MID TERM ASSESSMENT OF AGRICULTURE INTERVENTION IN DANGS

IN COLLABORATION WITH UPL LIMITED

MID-TERM ASSESSMENT OF AGRICULTURE INTERVENTION IN DANGS

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PREFACE

From the hustle and bustle of a fast moving city like Mumbai, within a span of 4 hours, I arrived in the industrial town of Vapi in Gujarat. This was my first pit stop before continuing with the second leg of my journey to Ahwa, a quaint little town situated on a hill which was to be my home and place of work for the next 5 weeks.

After the initial briefing by our guides I spent the rest of the day getting to know the company and its activities in the business and CSR space. I had studied about the company as a small case for one of my courses in first year of PGDM at SPJIMR. My project guide was due to take me to my destination the following morning and we arrived in Ahwa after a four hour drive, an hour of which was in the hills.

It was a very peaceful town, nothing like I had ever seen before. My project guide showed us our place of stay and then we started about to exploring the activities UPL was engaged in Ahwa. We were fortunate to have been introduced to Hiren Sir, who was to be our on field guide for the project. We were shown around the educational initiatives that UPL was supporting and the laurels achieved by students of the girls' school were amazing.

The overall environment was a very different and the whole town could be travelled on foot. This was again in stark contrast to Mumbai, my earlier residence. The facilities I would have during my stay would be very limited and I had to go back to grassroots by living on minimum support systems, an art long lost.

There were butterflies in my stomach along with excitement and eagerness to do something good for the farmers and having a personally fulfilling experience.

ACKNOWLEDGEMENT

The DOCC experience was unique in every sense and was an extensive rural immersion in its true meaning. The following report is a result of immense support and assistance of many people who have provided valuable inputs at every stage of the project towards making it a successful endeavour.

I extend heartfelt gratitude to all individuals who were part of this journey.

Mr Rishi Pathania, Head-CSR, UPL Limited who was my overall project guide and ensured a hassle free DOCC project experience. He gave us critical inputs during every stage which helped me execute the study in an efficient manner. I thank Mr Rakesh Kumar, Project Lead, UPL Limited, who guided us in the operational details and made available all resources at the project location to make our stay as comfortable as possible. His insights into assessment parameters and tool preparation were invaluable and helped me in taking the project to its current shape. I also like to thank Hiren Sir who was our local guide and personally took care of us during the course of the project. His rapport with the farmers and his wealth of on-field experience is one of the primary factors for ensuring a successful completion of our field visits within stipulated time frame.

I extend a big thank you to Ms Shobha and Mr Sukumar from Aga Khan Rural Support India for the detailed discussions and feedback they were able to provide to our questions and observations. Their forte in the ground realities helped us foresee challenges and plan to mitigate them during the field visits. I thank Hitesh Sir from AKRSPI for helping us in the Waghai leg of the field visits and achieve maximum responses from the cluster. It would have been impossible to get so many responses without his assistance.

I would like to express sincere thanks to Ms. Nirja Mattoo, our faculty guide and Chairperson, DOCC and the entire DOCC Committee without whom, the experience could not have been what it is today.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Dang is one of the most poor and backward districts in India. More than 80% of the population living here is tribal and most of the population is either a cultivator or is employed as agricultural labourer. Agriculture practice is still subsistence oriented and there is high pressure on land. Majority of the area is forest land and 68% of the arable land is situated on a slope. There is the added problem of water run off due to the land being rocky and unable to retain much water.

UPL has been working in Dang district through direct intervention in 11 villages and through indirect intervention in 18 villages by supporting an NGO, Aga Khan Rural Support India. The intervention is primarily in the agriculture space with three initiatives – AKRSPI SRI Project, Paddy Development Project and Farmer Training School situated in Naholi. The AKRSPI SRI Project and Paddy Development Project are aimed at providing food security and economic development to farmers through twin approach of capacity building and demonstration of farming techniques. There is specific focus to enhance paddy productivity of tribal farmers and introduce them to efficient farming practices.

The following study aims to conduct a mid-term assessment of UPL's agriculture intervention in Dang district. The key outcomes expected of this study are complete review and farmers' opinion on various outcomes, compilation of quantitative and qualitative data followed by recommendations for the future.

The study was conducted keeping impact of SRI on income and expenditure as the main assessment criteria for both modes of intervention along with secondary parameters like Landless Garden, Training efficacy in case of direct intervention and Fertilizer inputs in case of indirect intervention. The modes of assessment were Personal Interviews, Focus Group Discussions and Questionnaires and primary research was conducted with help of volunteers. Through surveys and discussions, quantitative analysis yielded impact metrics on input costs and productivity pre and post SRI. Qualitative analysis was instrumental in data validation and gave us insights into the thinking and concerns of the farmers. In course of the study, certain challenges and limitations which were identified and taken into consideration while performing field research. After a detailed analysis, recommendations were made to improve the efficacy of the agriculture intervention and help UPL CSR achieve better results.

ABOUT UPL

UPL Limited formerly known as United Phosphorus Ltd. is a global generic crop protection, chemicals and seeds company, headquartered in India (Mumbai). UPL, Advanta and UEL, the three companies in UPL group, are listed on the Indian stock exchange, with a combined market capitalization of approx. $2.5 billion. The revenues of UPL have grown at a CAGR of 26% over the last 5 years. UPL Limited was incorporated in the year 1985. UPL has a customer base in more than 123 countries and they have 23 manufacturing sites (9 in India, 4 in France, 2 in Spain, 3 in Argentina, 1 each in UK, Vietnam, Netherlands, Italy, China). They have been certified under ISO 9001 for Quality Assurance, 14001 for Environment Pollution Control Norms and OHSAS 18001 for Health and the Society.

ABOUT UPL CSR

At United Phosphorus Limited (UPL) the CSR vision is to enable all stakeholders to become active partners in self-reliant society. Various CSR activities being undertaken by UPL are - need based CSR projects, capacity building of stakeholder so as to make them self-reliant, developing partnership with stakeholders and integrating CSR with UPL business strategy. Agriculture development is an important thematic focus for UPL and agriculture development intervention has been adopted to systematically develop, communicate and disseminate approaches and concepts on sustainable agriculture. UPL began CSR activities long back in 1969, before it broke even. Following are the areas where UPL undertakes CSR activities:

- Pardi and Umargam taluka of Valsad District
- Ankleshwar and Jhagadia taluka of Bharuch District
- Dang District
- Vadodara District

CSR Vision

"We and our subsidiaries along with our partners commit ourselves to create a more equitable and inclusive society by supporting processes that will lead to long term sustainable transformation and social integration and by creating opportunities that enable the socially disadvantaged to utilize their potential in achieving their aspirations and ambitions."

CSR Mission

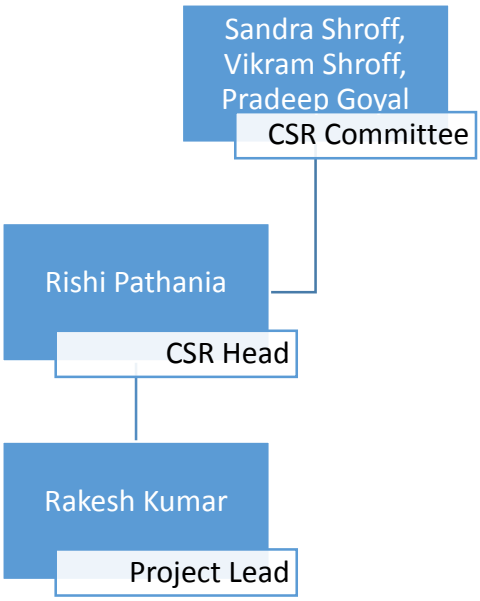
- To implement need based CSR projects and extension work

- To build capacity of community so as to make them self-reliant
- To develop partnerships with all stakeholders
- To promote and institutionalize CSR with UPL group business strategy

CSR Values

- Care
- Excellence
- Partnership
- Sustainability
- Learning and Sharing

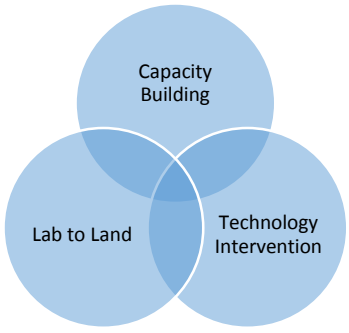
CSR Team and Structure



The UPL CSR Team is a very small unit with 3 members forming the CSR committee – Mrs Sandra Shroff who is the Vice Chairperson, UPL Ltd; Mr Vikram Shroff, who is the Executive Director, UPL Ltd; and Mr Pradeep Goyal who is a Director, UPL Ltd. The CSR Committee oversees a staff of 7 people. The annual budget of the CSR department is approx. INR 70 million and is funded directly by UPL Limited.

UPL Agriculture Intervention

Agriculture Development forms one of the 6 thematic areas of focus for UPL. The other five being – Employability and Entrepreneurship; Education and Empowerment; Environment and Nature Conservation; Health and Sanitation; National/Local Area Need. The framework for UPL's agricultural intervention focuses on three crucial aspects as seen in the diagram. The framework for UPL's agricultural



intervention focuses on three crucial aspects as seen in the diagram. UPL has been operating multiple projects in the agricultural sphere.

The System of Rice Intensification (SRI) Project in Dang district focuses on the food security issue of farmers with low land holding and low rice productivity. This project is being implemented in partnership with an NGO, Aga Khan Rural Support India.

The Dang Paddy Development Project is another project being undertaken in Dang district. Emerging from the traditional system of slash and burn, subsistence farming is the primary source of livelihood for the tribal population. The project aims to boost rice productivity by demonstrating high yield paddy seeds and building farmer capacity through village level training and exposure visits.

The Farmers Training School at Vikram Farm, Naholi imparts new farming methodology to farmers through practical demonstration of crops and farming equipment. Exposure cum training modules at this school helps farmers develop expertise to make their own crop management decisions. Various demonstrations like Sugarcane, Paddy, Vegetable, Nursery, Inter-Planting, Land Management and Vermicomposting are also conducted here to give farmers added knowledge to increase their breadth of farming.

THE PROJECT

Defining the Project

For the first time in my career, I was faced with a project where only the name and broad area of work was known to me. The scope, criteria of assessment, methodology all of it were ambiguous. This was the beauty of DOCC. Being thrown into unstructured situations and then working out a way to achieve the stated objective is the biggest takeaway a manager could ask for. And to do it all in a rural setting working in the most backward of areas with the poorest of people with minimal resources is what makes it challenging albeit enriching.

First Look

The first day of my DOCC experience was not at the work location but at Vapi, where I met my project guides with whom it was the first in-person interaction. The CSR Head of UPL India briefed about the CSR activities of UPL and asked me of my expectations and prior experience in the developmental sector or rural immersion. Later I was briefed about my work location and the work that I was expected to do over the next 5 weeks. The next day I was scheduled to be at the work location where my project guide showed me around the place and introduced me to the local man in charge and performing the day-to-day activities with the farmers. I was to work alongside him for my daily tasks and he would facilitate any information or resources that I might need.

Based on the interaction with the local guide and project guide, I understood that UPL worked with farmers in various villages in Dang district to improve their livelihood. The primary objective was to provide food security to them by helping them enhance their farm produce through sustainable and economical practices and skill building.

Dang is known to be one of the poorest and most backward districts in India with 80-90% tribal population. Livelihood security is a severe with survival being the immediate concern rather than luxury or comforts. There is immense dependency on rain-fed agriculture, insufficient agricultural land, low agricultural productivity and lack of alternative employment

opportunities. Most of the population is either a cultivator or employed as agricultural labour or both in a year. The agricultural practice is still subsistence oriented. There is a high pressure on the land, since the majority of the land is forestland (59%) and only a limited amount of land is available for agriculture to support a growing population. Another limiting factor is the fact that 68% of the land is situated on a slope which makes water retention an issue over and above the existent water scarcity.

UPL is implementing a Paddy Development Project in Dang district. This entails efforts to push paddy productivity, which forms the staple crop of the region. The methodology being pushed is called SRI – System of Rice Intensification. All agronomic principles related to crop production are put into practice. The technique involves systematic sowing and cultivation of rice as opposed to traditional method which was far less productive.

UPL is trying to implement SRI through two mediums – Direct Intervention and Indirect Intervention. In the Direct mode, UPL has adopted villages directly under its purview and helps farmers through training in techniques, equipment and input factors related to paddy cultivation. Currently, it has 11 villages under its purview in the Ahwa cluster. The second mode of intervention is Indirect, where UPL has partnered with Aga Khan Rural Support India (AKRSPI), a huge NGO working across the country on various rural initiatives. UPL supports AKRSPI in its SRI Project in 18 villages in the Waghai cluster of Dang district.

The objective of my work at UPL would be to assess the impact of intervention by UPL – Direct and Indirect in these villages. Based on inputs provided directly by the beneficiary farmers in the form of primary research, I would be assessing how UPL has fared in its initiatives. Since the project is still in a very nascent stage, this would be a mid-term assessment of the work done so far.

I began simply by touring the nearby villages with my local guide to get the feel of the area and the community. The habits, language, culture, safety, security, farming patterns, weather, transportation facilities, etc.

Scope of the Project

Before work could be started on the project, I had to clearly define my scope of work and breadth of my research. Based on initial discussion with project managers from AKRSPI, UPL and my local, I had to tour the villages and prepare a blueprint of what I could cover in my study. A lot of factors were under consideration while defining my scope:

- Duration of the project
- The week-long celebration of Holi and local fest Dang Darbar
- Migration of farmers for labour work in sugar factories
- Language and Communication Barrier
- Lack of awareness of farmers in communicating precise information

This is why the initial acclimatisation week was instrumental. It helped me get a feel of the people and my scope of work. After detailed discussion with project guides, I defined the scope as following:

- Direct Intervention - Visit 5 villages out of 11 in Ahwa cluster adopted by UPL
- Indirect Intervention – Visit 9 villages out of 18 in Waghai cluster where AKRSPI is doing the ground work
- The scope would be limited to specific activities being undertaken in each of these modes
    - Direct Intervention – SRI, Training at Vikram Farms, Landless Garden
    - Indirect Intervention – SRI, Fertilizer assistance

Parameters of Assessment

After narrowing our scope, the next logical step was to decide on factors which would be the building blocks and yardstick of the study. Since the aim of the project was to assess the impact of UPL's intervention in agricultural activities, there were a lot of factors under consideration which could help in gauging the impact but all of them could not be incorporated in the study due to time limitation. As with the scope of the project, it was paramount to be focussed when deciding parameters. There was a certain qualifying criteria for any parameter to be deemed fit as an assessment parameter. Broadly, the criterion applied were:

- Time
- Availability of information
- Willingness of respondents to disclose the information
- Ease of quantification, in some cases
- Amount of subjectivity involved
- UPL's contribution
- Amount of circumvention required to arrive at needed information if respondent unable respond directly

At this juncture, again the on field experience of UPL local guide and AKRSPI guides came to the rescue after detailed discussions unravelled practical and foreseeable constraints in various parameters. Ultimately, following were the parameters chosen to be assessment criterion for impact study:

- Migration Rate
- Annual Income level of a household
- Impact on Livelihood
    - Food Consumption
    - Education
    - Standard of Living
- Efficiency of Agricultural Activities
- Contrast between Direct and Indirect Intervention from a farmer's perspective
- Scope of Improvement

Research Methodology

Tools Adopted

For the initial one week, after visiting various villages where UPL was directly or indirectly working with farmers, the broad parameters were understood which could be assessed through primary research and for which data could be collected for substantiating the assessment both quantitatively and qualitatively. There was complete independence in designing of the study and methods to assess the aforementioned parameters. After the initial week of acclimatisation in the area, three tools of assessment were decided upon – Questionnaire, Personal Interview and Focus Group Discussions.

Questionnaire

The questionnaire was chosen as the primary data collection tool. Since the objective was to cover maximum no of farmers, a questionnaire would be the tool of choice. Assistance was also obtained from the local project guide from UPL and AKRSPI, and consequently, questionnaire would have been the best way to increase the sample size. The questionnaire was also designed in such a way that it captured quantifiable data for assessment.

Personal Interview

The Personal Interview was chosen to get qualitative information about the farmers, and village life. There were some aspects which could not be captured using a questionnaire or any other written form. There were softer aspects regarding how the farmers felt about farming and livelihood which could only be captured through open ended discussions.

Focus Group Discussion

Another tool to capture broader qualitative information about villages and farmers as a group was the Focus Group Discussion. These discussions were leveraged to validate information provided by farmers in questionnaires. FGDs became instrumental in data validation. Farmers were quick to point out discrepancies in responses being given by another farmer. Being a close-knit community, all farmers knew about almost every other farmer in their village.

Sampling

After freezing the no of villages as the scope for assessment of Direct and Indirect intervention, the next step was to decide how to choose villages and later how many farmers and how to choose them. Nine villages in the Indirect Intervention Area (Waghai Cluster) and five villages in the Direct Intervention Area (Ahwa Cluster) were decided upon as the scope. These formed approximately half of the total villages UPL currently supports. Some of the villages are in their second year with UPL while the remaining are in their first year. Villages for the sample such that there was a balance between villages in their first and second year. After choosing the villages which under scope, farmers who were to be interviewed, were selected. The farmers were chosen randomly from every village and a target was set for 10 farmers from every village. Most of the farmers migrated out of their villages to work in the sugar factories a labourers, since they predominantly farmed only in monsoon season due to unavailability of water otherwise. A preliminary field testing for the first draft of questionnaire and interviews was done in some villages which were randomly chosen from the above sample itself.

Evolution of the Questionnaire

The questionnaire had to be extremely focussed and a lot of time was spent on framing the right questions. There could be multiple ways of extracting data for assessment parameters and things had to be looked persistently from a farmer's perspective as much as possible. Also, the questionnaire could not be long since more weightage was given to covering more farmers than more data per farmer. Aspects regarding their food security, economic and financial security,

awareness about farming techniques, what difference in farming efficiency did SRI and allied activities make in view of the farmers, were the prime factor of assessment in consideration. Keeping all parameters in mind, a questionnaire with 2-3 questions revolving around each of them was prepared. Every question was designed keeping in mind the comfort level of the farmer such that he/she was able to provide a reasonably good answer and information needed to assess that parameter was also obtained succinctly.

This first version of the questionnaire can be found as Appendix 1. Upon preparation, a discussion with the UPL project guide gave us excellent suggestions which were incorporated to get a second version of our Questionnaire. This can be found as Appendix 2.

After finalising the first draft, it was imperative to test the questionnaire on the field before freezing it. Some villages were randomly chosen from those which were within scope and so were the farmers to be interviewed.

During on-field testing, multiple techniques had to be adopted to extract answers. Inspite of giving it a fair amount of thought initially and making it easy for farmers to respond, it was still difficult to get the necessary information. A lot of points had to be circumvented to extract the exact information.

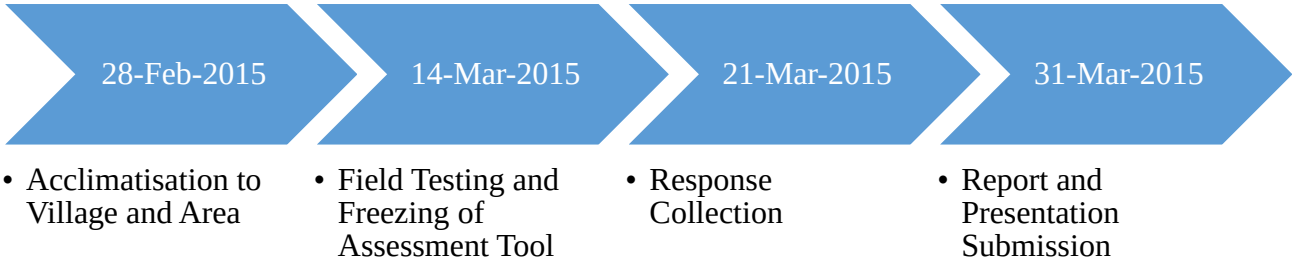
After first round of field testing, a discussion was planned with the Area Manager of Aga Khan Rural Support India, the NGO working directly with the farmers and is supported for some initiatives by UPL. Their inputs were important since the villages being managed by AKRSPI were within scope as well. Being involved directly with the ground work, AKRSPI inputs were invaluable in terms of understanding farmer problems and behaviour. The meeting with AKRSPI turned the study on its head. What was thought earlier as being a focussed study with specific parameters in mind was in reality too broad based and dependent on a host of other factors which were a blind spot

in the assessment. The assessment failed to take into consideration that the impact on farmers' lives was not solely because of SRI but 14 other activities which were being undertaken by AKRSPI in villages under its purview.

After inputs from the Area Manager and project guides, the analysis was bifurcated into understanding Direct Intervention and Indirect Intervention separately and independently. Direct Intervention would be assessed on parameters different from those of Indirect Intervention. Earlier a common questionnaire was designed to study the impact of agricultural activities for both modes of intervention and then draw comparisons between the efficacy and impact in both cases. This turned out to be a fallacy and the questionnaire had to be redesigned with two versions this time with separate assessment criteria. The final questionnaire used for collecting responses can be found in Appendix 3. They have been titled Direct and Indirect Intervention.

One last hurdle which was seen during field testing was the problem of language. The questionnaire designed in English was difficult to work with for the volunteers and local project guide. With assistance, the questionnaires were hand written in Gujarati and then finally frozen.

Timeline



Broadly, weekly targets were set after the initial acclimatisation trips to core villages and discussions with project guides and AKRSPI affiliates. Greater amount of time was allocated initially for tool design and field testing because the kind of questions to be asked to farmers was crucial to have correct data in hand for analysis. The initial acclimatisation came in handy when the questionnaire and FGDs pointers were being designed. During this time, there was a local

celebration called the Dang Darbar where people from far off villages flocked to the town of Ahwa for 3-day festivities and an official felicitation ceremony of the erstwhile kings of Dang by the Government followed by Holi festivities where visiting the villages was not advisable due to security issues.

Also, there were restrictions on the time during which villages could be visited since most of the day, farmers were out for work or were migrating out of their villages. Evening visits were again ruled out due to security issues.

The last week was earmarked for data compilation, analysis, final report and presentation preparation and submission.

Primary Research

Post the freezing of the assessment parameters and designing of the assessment tools, it was time to hit the ground running. After selecting villages, the schedule was decided and villages were allocated to specific dates of their visit. A couple of volunteers were brought on board to assist in the data collection.

Field Experience

After all planning and homework before the actual task, field visits were started as per schedule and the on-field experience of the volunteers was a great help as the response collection was begun.

The villages chosen were different in their economic and demographic profiles. Selection of farmers was done on the spot based on their availability, which was the biggest constraint in achieving the numbers the study set out to achieve. After making corrections post the initial field testing, it was still a mammoth task to extract correct information from the respondents. Low financial literacy levels, absence of the need to maintain accounts and information about their finances, absence of precise metrics in measuring farm produce and

inputs were huge issues faced during response collection. It was at this stage that the excellent rapport developed by UPL/AKRSPI local guides and volunteers with the farmers, came in handy. They were able to cajole the farmers into estimating any data farmers could not quantify but was necessary for assessment. There were metric systems for weight like Champa, Dang Man, Gujarat Man which had never been heard before but the local volunteers were well aware. Similar was the case with land area where units such as Kenda, Guntha and Kyari were unheard of. Some farmers did not have any estimate of their own land. Such was the extent of variation that different villages used different weight and area metrics – most of which were unknown. Another challenge which was thought to have been mitigated through a Gujarati questionnaire was again language. The local dialect of Gujarati spoken here was Dangi, which was remarkably different from Gujarati and had elements of Marathi in it, as told by some locals who understood all three languages. Dang had earlier been part of Maharashtra. Some local shop owners, when asked about why certain products were unavailable in the area, responded by saying that they were not prevalent here but were in Gujarat. This was startling considering that Dang was a district of Gujarat but the locals still felt Gujarat was a different state than theirs.

Entering into a house within a village was an interesting experience. There were striking features which were unexpected from a house in such interiors of the country. Every house had a DTH connection with at least a 20-21 inch TV and most houses also had a motorcycle. Every house was made of mud, dung, thatch and bamboo/wood to support the structure with sloping roofs. The ceiling of the house was separated by the roof by an air pocket which probably kept the inside of the house cool. They were mostly one or two huge rooms in the house with beds in some of them. The kitchen was a small one with

cooking happening outside the house using wood as fuel.

All of the homes housed animals in their huge shaded courtyards with the place looking almost like a mini-zoo. There was cattle, poultry, dogs, pups, parrots and goats with every house having 3-4 of these animals, cattle and poultry being common to all households. Poultry and goats were understandably reared for self-consumption or selling. Cattle were reared for milk and use in farms.

Homes were usually located next to or in the middle of farms owned by the households. Some of the homes had setup small shops operating from one room and selling small edible items.

The people were very warm and welcoming into their homes and offered water and tea and made us feel comfortable. This was again due to the respect they held for UPL/AKRSPI and the rapport they shared with the local guides from these organizations.

We were fortunate to have witnessed a Gram Vikas Mandal meeting and the village people looked up to us. Some of the households were very kind to serve us tea and snacks and in some cases, home-made lunch. This helped us in developing a personal connect with the villagers.

Towards our response collection period, the weather had become especially hot and we were able to understand to some extent the plight of farmers who work tirelessly in the scorching sun to produce a commodity which was severely undervalued by the city-dwellers.

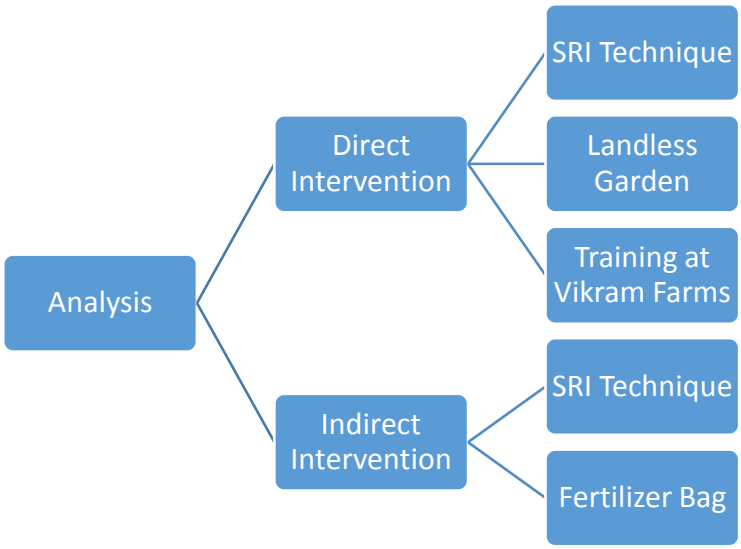
The striking feature of farmers in this part was that they grew primarily for self-sustenance and not for selling outside. Secondly, the farming in this part was purely organic without any use of chemical fertilizers or medicines. Medicines were made organically at home in some cases and fertilizers procured was organic too. It was heartening to see that the little that they ate was pure and organic. We were also lucky to have been able to eat organic produce almost every day farm fresh in the true sense of the word. The fruits were plucked from trees in their courtyard and they generously allowed us to have them to our heart's content.

During our conversations with farmers, we understood water as being the biggest issue in most of the villages. The villages where water was extremely scare, the farmers' income level was lower than those who lived close to water sources and could reap benefits of cash crops as well. Another challenge we faced was the farmers' inability to estimate expenditures and income from various activities. In some cases they liberally told us expenditure figures which were far less than the income sources and amounts that they outlined. Based on FGDs and estimations, we had to guess their income sources in some cases as well. Even after repeated clarifications that we were not a benefactor of any kind to them, the challenge still remained. There were instances when a farmer would not have space to sit down and record his responses. We had to stop in the middle of the road and bring the farmer to our vehicle to save ourselves from the scorching heat and then record responses sitting inside the vehicle.

At the end of our field visits, we found there were many challenges which we could not surmount and at the end of stipulated time, we were short of 1 village in our scope in the Indirect Intervention area – Waghai and we managed 94 responses from 8 villages. In the Direct Intervention Area – Ahwa, though we did manage to cover all villages, there was a shortfall from our targeted responses due to absolute unavailability of farmers and we managed only 28 responses from 5 villages.

Data Analysis

Based on the different parameters of assessment for the Indirect and Direct mode of intervention, the analyses have also been presented separately. Adopting a bottom up approach, we would then analyse the broader factors associated with the impact.



The above chart shows the quantitative assessment parameters for every mode of intervention. However, due to the varied nature of responses and differences in conditions of every village and farmer, these analyses would be incomplete without a few qualitative assessments which have been observed after interactions with farmers over the course of field testing and data collection.

Indirect Intervention

Following are some statistics obtained after compilation of data grouped by villages. The statistics represent change in agricultural efficiency in term of reduced input costs for various factors in Paddy cultivation and increase in productivity after adopting SRI.

	Diwadiyavan	Maachli	Dagdiamba	Barda
Average Area of Paddy under SRI (As % of total area under Paddy)	17%	47%	29%	25%
Average Planned Area of Paddy under SRI (As % of total area under Paddy)	49%	74%	69%	56%
Average increase in Paddy Production	35%	21%	35%	28%
Average Decrease (Increase) in Labour Costs of Paddy	38%	9%	(1%)	(1%)
Average Decrease (Increase) in Seeds Costs of Paddy	34%	20%	22%	6%
Average Decrease (Increase) in Fertilizer Costs of Paddy	24%	16%	17%	14%

	Maleen	Davdahad	Kukadnakhi	Borigavtha
Average Area of Paddy under SRI (As % of total area under Paddy)	24%	23%	11%	19%
Average Planned Area of Paddy under SRI (As % of total area under Paddy)	39%	50%	25%	30%
Average increase in Paddy Production	28%	25%	47%	35%
Average Decrease (Increase) in Labour Costs of Paddy	4%	(4%)	20%	7%
Average Decrease (Increase) in Seeds Costs of Paddy	26%	24%	50%	45%
Average Decrease (Increase) in Fertilizer Costs of Paddy	8%	4%	0%	12%

Note: Lot of farmers experiencing no decreased cost or increased cost in at least one of the paddy inputs. The percentages for every respondent are heavily skewed and no of respondents varies in each village.

Direct Intervention

	Nadagkhaadi	Kutarnachiya	Wangad*	Gaurya*
Average Area of Paddy under SRI (As % of total area under Paddy)	36%	36%	38%	43%
Average Planned Area of Paddy under SRI (As % of total area under Paddy)	41%	57%	75%	88%
Average increase in Paddy Production	69%	8%	19%	40%
Average Decrease (Increase) in Labour Costs of Paddy	17%	(16%)	37%	(18%)
Average Decrease (Increase) in Seeds Costs of Paddy	45%	15%	58%	4%
Average Decrease (Increase) in Fertilizer Costs of Paddy	4%	(14%)	25%	(2%)

Note: Lot of farmers experiencing no decreased cost or increased cost in at least one of the paddy inputs. The percentages for every respondent are heavily skewed and no of respondents varies in each village
(*) Wangad village data consists of only 2 respondents since most of the farmers were unavailable
(*) Gaurya village data seems highly inconsistent due to severe problems in extraction of data from farmers' responses. Their responses could not be validated and seem incoherent.

Observation and Inferences

Common Observations

There are major problems being faced farmers in both – Ahwa region and Waghai region. Some of them are:

- SRI has been leveraged well by those farmers who have a decent level of resources within their reach. The farmer looking primarily for food security has not been able to implement SRI to the same extent.
- Water shortage is the biggest issue in all the villages. They are not able to do practice Piyat (Non-Monsoon farming) because of that and are forced to look for employment as labourers and cultivators elsewhere for income

- The second major issue is availability of labour at the right time. SRI requires a high amount of labour initially at the time of sowing and excess demand w.r.t. supply creates an issue with timely availability of labour
- The third problem being faced by farmers is levelling of land. Most farmers do not have tractors and face a huge challenge in levelling land initially. Subsequent ploughing is also a challenge since most of them do not have tractors
- Some farmers expressed a need for drip irrigation facility
- In some cases, it has been observed that excess seeds and fertilizer in being used for SRI than what is sufficient for a specified area of land. This might be due unwillingness to discard old practices in hope of extra inputs yielding more.

Direct Intervention

The Farm Training School seemed to be a hit among the farmers with 20 out of 28 farmers visited the school for training and implemented at least two practices in their own farm, with SRI being the most common. Some farmers reported that others from their house went and they learnt the techniques through them and implemented them in their farm. A lot of farmers expressed a desire to learn about tackling crop infections in different crops. They were willing to attend school for awareness about diseases and their prevention/treatment. Some farmers wished to learn about crops which consumed less water and how they could better manage the limited water and land resources that were available to them.

A few farmers in Nadagkhadi village have been able to avail the Drip Irrigation subsidy provided by the government. The villagers of Nadagkhadi plan to move on to Sugarcane farming for the next 3-4 years due to the revenue prospects and lesser effort required in cultivation.

70% of the farmers interviewed managed to sell some paddy from their farms to earn an average of Rs.15000-20000 a year. Lesser percentage of people than those in the Waghai cluster keep more than 70% of the produce for self-consumption.

Half of the farmers in this cluster did not avail of the Drumstick saplings offered by UPL at a concessional rate. None of the respondents seemed excited about the growth and future prospects of farming drumsticks.

16 out of 28 farmers did not avail of the Landless Garden (Bori Bagicha) option given to them by UPL. 60% of the farmers who did adopt Bori Bagicha were excited with the prospects and planned to increase the count next year and spread word about its good growth to their relatives and friends.

Indirect Intervention

Only 2 respondents said that they did not avail the fertilizer bag provided by AKRSPI. The villagers in Maleen were concerned that the bag arrived later than the ideal time for its usage. Otherwise, the fertilizer bags have been much appreciated by the villagers and some of them went to the extent of saying that they would use only the same fertilizer going forward and would recommend the same to their peers as well.

54 farmers out of 94 surveyed were part of a Self Help Group or a Village Level Administration Body. There seems to be scope here for greater involvement in co-operatives and groups where farmers can leverage the power of community and grow together instead of each one on his own.

70 farmers have availed of some or the other Government benefit scheme or subsidy with Indira Awas and Sardar Awas Yojana being the most common ones. All the farmers in Diwadiyavan has availed of various subsidies in agriculture – irrigation, fertilizer and hybrid seeds. This sphere is another are where some improvement may be possible since no other village has availed of these subsidies.

Almost half the respondents kept equal to or more than 70% of the paddy produced in their farms for self-consumption. Most of them make their livelihood through farming other crops, working as labourers on need basis and some of them earn a major chunk of their incomes through animal husbandry.

Limitations of the Study

Every attempt was made to undertake a thorough assessment with as little scope of ambiguity as possible. However, considering the nature of our respondents, it was challenging to get the precise information. Following are some of the limitations of this study:

1. Multiple factors contribute in enhancing the efficiency of paddy cultivation among farmers apart from SRI. Irrigation, Land Management, Skill Building to name a few. We have tried to assess the independent impact of SRI on agricultural efficiency and

food security of farmers but there might be influences from the aforementioned factors which are not part of this study.

2. The responses provided by farmers have been assumed to be correct and accurate. There might be cases where the farmer was reluctant to disclose true information and may have provided wrong information.
3. It is assumed by random sampling that the range of farmers covered were broad in terms of crops cultivated, area under farming and income levels.
4. The original target was to cover 5 villages in the direct intervention cluster but only 4 could be covered. Also, a soft target of 150 farmer responses, set initially, could not be met and the study was limited to only 122 responses due to unavailability of farmers in villages.

Recommendations

1. A little more than half of the farmers surveyed have some member in the household as part of a Self Help Group or a Village Level Administration Body. There is scope for much improvement as I believe there should be at least one member per household in at least one of the above bodies. The idea of co-operatives and community groups should be promoted
2. Water is the biggest issue voiced by every farmer. Though out of immediate scope for UPL CSR, water harvesting can solve the biggest headache for the farmers. They would be able to do non-monsoon farming and adopt SRI to a greater extent. Community water storage tanks could be constructed
3. One of the biggest challenges while collecting data from farmers was their inability to specify income and expenditures. They fail to maintain track of their expenses and incomes. Farmers need to be made financially literate. Financial knowledge would also enable them to avail government and bank benefits better
4. Farmers sell year-old paddy at a price lesser than fresh paddy. In the retail market, aged rice is coveted and sells at a higher price. Farmers are very well aware of this and they still are unable to leverage it. Reasons for this can be looked into and economic angle explored. Low quality of Storage facility at farmers' end could be part of the problem

APPENDIX

Appendix 1: First Draft of the Questionnaire

Scope:

1) Indirect Intervention (Through AKRSP): 9 villages out of total 18 villages of Waghai District
2) Direct Intervention: 5 villages out of 11 total villages near Ahwa

Parameters to asses:

1) Migration rate
2) Annual Income of a household
3) Impact on livelihood
    a. Food Consumption
    b. Education
    c. Standard of Living
4) Efficiency of Agricultural activities
5) Comparison between Direct and Indirect Intervention from farmer's perspective
6) Scope of improvement

Tools: FGDs and Personal Interviews

Questions to be covered:

Farming Activities

1) Which crops did you grow before intervention? (In Monsoon and otherwise)
2) Which crops do you grow after intervention? (In Monsoon and otherwise)
3) How UPL has helped you in improving farm practices? (Expected answers: SRI, Thrasher, Training, Bori-Bagicha)

Input Cost

1) How much annual cost did you incur before the intervention? What were the various inputs which make up these costs?
2) After using the techniques and tools suggested by UPL, which input costs have been affected? And by how much?

Productivity/Income

1) How much has the annual crop production changed after implementing techniques suggested by UPL/AKRSPI? (Will be measured in %)
2) What was your annual disposable income before the intervention?
3) What was you annual disposable income last year?
4) What are the other sources of income? (E.g. Sugar, business, Hotel/farm labourer)

Page 1

Impact on Livelihood

Food Consumption

1) From all the crops that you grow, how much do you consume (as a family) and how much do you sell?
2) How have you used the extra crops that have been produced in last year? (If any)
3) How do you use the vegetables/fruits that you have started to grow recently? (e.g., watermelon, chana, bhindi, lauki etc.)
4) Has there been any change in the quantity/no. of daily food items that you consume?

Education

1) How much are you able to spend on the education of your children? Are you satisfied with that?
2) Has the increased income transferred into extra spending on education?
3) What career have you thought of for your children? Are you willing to let go farming activities if your children prefer to do so?

Standard of Living

1) What are your broad expenditures from the annual income?
2) How do you plan to use any extra income that you might earn?
3) Do you manage to save any amount after all the necessary expenditure? If Yes, How much?
4) Is saving money for future/emergency a priority over consuming it now?
5) Apart from the monetary benefits, how have new techniques and machines affected the amount of effort that you put in?

Migration Need

1) How many members of your family go out of the village to earn money during the off-farming season? What is the need of doing that? Will you stop doing it if you have the option?
2) Has the increased income/better practices affected the need of migration? If yes, How?

Comparison between Direct and Indirect Intervention

1) How are UPL's and AKRSPI's activities different?
2) Which of the two channels do you find better and how?

Scope of Improvement

1) What are the two biggest challenges that you are facing in your current farming activities?
2) Were there any areas where you feel UPL could have done more?
3) Was there anything you hoped would happen but did not happen?
4) In future, which areas you think UPL should intervene and through which channel, direct or AKRSP?

Appendix 2: Second Draft of the Questionnaire

Name of Assessor: **Date:**

Name of Farmer: **Village Name:**

1) Farming Activities:

Season	Crops							
	Before Intervention	Qty		Income	After Intervention	Qty		Income
		Prod.	Sold			Prod.	Sold	
Monsoon								
Non-Monsoon								
Total								

2) Input Costs

Cost Factor	Amount(Rs.)	
	Before Intervention	After Intervention
Labour		
Seeds		
Irrigation		
Transportation		
Post-harvest activities		
Total		

3) Sources of Income

Source	Before Intervention	After Intervention
Farming		
Sugar Industry		
Own Business		
Labour on other's farms		
Jobs in companies, hotels etc.		

Page 1

4) Food Consumption

Items consumed before Intervention:

Items consumed after Intervention:

5) Expenditure

Expenditure Head	Before Intervention	After Intervention
Food items		
Education		
House		
Savings		

6) Migration

No of family members migrating: Before- Duration- After- Duration-

7) Comparison between Direct and Indirect Intervention

Remarks:_____
_____
_____
_____

8) Scope of Improvement

- Was there anything you hoped would happen but did not happen?

- What are the two biggest challenges that you are facing in your current farming activities?

- Were there any areas where you feel UPL could have done more?

- In future, which areas you think UPL should intervene and through which channel, direct or AKRSP?

Appendix 3(a): Final Questionnaire - Direct Intervention

Name of Farmer: **Village Name:** **Assessor:**

Total Land under farming: **Date:**

1) Adoption of SRI Technique

Area under Paddy	Area under SRI-Paddy	Planned Area under SRI-Paddy

- Increase in production through SRI technique:
- Use of additional Paddy: Sold- Self-
- Increased Income:

➢ **Input Costs of Paddy**

Cost Factor	Amount(Rs.)	
	Before Intervention	After Intervention
Labour		
Seeds		
Irrigation		
Transportation		
Post-harvest activities		
Total		

2) Adoption of Moringa

➢ Yes/No: If Yes, How many:

3) Adoption of Bori-Bagicha

➢ Yes/No:

- Planned usage of grown vegetables: Sold- Self-
- Will you continue with Bori-Bagicha? Yes/No:
- If Yes, by how much amount you plan to increase?

4) Efficacy and Adoption of Training

- Did you take the training conducted by UPL? Yes/No:
- What were you taught?
- What practices have you implemented?
- Reasons why you didn't implement certain practices?

Page 1

- Do you plan to implement the remaining practices?
- What additional training you would like to undergo in future?

5) Income and Expenditure

➢ **Sources of Income**

Source	Before Intervention	After Intervention
Farming		
Sugar Industry		
Own Business		
Labour on other's farms		
Jobs in companies, hotels etc.		

➢ **Expenditure**

Expenditure Head	Before Intervention	After Intervention
Food items		
Education		
House		
Savings		

6) Scope of Improvement

- Are you aware of any Government Schemes/Benefits?
- Do you avail any of these Schemes/Benefits?
- Are you aware of any Self Help Groups or Panchayat level administrative bodies (Mahila Mandal, Sakhi Mandal etc.)?
- Was there anything you hoped would happen but did not happen?
- What are the two biggest challenges that you are facing in your current farming activities?
- Were there any areas where you feel UPL could have done more?

Appendix 3(b): Final Questionnaire - Indirect Intervention

Name of Farmer: **Village Name:** **Assessor:**

Total Land under farming: **Date:**

1) Adoption of SRI Technique

Area under Paddy	Area under SRI-Paddy	Planned Area under SRI-Paddy

- Increase in production through SRI technique:
- Use of additional Paddy: Sold- Self-
- Increased Income:

➢ **Input Costs of Paddy**

Cost Factor	Amount(Rs.)	
	Before Intervention	After Intervention
Labour		
Seeds		
Irrigation		
Transportation		
Post-harvest activities		
Total		

2) Usage of Fertilizer Bag

- Have you made use of the fertilizer provided by AKRSPI? Yes/No-
- If Yes, how useful did you find it?

- If No, why were you not able to use it?

3) Income and Expenditure

➢ **Sources of Income**

Source	Before Intervention	After Intervention
Farming		
Sugar Industry		
Own Business		
Labour on other's farms		
Jobs in companies, hotels etc.		

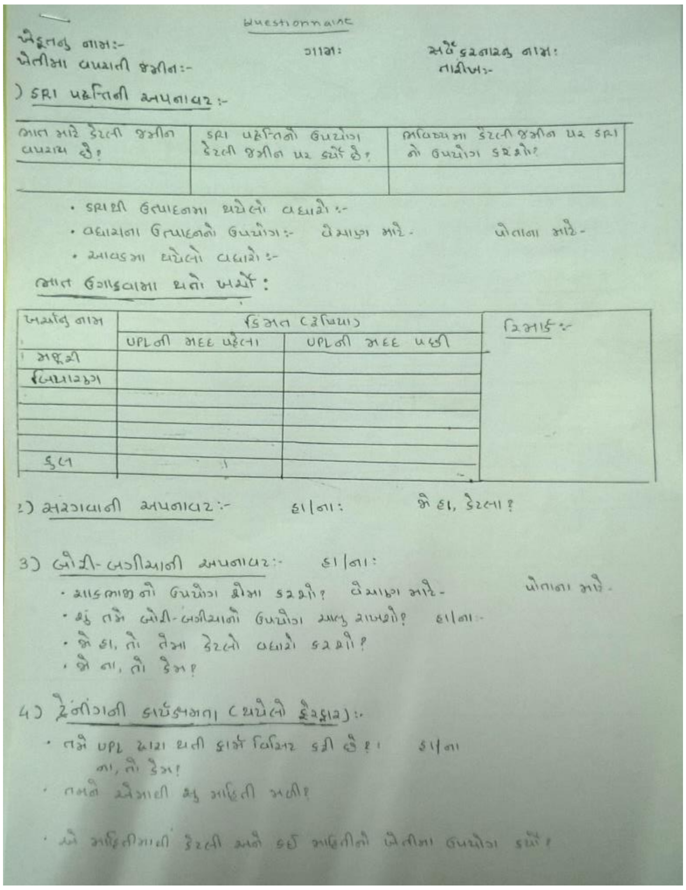
➢ **Expenditure**

Expenditure Head	Before Intervention	After Intervention
Food items		
Education		
House		
Savings		

4) Scope of Improvement

- Are you aware of any Government Schemes/Benefits?
- Do you avail any of these Schemes/Benefits?
- Are you aware of any Self Help Groups or Panchayat level administrative bodies (Mahila Mandal, Sakhi Mandal etc.)?
- Was there anything you hoped would happen but did not happen?
- What are the two biggest challenges that you are facing in your current farming activities?
- Were there any areas where you feel UPL could have done more?

Appendix 4: Final Questionnaire - Gujarati Version



Questionnaire

ખેડૂતનું નામ:- ગામ: સર્વે કરનારનું નામ:
ખેતીમા વપરાતી જમીન:- તારીખ:-

1) SRI પદ્ધતિની અપનાવટ:-

ભાત માટે કેટલી જમીન વપરાય છે?	SRI પદ્ધતિનો ઉપયોગ કેટલી જમીન પર કર્યો છે?	ભવિષ્યમા કેટલી જમીન પર SRI નો ઉપયોગ કરશો?

- SRI થી ઉત્પાદનમા થયેલો વધારો:-
- વધારાના ઉત્પાદનનો ઉપયોગ:- વેચાણ માટે- પોતાના માટે-
- આવકમા થયેલો વધારો:-

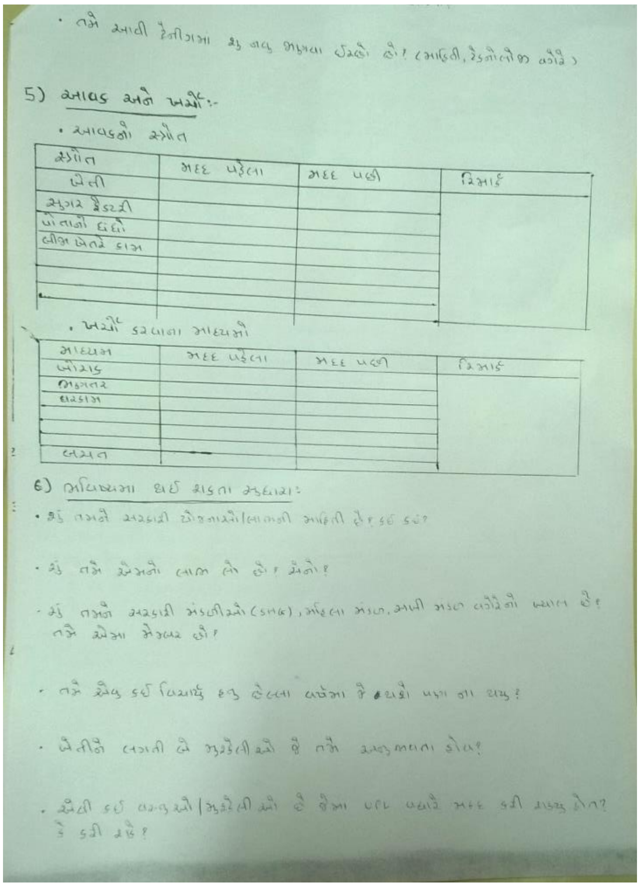
ભાત ઉગાડવામા થતો ખર્ચો:

ખર્ચનું નામ	કિંમત (રૂપિયા)		રિમાર્ક:-
	UPLની મદદ પહેલા	UPLની મદદ પછી	
મજૂરી			
બિયારણ			
કુલ			

2) સરગવાની અપનાવટ:- હા/ના: જો હા, કેટલા?

3) વાડી-બગીચાની અપનાવટ:- હા/ના:
- શાકભાજીનો ઉપયોગ શેમા કરશો? વેચાણ માટે- પોતાના માટે-
- શું તમે વાડી-બગીચાનો ઉપયોગ ચાલુ રાખશો? હા/ના:-
- જો હા, તો તેમા કેટલો વધારો કરશો?
- જો ના, તો કેમ?

4) ટ્રેનીંગની કાર્યક્ષમતા (થયેલો ફેરફાર):-
- તમે UPL દ્વારા થતી ફાર્મ વિઝિટ કરી છે? હા/ના
  ના, તો કેમ?
- તમને એમાથી શું માહિતી મળી?
- એ માહિતીમાથી કેટલી અને કઈ માહિતીનો ખેતીમા ઉપયોગ કર્યો?



- તમે આવી ટ્રેનીંગમા શું નવુ જાણવા ઈચ્છો છો? (માહિતી, ટેકનોલોજી વગેરે)

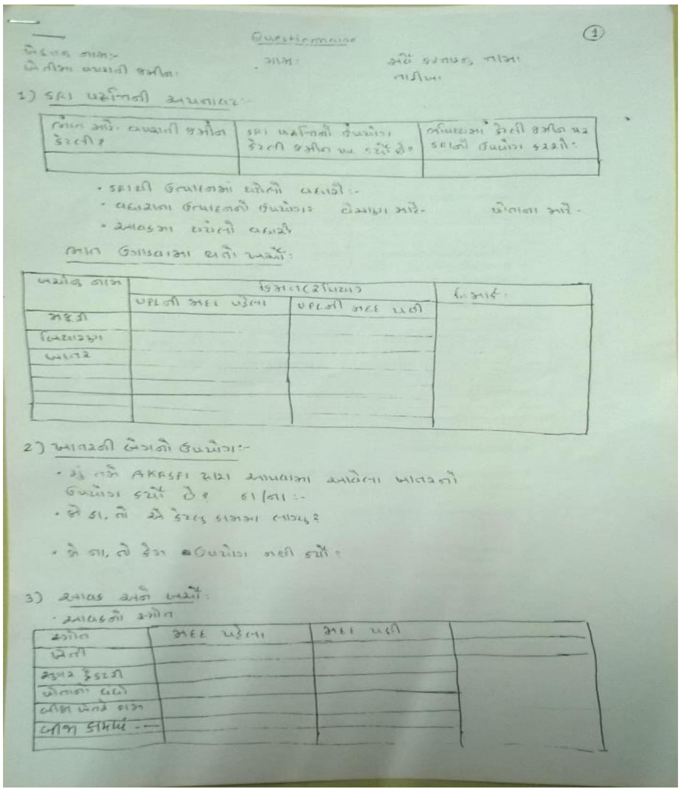
5) આવક અને ખર્ચો:-
- આવકનો સ્ત્રોત

સ્ત્રોત	મદદ પહેલા	મદદ પછી	રિમાર્ક
ખેતી			
સુગર ફેક્ટરી			
પોતાનો ધંધો			
બીજા ખેતરે કામ			

- ખર્ચો કરવાના માધ્યમો

માધ્યમ	મદદ પહેલા	મદદ પછી	રિમાર્ક
ખોરાક			
ભણતર			
ઘરકામ			
બચત			

6) ભવિષ્યમા થઈ શકતા સુધારા:
- શું તમને સરકારી યોજનાઓ/લાભની માહિતી છે? કઈ કઈ?
- શું તમે એમનો લાભ લો છો? કેનો?
- શું તમને સરકારી મંડળીઓ (SHG), મહિલા મંડળ, ગ્રામ્ય મંડળ વગેરેનો ખ્યાલ છે? તમે એમા મેમ્બર છો?
- તમે એવુ કઈ વિચાર્યુ હતુ છેલ્લા વર્ષમા કે થશે પણ ના થયુ?
- ખેતીને લગતી એ મુશ્કેલીઓ છે તમે અનુભવતા હોવ?
- એવી કઈ વસ્તુઓ/મુશ્કેલીઓ છે જેમા UPL વધારે મદદ કરી શક્યુ હોત? કે કરી શકે?



Questionnaire (1)

ખેડૂતનું નામ:- ગામ: સર્વે કરનારનું નામ:
ખેતીમા વપરાતી જમીન: તારીખ:

1) SRI પદ્ધતિની અપનાવટ:-

ભાત માટે વપરાતી જમીન કેટલી?	SRI પદ્ધતિનો ઉપયોગ કેટલી જમીન પર કર્યો છે?	ભવિષ્યમાં કેટલી જમીન પર SRIનો ઉપયોગ કરશો:

- SRIથી ઉત્પાદનમાં થયેલો વધારો:-
- વધારાના ઉત્પાદનનો ઉપયોગ: વેચાણ માટે- પોતાના માટે-
- આવકમા થયેલો વધારો

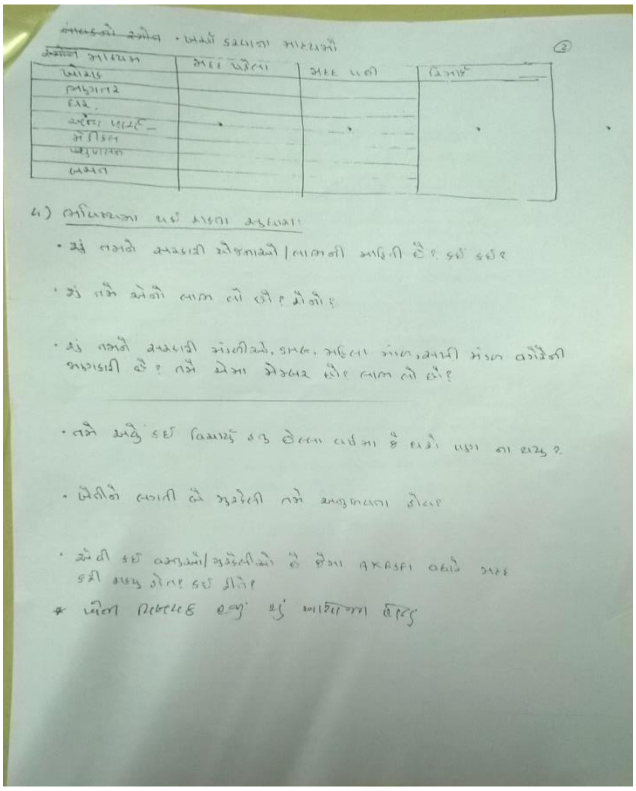
ભાત ઉગાડવામા થતો ખર્ચો:

ખર્ચનું નામ	કિંમત (રૂપિયા)		રિમાર્ક:
	UPLની મદદ પહેલા	UPLની મદદ પછી	
મજૂરી			
બિયારણ			
ખાતર			

2) ખાતરની બેગનો ઉપયોગ:-
- શું તમે AKRSPI દ્વારા આપવામા આવેલા ખાતરનો ઉપયોગ કર્યો છે? હા/ના:-
- જો હા, તો એ કેટલુ કામમા લાગ્યુ?
- જો ના, તો કેમ ઉપયોગ નહી કર્યો?

3) આવક અને ખર્ચો:
- આવકનો સ્ત્રોત

સ્ત્રોત	મદદ પહેલા	મદદ પછી	
ખેતી			
સુગર ફેક્ટરી			
પોતાનો ધંધો			
બીજા ખેતરે કામ			
બીજા કામધંધા --			



~~આવકનો સ્ત્રોત~~ • ખર્ચો કરવાના માધ્યમો (2)

~~સ્ત્રોત~~ માધ્યમ	મદદ પહેલા	મદદ પછી	રિમાર્ક
ખોરાક			
ભણતર			
ઘર			
[illegible]			
મેડિકલ			
પશુપાલન			
બચત			

4) ભવિષ્યમા થઈ શકતા સુધારા:
- શું તમને સરકારી યોજનાઓ/લાભની માહિતી છે? કઈ કઈ?
- શું તમે એનો લાભ લો છો? કેનો?
- શું તમને સરકારી મંડળીઓ, SHG, મહિલા મંડળ, ગ્રામ્ય મંડળ વગેરેની જાણકારી છે? તમે એમા મેમ્બર છો? લાભ લો છો?
- તમે એવુ કઈ વિચાર્યુ હતુ છેલ્લા વર્ષમા કે થશે પણ ના થયુ?
- ખેતીને લગતી એ મુશ્કેલી તમે અનુભવતા હોવ?
- એવી કઈ વસ્તુઓ/મુશ્કેલીઓ છે જેમા AKRSPI વધારે મદદ કરી શક્યુ હોત? કઈ રીતે?

* બીજા ફિડબેક [illegible]

Appendix 5: Master Survey Data and Field Visit Schedule

Master Survey Data.xlsx

Appendix 6: References

UPL CSR Report, 2013-14

Appendix 7: List of Abbreviations

AKRSP (I) – Aga Khan Rural Support Programme (India)

CSR – Corporate Social Responsibility

FGD – Focused Group Discussion

SRI – System of Rice Intensification

UPL – United Phosphorous Limited

Appendix 8: Contact Details

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