DOCC Project Report

United Phosphorous Limited

Mapping on Agriculture & Allied Sector Scenario

By
Supriya Kashyap – (PGP-15-071)

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Center for Development of Corporate Citizenship
S P Jain Institute of Management & Research, Mumbai

Preface

SPJIMR is a learning organisation known for its commitments towards social sector.As part of its Social sensitivity program, the centre for "Development of Corporate Citizenship ", DOCC gives an opportunity to all the PGDM students to work on projects involving rural stakeholders. This is a win-win approach for both the MBA students, who get an opportunity to get a feel of Rural India and implement their learnings there and for the Rural people, it is an opportunity to levaerage the managerial inputs by the students.

As a part of this program, we got to work on a project on "Mapping of Agriculture and allied sector" in association with the CSR wing of United Phosphorous Limited (UPL), Vapi. The CSR initiatives of UPL are as old as the organisation itself.They are committed for the CSR works in 6 focus areas – Agriculture, Employability and Entrepreneurship, Education and Empowerment, Environment and Nature conservation, Health and Sanitation and Local and National area needs. Our project required us to work in the Agriculture sector initiatives of UPL in the clusters of villages in Vapi.

After getting a project brief from our college, we reached Vapi UPL office and was very excited to exlpore one of the most rural setting in one of the fastest developing state in our country. Being from Delhi and currently studying in Mumbai, this was my first opportunity to get a feel of rural setting and interact with farmers and other stakeholders. We were received by the NGO people and the local guide. The warmth and the excitement in their eyes set the stage for our coming 5 weeks stay there.Quite excited about our project, we started visiting villages and interacting with farmers. It was a very different experience altogether for all of us as the people in villages were so welcoming and affectionate, it never occurred to us that we are strangers to them.They shared so many valuable input to us, though they were initially hesiatnt. With the challenges of its part, the 5 weeks stint in 12 villages of Vapi has been quite an enriching journey for me. I have learnt about the situations and problems the farmers are facing from a first-hand experience and also got to see the immense business opportunities that the field provides. I have drafted my learnings and recommendations in the report ahead.

Acknowledgement

The entire DOCC experience was one of its kind. The 5 weeks rural sensitization program proved to be instrumental in developing a sense of social citizenship. Our project would not have been such a scuccess without the efforts of many.

Firstly, I would like to thank **Mr Rishi Pathania, Head, CSR** , UPL Limited for his immense contribution and guidance throughout. The excitement, interest and involvement he showed for our project was truly inspiring. He kept on taking regular updates from us and enriched us with his valuable and experienced inputs at whatever place we needed. I would also like to thank **Mr Rakesh Kumar, Project Lead**, UPL Limited who guided us all along these 5 weeks. I would like to thank him for making sure that our travel, stay and food arrangements are all comfortable and up to par.

I would also like to thank **Mr. Jitesh Kumar** and **Mr. Chandra Mohan** for taking out time from their schedule and accompanying us to some villages and introducing us to the people there. They introduced us to key people including the KVK scientist and the experts from Vikram farm. Our knowledge gain wouldn't have been this enriching without their help.

I would also like to thank our **Dean (SPJIMR) , Dr. Ranjan Banerjee** and our **Respected Director (SPJIMR), Dr. R. Sesha Iyer**, for providing us with the unique opportunity of exploring different rural sectors by conceptualising the DOCC. This gave me a first-hand experience and a new perspective towards Rural India.

Finally, I would express my sincere gratitude towards DOCC committee and **Dr. Neerja Mattoo** ma'm , our faculty guide and Chairperson, DOCC for giving us this opportunity to see Rural India from a different perspective altogether abd being a constant support throughout. The learning has been immense.

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Executive summary

Agriculture is the backbone of Rural India. More than 70% of the total population is dependent directly or indirectly on agriculture for its subsistence. The situation is not very different in Gujarat, one of the fastest developing states in the country. Though Vapi, a district in South Gujarat is one of the most industrialised place in the country with the presence of various industries and chemical plants, still the villages in and around the district still has Agriculture as the main occupation. With majority of people dependent on Agriculture, the sector has its own sets of challenges and opportunities, with farmers leaving agriculture in lack of proper help and guidance.

UPL, as a part of its CSR contributions in the field of Agriculture has taken up the initiative to understand and improve the agriculture scenario in some 12 villages in and around Paria and hence our project was on "Mappimg of Agriculture and Allied Sector in villages". As part of the project, we visited 12 villages, interacted with close to 75 farmers, met experts who run a 65 acres Vikram Farm and provide Training & Guidance to farmers and also interacted with scientists from Krishi Vigyaan Kendra.We used various tools like Questionnaire, Surveys, Personal Interviews and FGDs to conduct discussions and applied Design Thinking to extract insights from the observations. A need assessment was also done by interacting with Sarpanchs from these villages.All these interactions and field visit helped us observe so many different things, our first-hand experience with agriculture led us to understand the situation of farmers from a different perspective altogether.

Our main observations came out to be in the form of various challenges being faced by farmers and the immense business opportunity availabe to explore. The challenges faced by farmers are

multifaceted with help required both in pre and post farming activities. Farmers need to be eduacted and updated more about the modern ways of doing farming to improve yield and productivity. Also, they need help with the marketing facilities for their prouduce so that their dependence on middlemen can be reduced. Challenges apart, the entire supply chain is quite unexplored and there lies an immense business opportunity in this field which can be of help to both entrepreneurs as well as farmers. Based on these insights, some recommendations have been made to leverage the opportunities and improve on the challneges.

Introduction

As Sardar Vallabh bahi Patel rightly said, *"Agriculture is the locomotive of any economy and a prosperous rural economy based on agriculture will ultimately lead the nation on path of prosperity."*

Indian economy is Agriculture based and even in the 21st century agriculture is rightly considered as the backbone of our economy. In India, agriculture has been in practice right since ancient times. While other countries were developing sectors like services,manufacturing etc. and they were not even in existence; farming was the sole life sustaining activity. However, in recent past, due to rapid urbanization and industrialization in nearby areas dedicated to farming, excessive exploitation of farmers has rendered agriculture only for survival and in a few cases, even a loss making occupation. Thankfully, today agriculture has achieved commercial importance worldwide and it has an enormous potential of being one of the most powerful sectors contributing significantly towards nation's GDP. Hence, all this calls for immediate focus towards the development of agriculture to make it a promising and sustainable livelihood option for farmers.

Project Area:

With over 60% of India's mango production coming from Gujarat, the state has upto 1,09,600

ha under mango cultivation. Valsad, a district located in South Gujarat is known for its commercial cultivation of various mango varieties: Alphonso, Kesar and Rajapuri, all of which form a major part of India's mango exports. This district also boasts of presence of industrialisation in various sectors like paper, chemicals, food processing and textiles most of which are related to agriculture.

Our main area of focus included twelve villages in surrounding area of Paria village of Pardi taluka, Valsad. These 12 villages have around 7500 households, and around 80% of households are dependent on agriculture as either their primary or secondary source of income.

Project Objectives:

The main purpose of this study is to evaluate the factors that affect the performance of agriculture and allied sector for Indian farmers residing in these clusters of Vapi while suggesting ways to enhance the same. Some of our key deliverables include:

- Detailed study of agriculture and allied sector scenario in the clusters of Vapi that included 12 villages surrounding Paria.
- Enhancing the performance of Agriculture for sustainable livelihood.
- Search for new markets, technology and variety in crops.
- Creating awareness while keeping in touch with this sector focused schemes of Gujarat & Indian Government.

Solution desirability & Possible impact:

Presently, a lot of farmers are indulging in poor farming practices which is affecting the yield as well as productivity/acre in the area. Moreover, the entire value chain from seed cultivation to marketing of produce is highly unorganized and intervention is required in each step from management and research point of view. The impact that we hope to create from this project are:

- Reduction in the input cost price/acre of farmland.
- Reduction in post harvest losses through better management practices.

- Increase in the returns/kg of produce for better profitability.
- Increase in the crop yield/acre.
- Reduction in the cost price of the produce for customers.

Methodology Used

Since our project involved both quantitative and qualitative assessment of the factors affecting agriculture, we were required to study the current scenario of agriculture and allied sectors like animal husbandry, nursery development etc. We figured out the best way to collect information was through regular field visits to all these 12 villages, interact and get first hand information from the local people themselves. It was truly a great learning experience going through the interiors of rural India to understand the landscape and people in those areas.

Methodology adopted during the course of this project included:

1) **Primary research – Observational**:

During our visits to each of these village on bike, auto or any other means of transport available, we used to pay close attention and tried to look through the lenses of AEIOU framework. Here, we observed:

- The various primary and secondary activities of farmers.
- Farm lands for size of land holdings and crops cultivated.
- The various items in a farmer's house to get an idea of the household income while keeping a close eye on other sources of income.

2) **Primary research – Experiential (Direct):** One of the best ways to extract information is through direct interaction with people directly involved in those particular activities. This not only widens our perspective, but also provides deep insights into farmer's lifestyle and challenges faced by them in modern day agriculture. Following formed a part of our primary research:

- **Personal Interviews:**

After a couple of visits to a villages Rohina and Goima, one of the largest villages in the area, we tried building a good rapport with the local people, which helped us further in the process. On the basis of these visits, we prepared a questiotnnaire (Appendix) that we kept on evolving after every visit. For ex : Initially, we used to directly enquire about size of a farmer's land but soon we realized they hesitate while sharing this information. We then changed our questionnaire to the number of trees or tonnes of crop cultivated and estimated the land size from the data. Finally, we managed to conduct personal interviews of 75 farmers in 12 villages. During our interviews, we also tried to make ourselves aware of the individual's body language.

- **Focused Group Discussions:**

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We conducted FGDs in three villages namely Rohina, Tukwada and Sarodi provided us with us a much broader picture regarding the markets, agricultural methods etc. Since, different farmers have different opinions on certain topics, they used to disagree, which made our interactions with them more knowledgeable and interesting.

3) **Primary Research – Experiential (Indirect):** Apart from farmers, we also did interaction with people who were indirectly associated with agriculture and that included:

- Discussions with managers, experts from Vikram Farm and UPL officials. The manager at Vikram farm, owned by UPL helped us understand the basics of agriculture in the area and mindset of the farmers.
- Discussions with research scientist, KVK, Paria, village heads, MLAs and manager, Casilla (food processing industry). All these people broadened our understanding through their valuable inputs. For ex: The research scientist told us about new crops like jackfruit, pineapple etc. that can be cultivated in the area and most of the farmers had no information about the same.
- Interaction with students from Navsari Agricultural University and Gujarat

government officials. Some of these students were children of farmers, they provided us their unbiased opinions about farming and the challenges their families are facing in the same.

4) **Secondary Research:** Apart from the fieldwork, we used other sources to increase our knowledge on the subject and came up with better insights, ideas and recommendations. These included:
    - Study of various schemes of Indian and Gujarat government alongwith UPL CSR policy.
    - Literature review of new technologies being used in various agricultural processes like land preparation, seed cultivation, harvesting etc. and better post harvest management.
    - Study of integrated farming involving organic products and low budget farming propagated by Subhash Palekhar.

About UPL – CSR

UPL Limited, formerly known as United Phosphorus Ltd (UPL) was established in 1969 as chemical manufacturing plant in Vapi, District: Valsad with headquarters in Mumbai and is a global generic chemicals, crop protection and seeds company. UPL group comprises of 3 companies in India namely Advanta, UPL and UEL with a market capitalization of approximately $2.5 billion.

UPL is the largest agrochemical producer in India and ranked 4th amongst the top 8 generic agrochemical companies in the world. The company has 23 manufacturing sites and has consumer base in more than 120 countries. Advancing with its motto “Doing things better”, the company aims to be a one stop shop for farmers by offering them products, consultancy and services related to farm management.

About UPL – CSR

UPL’s CSR initiatives are as old as the organization because at UPL the management recognizes

the dangers arising out of the 'islands of prosperity' that don't translate into benefits for those co-existing in the proximity and hence, they have been working in partnership with the government, NGOs and businesses in solving the problems faced by new industrial towns.

The company's commitment towards community exists in 6 focus areas:

- Agriculture
- Employability and Entrepreneurship
- Environment and Nature conservation
- National and Local area needs
- Health and Sanitation
- Education and Empowerment

CSR Vision

"To be a catalyst for a more equitable and inclusive society by supporting long term sustainable transformation and social integration."

CSR Mission

- Implementing need based projects through participatory approach.
- Focusing on building capacity to make community self- reliant.
- Developing partnership.
- Transferring knowledge.

UPL CSR Strategy – 5E Process

- ENGAGE with the community to understand their needs and priorities.
- EVOLVE the key community need by facilitating the community to identify its prioritized need.
- ENABLE the community by providing them the skills required to effect changes in their own lives and surroundings.

- ENRICH people's lives through CSR initiatives.
- EVALUATE the initiatives through learnings from past experiences, improvising service delivery system, optimizing resource allocation, systematic planning and results demonstration.

The CSR committee comprises of three members:

Mrs Sandra Shroff	Vice-Chairman
Mr Pradeep Goyal	Director
Mr Vikram Shroff	Executive Director

CSR Impact:

- 30%-50% increase in the paddy yield for different paddy varieties under the UPL AKRSP SRI project.
- Till date, 23 trainings have been organized for farmers in 18 villages across Valsad and Ahwa benefiting 759 farmers at UPL Khedut Niyojaniy Kendra, Vikram Farm.
- At UPL Niyojaniy . Kendra, comprehensive skills . training on industry specific . skills like forging, fitting, welding etc. is being provided . and more than 60 candidates have been placed in various industries.
- Under UPL Vasudha programme, 4560 saplings have been distributed to 1705 students across 12 villages of Valsad and Bharuch.
- For promotion of Khadi, Fashion design Council of India collaborated with Gujarat State Khadi & Village Industries Board and organized a fashion show "From Huts to the High Street" in association with UPL Limited.

For all such initiatives, The Jury and Council of Board Members of World CSR Congress conferred UPL Limited with the '50 Most Caring Company Award 2014'.

Problems and Challenges

(Using SWOT Analysis)

To get an overview of the problems and challenges faced by the farmer communities in these village, our interaction with around 75 farmers led us to some findings. To capitalise on the strengths, understand the weakness, levaerage on the opportunities and mitigate the threats that are present in this sector, we did the SWOT analysis of our findings and below is our findings :

Strength :

1. **Adequate landholding available to farmers** : Land as a factor of production is of immense importance. The quantity of quality of agricultural wealth in any village depends on the nature of soil, climate and adequate rainfall available. Though of the 12 villages that we visited, landholding varies across villages, still on an average farmers in these villages have got adequate lands with them. The handholding per farmer varies with bigger villages like Rohina and Gohima having farmers with on an average 10 acres land per farmer and smaller villages like Tarmalia and Nanavagchipa having average 2 to 5 acres land per farmer. Still almost all the farmers have sufficient land to produce whatever they are capable of producing given their economic status. Not only all the farmers have adequate land available, the land is quite fertile and healthy too. If taken care properly, they always provide satisfactory yield.

2. **Adequate water, irrigation and electricity facility available** : Increase in agricultural production and productivity, to a large extent, depends on the availability of water. Productivity on irrigated lands is considerably more than the productivity in un-irrigated land. These villages receive adequate rainwater and have proper bore-well facilities and hence flood irrigation is most popular in almost all the villages here, with some educated farmers also using drip irrigation to save water. Adequately available water facilities in addition to the tropical and sub-tropical climates make multiple cropping possible in

these regions. This also considerably enhances the agricultural pproduction and productivity in these regions.Also, irrigation facility has helped in stabilising output and yield levels.

3. **Availability of a large workforce** : Even though it is true that people are shifting away from agriculture and allied sector jobs in these regions, still a majority of population in these village is dependent on agriculture only and thus a large workforce is the strength of this sector.

4. **Strong Customer base** : Agriculture sector still contributes 15% of GDP and Presence of a very strong customer base, both locally and in surrounding markets like mumbai is a positive factor contributing to the strength of the sector. The strong customer base makes it less affected by inflation.

5. **Availability of a large selling market** : The produce of these farmers are sold either in local markets or sent outside. The local Rohina market is a large one where produce from several nearby villages are sold. Availability of a large selling market provides easy access for the farmers to sell their products.

6. **Livestock options** : Apart from agriculture, farmers in these villages are also dependent on livestocks for their income, which includes cows and poultry. These livestock options are quite profitable for farmers as they get a decent rates for the milk (depending on the fat content) at the dairy collection centres and the poultry is also quite profitable. This serves as giving some economic prosperity to the farmers.

Weakness :

1. **High Input costs and low profit margin** : Farmers are not educated enough which is why they still rely on traditional methods for farming. With no access to modern technologies or proper training facilities, they are unaware about the optimum quantity of input they should use. This increases the input costs for farmers and as the rate at which they sell to the local markets or to the middlemen is also very less, which leaves the farmers with a meagre profit margin.

2. **Uneducated and unaware farmers** : Farmers being uneducated and unaware about the newer ways of doing agriculture adds on to the woos. Not only do they not know about modern ways, they are least interested about being updated too. Though there are training centres available which provide training free of cost, farmers don't even bother to attend seminars. This leads them to doing farming by traditional ways and increases their input costs and also decreases yield.

3. **No access to modern technologies** : The fragmentation of farmland is a factor behind the limited use of mechanised farming techniques and prevents the development of a more organized and productive agricultural sector. Besides, either equipments are not available easily or they are too costly for farmers to access, leaving farmers with dependency on labourers for plucking and harvesting.

4. **Low Value addition and Food Processing** : Food processing and value addition are two sectors which have a lot of potential to provide rural employment. Unfortunately, in India we have only 2% of value addition and 6% food processing. Of the 12 villages that we visited, there are around 2 food processing industries that operate only in the mango season, leaving them idle for three quarters a year and there is only 1 industry which operates round the year. Low scope of food processing also allows the wastage of many fruits like chikoo, which are not even stored properly.

5. **No knowledge about use of fertilisers and pesticides** : Almost all the farmers in these villages have no knowledge about the use of fertilisers and pesticides, which leads them to using these in inadequate quantities. Per spray cost of fertilisers and pesticides cost these farmers around Rs 10,000. Thus using them in excess quantity not only affects the land and the crop adversely but also increases the input costs for farmers.

6. **Small and dispersend lands** : Smaller farmers in these villages have small and dispersed lands which makes it difficult for them to take care of those lands or grow something substantial on those. Such small landholding creates problems in performing farm mechanisation and makes farming non-renumerative for these farmers, which is why they don't grow anything on those lands they are left uncared for.

7. **Post harvest loss and food wastage** : Due to low processing levels in these villages, there is a considerable amount of wastage in agriculture and horticulture produce. Also, since there is no cold storage or any other facility available, farmers either sell their produce at throwaway prices or let them rot. Sometimes the labour cost of plucking and harvesting is too high and low market demand coupled with no storage facility, all this creates such a mess for farmers that sometimes they let the crops rot in plants only and don't even bother to pluck them out. This is a cause of concern for all the stakeholders.

8. **Absence of Proper Selling Channels** : These farmers lack a proper sales channel to sell their produce. Unavailability of proper sorting, grading and packaging facilities and the transport facility being quite a burden for these farmers, they have no option but to sell their produce to middlemen, who don't offer fair price to these farmers.

Opportunities :

1. **Diversification :** Land being already a limiting factor and no more horizontal expansion possible, there are opportunities in vertical expansion by integration of food crops with allied enterprise like Apiculture, Floriculture, Sericulture, Horticulture and vegetables etc. Some farmers in the village have already entered into Floriculture too, which is proving to be quite a profitable income source. The state of Himachal Pradesh earned Rs 11 Crore by selling flowers in the Commonwealth Games. Similarly, Goatry and Poultry are other highly renumerative enterprise with a high benefit cost ratio.

2. **Organic Farming** : It avoids the large scale use of synthetic fertilisers, pesticides, growth regulators and solely depends upon the use of on-farm and off-farm crop residues, animal wastes, green manures and biological pest control to maintain soil productivity. The philosophy is to feed soil rather than crops to maintain soil health. It is an alternative and best answer to the chemical intensive agriculture that has led to the degradation of our natural resources. Organic farming can also be used in rain-fed areas where there is a limited use of fertilisers.

3. **Food Processing and Value addition Industry :** These are two sectors which are almost entirely absent in these villages and hence present a significant opportunity with respect

to benefit to both farmers and also employment to other unemployed people who are not into farming as well. Provision of efficient supply chains and processing infrastructure can do wonders in terms of employment generation and creation of productive assets in rural areas. Mega Food Parks (MFPs), a flagship scheme of ministry of food processing facilitates the establishment of a strong infrastructure backed by efficient supply chains. The advantage of these schemes can be levaraged onto, which will help both in preventing food wastage and generating some additional employment too.

4. **Agri-Clinics and Agri-business schemes** : There are so many agri-business schemes and subsidies being granted by the government, NABARD and MoFPI that these people are unaware of and hence there lies a huge opportunity in taking advantage of these schemes to help these people set up various projects like the cold storage project . The Government of India has launched ACABS scheme with an aim to provide self employment opportunities to unemployed agriculture graduates by transforming them into entrepreneurs who would then be job providers instead of job seekers. These various schemes can be leveraged upon by these farmers.

Threats :

1. **Declining interest in agriculture** : Even in agriculturally progressive villages, farmers want to quit agriculture if they are given an option. Not a single farmer wants their next generation to continue in agriculture because they feel the return on investment in agriculture is quite low. Youth feel that agriculture is not economically rewarding or intellectually stimulating, hence the declining interest in that.Farmers are losing their main cultivator status and are pursuing other occupations like teaching, as workers in industrues as their side occupation. This is a threat to agriculture in these villages as almost all the farmers we met are the last generation interested in doing farming now.

2. **Decreasing average landholding :** The average landholding in these villages is continuously declining as because of the declining interest in agriculture, farmers are selling off their land to industry people in prospects of more money received and then invest it somewhere else. This decreases the amount of arable land that each farmer

possess and hence the production is also declining.

3. **Climate Change and Land degradation** : Threat of land degradation looms large over Indian agriculture in general and more particular to these villages as because of being closer to Vapi industrial area, surrounding villages are anyway experiencing a lot of pollution and this climate change is affecting the crops. Almost all the farmers complained of experiencing lower yield per plant due to changing climate. It has resulted in increased dry land besides increasing the average temperature in these areas. Climate change has also resulted in the emergence of new insect pests besides reducing the milk yield in cattle and affecting fruit crops such as mangoes and chikoos. Besides climate change, indiscriminate use of fertilisers and pesticides, without knowing the adequate quantities to be used has also added to the land degradation.This is a serious threat to farming as a considerable portion of production gets wasted due to this in addition to low yield.

Analysis of Findings

We visited around 12 villages in and around Paria, interacted with various stakeholders including the farmers, Sarpanch, people from food processing industry, Experts who provide training on agriculture and scientists from KVK to understand about the current agriculture scenario and problems being faced and possible solutions to those. We used **AEIOU framework** for our observations.

Activity	Environment	Interaction	Observations	User

- Agriculture and Horticulture as main occupations. - Also do dairy farming and poultries as side occupation. - Floriculture is also coming up in these villages.	- Mostly, interacted in their home. - Also, visited various agriculture farms and paddy fields. - Visited Vikram Farm, a 65 acres farm to learn about all the agriculture methods.	- Interacted around 75 farmers in 12 villages. - Used questionnaire for our interaction. - Learnt about current agriculture scenario and the problems and challenges faced.	- Occupation, Landholding and mode of operation of farmers. -Irrigation methods used. - Income level of farmers. - Availability of labour and selling market.	- Farmers . -Scientists from Krishi Vigyaan Kendra. - Food Processing Industry People. - Experts providing training to farmers.

Analysing through the **AEIOU framework**, our analysis came out to be :

1. **Occupation** : Main occupation of people in these villages is agriculture (including horticulture) and some farmers also keep livestocks. Because of the availability of adequate temperature and rainwater, the major food grain produced in these villages is Paddy, which people grow for both domestic consumption and commercial purposes. On an average, farmers generally contribute 2 to 2.5 acres of their land to rice production. In horticulture crops, the major produce is Mango with their different varieties as Alphonso, Kesar and Rajapuri. Other produce include chikoo and sugarcane. Apart from agriculture, people in some villages are also dependent on livestocks for their income. This include cattle or dairy cows, chickens and goats. Poultry raising and dairy farming contribute to signifcant income to these farmers. Apart from all this, they also produce vegetables, mainly for their local consumption and selling it to local markets. Main vegetables include brinjals, cabbage, cauliflowers, carrots and bhindi.

2. **Landholding :** The landholding per farmer varies with different villages with some villages like Goima, Rohina and Dongri having farmers with approximate landholding of 10 acres/farmer and smaller villages like Sarodi, Tarmalia and Nanavagchipa having farmers with landholdings in the range of 2 to 5 acres per farmer. Though because of

declining interest in agriculture and people migrating to service sector jobs, farmers are selling their land off and hence the average landholding is declining only.

3. **Irrigation :** Depending on the type of crop being cultivated, the irrigation methods in these villages vary from Rain water irrigation, Borewell, and drip irrigation. Because of availability of adequate rainfall, flood irrigation is more popular in these areas and drip irrigation is used by only a handful of farmers. For rice and mangoes, mostly all farmers use flood irrigation only, whereas for sugarcanes and banana, drip irrigation has also been employed.

4. **Income Level :** The income level of farmers vary between villages with bigger villages like Rohin, Gohima having more prosperous farmers and villages like Nanavagchipa seeing more poverty for farmers. Apart from the landholding, another factor which affects farmers income level is the side business. Women and younger generation of many families in these villages have got their employment in the nearby industrial areas, which contribute to their good income level. Families in which there are some people doing services apart from agriculture like industrial workers, teachers are relatively more prosperous.

5. **Mode of Operation :** Majorly farmers operate on their land by their own, that is they themselves do all the agriculture related activities and employ some workers to help them. Some farmers, on the other hand, give their entire land to third party, who operates in their land and give a part of their revenue. Generally farmers with bigger landholding do this.

6. **Selling Markets :** Apart from keeping produce for domestic consumption, farmers sell their produce in both local market (preferrably Rohina) and also sell it to middlemen who then send it to Mumbai market. Generally, Rice and Mango being the main produce are produced in sufficient quantity to send it to Mumbai market, whereas side crops like Chikoo and vegetables are sold in local markets only. Sugarcane produce are sent to Valsad Sugar Co-operatives, of which some farmers are members as well as shareholders. These Sugar Co-operatives operate on a no-profit-no-loss basis, they work on the principle that even if the sugar prices fall significantly, procurement prices do not fall

below Fair and Renumerative Prices(FRP), which is fixed by centre. Hence, farmers need not worry much about the fluctuating market price for their sugarcane produce. For the Cows and buffaloes that these farmers have, they are able to get around 10 litres of milk per cow everytime they milk them, and the milking happens twice a day. They collect all the milk and send it to the Dairy collection centre, where the weight of the milk and its fat content is tested and a payment slip is given to the farmers. Since the payment rates are fixed and farmers are able to get adequate milk from cattles, this is seen as a profitable occupation by farmers.

7. **Labour Availability :** During interaction with farmers, the challenge of shortage in availability of agricultural labour came to the fore. Almost all the farmers face the labour shortage problem. The reduction in labour supply along with the support from a number of Government schemes, including MGNREGA has led to an escalation in farm wages which is adversely impacting the profitability of farmers. Rural wages have been growing by 17% on average since 2006-07 outstripping urban wages. At the same time, increasing wages without an increase in productivity is fuelling inflation. The increasing labour wages make up for more than 60% of the input costs and sometimes the farmers can so not afford these labour costs that they prefer not to pluck out the ripen crops and let them rot in the plants themselves. That accounts for a big loss. The reduction needs to be compensated by adequate measures to reduce the overall labour intensity of the sector.

8. **Storage Requirement :** Storage facilities in all the villages we surveyed is entirely absent or grossly inadequate. . Lack of proper storage and transit facilities lead to wastage of agriculture produce. Under these conditions, the farmers are forced to sell their produce immediately after harvest at the prevailing market price which are bound to be low. By taking advantage of their inability to store goods, middlemen exploit farmers by giving them insufficiently low price for their goods and deprives the farmers of their legitimate income. In some cases, since the transportation costs of taking the goods to the market for sale is high enough and farmers can't afford to take the goods back as the transportation costs on return journey will again add on to their already high input costs, sometimes the farmers are compelled to sell their produce to middlemen at throwaway

prices , which are so low that they are not even able to recover their input costs. A proper storage facility will put farmers in a better position and they will give a better bargaining power in their hands so that they are able to command a decent price for their produce.

9. **Other Activities :** Apart from the regular agricultural activities that farmers in these villages do, there are also some side activities which they do for their living. Women and younger generation in some families have started going for job options in industrial sector of vapi and around. Ladies in Sarodi village are involved in Papad making as their side profession, which they send to mumbai. According to them, Papad making require a very small input costs and provide them a good return. Also, farmers in some villages grow decorative flowers as well which they sell to local markets and are used in occassions like in temple, during any ceremony in village etc. Mostly Lily flowers are grown for this purpose. In one of the village visited for the purpose Nanavagchipa, we observed that agriculture is their secondary work and they are more dependent on Bricks preparation and Wood cutting as their primary occupation. This leads to a generally observed lower income level in the same village.

Conclusions

Famers no longer see agriculture as a profitable and sustainable profession. As a result, most of the households now consider it as a secondary source of income because in some cases farming had actually resulted in losses to the families either because of poor weather or market conditions. Some of the conclusions drawn from analysis of the present state of affairs of agriculture in the clusters of Vapi are:

1. **Input costs in farming**: Currently, due to high prices of pesticides and fertilizers, farmers incur a high input cost in farming which results in declining profit margins. This is mainly because famers have almost no knowledge about the use of fertilizers and pesticides (F&P) and are totally dependent on Agro people for their usage. These people recommend those F&P in which they earn higher commissions irrespective of the costs.

Hence, there is a need to provide training to the farmers regarding optimum usage of F&P so as to control this cost and also ensure that the soil doesn't degrade. Moreover, there is a need to shift focus towards "Low Budget Farming" as propagated by Subhash Palekar. This unique method of farming requires no monetary investment for purchase of plant protection chemicals and fertilizers from the market as the farmer only requires one cow and things like lime, jaggery, black pepper, neem etc which can be found on a farm for treatment of soil and crops . Even though, this is farmer friendly and financially viable, the results are not supposed to be good in initial years because of the lingering effects of chemicals.

2. **Crop Selection:** Farmers in these villages are too much dependent on only mango as part of their agricultural produce and continue to overlook other crops that can prove to be profitable with minimum inputs. Crops like pineapple, papaya, jackfruit and banana have been tested successfully in the prevailing climatic conditions.

   It is required to educate farmers regarding the production of crops that require lesser inputs and are more profitable. Also, famers need be encouraged to look for other avenues of income while working like a farmer for eg. Development of nurseries, ginger in the space between two mango trees and growing crops like haldi etc. Not only this will ensure proper land utilization, but also result in better income for the farmers.

3. **Post Harvest Management:** After these crops are harvested, farmers directly take the produce to the local markets for sale on the same day, due to absence of proper storage facilities.As all these products are perishable, farmers are forced to sell their produce to the traders at the price quoted by middlemen. Poor post harvest management of produce by farmers leads to not only wastage but also is one the primary reasons for low profit margins in this profession. For instance, Alphonso mangoes that sell at Rs 250-300/kg in retail outlets in cities like Mumbai is sold by famers to the traders at a meager amount of Rs 40/kg.

   Such situation concludes towards the need for following:

   - Better post harvest management like sorting, grading and packaging in case of

fruits.

- Arrangement of proper transportation facilities for marketing the packaged produce directly to cities like Mumbai and Ahmadabad.
- Multi-purpose storage capacity areas for storing the produce at time of peak harvest when market prices are low and releasing it later in the market.
- Provision of tie-up of farmers with local food processing industries to enable them to semi-process their produce like mangoes to pulp and then market the produce later in national and international markets.

Apart from this, some crops like Chikoo are facing the threat of getting extinct because of the alarming pace at which chikoo trees are being cut by farmers and replaced by mango trees and other even though chikoo tree bears fruit nearly 8 months per year and require very low maintenance. This is mainly because of the fact that chikoo is perishable and able to fetch a low price in the market.

Hence, there is an urgent need to encourage processing of chikoo and make this fruit a delicacy with proper marketing in form of juices and milk shakes.

Recommendations

We would recommend rolling out the below recommendations in subsequent phases. Our recommendations are :

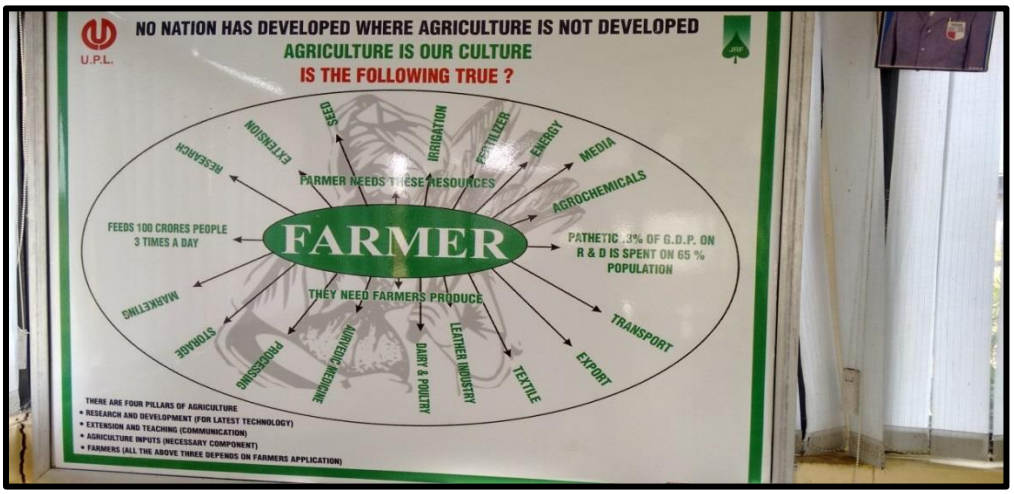
1. **Phase 1 - A Self-Help Group of Farmers Under the Joint Liability Scheme** :
   Group liability is a key to avail easy Micro credit. The "One for all, all for one" philosophy when marketed as a business proposition can tip the scales in the favour of small and marginal farmers and other semi-skilled workers and rural women, who otherwise are unable to avail bank loan for want of collateral. A Joint Liability Group(JLG) is an informal group comprising preferably of 5-15 individuals coming together for the purpose of availing bank loan either singly or through the group mechanism against a mutual guarantee. Another feature of JLG is that the quantum of credit need not be linked to savings and no collateral will be insisted by banks against

their loan to JLGs.Thus JLG will prove to be the best medium for financing these landless and tenant farmers.In the villages that we visited, Farmers told us that due to the lack of easy loans from banks at the appropriate time, farmers take it from the middlmen or other lenders and thus bound themselves for returning the obligation, they have to sell their produce to that particular middlemen only at whatever price he takes. Middlemen take advantage of the situations and exploit farmers to sell their produce at throwaway prices. Hence to resolve this issue, in first phase we recommend the formation of a Self Help Group of 15-20 farmers under a Joint Liability Scheme, where the Joint Liability Group (JLG) enables the members to avail credit without collateral, purely on the strength of peer partnership and at the same time gives them the flexibility to pursue individual objectives too.

2. **Phase 2 - Formation Of a Producer Company :** The actual problems that farmers face today can be summarized as having low incomes due to the absence of post-harvest infrasture, low value addition and absence of organised marketing processes. The solution to all these, in fact, lies in ensuring that farmers get a higher portion of the price paid by the consumers, which will ensure higher incomes for them. This, in turn, will spur investment in agriculture, leading to increase in farm productivity and easing of supply side constraints responsible for downward spiralling foodgrains prices. Organising farmers in a structured mode that's conducive to efficient value addition and marketing will be in the interest of the small and marginal farmers we interacted with. In view of this, expanding our network of the SHG of farmers from 15-20 to around 60 and above, for farmers we recommend the setting up of a Producer Company – a hybrid between cooperative societies and private limited companies. The so recommnded Producer company can be set up based with the farmers providing some part of the investment and some part can be taken as loan, while availing the government subsidies that are already in place. UPL can also provide the required assistance in the process by being a third party member. Producer companies, with the intention to organise farmers into a collective to improve their bargaining strength in the market, are owned and governed by shareholder farmers and administered by professional managers. They adopt all the good principles of cooperatives and efficient business practices of companies and also seek to

address the inadequacies of the co-operative structure. They can undertake activities related to production, harvesting, procurement, grading, pooling, marketing, processing etc of agricultural produce.The working of these companies will be beneficial to farmers as the structure will reduce the number of intermediaries in the value chain and also bring in higher income for farmers.

3. **Phase 3 – Providing Training & Development facilities to farmers** :



Almost all the farmers in these villages have learnt agriculture from their forefathers and thus they continue to do the farming in the old ways only . Though there are some training centres available in the surrounding villages, these farmers don't feel the need for training and continue to do agriculture in primitive ways only with no adoption of modern technology or mechanisation. This results in inefficient use of their land and improper yield. Thus, as part of our recommendation, in phase 3, we suggest that the producer company so set up can extend its horizon to provide Training facilities to these farmers. They need to be educated about newer and efficient ways of doing farming so that they can adequately utilise their land. For instance, primitive ways of farming leads farmers to leave around 30 ft space between two mango plants and that space between plants is left without any use, whereas a new method of farming , known as High Density Plantation allows farmers to plant mango trees with only 6 ft space between two of them. Though these trees with HDP require proper trimmimg and prunning at required intervals, it allows farmers to plant nearly 5 times more trees on the same area available.

Also, in the space left whatsoever between two trees, some farmers even plant ginger and other side crops, which increases the produce available from the same land. Like this, there are other numerous examples available about modern way of farming, which most farmers are unaware of. In addition to that, another major problem being noticed is that since farmers are not educated enough, they are not aware of what fertilisers and pesticides they should use for each crop and in what quantity. This leads to their exploitation by the agro people. As agro-people have a commission in the fertilisers and pesticides they sell, they often recommend expensive fertilisers and pesticides in place where an inexpensive ones can also do the work, and also in more quantities and more number of times than required. This significantly increases the input cost for farmers. Thus, our recommendation would be to provide adequate training and development facilities for farmers and in addition to that also make them aware about the correct usage of fertilisers and pesticides as well. Also, for increasing the yield, farmers in these regions have been using fertilisers and pesticides indiscrimantely without any heed towrards the soil. This, in addition to the growing pollution due to the industrialisation of the area, has led to the depletion and exhaustion of soil leading to their low productivity.

4. **Phase 4 – Help with Transportation and Marketing facilities :** Support for natural resource management, ensuring food security, creating marketable surplus and better income leading to livelihood improvement are the normal sequences of any development programme. Production technologies put together may increase production significantly. But, the ultimate objective of increased farm income may not be realised through production led approach alone. Absence of appropriate, viable and competitive marketing facilities often restricts small and marginal farmers in deriving maximum benefits from development efforts. The small marketable surplus, the produce not meeting market preferred quality, poor negotiation capacity of the unorganised farming communities further complicate the situation. Agricultural marketing still continues to be in a bad shape in thses areas. Transport costs play a critical link between accessibility and agriculutuarl development. In the absence of sound marketing facilities, these farmers have to depend on local traders and middlemen for the disposal of their farm produce which is sold at throw-away prices. Our interaction with farmers let us know that earlier

some farmers used to send their produce directly to Mumbai markets where they commanded a better rate. However, because transportation costs were significantly high that put a pressure on their profit margins, they stopped doing so. So our recommendation would be to promote this SHG farmers to form a cluster of 5 each and jointly send their produce to Mumbai and they can thus jointly bear the transportation costs, which wouldn't be significant then. Also, some help from the producer company on sorting, grading, packaging and transportation part would be appreciated.

5. **Phase 5 – Development of a Cold Storage Facility :** Storage facilities in all the villages we surveyed is entirely absent or grossly inadequate. Lack of proper storage and transit facilities lead to wastage of agriculture produce. While the agricultural production base is quite strong in these villages; wastage of agricultural produce is massive.Poor infrastructure, including the lack of integrated cooling facilities has also retarded the growth of food processing industry also. Under these conditions, the farmers are forced to sell their produce immediately after harvest at the prevailing market price which are bound to be low. By taking advantage of their inability to store goods, middlemen exploit farmers by giving them insufficiently low price for their goods and deprives the farmers of their legitimate income. In some cases, since the transportation costs of taking the goods to the market for sale is high enough and farmers can't afford to take the goods back as the transportation costs on return journey will again add on to their already high input costs, sometimes the farmers are compelled to sell their produce to middlemen at throwaway prices , which are so low that they are not even able to recover their input costs. A proper storage facility will put farmers in a better position and they will give a better bargaining power in their hands so that they are able to command a decent price for their produce. Thus in our final phase, we would like to recommend the setting up of a Cold storage facility for villages in Paria and around, which will preserve the perishable commodities of food items for a longer period with retention of original colour, flavour and taste. Farmers can then store their excess produce and then also take them out for selling purpose in the non-harvest season. Not only will it prevent the wastage of fruits and vegetables and provide farmers with a source of income round the year, but also will strengthen their bargaining power in front of traders and middlemen and they will be able

to command a better price for their produce.

Appendix

Appendix I – List of abbreviations used :

- KVK – Krishi Vigyaan Kendra.
- FPI – Food Processing Industry.
- FRP – Fair and Renumerative Price.
- MFP – Mega Food Parks.
- MoFPI – Ministry of Food Processing Industries.
- ACABS – Agri-Clinics and Agri-business schemes.
- NABARD- National Bank for Agriculture and Rural Development.
- JLG – Joint Liability Group.
- SHG- Self Help Groups.
- PPP- Public Private Partnerships.
- HDP – High Density Plantation.

Appendix II – References Used :

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- https://www.organicconsumers.org/news/organic-agriculture-future

Appendix III – Tools for Data Collection :

Questionnaire, FGDs and Surveys.

Appendix IV – Excel sheet containing all observations:

..\UPL\Obsv.xlsx

Appendix V- Contact Details :

1. Mr Rishi Pathania, CSR Head, UPL Limited

   Contact no- (+91)9909994725 Email- rishi.pathania@uniphos.com

2. Mr Rakesh Kumar, Project Lead, UPL Limited

   Contact no- (+91)9909994965 Email – rakesh.kumar@uniphos.com