry, which transformed the very character of the seed industry. The policy gave access to the Indian farmers the best of seed and planting material available anywhere in the world. The policy stimulated appreciable investments by private individuals, Indian Corporate Houses and MNCs in the Indian seed sector with a strong research and development base for product development in each and every seed company, with more emphasis on high-value hybrids of cereals and vegetables, and hi-tech products. As a result, the farmer now has a wide product choice and the seed industry today is set to work with a 'farmer-centric' approach and is market driven.

The State and Central Governments are giving high priority to the uplift of the rural economy through the development in agricultural sector. Seed being vital to agriculture, continuous efforts are being made to ensure availability of quality seeds to the farmers in order to sustain the agricultural

development. Without the quality seeds, production of quality crops is impossible. Small wonder then that Mr. Sharma chose to venture into seed production for his livelihood.

Initiation of Mr. Sharma into Agribusiness

In 2003, Mr. Bajranglal Sharma attended a training programme organized by the State Institute of Agricultural Management (SIAM, Jaipur) under the Agriclincs and Agribusiness Centres Scheme sponsored by Ministry of Agriculture at the Technology Support Centre for Vetiver Industry, Dholpur, Rajasthan, a centre of MSME, Government of India. It had brought about a drastic change in his thinking, attitude and working style. He decided to become a seed grower rather than a traditional farmer. He metamorphosed himself into a complete and a self-reliant farmer within a short period of time by adopting the seed production as a commercial venture. Further, he expanded his seed production business steadily and gradually. He began the cultivation of crops for seed production with just one acre of land and by 2014 he is a registered seed grower! Now, he is a commercial supplier of seeds of various crops to many reputed seed companies throughout the country.

During the training period, the Centre identified his risk taking abilities, desire for innovative approaches for additional income generation and farm management skills. In this process, Sharma has been converted into a man of courage who has set himself as an ideal for others in the Etawah Badhal area. He was encouraged and motivated by the training programs to take up seed production as a challenge. With great courage he ventured into it with full dedication. He is very positive and keen to adopt new technologies available in the seed sector which have helped him take the right decisions. He earns about Rs. 30 lakh per annum from the seed production and allied businesses. He has become a "role model" in his village and nearby areas for the success he has achieved as a progressive seed grower. Presently, he is also running a "Kisan Sewa Kendra" for the benefit of the nearby farmers providing support with the new technologies, inputs and farm advisory etc.

The rapid growth of Bajrang Lal Sharma

For the last 14 years, he has been growing crops like mustard, spinach, sasbania (green manure), cluster bean (for guar seed and vegetable), coriander, sesame, ridge gourd, pearl millets and Sorghum for fodder and

seeds. However, he started seed cultivation of spinach, coriander and ridge gourd crops and now has been extended to other crops. Moreover, after enjoying the fruit of success, he managed to hire the land from other farmers for seed production. It depends on the demand of the seed from the market. Accordingly, he decides to hire the land up to 60-70 acres from nearby farmers. Enriched by his postgraduate qualification, he believes in hard work and sincere efforts in his endeavours. Other farmers in the village respect him for his perseverance and experience in the field. When any farmer in the village is in crisis, he is there with him till a solution is arrived at. That is the reason why he has become a lead-farmer with a remarkable success. He is only the seed grower in the area and turned into a successful agripreneur by doing seed production business.

Requirements to be a Successful Seed Grower

The essential factors that constitute a successful seed grower are an active farm, a processing plant and other infrastructural facilities, electricity, raw material, manpower, knowledge of marketing of seeds, credit availability and entrepreneurial skills etc.

The Active Farm

An active farm is a piece of fertile and tillable land with irrigation water availability suitable for seed production. Mr. Sharma has 7 acres of land owned by his family which is being used for the production of seeds. To make it a profitable business, all the family members and hired labourers (need-based) work hard on this piece of land. The land is jointly owned by the two brothers of the Sharma family. Extra area of land also is leased in whenever more seeds are demanded by the seed companies. The farm has micro-irrigation facilities submersible pumps for seed production.

The nature of the farmland is sandy loam, sandy and clay sand and is slightly red coloured. He has assured irrigation facility at the farmland with a submersible pump connected with sprinkler irrigation. The all seven-acre land is located on a sub-road connected to Chomu which is about 100 kms from Jaipur. Based on demand, he leases about 60-70 acres of extra land with assured irrigation facilities from the nearby farmers. As the land is slightly saline in nature and suitable for cultivation of spinach and mustard while another category of land is used for cultivation of other seed crops. In the year

of 2015-16, he leased in about 83 acres of land from the nearby farmers for production of seeds. Whenever any farmland is leased in by him, he provides all the inputs and 25% of the total production given to the landowner towards rent for the land. The borewell used for irrigation is quite deep and the water table is around 500-600 ft.

The Seed Processing Plant

Mr. Sharma has a well equipped seed processing plant for cleaning, grading, and winnowing operations of seeds. Besides, he has a seed storage facility to store the seeds of spinach, ridge gourd, coriander, sesame, cluster beans and sesbania separately. For additional storage of seeds, the seed processing unit installed at the backyard of his residence is also being used. Seed cleaner is the basic machine required in a seed processing plant. However, cleaning and sorting of ridge gourd is done manually by the farm women.

Considering the ambitious seed production plan of Mr. Sharma, he requires a seed processing plant of 100 kg per hour capacity to meet the present requirements as well as to handle future processing needs. At present, he is using a small seed processing plant for the purpose.

The seed production plan of Mr. Sharma is designed on the basis of demand for different kinds of seeds in the market and it varies from time to time as per the need of the market and seed companies. According to the requirement he has adopted and conforms to the following seed production plan to meet the demands. The seed production plan for last three years is as under:

Table-1: Seed production plan for last three years (Kg.)

S. No.	Season/Crops	Years		
A. Kharif				
		2013-14	2014-15	2015-16
1.	Cluster bean	1200	1100	4700
2.	Cluster bean	200	350	400
3	White sesame	Nil	Nil	400

B. Rabi				
1.	Spinach	3500	3000	48000
2.	Coriander (multi-cut)	1500	1300	8000
3.	Mustard	1100	1500	15400
C. Zaid				
1	Ridge gourd	500	700	1500
Total seed production		8000	7950	78400

Cluster-bean is cultivated for the purpose of gum seed and for vegetable purpose. White sesame is produced for seed purpose in the kharif season. The white sesame was cultivated for seed production on an experimental basis and it yielded about 1 tonne of seeds initially. In the rabi season, spinach, coriander (multi-cut) and mustard were grown for the purpose of seeds. Multi-cut coriander is used for vegetable purpose and after the last cutting of the crop, it is also used for the production of seeds. In the Zaid season, only ridge gourds were grown for the production of seeds of a different crop. He produced 8000 kg, 7950 kg and 78400 kg seeds of different crops in the year of 2013-14, 2014-15 and 2015-16 respectively.

Table-2: Total seed production and area sown during 2015-16

S. No.	Season/ crop	Area sown (acre)	Yield (Qntl/acre)	Total Production (Qntl)	Variety sown
A-Kharif					
1	Cluster bean for gum seed	15	5.0	75.0	SG-20
2	Cluster bean for vegetable	20	-----	-----	-----
3	White sesame	2	2.0	4.0	Jeevan
B-Rabi					
1	Spinach	60	8.0	480.0	All Green
2	Coriander (multi-cut)	20	4.0	80.0	Pant haritima
3	Mustard	22	7.0	154.0	T-59 and Pusa bold
C- Zaid					
1	Ridge gourd	5	3.0	15.0	JPL

Electricity

The Jaipur Vidyut Vitaran Nigam Limited provides electricity and the Rajasthan State Electricity Board supplies power. The power supply is generally required for the purposes of irrigation, winnowing, cleaning of seeds, grading of seeds and for lighting purpose. It is also required for the petrol pump installed on the road near the farm site. However, a standby DG set is also available for emergency and during power failure. To provide hassle free electric supply, he has also installed a solar system on the rooftop of the office of the petrol pump to manage the ATM, Kissan Sewa Kendra, irrigation, seed processing plants and the petrol pump. With the help of the State Government subsidy, he has invested an amount of about 15 lakhs for the installation of solar power system. By this 24 hrs power back up is available to him for uninterrupted power supply.

Infrastructural Facilities

Infrastructural facilities such as buildings, storage, reject-store, processing sheds, cattle sheds, residential house, power tillers, threshers, sprayers, dusters, seed processors, Genset and solar power system are available at the farm for seed processing and for other requirements. Office accommodation is also available at the site to manage all the activities related to seed production and others. He has a two-wheeler and a jeep for transportation.

Table-3: Infrastructure available with the farmer

S. No.	Type of assets	No.	Purchase Value (Rs.)	Present Value (Rs.)
1	Building (Residence)	1	Parental	25.00 lakh
2	Animal shed	3	Parental	2.50 lakh
3	Tractors	Tractor, power tiller and harrows hired time to time on need-based at the time of preparation of land for cultivation seed crops.		
4	Power Tiller			
5	Threshers	1	70000/-	60000/-
6	Sprayers	3	2700/-	2500/-
	Dusters	2	3000/-	2700/-

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“Pearl Jubilee Celebration of CCS NIAM”

7	Gen sets	1	2.00 lakh Kirloskar	
	Solar power station	1	15.00 lakh	
8	Primary Seed cleaners	1	1.30 lakh	
	Gravity Separator	1	2.50 lakh	
9	Seed processor	1	60000/-	
10.	Domestic capital assets	1	25000/-	Not required
	a) Radio/TV	1	70000/-	
	b) Vehicle-two wheeler	1	500000/-	
	c) /four wheeler			

Raw Materials

The raw materials for multiplication of the foundation seed is obtained from the seed companies namely, Rajdhani Seeds, Delhi, Jai Durga Seeds, Delhi, Ambika Seeds, Delhi, New-Tech Seed, Delhi, Known You Seeds, Pune and Vikash Hybrid, Gujarat. The rates of seeds differ from time to time and from season to season. The seeds are available for multiplication without any problem from the seed companies, Krishi Vigyan Kendras and from Daga Seeds. The rates of seeds procured from the companies are higher than the seeds procured from KVK and Daga Seeds. The seeds are procured from the companies on credit basis and that amount adjusted at the time of sale of seeds to the respective company. Generally, he prefers to purchase seeds from the seed companies. It helps in the building a professional relationship which is helpful in the hassle-free marketing of seeds. The details of the purchase of seeds from various companies and the variation in the rates are given below:

Table-4: Rates of the seeds procured by the farmer from various agencies during the year 2015-16.

S. No.	Name of crop		Seed Rate (Rs. per kg.)		
			Purchased from	Company	KVK Daga Seeds
1	Spinach	Rajdhani Seed	200.00	120.00	150.00
2	Coriander	Jai Durga Seed	130.00	100.00	120.00
3	Cluster bean	Jai Durga Seed	90.00	70.00	80.00
4	Ridge gourd	Rajdhani Seed	250.00	210.00	230.00

Table-5: Total expenditure on purchase of seeds during the year 2015-16

S. No.	Crops	Area Sown (acre)	Seed requirement (kg/acre)	Total seed required	Rate/kg.	Total cost on seeds (Rs.)
1	Spinach	60	8	480 kg.	200/-	96000
2	Coriander	20	6	120 kg.	130/-	15600
3	Cluster bean	15	6	90 kg.	90/-	8100
4	Ridge gourd	5	4	20 kg.	250/-	5000

Other raw materials, like farmyard manure is obtained from the farmer's own cattle shed. However, additional FYM is purchased from the Goshala. The stubbles of the crops are converted into compost and it is used as manure. Packing material is procured from the open market. As far as other inputs are concerned, chemical fertilizers are purchased from Gram Seva Sahakari Committee (GSSS) well in time and no delay is reported in the availability of these inputs. Insecticides and pesticides are procured from the open market on the prevailing rates.

Manpower

An adequate labour force is available around the area to work on the agricultural field, processing plant and other activities. This is a wage earning opportunity for the unskilled and semi-skilled rural youth in this backward rural area. Technical expertise is available from the seed companies at the time of planting of crops, roughing, cleaning, grading, packaging and marketing activities. Women of the family also play an important role in handling the in-house activities like winnowing, cleaning, sorting of seeds and cleaning of seed cleaner etc. The well educated boys of the family look after the administrative needs of the seed production business.

Marketing

Mr. Sharma supervises the cleaning, grading, sorting, winnowing and packaging of all the seeds at the farm site suitable for the market. During all these activities around 15-20 % are wastage and neat and clean seeds are sold to the companies. No extra efforts put on the marketing of seeds because he has a good rapport with the seed companies which help him in the marketing of seeds. Generally, loose seeds are sold to various companies like Rajdhani

Seeds, Jai Durga Seeds, Ambika Seeds, New Tech Seeds, New Delhi, Known You Seeds, Pune and Vikash Hybrids, Gujarat on pre-decided rates. No agreement has been entered with any company for the sale of seeds. Therefore, he is free to sell the seeds to those who offer higher prices of the seeds. He always succeeds in the marketing of all quantity of seeds whatever he produced at his farm. Seeds are sold in 50, 60, 80 and 100 kg of gunny bags purchased from the open market.

For strengthening the marketing network, he participates in Kisan Melas, exhibitions organized by the agricultural department, one-on-one interactions through buyer-seller meets organized by the seed companies and Krishi Vigyan Kendras. Mr. Sharma has a very strong network for selling seeds all over the country. In terms of marketing cost, he incurs only purchase of gunny bags, cleaning, winnowing and sorting activities of seeds. In the light of all these, it can be claimed that he has an assured market for the sale of seeds.

Credit Facilities

He has a very strong financial background and he hardly takes credit from the seed companies directly in terms of rupees. He manages his credit requirements through the Kisan Credit Cards that his brother and he possess. He manages the credit need from other sources like Kisan Sewa Kendra, Sale of Milk, rent of ATM shop and income from the petrol pump. He obtains seeds on credit from the companies during the sowing season and the same gets adjusted at the time sale of seeds to those companies. He remits payments of Kisan Credit Cards annually to the bank with nominal interest. It can be said with certain authenticity that Mr. Sharma does not take any cash-credit either from any financial agency or from any company or from any moneylender.

Entrepreneurship

Sharma has become a full-fledged and a successful entrepreneur of seeds. He has all farm machinery required for processing of seeds of different crops. Both the brothers are the owners of all inventory of the land, buildings, processing machinery, tube well, Kisan Sewa Kendra, petrol pump, ATM all are in operation and serving the beneficiaries of the local area. The petrol pump is operated and managed by his son Mr. Gajendra. He is 25 years old and is a postgraduate in Commerce. The Kisan Seva Kendra, E-mitra and the ATM are managed by his brother's son Mr. Prahalad. He is 24 years old and

has postgraduate degrees of M.Com. and MBA. All the family members are jointly managing the agricultural and other activities for the last 20 years.

Opportunities and challenges

There are great opportunities in seed production and its multiplication because it fetches higher incentive to the farmers than the traditional cultivation of crops. Value addition of seed production of spinach, coriander, cluster bean, mustard, white sesame and ridge-gourd also add value to the farmers' knowledge provides better prices. The government policies are also in favour of the farmers and encourage for seed production of vegetables for their betterment.

Mr. Sharma could produce quality seeds due to a well-established marketing network and he is trying to tap the export market of seeds. He is the only seed grower in the area of Itawa Badhal and he is enjoying the monopoly of a seed grower.

Table-6: Economics of foundation seed production

S. No.	Crop	Expenditure/ acre	Gross production Qntl/ acre	Wastage Qntl.	Net production	Rate/ Kg.	Net Value	Net Profit / Acre
1	Spinach	6500	8.00	2.00	6.00	40.00	24000.00	17500.00
2	Cluster bean	6000	5.00	1.00	4.00	40.00	16000.00	10000.00
3	Coriander	9000	6.00	1.00	5.00	60.00	30000.00	21000.00
4	Mustard	7000	7.00	1.50	5.50	55.00	30250.00	23250.00
5	Ridge gourd	8000	3.00	0.50	2.50	140.00	35000.00	27000.00

Problems in seed production

- Assured irrigation facility is the prime requisite for the production of foundation seed in the area of Itawa Badhal because the nature of soil varies sandy to sandy loam. It needs frequent irrigation at the time of production of seeds. It has been briefed by the farmer that the water table is going down every year and now it is around 500-600 ft. from

the ground level. Due to shrinking source of water, only 8-10 sprinklers are operated at a time while before 10 years the number of sprinklers operated was 18-20.

- A net-house is required for multiplication of seeds but this facility is not available with the farmer at present and he is in need of some guidance from the government regarding subsidy on the net-house and other facilities.
- Natural calamities are also a major problem in seed production namely, frost, aphids and hailstorms during the winter season which destroys the crop of spinach and coriander.
- Sometimes, if the farmer is not registered as a seed grower with state government then transportation of seeds from one place to another or inter-state boundaries become more difficult of marketing of seeds.
- No market avenue is provided by the state government for sale of produce.
- Training on production of seed is required for updating the knowledge and changes in the seed industry.

Strength

- Complete infrastructure and knowledge base about the seed production industry are the main strengths of Mr. Sharma.
- Credit facilities are also available in time from the bank in the form of Kisan Credit Cards which is being used at the time of sowing of crops at a very nominal rate of interest.
- Education and training are the foundations for knowledge acquisition from various departments. Therefore, being a graduate, he is taking maximum benefit of education and uses his wisdom and knowledge in the production of seeds.
- The demand for quality seeds are increasing day by day. Guidance from qualified experts is available and is provided by the seed companies from time to time.
- For production of quality seed, new production technology of seed is

available frequently from the seed production companies.

- There is no market failure of seed. The companies purchase all the seed materials in time on the pre-decided price, hence there is a surety of seed market.
- Payment of sale of seed is available in time without delay.

Weakness

- The water table is going down every year due to that irrigation of scattered field is a challenge. Presently, it is around 500-600 ft. from the ground level. In the time to come, it is necessary to opt for other options for income generation.
- Sometimes the poor quality of inputs is available in the market which affects the overall production and quality of seeds. This in turn damages the personal rapport in the seed market.

Opportunity to produce hybrid seeds

Hybrid seeds, including biotech seeds, represent new business opportunities in India based on yield improvement. Approximately, 7000 plant species are estimated to be used for human consumption. Of these, just four crops - wheat, maize, rice and potato - provide half of the total world food production and 15 crops contribute two-thirds. Many of these crops are grown in India, which has the potential to become a major producer of hybrid seed of vegetables. The need of the hour is to liberate agriculture from the clutches of climate change and to utilize biotechnology to meet the growing demand for food. India's food security depends on producing cereal and legume crops as well as more fruits and vegetables to meet the demands of a growing population with rising incomes. To achieve this, the country needs a productive, competitive, diversified and sustainable agricultural sector to emerge at an accelerated pace, which includes plant biotechnology and hybrid seed production. The production of hybrid seed, though capital- and labour-intensive, activities has increased the profitability of farmers through enhanced productivity. But, the increased adoption also warrants increased availability of hybrid seeds to the farmers for seed production in vegetables, especially of hybrids, though a specialized skilled activity. Hybrid seed production needs specific agro-climatic suitability of a specific area, besides

availability of other factors. The commercial (on-farm) seed production in vegetables undertaken in India not only meets much of the requirement of domestic demand but also fetches foreign exchange for the country, and thus adds substantially to the economic development of the farm families. Commercial seed production in vegetables is gaining popularity with the farmers and private seed companies, as it is undertaken mainly in dry areas for want of suitable agro-climatic conditions for increased seed set.

There is a great opportunity in the hybrid seed production of crops like ridge gourd, spinach, coriander, millet, cluster bean, mustard and maize in the area of Etawa - Badhal near Chomu.

Rural Branding to Stay Competitive :

Engine Brand Mustard Oil

Dr. Hema Yadav

The case study discusses how a small mustard oil mill established in 1959 in the small town of Bharatpur, with hardly any conscious effort on branding, in Rajasthan became a national brand enjoying high customer trust and loyalty. The case is about Shree Hari Industries (Hari Oil Mills) which is a ISO 9001-2008 certified Indian edible oil manufacturing organization. Engine Brand Mustard Oil was launched by Shree Hari Industries and is a well known brand which is a preferred brand for Kachchi Ghani mustard oil of Consumers in North and East India for last 58 years. Kachchi Ghani refers to cold press extraction process for taking out oil from seeds.

The case also demonstrates the use of conjoint analysis for assessing consumer preferences and perceptual mapping of different brands of edible oil. Conjoint Analysis is done to evaluate new products and variation against an existing range of products already offered by the company or within market place. A conjoint analysis is done to find out the consumer preference of mustard oil over other edible oil like soya oil, groundnut oil etc. The survey was done to find out the brand preference over attributes varying with different levels like pungency, purity, viscosity, taste, packing, and availability.

There are many competing brands in market like Dhara, Fortune, Ruchi and Patanjali. All MNCs and National brands are tapping market with different marketing strategy. Engine being a MSME and a national brand with very less marketing less promotion is being preferred by consumers over their competitors. On the basis of many attribute mentioned above engine tops in all like packing , pungency , taste ,viscosity, and market availability. Engine customers are quite happy. But still product line can be increased with differentiated marketing can be done in different areas.

The case is useful to teach students about rural branding, marketing mix and consumer preference for edible oil.

Critical Time Consumer Trust

The year 1998 witnessed a major disaster that claimed the lives of 60 and hospitalization of over 3000 people due to adulteration of mustard oil with

argemone mexicana seed oil. In the wake of this incidence, the government had banned the sale of loose mustard oil and restrictions were put on sale of packaged mustard oil as well. However, the Engine brand mustard oil continued to be trusted by consumers as unadulterated. The consumer trust enjoyed by the Engine brand mustard oil is a result of not compromising with quality.

Hari Oil Mills

Shree Hari Industries (Hari Oil Mills) is an ISO 9001-2008 certified Indian edible oil manufacturing organization. It was founded by Lala Haricharan Lal Agarwal in 1959 with a passion to deliver premium quality products. Later, Kedarnath Agarwal's persistent efforts paved the way for the group's progress. The group comprises three companies: (i) Shree Hari Industries, (ii) Shree Hari Oil Mill and (iii) Hari Vegetable Mill. All the three companies were ventures of inheritance to three brothers. The coordination amongst the three companies was well achieved as all three companies were manufacturing a common brand by maintaining the quality. For the sales of Engine Brand Oil, the markets were divided amongst the three companies to avoid any internal competition. This kind of coordination has been working well for managing and marketing Engine Brand Mustard Oil.

Emergence of Rural Brand

In 1959 Mustard oil was branded as Engine during a time when branding was not a conscious marketing activity. Brands were simple and based on familiar objects which people could recognize like Ship, Robin, Parrot, and Lion etc. Shree Hari Oil Mills was established in Bharatpur near the metre gauge railway track. Bharatpur Junction saw shuttling of many engines in a day and was the powerful factor of location of industries. Bhupesh Agarwal, Director, Hari Vegetable Oil, recounts how the Engine as the brand must have come to the mind of his great grandfather. The hustle of engines on both the sides of the factory was probably also the inspiration for the engine brand mustard oil.

Engine Brand Mustard Oil was launched by Shree Hari Industries and is a well known brand which is a preferred brand for Kachchi Ghani mustard oil of consumers in North and East India for the last 58 years. Kachchi Ghani refers to cold press extraction process for taking out oil from seeds.

Traditionally, oil was extracted from seeds in Kohlus (bullock-driven

wooden cold press). In this process, seeds are crushed at low temperature so natural properties, antioxidants and essential oils are retained in the oil. The production units now use the same process but replaced bullocks with technology for expelling oil.

The brand has evolved from being a regional brand to a national brand. Shree Hari Industries is registered as a Medium and Small Scale Enterprise (MSME). Engine brand mustard oil is an AGMARK Grade-1 Oil. Grade I mustard oil is also known as the raw grade and is obtained by a process of cold pressing chain of clean and sound mustard seeds of species like *Brassica campestris* linn (yellow or brown) or *brassica juncea*.

Importance of Oilseed and Edible Oils

Oilseeds and edible oils are two of the most sensitive essential commodities. India is one of the largest producers of oilseeds in the world and this sector occupies an important position in the agricultural economy accounting for production of 27.51 million tonnes of nine cultivated oil seeds during the year 2014-15. (Table- 1)

Table 1-Area, Production and Productivity of Rapeseed and Mustard in India				
2000-2001 to 2015-2016 (4th Advance Estimates)				
Year	Area (In ' 000 Hectare)	Production (In ' 000 Tonne)	Productivity (In Kg./Hectare)	Percentage Coverage under Irrigation
2000-2001	4476.7	4190.0	936	66.1
2001-2002	5073.0	5082.6	1002	68.3
2002-2003	4544.0	3879.8	854	69.2
2003-2004	5428.1	6291.4	1159	67.0
2004-2005	7316.4	7593.1	1038	69.3
2005-2006	7276.4	8131.2	1117	72.1

2006-2007	6790.0	7437.8	1095	74.3
2007-2008	5825.5	5833.6	1001	75.5
2008-2009	6298.1	7200.7	1143	73.9
2009-2010	5588.0	6608.1	1183	71.1
2010-2011	6900.5	8178.7	1185	69.9
2011-2012	5893.5	6603.7	1121	73.2
2012-2013	6362.6	8028.9	1262	-
2013-2014	6645.7	7876.7	1185	-
2014-2015	5799.1	6282.4	1083	-
2015-2016#	-	6821.0	-	-

Out of the 20-21 million tonnes (mt) annual consumption in the country (next only to China's 34-35 mt) 14.5-15.5 mt is imported which shows an increase from 11.6 million tonne a year back. The retail price of various oil over the years is as shown in Table-II.

Table –II Average Retail Prices of Essential Commodities in India (As on 07.12.2012 to 29.07.2016)					
(In Rs./Kg.)					
Commodities (Packed)	As on 07.12.2 012	As on 06.12.2 013	As on 05.05.20 14	As on 05.05.2015	As on 29.07.2016
Groundnut Oil	133.45	124.83	121.61	120.9	134.76
Mustard Oil	105.65	98.6	97.38	99.6	109.09
Vanaspati	72.9	75.13	76.58	75.55	74.03
Soya Oil	85.24	85.12	85.46	85.32	82.73
Sunflower Oil	95.73	97.21	95.21	94.48	95.41
Palm Oil	67.17	71.63	71.56	67.58	68.46

India imports more than 50% of its annual edible oil requirement of 22-24 million tonne. The current import duty is 20%. In September 2016, the government had hiked import duty on edible oil by 5% for safeguarding the domestic industry.

Consumption of Edible Oil

Traditionally, Indians use broadly two types of edible oils. The first is 'vegetable' oils obtained from crushing local oilseeds - mustard in northern and eastern India; groundnut in Gujarat, Maharashtra, Karnataka and Andhra Pradesh; sesame and groundnut in Tamil Nadu; and coconut in Kerala - in kachchi ghanis. Kachchi Ghani is mostly bullock-driven cold presses that extracts the oil at below 50° Celsius, the normal heat produced through friction. Besides, there are the bigger mechanical expellers or screw press plants that compress the seed at temperatures going up to 100° Celsius.

The second cooking oil medium is 'animal' fat, mainly desi ghee (clarified butter) from milk. This is an expensive option that households could exercise; maybe once a week or on special occasions.

Evolution of the Technology for Extraction of Edible Oil

Amongst the Edible Oil category, there are two extraction processes that distinguish solvent extraction and refining with cold pressed extraction. Solvent extraction and refining, unlike normal expeller-pressing and filtering, involves use of chemicals. With the mechanical pressing, only about 85 per cent of the oil from groundnuts can be recovered whereas, with the use of a solvent (edible-grade hexane), 99 per cent of the oil can be extracted by squeezing out even the residual oil in the expeller cake. The raw edible oil is further refined - that is, de-gummed (to remove gums, waxes and other impurities), neutralised (to remove free fatty acids), bleached (to remove colour) and de-odorized (to remove volatile compounds) - by treating with sodium hydroxide and other chemicals.

The first solvent extraction plants came up during the late 1940s, mostly in Gujarat's Saurashtra region for extracting oil from groundnut cake. By the early fifties, Ahmed Umar Oil Mills in Mumbai had also introduced refined groundnut oil under a once-iconic Postman brand. In 1962, in the district of West Godavari, Andhra Pradesh, which is the Rice Bowl of Andhra Pradesh, a company

called Food Fats & Fertilisers Ltd. at Tadepalligudem established a solvent extraction plant to produce oil from rice bran, a by-product of paddy milling.

However, with the advent of large-scale cultivation of soybean, the real solvent extraction boom took place during the late seventies in Madhya Pradesh, Rajasthan and Maharashtra.

Consumption of Mustard Oil

The mustard seeds are used as condiment throughout India. The seeds yield 28 per cent of a fixed oil which is used in medicine and soap-making. The seeds also contain about one per cent of a volatile oil which is used as a counter-irritant when greatly diluted. The oil extracted from the seeds is used in the North and East India as hair oil and for cooking purposes. In Punjab, Delhi and Western Uttar Pradesh, the leaves are used as vegetable. Mechanical extraction of oil produces a crude oil and a cake that contains approximately 5 to 10 percent or more of the original oil content of the seeds. The oil in the cake may enhance its value as a livestock feed, depending on the needs of the animals being fed. Oilseed meal is often used as a protein supplement for cattle. Therefore, the cakes with higher protein content often command a higher price.

Mustard oil processing

Mustard oil processing in India is an unorganised business. There are 7,000-9,000 oil extracting units and out of which, only 20 per cent are registered in the organised sector. The industry has an installed capacity to process 23 lakh tonnes annually.

Production and Consumption of Mustard oil

Rajasthan is the major producer of Mustard contributing up to 47 per cent of the domestic production, followed by Haryana (12 per cent), Madhya Pradesh (11.44 per cent), and Uttar Pradesh (10.41 per cent). Bharatpur, the eastern district of Rajasthan, is the largest mustard growing division covering about 48 per cent of the total production in the State and therefore it is a preferred choice for oil mills.

Mustard oil consumption is increasing at a rate of 20 per cent every year. Demand for mustard oil comes from semi urban and rural areas and is consistent owing to its multipurpose uses. The rapeseed-mustard

varieties/hybrids contain 40–45 per cent oil. But its recovery is realised by the mechanical crushing processor (oil expeller) - the largest segment of edible oil processing industries which is up to 35 per cent only.

Regional preferences: The edible oil market shows a strong polarization of preference. The preference is dependent mostly on the availability of any dominant oilseed in the regions. The consumption of groundnut oil is prevalent in West and South India, while those in the East and North use mustard seed/rapeseed oil. Likewise several pockets in the South have a preference for coconut and sesame oil. In the case of Mustard oil, it is processed in West India and consumed in East India, specifically in the States of West Bengal, Assam, Odisha, Jharkhand, Chattisgarh and Manipur. The preference of Mustard oil in this region is because of consumption of fish. Mustard oil is well known for being anecdote for fish and hence this preference. Engine Mustard Oil is processed in Bharatpur in West Rajasthan but distributed to the established market in Kolkata, Ranchi, Bhubaneswar, Guwahati, Raipur, Imphal etc.

Engine Brand Mustard Oil: The best quality mustard seeds are purchased from the market and cleaned properly. Then it is sent to the automated Kacchi Ghani where all the process are monitored by the skilled labourers to obtain the right level of natural pungency in the extracted oil. After this the oil is filtered in three stages to remove all the micro impurities from the oil. The sample of the oil obtained then sent to the laboratory for testing in accordance with the standards set by the company. At the end of all, the final product is then packed in Food Grade Packing materials (Tins, Jars, Bottles and Pouches) approved by CFRTI, Mysore.

Sourcing and Operations: The company is the highest seller of premium quality pure Kachchi Ghani Mustard oil in consumer pack in India. 'Engine Brand Mustard Oil has a major distribution network in almost all the States of India. Recently the company has launched its new products like the Engine Brand Premium quality sesame oil and pickles. The annual turnover of Shri Hari Oil Mill is from 100 to 500 crore. It produces 35–40 tonnes of oil daily.

Management and Marketing: Shri Hari Oil Mill, Bharatpur, Hari Vegetable Oil, Bharatpur, Hari Oil and General Mill (Mathura) are three industries producing the Engine Brand Mustard oil. These three industries have different management teams but produce a common brand called

Engine Brand Oil. Bhupesh Agarwal informed that procurement of oilseed through an established traditional channel of the same grade over the years has helped in achieving the uniform quality standard mustard oil. The distribution channel for the Engine Brand Oil is common with three companies. The packs of bottle, pouch, and jar are loaded in trucks and taken through the railways for onward movement to Ranchi. At Ranchi the marketing office of Engine Brand looks after the distribution and marketing of Engine Oil to the markets of North East States.

Shree Hari Oil Mill has also ventured into selling the Engine Brand Mustard Oil on online e-commerce sites to reach out to the consumers. The Shree Hari Oil Mill supplies Engine Brand Mustard Oil to Big Basket Company also and has thus ventured into the alternative market channels.

Packing of Engine Brand Mustard Oil: From the earliest times Engine Brand Mustard Oil has been sold as packaged oil. It used to be sold in tins of 15 litres and 5 litres in 1957. With the advent of refined oil and emergence of small families the packaging of Mustard Oil has undergone change. Understanding the consumer trends Shri Hari Vegetable Oil mills was quick to respond and made Mustard Oil available in jars, bottles and pouches. The details of various sizes of packages are shown in TableII:

Table-III- Pack Sizes

Tin	15 kg, 15 ltr, 5 ltr, 2 ltr
Jar	5 ltr, 2 ltr
Matka Jar	5 ltr, 2 ltr
Bottle	2 ltr, 1 ltr, 500 ml, 200 ml, 100 ml, 50 ml
Pouch	1 ltr, 500 ml

Source: www.enginemustardoil.com

A survey of the consumers in the semi-urban area of Jaipur revealed that packaging is more helpful in buying, better packaging contains a better product and it is easy to store and carry. The size of package, gross weight, simplicity, transparency and similarity of packaging have also emerged as the critical brand identity factors among the consumers.

Branding: Brands in rural and semi urban markets develop with the acquaintance and familiarity of consumers with the firm and buying behavior

of consumers towards the acquainted brands which is referred to as brand association. Consumers have only one image of a brand, created by the deployment of the brand assets at their disposal: name, tradition, packaging, advertising, pricing, customer satisfaction, repurchases patterns, etc. The red colour of the label with a logo of engine is the trademark of Engine Brand Mustard Oil. Red colour has a strong association with the Engine Brand. The company tried to change the colour of the pouch but it did not go well. The feedback of marketing team of the company was that the change in colour was perceived as that the oil is a fake one. The company could not afford to lose the trust of the customers and credibility of the brand. The colour red was retained and has continued to be part of the branding strategy of the company.

Analysing Consumer Perceptions: In order to understand the consumer preferences, a conjoint analysis was carried out.

Conjoint Analysis is done to evaluate new products and variation against an existing range of products already offered by the company or within market place. A conjoint analysis was carried out on a sample size of 25 people in Pratap Nagar which is the semi urban area in the periphery of Jaipur city. It was conducted to find out the consumer preference of mustard oil over other edible oils like soya oil, groundnut oil etc. The survey was done to find out the brand preference over attributes varying with different levels like pungency, purity, viscosity, taste, packing, and availability. Brands taken were like Engine, Fortune, Dhara and Ruchi.

The survey was done by making cards for five attributes. These cards were a translated in Hindi with the attribute and respondents were asked to rank the attribute on the scale of 1 to 16. There were eight cards generated to conduct on joint analysis. During the survey many attributes for evaluation like packing, pungency, purity, viscosity, taste and availability were decided. The description of the attribute is as follows:

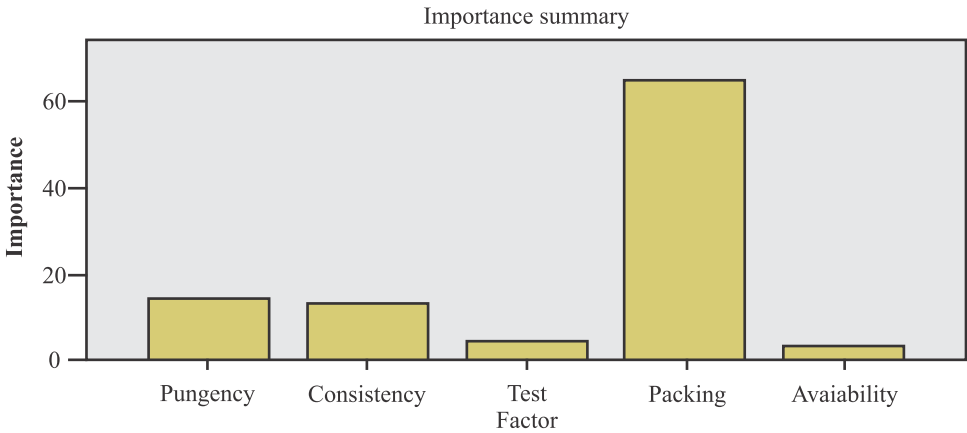
- **Pungency:** Pungency as a dominant attribute is a core value of mustard oil. The mustard oil with its characteristic pungency is healthy. This is something many consumers, especially in northern and eastern India, would consider as the ideal oil for cooking and frying. Pungency is also related to purity by consumers.
- **Viscosity:** Mustard oil has high boiling temperature and viscosity

compared to other oil.. Mustard oil has boiling temperature of pan frying (sauté) on stove top heat: 120 °C (248 °F), deep frying: 160 - 180 °C (320 °F - 356 °F) and oven baking: Average of 180 °C (356 °F).

- Price:** The retail price of 1 litre the of the mustard oil of different brands like Dhara, Engine, Patanjali and Kanodia etc., are in the range of Rs 135-140 in the market. The competition amongst the brands is not based on price. (Table-III)

Table -IV- Retail Price of Mustard oil

Brands	Quantity	Price
Kanodia Mustard Oil	1 Ltr	140.00
TEZ Mustard Oil	1 Ltr	120.00
Fortune Kachi Ghani Mustard Oil Bottle	1 Ltr	152.00
Dhara Kachi Ghani Mustard Oil	1 Ltr	138.00
Engine Mustard Oil	1 Ltr	135.00
Patanjali Mustard Oil	1 Ltr	135.00



Packaging emerged as the single most important factor affecting the buying decision for mustard oil. Pungency and consistency are the other attributes for which the mustard oil is purchased.

The output tables derived from conjoint analysis for relative weights and importance value of attribute is given in Table IV

Table V- Attributes and Competiveness

Atributes	Engine	Fortune	Ruchi	Dhara
Pungency	4.00	3.48	3.04	3.04
Consistency	3.78	2.83	3.09	3.30
Taste	3.65	3.00	3.13	3.78
Packing	3.70	3.43	3.09	3.04
Availability	4.09	4.00	2.78	3.35

Perceptual Mapping: There are many competing brands in market like Dhara, Fortune, Ruchi and Patanjali. All MNCs and National brands are tapping the market with different marketing strategy. Engine being an MSME and a national brand with very less promotion is being preferred by consumers to other competitors. On the basis of many attributes mentioned above, Engine brand tops in all the attributes like packing, pungency, taste, viscosity, and market availability. The customers of the Engine brand mustard oil are satisfied and trust the brand for retaining its core values of the product.

Results of the Conjoint Analysis and perceptual mapping of four competing brands were sent to Mr. Bhupesh Agarwal, Director, Hari Vegetable Oils to decide on suitable marketing mix for different regional market of the country.

For decades now, the Engine Brand has managed to surpass the competitors mainly because of the premium quality of the product that it has been maintaining from the beginning.

Dileep Industries : A Case Study on Working Capital Management and Entrepreneurship

Dr. Irina Garg

The constant hum of sawing of wood, and the order from a new client so soon after the recently concluded International Handicrafts and Gifts Fair did not provide comfort to Dileep Baid. In March 2015, a month short of turning 50, with 26 years of being in the business of export of handicrafts, there was a need for his product to be recognised as a brand since it symbolised a whole philosophy, a way of life. The dry leaves rustled under his feet as he moved out of his office, there was restlessness in the air, a precursor to the change in the weather. He too needed to cast the die for change, for the next level of the game before it was too late. He would want the turnover to increase three fold by 2020, at Rs. 500 crores requiring an annual growth rate of 30% against the present 10-12% and, the brand Dileep to be recognised. He wasn't sure what his team would have to say, but he had thrown his hat in the ring.

The brainstorming with his team and the heads of the business units next day, helped identify the challenges. Foremost, manpower, they would need to induct people across the organisation to spearhead this growth, while existing people would need to be trained.

Dileep Group of industries took pride in its designs whose USP was combining different materials to create a work of art from traditions of Indian craftsmanship. The designers were the core to creating value and generating this growth, their numbers must increase.

Since very little production was outsourced, factory space would have to be added to meet increased production and perhaps new materials to be added to the existing repertoire of materials being handled by the group.

Finally, analyses of the buyers needed to be done. The group was selling to 80 buyers mostly in USA and then Europe through trade fairs and efforts of his merchandisers, but only 10 to 12 buyers were responsible for 80% of the group's turnover.

The Beginning

Born in a joint family business environment Dileep Baid had often spent his vacations manning different tasks during school and college holidays in the

businesses of the joint family, comprising primarily of manufacturing of edible oils and trading in jute and pulses. However, he was inducted formally in 1987 and soon realised that he did not enjoy the commodity business wherein the profits were often dependant on speculative acumen. He wanted to create value, wanted to build an ecosystem of production where he would be able to add value to human life and to the commodity. Profits would of course be the underlying principle but they would be driven from the heart a philosophy he had imbibed from his late father.

He cut his teeth by supplying provisions to the Naval Coast Guards in Vishakhapatnam but kept looking for an opportunity, which came his way during his visit to his brother-in-law in Amsterdam. Observing his restlessness the brother-in-law gave him a Directory of buyers in Holland to pursue and get orders from, a challenging task, given the rigid resource procurement procedures followed by the Dutch businesses that did not encourage direct contact with individual retailers. Endless patience and phone calls yielded one response just when he was ready to give up. The person at the other end was a prominent buyer of handicrafts in Holland. He promised young Dileep experiential learning but no profits if he accepted the deal. The first order was for rosewood figurines and brass castings. Thus destiny chose the handicrafts sector for him.

When the joint family failed to buy into his vision, he was left with no working capital to fulfil his first order of Rs. 10 lakhs in 1989. He walked into the office of a leading Bank in Jaipur, without any collateral but with hope that his past performance in the South may come in handy. He walked out with the working capital loan and a loan policy intervention for the Bank which is followed still by it. The banks used to give loans of 75% of total shipment value as packing credit limit, to the exporters but insisted on some collateral. Young Dileep negotiated instead, for a 50% limit with 15% to be kept as an FDR with the bank. He had set the rules for the future of his enterprise- complete financial discipline, with a major portion of the cash flow getting re-invested in the business and creating value and trust for all his partners including the banks.

His first company, Dileep Trading Ceramics, was registered on 04.04.1989 his birthday and remains the hub for all the other 10 companies that are viscerally linked to the hub like spokes of a wheel. Initially the

manufacturing was outsourced. The first factory was set up in 1992 in Jodhpur, with the help of a Swedish buyer, to bring technical sophistication in the production of ceramics. Production of ceramic handicrafts was hitherto a cottage industry in India and continues to be so. Establishing a factory with supportive designers and technology brought in a paradigm shift in quality of production in ceramic handicrafts in India. A searing pace of growth was set from 1992 to 2007, by re-investing almost 90% of the profits of the group back into business through capital investment by way of land and modern machinery, to sustain the growth.

The first setback occurred in 2007 when a close family associate and head of a business unit of the group embezzled a substantial amount of money depriving the group of almost 50% of its cash-in-hand and confidence of the CEO in his financial acumen and philosophy of business. This coincided with the global slow down due to the financial crises, wherein housing industry in USA took a major hit, resulting in a decline of 30% to 40% in orders. It took Dileep Baid 3 years to recoup the cash balance and 4 days' of introspection to regain confidence to draft a strategy for a turn around. On the fourth day, he assessed the situation and found that he possessed more than what he had started his career with- that is naught. He had nothing to lose but everything to gain by bringing around a recovery. But some decisions needed to be taken quickly.

Turnaround 2007-08 to 2015

The strength of his group was in the designs, so, the designers and the skilled workforce had to be retained even if it meant dipping into his personal savings. It called for curtailing personal expenditure to minimum, including cancelling family vacations, and small indulgences.

Structural Reorganisation

Hitherto all the factories were yielding profits but most of the decisions were being taken by the Head Office. It was decided to convert each production centre to a strategic profit making unit under the ownership of the manager. The decision making areas and the profit sharing between the Head Office and the production units were clearly defined and made transparent. The model was a simulation of a wheel with the Head office being the hub and the production units being the spokes. The hub was responsible for getting the

orders, developing designs, and marketing the product, while the production units were responsible for the production. Risks relating to production were the unit head's responsibility while the post production risk was to be borne by the Head Office (HO).

The profits were shared between the Head Office and the production units equitably. The HO was responsible for product development and design development, marketing and quality audits, and risk management. The head of the production unit was free to manage the business to ensure maximum profits for him, provided, that the functioning of his unit was law compliant and quality control was adhered to. The production head/partners were required to be present during the price negotiations with the buyers. HO and even customers conducted audits regularly. More likely than not the building, machinery and working capital was provided to the production spoke by the Head Office to ensure quality in production and mitigate risk on account of poor technology. The cost of production included the cost of these facilities.

This model helped to leverage the strengths of all the managers of the production units by making them partners, wherein they had a sense of ownership and took complete responsibility for cutting costs and inculcating efficiencies in these units to increase the profits for the group and thereby generate better margins for themselves. The profits and losses were shared proportionately across the board. Regular salaries were not given, all payments (except to contractual workers), including to the designers, were linked to the annual profits.

There was an increase in stakeholder ship in the fate of the group, pride in the product and trust in management. From managers the unit heads had become business partners.

Financial Management

The financial management was made robust and more checks and balances were introduced. The advances to the production spokes were given on the basis of existing raw material inventory that was personally checked by the HO with a monthly roll over plan after verifying the production and work-in-progress.

Given the conservative financial planning being already followed by Dileep Baid, the financial stress due to embezzlement and economic slowdown did

not seriously impact his working capital requirement. Production was initiated only after getting financially viable orders. An advance of 30% of the order was sought to be taken. Thus there was seldom any finished product inventory and minimum raw material inventory. Substantial portion of the profits of the group had been invested in expansion by acquiring land, buildings and machinery for factories, obviating the need to pay any rentals. Similarly, no expansion had been undertaken by taking a term loan so there was no requirement for fixed interest payment. The bill for salaries was also low since the model had a built in system of profit distribution rather than payment of fixed salaries. Thus the fixed operational costs were less than 20% of the total production costs.

The requirement for cost of operations was met through the packing credit loans from banks which spiralled from 7% to 25%- 30% for a span of 3 years post 2007-2008, and again stabilised at 7% after 2012 when the group started to reflect a comfortable annual growth of 12% and was generating sufficient cash.

Risk Management is essential to effective financial management. The major business risk identified was cancellation of orders. The sales were subject to international quality protocols. The material used was mostly natural material and was sourced from vendors. In such a situation it was essential to identify the vendors who would not compromise the quality of supplies since even a small percentage of banned material detected in quality testing ensued in rejection of the entire consignment.

Lists of reliable vendors had been prepared based on past experience, standardized testing protocols had been developed and laboratories for testing the material from vendors had been established in the factories to manage this risk and ensuing loss.

Similarly, delay in despatch could result in cancellation of the order. Since the product was handcrafted there was substantial dependence on labour that had to be managed to this effect.

Cyber crime was emerging as a new risk. In a recent incident the buyer's account had been hacked and the on-line payment had been diverted. Protocols were in the process of being developed to prevent such loss in the future because the litigation to get the payment would cut severely in the profits.

Product analyses

The group had acquired a large portfolio of products over a span of 15 years that had never been examined in terms of profitability. Production in each category was examined and its profitability was determined, the bench mark being 30% profits. Those products showing less than 10% profits either due to low demand or high production costs were hived off. Whole categories of items were removed for example the existing furniture unit was closed since the cost of production was too high.

The services of in house trend analysts were employed to predict trends for the next season. An existing computer programmer was encouraged to emerge as a merchandiser. From merely handling correspondence with the buyers and attending to their problems and feedback he started to study the markets, price requirements of the buyers and those offered by competitors. Having understood the back end production process he doubled the accounts of customers by holistically examining the requirements of all the departments of a particular store.

The strength of the group had always been the design and quality of its products. A SWOT analysis of all the major items resulted in a product overhaul. The USP of the group is that it produces handicraft items combining several materials and so caters to a niche clientele. The category of materials was expanded keeping in mind the global trends. According to Dileep "People take their customers for granted, what they forget is that the profile of customers keeps changing as the existing customers age they require different products and the new customers have their own requirements. Businesses should constantly connect with the new generation of buyers and keep inventing to keep pace with contemporary demand."

Thus, Dileep Baid gathered all his energies and those of his group to weld different strengths of his team members as of his products, to design an organisational model to create value for all the stakeholders.

Future

The target of annual 30% growth had been achieved in 2015-16. However, to sustain the targeted growth, it was decided to enter into the domain of e-commerce and to develop its own brand. The process of selling its products under its own brand had started in some stores in North America.

E-commerce aimed at building the brand through on-line marketing had thrown up its own challenges. The group had always worked with minimum orders of 125 pieces as these had been found to be financially viable in terms of production cost. It was not geared to cater to production of smaller quantities wherein the cost would rise or, inventories of finished products and unsold stock would increase locking up cash flow. Moreover, there would be a requirement for a new set of designers different from the existing ones to roll out the e-commerce campaign successfully.

Marketing on-line was challenging, since getting a customer to a retail store is always more difficult. To quote Dileep- "The arena of e-marketing is very dynamic and requires constant analyses of data to keep up with trends and technology." Community building was required to track the followers and convert them into customers. Digital marketing demanded a sustained and substantial revenue outflow over a period of several years before positive results came in. It required immense patience, and listening to the markets constantly to keep abreast with the life style changes.

A new team had been set up to deal with the issues of after sales service, marketing, on-line fraud and lifting of designs. They were also required to undertake tie-up with Flipkart and Amazon while B to B online marketing was being pursued simultaneously.

The buyers were getting increasingly aggressive about price. While there was no competition for the group in terms of design and the unique products combining several materials, the challenge was to keep the price competitive without compromising the quality. While it would be easy to reduce the cost to increase the turnover, the real challenge was to innovate to increase the turnover without compromising the cost of excellence in designs and quality of production.

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