FICCI



Evaluation of the PPPIAD Project on **MAIZE**



Documentation of the project on

Improving productivity of Maize in Maharashtra by
Department of Agriculture, Government of Maharashtra
UPL, Monsanto Pvt Ltd, PHI Seeds Pvt Ltd

Supported by

Public Private Partnership for Integrated Agriculture Development Programme



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1. Executive Summary



1. Executive Summary

Maharashtra is the first state in India to implement projects under the Public-Private Partnership for Integrated Agriculture Development (PPPIAD) scheme. In 2012, the State Department of Agriculture rolled out projects focusing on improving productivity of crops as well as developing integrated value chains for specific crops through public private collaboration and co-investment. In the first year the partnership was rolled out with the aim of reaching out to at least 200,000 farmers in the state.

FICCI undertook the evaluation of Maize project implemented by United Phosphorus Limited, Monsanto India Ltd and Pioneer (PHI Seeds Ltd) in the year 2013, Kharif season. The objectives of the study were to assess the outcomes in terms of increase in productivity of maize, improvement of farm incomes; document the processes of linkage of farmers with input and output markets; and to identify the processes that enable a successful partnership between the Government, private industry and farmers.

The project on maize, implemented by three companies in different districts aimed at improving the standard of living of maize growing farmers by enabling/empowering them to be self-reliant through supply of high yielding planting materials, providing agronomic support, assisting in adopting advanced agri practices, providing market linkages, and sharing experiences of research and development in maize cultivation.

Direct connect with the farmers, well-planned training programmes and field demonstrations have played a key role in engaging the farmers and informing them about the modern methods of farming of maize.

The project has enhanced the productivity of maize with the application of right kind of inputs such as seeds, fertilizers and knowledge about appropriate farming practices such as increasing the plant population by maintaining plant spacing efficiency. Regular advice on extension services by project partners has contributed to the adoption of best practices resulting in enhanced maize productivity to 24-30 qtl/acre. Innovative extension models such as UNIMART of United Phosphorus Ltd, MFAS (Mobile Farm Advisory Services) of Monsanto India Ltd and hot line technical guidance by PHI Seeds Ltd has been appreciated and embraced by the farmers at large.

Developing the right package of practices and its education to the farmers has been a central element of the project. Disseminating information and awareness about soil testing and post harvest management have been central to the project interventions. It has been observed that majority of the PPPIAD farmers are aware about significance of soil testing. Usage of soil testing report cards saved approx. Rs 500/ acre(equivalent to one bag of urea).

There is a well-defined institutional mechanism created both at the Government and company level to oversee the implementation and monitor the progress of the project with periodic reporting and assessment across all levels. PPPIAD project has created a framework where the Government and the private company have worked in tandem, supporting the development of the back end supply chain along with providing the market linkage opportunities to the maize growing farmers by organizing procurement meetings with buyers.

Based on the interactions during primary survey, three important focus areas for further strengthening the maize value chain are as under:

- Fertilizers and pesticides used for ensuring plant health are one of the most expensive inputs used for production. However their use has been indiscriminate and unscientific causing high financial burden to the farmer and rendering serious damage to the plant health and soil characteristics. Therefore integrated nutrient management and promotion of soil testing has not only decreased the cost of production for farmers but has also helped significantly in maintaining soil health. This needs to be promoted in big way.
- Post-harvest management has been the weakest link in the maize business. Maize suffers substantial post-harvest losses estimated at 20 to 30 per cent. The main underlying factor is the lack of farmers' education, coupled with poor infrastructure and handling during transportation, improper storage and during facilities, resulting in wastage and pilferage. Focus on post-harvest management practices like bulk handling and silos to reduce wastage is very critical.
- The final produce, maize is still largely sold in the mandis. Companies involved in PPPIAD have made a start in creating integrated value chain but the marketing model linking producer to buyers still needs to be developed. It is suggested that farmer producer organizations need to be encouraged to play an active role in collective marketing of the produce.

It was felt that the project has further scope of introduction of new technologies such as water conservation technologies, integrated nutrient management, creation of scientific storage godowns, encouraging warehouse receipt financing, promoting mechanized solutions during planting and harvesting period of maize.

The Agriculture Department can explore initiating an award/ certificate scheme for farmers/ farmer groups who have done exceptional work in the delivery of the project goals for encouragement.While the first year has seen initial success, it is important to maintain the momentum so as to provide enhanced opportunities to the farming community and maximize the outcome. The project will be able to leave a lasting legacy by way of transforming the way farming is practiced with the engagement of the Government.



Public Private Partnership for Integrated Agriculture Development (PPPIAD) 2



2 Public Private Partnership for Integrated Agriculture Development (PPPIAD)

Background:

Agriculture and allied activities supports more than 50% of the country's population and accounts for 13.7% of gross domestic product (GDP) at constant prices (2012-13). India ranks first in the world when it comes to production of milk and pulses, second in rice, wheat, sugarcane, groundnut, fruits and vegetables and cotton production. It is also a leading producer of spices and plantation crops.

A number of private sector companies are active in agriculture and agri-business, directly engaging with the farmers and improving their farm incomes. While most of these initiatives are successful, they are limited to specific geographical regions, crops and limited number of farmers. On the other hand, the Government has increased funding to farmers through a variety of schemes/subsidies for improving productivity/market linkages, etc. Unfortunately, the outcomes do not commensurate with the quantum of Government spending, mainly due to the limited extension capabilities leading to gaps in execution, delivery and results.

The Federation of Indian Chambers of Commerce and Industry (FICCI) has been working on devising policies and suggestions that contribute to increasing farm income, productivity and global competitiveness of Indian agriculture. Over the years, through its long standing collaboration with the Ministry of Agriculture, Government of India, FICCI has worked to promote public-private partnerships in various parts of the agriculture value chain including warehousing, farm mechanization, extension, secondary agriculture, risk management and agri-marketing reforms. FICCI was instrumental in developing a policy framework for public-private partnership for integrated agriculture development (PPPIAD) jointly with the Ministry of Agriculture, Government of India (GoI). The Ministry issued the guidelines on August 14, 2012. The main objective of the PPPIAD scheme was to facilitate large scale integrated projects led by private sector in the agriculture and allied sectors, with a view to aggregating farmers, creating critical rural infrastructure, introducing new technologies, adding value and integrating the agricultural supply chain. The PPP model aims to reduce the transaction costs and enhance the access to subsidies/schemes for farmers through a facilitator i.e. the company

and motivate them to build a profitable/self-sustaining model for improving the entire supply chain. The PPPIAD program embodies the following principles:

- Combine operational efficiencies of the private sector and the investment by the public sector;
- Quantifiable outputs with defined timelines and strategies; and
- Move away from business as usual approach replacing traditional methods of farming by modern and scientific methods.

FICCI is engaged with the Small Farmers Agri-Business Consortium (SFAC), Government of India, for promoting the adoption of the guidelines. It is involved in increasing the awareness amongst the private sector.

Download PPPIAD gudielines - http://www.nhm.nic.in/Archive/PPPIAD-Brochure.pdf



Overview of Maize and significance of Mahrashtra 3



3 Overview of Maize and significance of Mahrashtra

A. Global Maize scenario

Maize considered the queen of cereals, is the world's third most important crop after wheat and rice. It occupies an important place in world agriculture, being cultivated in more than 150 countries, including USA, China, Brazil, Ukraine, Argentina and India.

Maize is a cereal crop which has the highest production among all the cereals. The worldwide production of maize was around 960 million metric tonnes in 2013-14. It is an important staple food in many countries and is also used as animal feed and several industrial applications. Such diverse uses of maize have made it one of the fastest growing cash crops in the world. The crop has also tremendous genetic variability, which enables it to thrive in tropical, subtropical, and temperate climates.

Global production of maize has grown at a CAGR of 3.4 per cent over the last ten years, from 717 million metric tonnes in 2004-05 to 960 million metric tonnes in 2013-14. The area under maize cultivation in the period has increased at a CAGR of 2.2 per cent, from 146 million hectares in 2004-05 to 177 million hectare in 2013-14. Productivity of maize has increased at a CAGR of 1.2 per cent, from 4.9 metric tonnes/hectare in 2004-05 to 5.5 metric tonnes/ hectare in 2013-14. Such global maize revolution is characterized by new technology, consumer demand and growing agribusiness.

B. Importance of Maize to Indian economy

Indian agriculture is on the threshold of a revolution in maize. Maize accounts for approx. 9 percent of total food grain production of the country. India stands 7th in the world in terms of maize production and contributes 14% of the exports among the major exporting countries.

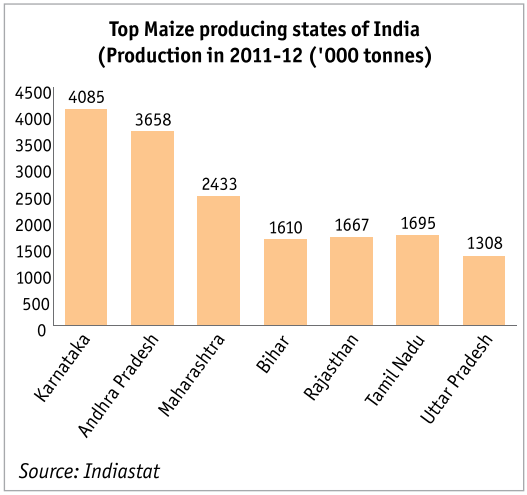
Today Indian maize has its significance as a source of large no. of industrial products besides its use as human food and animal feed.Almost a decade back industrial use of maize was barely 5-6%, however, the demand has now grown exponentially with India's poultry and livestock industry rising at almost 10% per annum.

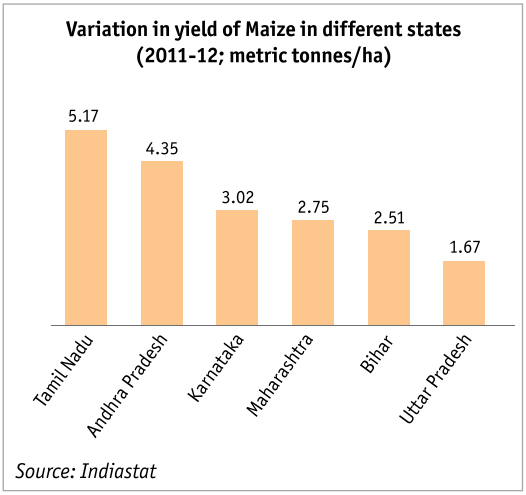
Green revolution has transformed the way rice and wheat was cultivated in India.It is predicted that after wheat and rice, the government's next big thrust to Indian farming could come from maize. This is reflected in Government's efforts towards encouraging farmers to grow more maize.Illustratively,

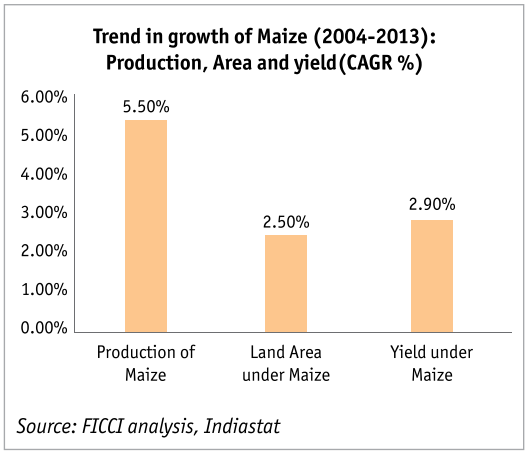
in the case of maize, minimum Support Price (MSP) has increased from Rs.840/- per quintal in 2009-10 to Rs 1310 per quintal in the year 2013, which is at par with the MSP for common grade paddy. This can encourage farmers especially in Haryana& Punjab to opt for maize in place of paddy.

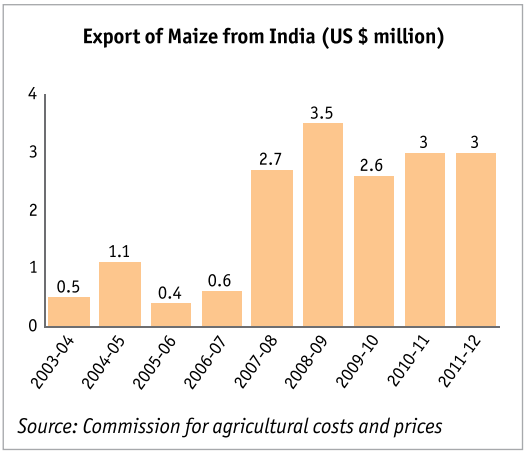
Maize production in India has grown from 14 million metric tonnes in 2004-05 to 23 million metric tonnes in 2013-14 i.e. at a CAGR of 5.5 percent over the last ten years and area under maize cultivation in the same period has increased at a CAGR of 2.5 per cent from 7.5 million hectare to 9.4 million hectare in year 2013-14.

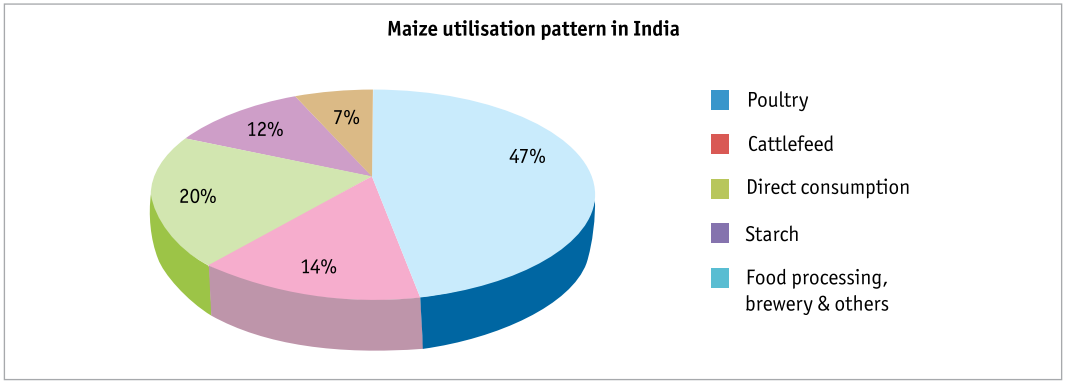
Graph 1: INDIAN MAIZE AT A GLANCE







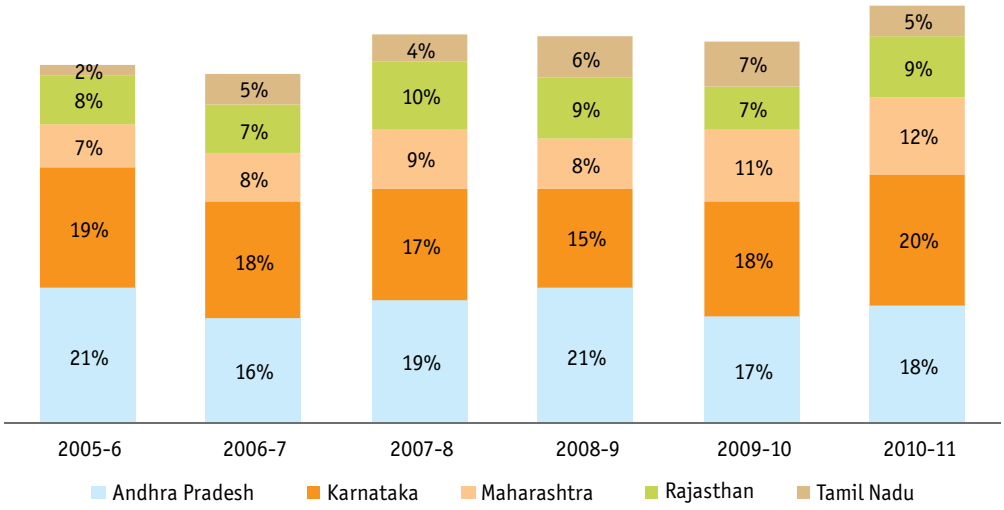




C. Share of different states in total maize production in India

Driven by encouraging support from Government and rising demand, maize has acquired centre stage in Indian agriculture. Maize production in India is dominated by Andhra Pradesh, Karnataka and Maharashtra cumulatively producing about 47 per cent of the maize produced in 2010-11 in the country.

Graph 2: Share of different states in total maize production (2005-2011)



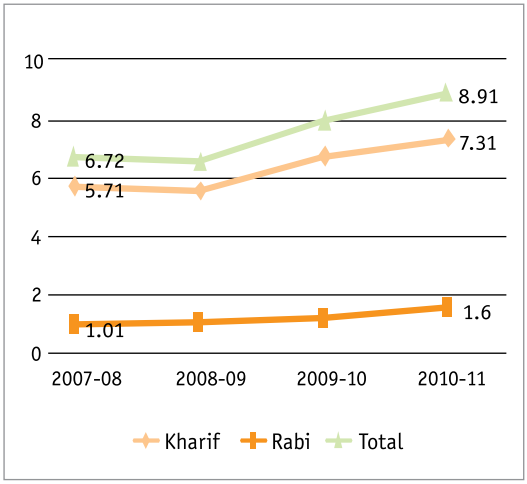
Source: indiastat.com

Adaptability to diverse agro-climatic condition and lowering of water table in the rice belt of India has contributed to the increase in acreages as well as the production of maize in the country. Maharashtra stands 3rd in production of maize and contributes 12% in total maize production of country.As evident in above graph the production of maize in Maharashtra has increased considerably in the last few years. Certain districts in Maharashtra are suitable for large scale cultivation of maize.

D. Significant boost in area & production of Maize in India as well as Maharashtra - propelled by Government intervention (MSP)

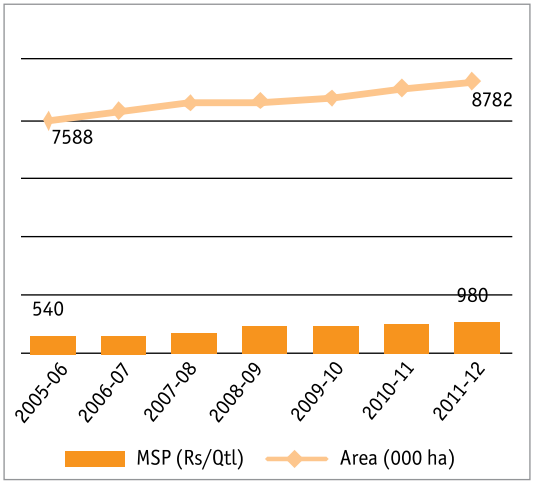
Maize has seen the highest growth of 34% in MSP since 2011 as compared to other crops. This has encouraged farmers to cultivate maize in their fields. As evident below, area under maize has increased not only in Maharashtra but also at national level.

Graph 3: Increase in area of Maize (lakh hectare) in Maharashtra 2007-11



Source: Statistical year book of India-2013, Directorate of Economics and Statistics, MOA

Graph 4: Area Vs MSP of Maize, India

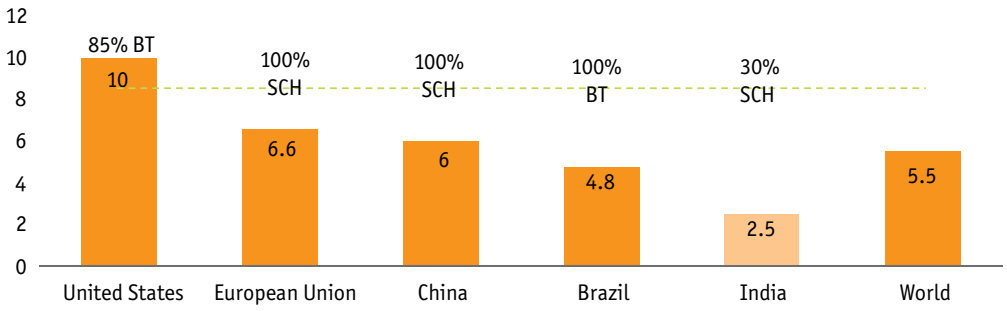


Source: Statistical year book of India-2013, CACP for MSP of Maize

E. India and particularly Maharashtra has vast scope in improving maize productivity

With increased demand for maize as food, feed and industrial applications, maize could become the important cereal in terms of area and production in the next few decades. It is predicted that by 2025, the total global maize demand will exceed the demand for wheat and rice. Thus in such a scenario, improving the maize productivity- will go a long way in fulfilling the future demand of maize.

Graph 5: Indian Maize Productivity (MT/Ha) Comparison, 2013-14

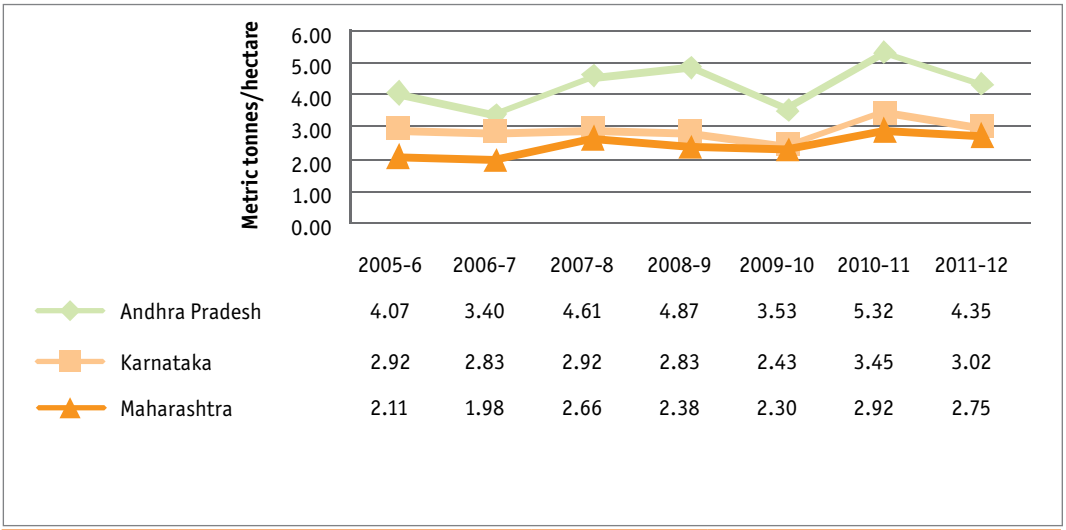


Source: USDA

While Indian maize production and area has been rising, there is ample scope for improvement on the productivity front. The productivity in India is 2.5 tonnes per hectare against the world average of 5.5 tonnes. US, the biggest producer of maize has a productivity of 10 tonnes, which sets a benchmark for improvement for other nations.

Maharashtra contributes 12% to the total maize production in the country. Over the years maize productivity has been growing in Maharashtra but still needs to match the yield levels of other states. This highlights huge opportunity for improvement in maize productivity by working closely with farmers.

Graph 6: Variation in productivity of Maize in top three Maize producing states



Productivity of Maize in Kharif and Rabi season in Mahrashtra(MT/Hectare)					
	2007-8	2008-9	2009-10	2010-11	2011-12
Kharif	2.7	2.4	2.27	3.02	2.88
Rabi	2.42	2.26	2.45	2.63	2.53
Total	2.66	2.38	2.3	2.92	2.7

Source: indiastat.com; mahaagri.com

Various reasons which result in the low productivity levels of the maize crop are (a) cultivation in kharif is mainly under rainfed conditions on marginal lands with inadequacy in irrigation(b) lack of development of single cross hybrid technology, which is key to higher productivity in countries like USA and China (in India only 25% of area is under SCH in maize) (c) deficiencies in the production and distribution system of quality seed (d) small farm holdings and limited resource availability with farmers.

These points to the fact that:

- Demand trend for maize is unlikely to reverse in the near near future as consumption of maize is increasing at a CAGR of 4%
- Area under maize cannot be increased substantially.

Therefore what is required?

- Productivity enhancement of Maize is critical
- Management of maize cultivation under limited irrigation /rainfall will be a challenge
- Integrated approach to provide end-to-end solutions to maize growing farmers is the key.

F. Achieving a productivity led growth in maize sector- areas to focus

f.1. Over 85% of Maize in India is sown under rain-fed conditions- therefore, management of corn under limited irrigation/ rainfall is important.

Graph 8: Approximate Values of Seasonal Crop Water Needs (mm/total growing period)

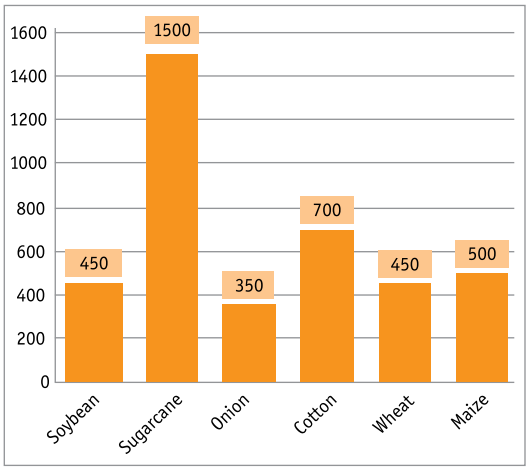


Table 1: Crop sensitivity to drought

	Crop	Sensitivity to drought
1	Maize	medium-high
2	Onion	medium-high
3	Cotton	Low
4	Soybean	low-medium
5	Sugarcane	High
6	Wheat	low-medium

Source: Natural Resources Management and Environment Department, FAO

Irrigation has a critical role to play in improving the productivity of Maize. Water stress during critical reproductive growth stages in maize cultivation can result in significantly lower potential yields. For instance, corn is very sensitive to water stress from flowering to grain filling stage. Therefore, agronomic management of corn under limited irrigation or rainfall is very critical.

Irrigated corn yields are almost 30% higher than non-irrigated yields in USA. Maharashtra is prone to low rainfall and drought. Therefore, efficient irrigation practices and other agronomic management strategies to help maximize grain production are very important.

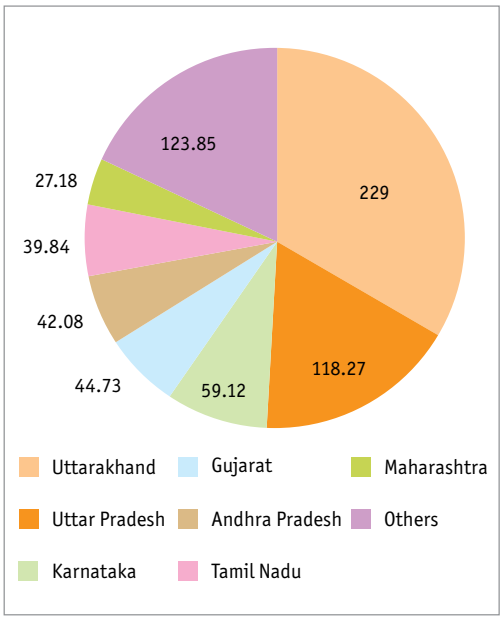
f.2. Agricultural top soil is degraded in India. Water and wind erosion degrade more than 100 mn ha of soil- Focus on soil health is the need of the hour

Ever since the green revolution, agriculture policies have focused on major plant nutrients and how to supply it through chemicals. The importance of soil health could not attain centre stage in agriculture policies in the past. The per hectare consumption of fertilizers in nutrients terms increased from 105.5 kg in 2005-06 to 128.6 kg in 2008-09. However, improving the marginal productivity of soil still remains a challenge.

Soil test based crop-specific fertilizer use can have a major positive effect on improving cost of production along with saving costs.

As evident in graph, 33% soil health cards were issued by Uttarakhand, 17% by Uttar Pradesh 9% by Karnataka and 4% by Maharashtra.

Graph 9: Soil health cards issued (till March 2012)(in lakhs)



Source: indiastat.com

f.3. Regionally suited high quality seeds- at forefront of significant technological advances

One of the core reasons for continued low use of quality seed has been inadequate access of quality seeds to farmers. It needs no emphasis that use of low quality seed adversely affects crop productivity. As evident from the table, availability of maize seed is not a concern in Maharashtra. In both the seasons i.e kharif and rabi, availability of maize seeds exceeds the demand. However, the need is to develop right kind of hybrids well suited for the region and soil conditions e.g hybrid seeds for rainfed area should be different from seeds required for irrigated areas. Therefore, availability of right kind of hybrid is very essential for good crop yield.

Table 2: Maize seed requirement and availability

Maize	Seed requirement as per SRR (Fig. in Qtls.)	Seed Availability (Fig. in Qtls.)	Surplus
Kharif	112575	116575	4000
Rabi	21000	30500	9500

Source: Department of Agriculture, Maharashtra

f.4. Maize suffers heavy post harvest losses estimated at- 20-30%- need to devise strategies to minimize this loss

Post-harvest loss i.e the loss of grains between harvest and consumption. Following harvest, about 60-70 percent of food grain is stored on farms for variable periods, normally in traditional structures and at unacceptable high moisture level. In maize, quantity loss can occur because of inconsistent harvest methods, spillage during transportation, or damage by pest organisms causing reductions in weight or volume. Quality loss can occur as changes in colour, smell or taste, contamination with toxins, pathogens, insects or rodent excreta and reduction in nutritional value. Maize suffers heavy post harvest losses estimated at 20-30%.

f.5. Time to reexamine extension service architecture in country

Indian agriculture has transformed from a food deficit subsistence farming system to a food self-sufficient commercial farming model. However due to technological, infrastructural, and resource related constraints, the Indian agriculture system still has lot of scope for improvement. It is in response to such constraints that agriculture extension system has undergone significant changes, in terms of management and reorientation including its role and approach. The new extension framework under PPPIAD which looks beyond productivity enhancement and encompass other areas such as, post-harvest management, agri marketing,natural resources management will go a long way in sustainable yield enhancement of maize in Maharashtra.

G. Significance of Maharashtra in improving maize productivity

Maharashtra has the potential of becoming leader in maize productivity in the country. Having realized the fact that new technologies for sustainably increasing the crop yields are essential, PPPIAD project takes a holistic approach to provide end to end solutions to the maize growing farmers in Mahrashtra. The PPPIAD project on improving the productivity of maize in Maharashtra looks at major reasons for low productivity in maize - such as poor soil fertility, use of low level of inputs like manures, fertilizers and crop protection chemicals, high labour cost and crop loss due to diseases, lack of resistant varieties and post-harvest losses.

Addressing these challenges on a mission mode will not only enhance productivity, profitability and quality of produce but will also will improve the financial status of the maize growers in the state.

Agriculture in Maharashtra: Agriculture in Maharashtra including allied activities, accounted for 12.4% of the Gross State DomesticProduct at current prices in 2011-12 but its role in State's economy is much wider as agriculture continues to be the main occupation of the state. Around 64.14% of the people are employed in agriculture and allied activities. During the XI Five Year Plan (FYP), an average growth of 4.3% was achieved against the target of 4%. The growth target for agriculture and allied activities sector in the XII FYP remains at 4%, as in the XI FYP.

Agri marketing reforms in Maharashtra

Agricultural Produce Marketing (Development and Regulation) Act in 2006 has opened up the market to competition and encouraged private investment in infrastructure development and agro- processing. Maharashtra was one of the first few states to amend the APMC Act in 2006. The amendment of the APMC Act has enabled licensed direct marketing agencies and private markets to participate actively in the agricultural marketing. Farmers in the state are now able to sell their produce in open markets and not constrained to the APMC (Agricultural Produce Marketing Committee) market yards.

The Maharashtra APMC Act was amended on the lines of the Model Act suggested by the Central Government. The amendments include provisions for establishment of proper markets, some elements of direct marketing, special commodity markets, farmers-consumers markets and single licensing system for all APMCs. Restrictions or regulations on storage are imposed as per the directives of the Central Government under the Essential Commodities Act.

The amendment made to the State Agricultural Produce Marketing (Development and Regulation) Act in 2006 has opened up the market to competition and encouraged private investment in infrastructure development and agro- processing.

Table 3: Chronology – Agri marketing reforms in Maharashtra

• 2003 – Amendments for terminal market. • 2005- Setting up of private market, direct marketing, farmer consumer market, single license totrader, cadre of APMC Secretary, special commodity market, regional/divisional APMC. • 2006- Amendments to the APMC act. • 2007- Rules of the amendments prepared and implementation of amended Act started
Achievements • Direct marketing licenses • Private market licenses • Licenses for e-trading • Single license to traders

Market linkage is currently the responsibility of the Maharashtra State Agricultural Marketing Board(MSAMB). However, its focus is more on fresh and primary processed products. The food-processing sector needs special attention for establishing sustainable market linkages. MSAMB therefore needs to give specific focus on providing direct

- Development of agricultural marketing infrastructure, grading and standardization;
- Dissemination of arrival and price information of agricultural commodities;
- Computerization of 291 APMCs and 54 submarkets;
- Agri-Export Zone: Creation of six facility centres for export;
- Initiation of the rural storage scheme;
- Information about market arrivals, prices, weather forecast, market guidelines to farmers through
- SMS on mobile phones;
- Modernization of terminal markets in the state;
- Direct supply of agriculture produce by farmer to consumers and consumer societies;
- Shetkari Bazaar to increase direct trade between producer and consumer



PPPIAD Project on Maize in Mahrashtra 4



4 PPPIAD Project on Maize in Mahrashtra

Maize consumption continues to grow at a CAGR of 4% over last ten years, chiefly due to rise in demand from the livestock feed in the industry. With overall area expected to remain constant or increase at a comparatively slower rate, PPPIAD project on maize crop in Maharashtra aims at improving the yield level of maize in Maharashtra with combined effort of State Government of Maharashtra, Industry and farmers.

PPPIAD project on Maize in Maharashtra:What does the project intend to do?

Maize production in India has grown at a CAGR of 5.5% over last ten years from 14 million metric tonne in 2004-05 to 23 million metric tonne in 2013-14.However, the productivity of Maize has increased at a CAGR of 2.9% from 1.9 MT/ hectare in 2004-5 to 2.5 MT/ hectare in 2013-14.One of the reasons for low productivity of Indian maize attributes to (a) deficiencies in production and distribution of good quality seed (b) cultivation of maize in Kharif period is mainly under rain-fed conditions on marginal lands (c) farmers with small farm holdings have limited resource availability.

Under this project private companies with support from the Government of Maharashtra introduced new technologies in maize cultivation besides introducing different type of seeds suitable for different agro climatic conditions. The three major stakeholders involved in the project are (a) industry players (Monsanto India Ltd, UPL, and PHI Seeds Ltd) (b) State Government of Maharashtra (c) maize growing farmers.

Major Stakeholders Involved in the Project

Table 4: Project detail

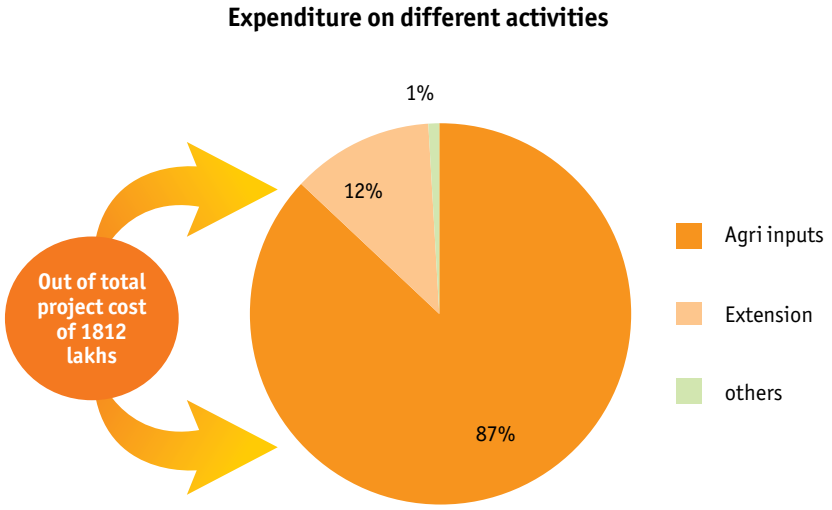
State Government of Maharashtra				
Project leads	UPL	Monsanto	Pioneer	Total
Project cost (Lakhs)	852.8	501	459.06	1812
Districts under PPPIAD	2	4	6	11

Different stakeholders have played their part in marking improvement in overall supply chain of maize in Maharashtra. The private sectorplayers have used innovative extension models to empower maize growing farmers with knowledge and technology. Government on the other hand has played an instrumental role in providing financial support to the project.

Broad Project Components

The total project cost which involves contribution from all the mentioned stakeholders is INR 1882 lakhs. Out of total project cost, the maximum expenditure is made on providing subsidized agri inputs to the maize growing farmers, followed by expenditure on agri extension activities.

Graph 11: Project components and project cost



FICCI has been involved in the formulation of PPPIAD guidelines with Ministry of Agriculture, Government of India and was therefore entrusted with a task of documenting the learnings from the pilot project on Maize for dissemination and advocacy. Research methodology & approach adopted for evaluating the impact of PPPIAD project is described in the next chapter.



Research Methodology and Approach 5



5 Research Methodology and Approach

A. Research Objectives

FICCI study on impact of Maize PPPIAD project in Maharashtra aims at evaluating and documenting major initiatives taken by three different companies in Maharashtra on improving maize supply chain.

Three major research objectives considered during the study are as follows.

- To assess the outcomes of the project in terms of increase in productivity of maize
- Document process of linking farmers with input and output markets.
- Document a process which enable a successful partnership between government, industry and farmers in improving maize productivity.

B. Approach and Methodology

The project through a series of well-designed intervention approaches worked on various aspects beginning with the selection of farmers, training and capacity building, field demonstrations and appropriate package of practices required for the maize production. These intervention approaches helped in the delivery of the project by preparing the farmers and developing their knowledge and skills. Approaches adopted during the project are indicated below:

a) **Discussion with Dr. Sudhir Kumar Goel, Additional Chief Secretary, Govt. of Maharashtra:** A discussion with Dr. Goel was held in Mumbai to understand the initiation of the PPP project in the state and get his insights on the study design and methodology.

b) **Review of secondary literature and developing the set of questions:** Secondary information was obtained from the PPPIAD secretariat based in the Department of Agriculture, Government of Maharashtra and companies involved. The documents included the proposal, baseline study, progress reports and presentations. Based on the review of literature and baseline information, focused group discussions were organized for collecting responses from the farmers on important parameters like inputs, capacity building, increase in yield and incomes, procurement and feedback on the delivery of the project.

c) **Visits to the project sites:** FICCI team visited the PPPIAD cover talukas to undertake focused group discussions with farmers and officials of the project implementation team (government and private companies). The list of respondents is given in the Annexure 1, 2 and 3.

d) **Interactions:** Interactions with officials of Maharashtra Government and private companies were held to understand the delivery of the project and elucidate responses on the project implementation,outcomes and improvement areas. Discussions were also undertaken to understand the perception of the government and the private sector on key areas requiring attention in scaling up the project.

e) **Collation of findings and developing of the report:** Based on the review of secondary literature, results of the focused group discussions with farmers, company officials and officials from state government, a report is prepared.

C. Project at a Glance

Table 5: Project details

<table>
<tr><th colspan="4">Stakeholders: Private sector and State Government of Mahrashtra</th><th>Farmer</th></tr>
<tr><td>Project leads</td><td>UPL</td><td>Monsanto</td><td>Pioneer</td><td rowspan="7">Total 390 farmers were surveyed while undertaking the project.</td></tr>
<tr><td>Project cost(INR lakhs)</td><td>852.8</td><td>501</td><td>459.06</td></tr>
<tr><td>Districts under PPPIAD</td><td>3</td><td>4</td><td>6</td></tr>
<tr><td>Districts covered in evaluation study</td><td>2</td><td>2</td><td>2</td></tr>
<tr><td>Sample size</td><td>109</td><td>193</td><td>124</td></tr>
<tr><td>Total sample size</td><td colspan="3">426</td></tr>
<tr><td>Total Project Cost of PPPIAD Maize in Mahrashtra</td><td colspan="3">INR 1812.86 lakhs</td></tr>
</table>

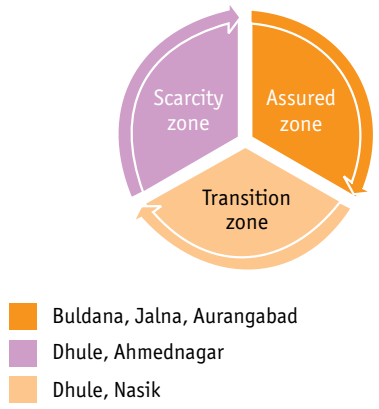
D. Sample Area

As mentioned in the table the districts sampled during the survey were shortlisted from three different agroclimatic zones of Maharashtra. The primary survey was done in scarcity zone were bimodal pattern of rainfall is seen and assured zone were maximum districts receive 700- 900 mm of rainfall as well as transition zone.

Table 6: Agro climatic zones of Maharashtra and Districts under PPPIAD

S.No.	Name of the zone (Maharashtra)	Average annual rainfall	Districts under PPPIAD (allotted to different companies)		
			Monsanto	Pioneer	UPL
1	Scarcity Zone	<750mm in 45 days, 2 peaks of rainfall: 1. June/July 2. September Bimodal pattern of rainfall	-	Satara, Dhule, Sholapur	Parts of Jalgaon & Ahmednagar
2	Assured Zone	700-900mm,75%rain received in alldistricts of the zone	Buldhana, Dhule	Jalna, Osmanabad, parts of Sholapur	Jalgaon& Aurangabad
3	Transition Zone	700-1200mm,well distributed rainfall	Pune, Sangli, Nasik, Dhule	Nandurbar, parts of Dhule	-

Table 7: Districts covered under survey (sample composition)



Monsanto	Pioneer	UPL
Buldhana & Nasik	Jalna & Dhule	Ahmednagar & Aurangabad

E. Sample composition and sample size

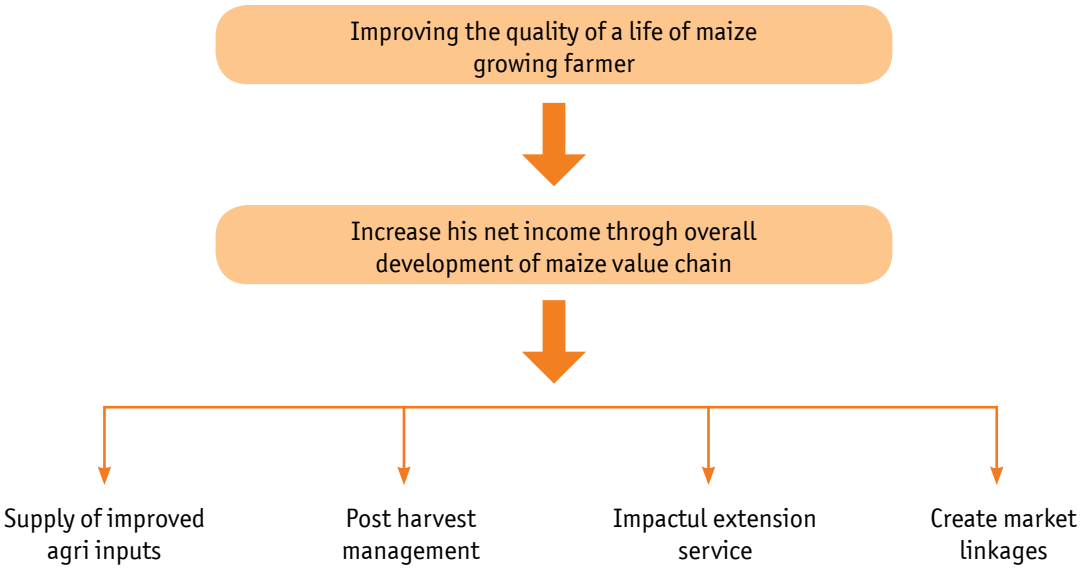
The data was primarily collected by interviewing 390 maize growing farmers, 25 industry officials, 11 Government officials in 21 villages of 6 different districts of Maharashtra undertaking PPPIAD Program. The total project cost of Maize which includes contribution from UPL, Monsanto, Pioneer and State Government of Maharashtra is INR 1882 lakhs. Out of total sample size of 426 respondents, 91% were farmers.

Table 8: Primary survey detail

Stakeholders	Monsanto (numbers)	Pioneer (numbers)	UPL (numbers)
Total farmers under (PPPIAD)	17069	10000	13758
• Farmers surveyed	172	116	102
• Government officials	7	2	2
• Company officials	14	6	5
Total	193	124	109
Districts under PPPIAD	4	6	3
• Districts surveyed	2	2	2

F. Expected outcome of the project

While access to hybrids and right variety of seeds might be seen as the first step towards addressing the productivity issues in Maize, clearly any solution is bound to be incomplete without providing end-to-end solutions to farmers.



A wide spectrum of extension activities are provided under PPPIAD scheme to impart knowledge and know-how to farmers through initiatives like field demonstrations and dedicated farmer trainings. In addition, access to quality inputs enable farmers to increase the crop productivity. These efforts are designed to create better quality agricultural produce which can get a higher value in the market. The detail of various initiatives undertaken by the three seed companies and their impact on maize growing farmers are detailed in the subsequent chapters.



PPPIAD Project on Maize by United Phosphorus Limited 6



6 PPPIAD Project on Maize by United Phosphorus Limited

A. Project Brief

As the maize crop and its use is advancing to a high-tech, high value and high demand product, agribusiness companies have a major role to play in increasing the productivity of maize. Yield and ability to adapt to diverse climatic conditions are the two major focus areas for improvement in maize. PPPIAD project provides maize growing farmers in Maharashtra access to the seeds,agronomical advice and training to enhance quality of crop.Participating farmers receive customized support on tips and information on proper irrigation, fertilizer usage, harvesting and post harvest aspects. A range of partners have collaborated in this project. These include, State Government of Maharashtra, UPL, maize growing farmers and procurement agencies.

B. Project Objective and Activities

The broad objective of the project is to increase income level of maize growing farmers by increasing yield per acre with appropriate and timely usage of all inputs. Proposed project is implemented in districts of Aurangabad, Ahmednagar and Jalgaon with following planned activities:

1. To increase productivity by adopting best of available technologies.
2. To mobilize farmers into groups and federate groups into producer companies.
3. To increase value of maize grain by primary processing and value addition.
4. Provide effective market linkage.

Project Activities:

1. Providing farmers a kit of all inputs to be used for profitable crop cultivation.
2. On site agricultural best practices models developed and demonstrated to farmers through these kits.
3. Educating farmers in crop management and agronomy practices for maize cultivation.
4. Product performance activities (result based) during harvest in cluster of villages.

C. Research methodology and approach

FICCI study on impact of Maize PPPIAD project in Maharashtra aims at evaluating and documenting major initiatives taken by UPL in Maharashtra on improving maize supply chain.

(C.1) Sample composition and sample size

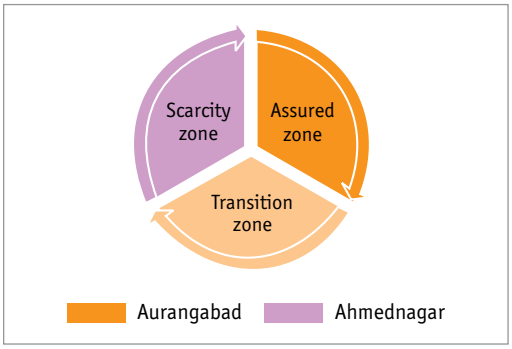
Table 9: UPL PPPIAD project details

UPL PPPIAD project (Kharif 2013)		Primary survey detail	
Districts	Area under each district	Districts surveyed	Ahmednagar, Auranagabad
• Aurangabad	5000	Villages surveyed: Ekarwae, Takri, Padegaon, Wari, Dahegaon	5
• Ahmednagar	2000	Stakeholders surveyed:	
• Jalgaon	3000		
Total area	10000 hectare	• Farmers surveyed	102
Total farmers	13758	• Government officials	2
		• Company officials	5
		Total sample size	109

(C.2) Sample area

The selection of Aurangabad and Ahmednagar for evaluating the impact of PPPIAD project on maize growing farmers was done purposively so as to compare the results between the region which comes under assured zone with one which comes under scarcity zone in regard to rainfall.Majority of Aurangabad region which comes under assured zone receives approx. 700-900 mm of rainfall. However Ahmednagar comes under scarcity zone which receives <750mm in 45 days and have bimodal pattern of rain with 2 peaks of rainfall, first in June/ July followed by second shower in September.

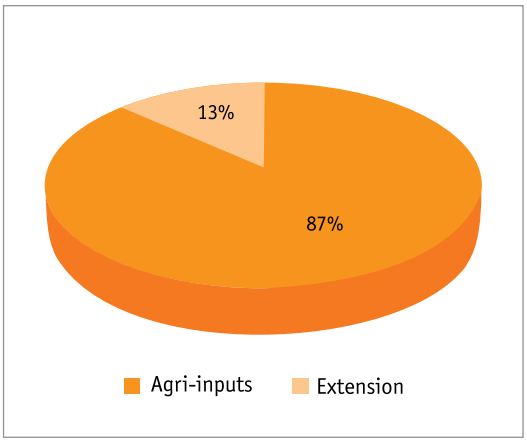
Graph 12: Agroclimatic zones of Maharashtra and districts covered



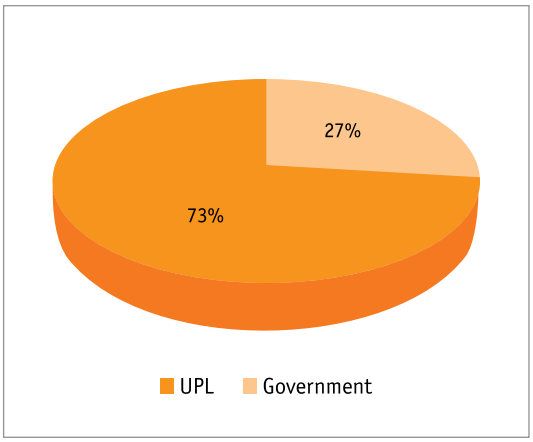
D. Project components and project cost

The graphs 13-14 shows that out of total project cost of INR 852.8 lakhs 87% is allocated to agri inputs (majorly seeds), followed by 13 % to extension activities. UPL aims at improving maize cultivation in designated districts by educating farmers in crop management and agronomy practices in maize cultivation. UPL through PPPIAD project also provides complete kit of inputs to be used for profitable crop cultivation. On site agricultural best practices model developed and demonstrated to farmers through kits aims at revolutionizing the maize cultivation done by farmers.

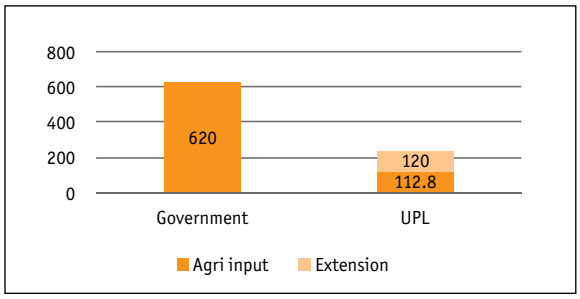
Graph 13: UPL Project components:
Total project cost: 852.8 lakhs



Graph 14: Share of different stakeholders (%) in Project



Graph 15: Share of stakeholders in different project components(INR lakhs)

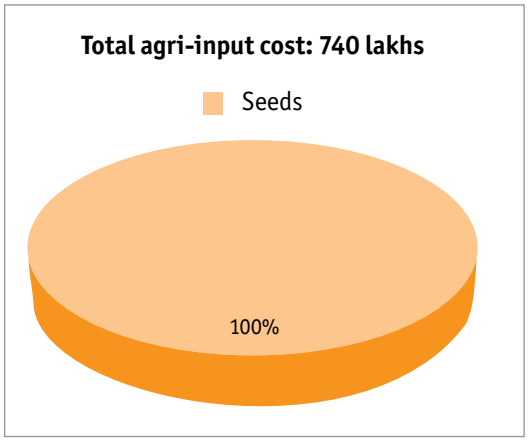


State Government of Maharashtra and UPL are the major financial contributors in the project. While on one hand Government officials streamlines the project by identifying the project area and shortlisting the beneficiary farmers. UPL officials on the other hand focus on ground level implementation of the project.

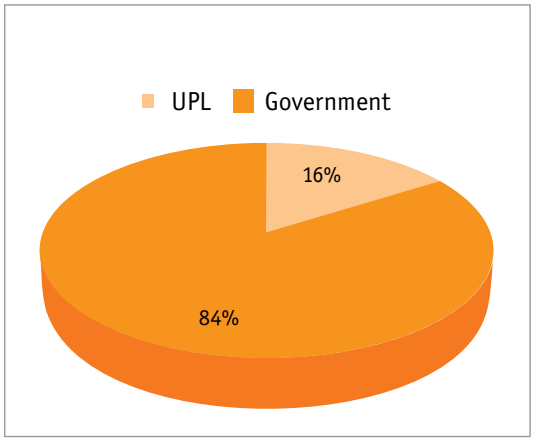
Project Component in detail

1. Agri Inputs:

Graph 16: Components under Agri-input



Graph 17: Share of different stakeholders in Agri-inputs



Importance of agri inputs cannot be ignored while we talk of improving the productivity level of maize. The exhibit shows that the major agri input provided to the farmers under PPPIAD project is hybrid seeds of maize. Often, Indian farmers don't recognize the difference between grain and seed. The

reasons for this are: (1) lack of awareness about the potential of quality seed, (2) the non-availability of good quality seed, and (3) seed price. To a greater extent, this also explains the large gap between attainable levels of productivity achieved in front line demonstration plots and the actual productivity at farm levels.UPL and State Government of Maharashtra through PPPIAD project supplies seeds to the maize growing farmers under PPPIAD project.

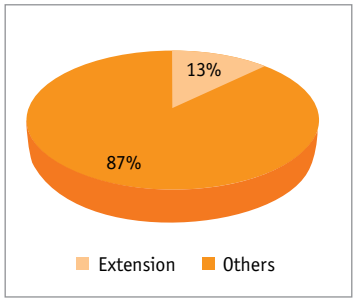
The contribution of UPL in providing hybrid seeds: The cost of hybrid seed PAC 740 per kg is Rs.185/ Kg, which is sold at the subsidized price of Rs. 120/Kg to Government of Maharashtra under PPPIAD project. Thus, Rs. 65/Kg is the company contribution in this joint project.

Table 10: UPL's contribution in providing hybrid seeds

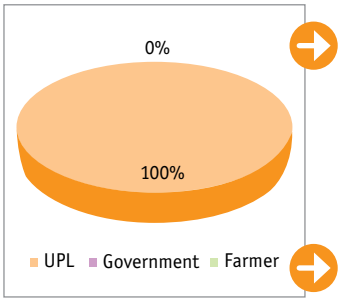
Hybrid Name	Price (Rs/Kg)	UPL contribution (Rs/Kg)	Government contribution (Rs/Kg)
PAC 740	185	65	120
Salient features PAC 740 (corn hybrid):			
1	Medium maturity(110-115 days)		
2	Consistent high/optimum yielding hybrid		
3	Bright Orange Flint grain fetches better market price		
4	Good tip filling with excellent husk coverage		
5	Notified by Govt of India		
6	Long cobs with holdings (more no.of grains for row)		
7	Drought tolerant		
8	Stay greener at harvest-useful for fodder purpose.		

2. Agri Extension:

Graph18: Expenditure on extension activities:112.8



Graph 19: Share of UPL in Extension activities



Particular	Amt (lakhs)
Resource and training	41
Beneficiary awareness & distribution support	62.5
Advisory services	8.3
Post harvest support	1

The above graphs shows that approx. 13% of the project cost is allocated to the agri extension activities. Agri extension activities includes distribution of promotional inputs, field visits and harvest days. One of the most innovative agri extension approaches of UPL is Unimart. UNIMART, a venture of United Phosphorus Ltd (UPL), is the chain of farm advisory and solution centers. It was established with an objective to contribute towards improving Indian farming by directly working with farmers at their field. Even though India is a big agro-based economy, Indian farmers continue to be poorly

informed about the developments in agriculture sector, leading to lower productivity and lesser profits. In order to overcome this information and development lag, UNIMART through its well trained and qualified team help and guide farmers with the best agricultural practices, technological know-how, post-harvest activities and ensure a better market for their produce, and also provide them with quality products as and when required. Following are the services extended from the UNIMART

1. Farm advisory services
2. Visit at farmer field -on field solutions.
3. Library- ready reference for farmers for the filed problems.
4. Market prices of vegetables & other crop produce.
5. Farm advisory at toll free Phones
6. Farmer Training

Table 11: Detail of extension advisory services provided by UPL

S. No.	Activity	Description	Aurangabad	Jalgaon	Ahmednagar	Total
	Trainings					
a	District cordinator Meeting	pre and 1 in field	2	2	5	9
b	MDR Training	pre and 1 in field	2	2	2	6
	Farmer Training					
a	Pre sowing	1 meeting / 200 Ha	25	15	20	60
b	Sowing	1 meeting / 200 Ha	25	15	13	53
c	Top Dressing	1 meeting / 200 Ha	25	15	15	55
d	Silking	1 meeting / 200 Ha	30	20	19	64
	Activities Scheduled					
a	Soil Samples	2 samples / 200 Ha	71	38	24	133
b	Training	2/Block	18	12	14	44
c	Field Days/ Crop Shows	4/Block	10	16	20	46
d	Cultivation practice Campaign (days)	25	29	18	13	60
e	Jeep Campaign Days	1/Block	29	22	23	74
f	Procuring Agency Facilitation and Joint Meeting	1/Block	6	5	16	27

One of the core principles of the PPPIAD project is to move away from business as usual approach replacing traditional methods of farming by modern and scientific methods. The analysis of various initiatives undertaken by State Government of Maharashtra and UPL Advanta for improving productivity of maize in Mahrashtra is captured in the next chapter.

PPPIAD Project on Maize by UPL

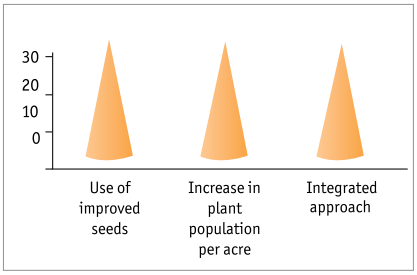
Stakeholder Analysis

1. Improvement in productivity level of Kharif Maize in PPPIAD covered area (of Ahmednagar and Aurangabad district) and farmer perception on factors behind such improvement.

Table 12: Average yield (quintal/acre)

	Before PPPIAD			PPPIAD covered area
	2008-09	2009-10	2010-11	2012-13
Aurangabad	11	10.6	14.6	24
Ahmednagar	12.6	10.9	11.3	20

Graph 20: Farmers perception on key interventions that helped in yield improvement significantly



Source: (2008-11) Special Data Dissemination Standard Division, Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India. For year 2012-13: FICCI survey

As evident in the exhibit above, yield of maize has improved by 9-10 quintal per acre in PPPIAD covered areas. The feedback obtained during primary survey indicate that improvement in the productivity of the crop is not only a factor of seeds but also a combined effort of adopting integrated approach for improving the productivity. Maintaining plant to plant and row to row spacing has a major impact on plant population and thus on the productivity of crop. Other factors as mentioned by farmers which have a major bearing on crop productivity includes, use of good quality seeds and overall improvement in cultivation practices.

2. Improvement in farmer income

Table: 13 Share of different operations in total cost of cultivation and new approaches introduced under PPPIAD project

	Particular	Share in total cost of cultivation (%)	Old practice	New practice
1	Land preparation	8.2%	Less importance to soil health	Farmer awareness on use of micronutrients to improve soil health.
2	Seeds and sowing	14.5%	Random	Plant to plant and row to row spacing maintained
3	Fertilizers	15.8%	Unbalanced	Soil testing based fertilizer dose applied
4	Insecticide	4.4%	Less awareness about spray schedule	Awareness about spray schedule increased
5	Weeding and intercultivation	6.3%		
6	Harvesting and threshing	37 %	Manual	Scope for maize harvester, awareness about drying and storage promoted
7	Transportation and marketing	12%	Sold at mandi	Procurement meetings for market linkages
8	Average yield per acre		11-14 qtl /acre	22-24 qtl /acre

Source: primary survey

Improvement in farmer income is the broad objective of PPPIAD project. Two major factors that have impact on the cost of cultivation of maize are (a) harvesting and threshing and (b) cost of fertilizers. As evident from the table, these two operations occupy 52% share in total cost of cultivation of maize. Thus, mechansiation in maize cultivation to tackle the problem of increasing labour cost and awareness about soil testing to reduce fertilizer expense can bring noticeable change in the cultivation of maize and consequently to farmer income.

3 Availability of agri machinery for maize cultivation

Table 14: Labour cost in different agriculture operations (per acre)

Operation	Labour required per acre	Approx labour charges/ day	Total labour charges (INR)	Percent share in total labour cost	Month of operation
Sowing	5	200	1000	15 %	June
Weeding	7	100	700	22%	July- Aug
Intercultivation	6	200	1200	19%	June- July
Fertilizer application	3	200	600	9%	
Irrigation	1	200	200	3%	
Harvesting and threshing	10	200	2000	31%	Sept- Oct
Total	32		5700		

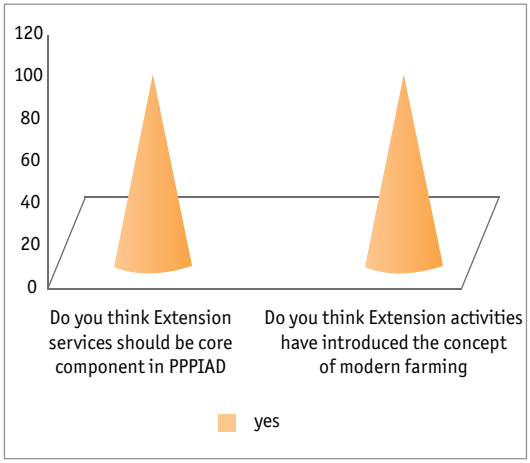
Source: primary survey

Labour cost is approximately 35% in total cost of cultivation. While efforts such as introduction of high yielding hybrid varieties of Maize has played crucial role in improving the productivity of crop in Maharashtra, there is more that need to be done on mechansiation. Diverse farm sizes and soil types results in the need for customized farm machinery and equipment for different regions. As evident from the table above harvesting and intercultivation operations requires maximum labour in maize cultivation. This indicates significant opportunity for mechansiation in maize.

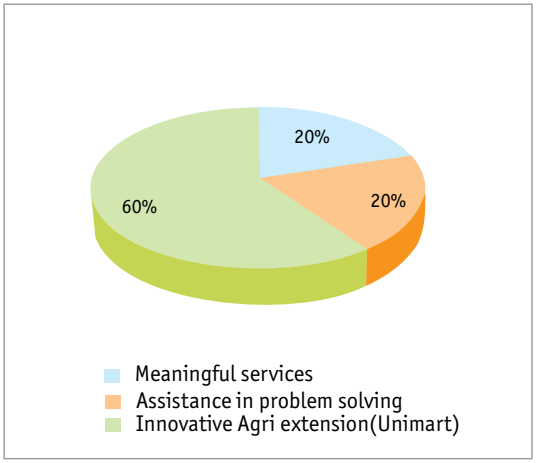
4. Farmer perception about extension model of UPL

Farmers were asked to give their view on need for agri extension in maize cultivation and their perception on various components under it. As depicted in graph 21-22, surveyed farmers were satisfied with the agri extension services provided by UPL under PPPIAD. They were very positive about Unimart extension model of UPL. When asked about major features which they liked about Unimart Agri services, farmers mentioned (a) its different approach from usual extension services provided (b) gives meaningful services (c) and thirdly, provides assistance in problem solving.

Graph 21: Farmer 's view on Extension activities under PPPIAD



Graph 22: Farmer response on benefit of Agri extension activities of UPL under PPPIAD



5. *Perception about farmer adaptability level*

Officials of UPL were asked about the variation in farmer response in terms of understanding the concept of modern farming, adoption of specific technologies at critical crop stage etc. As evident in the table below farmers from Ahmednagar district were much more responsive to the extension activities compared to Dahegaon village in Aurangabad.

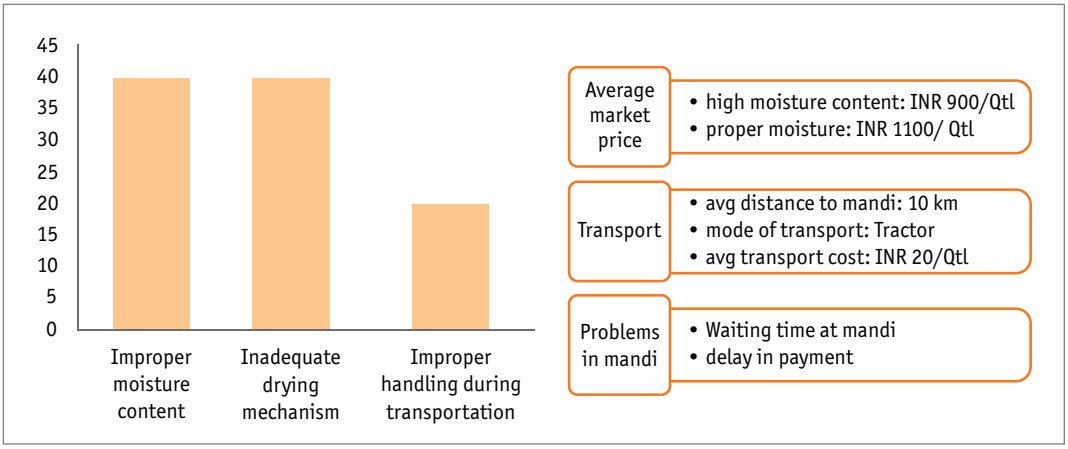
Table 15: Comparative perception about farmer adaptability level

District Ahmednagar				
Village	Farmer adaptability level	Farmer awareness level	Price received by farmers (INR/ qtl)	Awareness about moisture level
Ekarwe	High	High	1100	High
Takri	High	High	1150	High
Padegaon	Medium	Medium	1100	Medium
Wari	Medium	Medium	1000	Low
District Aurangabad				
Dahegaon	Low	Medium	900	Low

6. *Farmer perception about marketing of produce*

It has been widely recognized that development of market linkages is key to rejuvenation of Indian agriculture. Linking producers to value adding users reduces wastages, thereby leading to higher farm income. PPPIAD project for improving maize productivity aims at building market linkages, besides improving crop productivity. Various facets of post-harvest marketing remains a major concern. For example the average price for Maize received by farmers ranges between INR 900- 1100 per quintal whereas MSP of Maize is Rs 1310/quintal. There is dire need to focus on post-harvest aspect of the crop for improving the marketability.

Graph 23: Key concerns in Maize marketing



7. Linking farmers to end users

Supporting farmers in accessing markets can address various market constraints and thus help them respond to new opportunities resulting in better incomes. Farmers can avail better prices and assured market if efficient farmer- market linkages can be created. Under PPPIAD project UPL has organised 27 procurement meetings. Farmers were very positive about such meetings.

Table 16: Market linkages created by UPL through procurement meeting

Project Dist.	Block	Procurement agency	Quantity in mt
Ahmadnagar	Sangamner	Jaikisan Agro Industries	120
		Local Private traders sangamner, Songaon,	170
Ashvi	Kopergaon	Local Private Trader	90
	Rahata	Local Private Traders - Rahata	60
Jalgaon	Pachora	Local Private Trader	5
		Local Private Traders - Kathari Brothers	100
	Jamner	Local Private Trader - JP Bohara	10
	Chalisgaon	Local Private Traders	100
Aurangabad	Sillod/Kannad/ Fulambri	Local Private Traders	1500
			2155 mt

6.3 UPL Performance measure framework

Golf	Approach	Monitorable indicator	Result	Impact
1. Maize development	(a)Development of varieties for different stress conditions (rainfed, drought etc)	(a)Average output received by farmers even in adverse condition	(a)Even in low rainfall period farmers could attain yield level of Ahmednagar-25(qtl/acre) Aurangabad-20(qtl/acre)	• Even in low rainfall period farmer could attain yield of 20-25 qtl/ acre • Farmer meetings at different stages of crop cycle increased the confidence among farmers due to timely solution for crop problems • There is need to bring more focus on water harvesting techniques in extension activities of project
	(b)Integrated maize development, with end- to end solutions	(b) Farmer meetings at different stages of maize cultivation	(b)Conducted no. of meeting at different crop stages as listed: 1. Pre sowing: 60 2. Sowing: 53 3. Flowering stage: 64	
	(c)Climate resilient agriculture	(c)Improvement of water-use efficiency. Use of seed that is less water intensive	(c)Seed hybrid (PAC -740) is an early maturing variety, hence less water is required. PAC -740 is also tolerant to drought and since plant remains green on maturity it can be used for fodder also	
2. Increase in farmer income	(a)Best cultivation practices for increasing crop yield	(a)Increase in yield of maize	(a)Incremental yield of 9-10 qtl/acre in maize yield	• Farmers were more conscious about moisture content in harvested produce in Ahmednagar and thus they earned better price comparatively • Awareness about soil testing increased • Saving of Rs 500/ acre on fertilizers • Increase in yield due to awareness on plant population per acre
	(b)Educating farmers to reduce cost of production through modern farming techniques	(b.1)Number of soil testing done and company's investment on soil testing	(b.1) Approx 133 soil testing done for PPPIAD farmers. Company's investment on soil testing in Ahmednagar 9.6k Aurangabad 28.4 k	
		(b.2) Optimum use of fertilizers, based on soil testing reports	(b.2)With awareness on soil testing farmers have saved the cost of at least one urea bag, i.e Rs 500/ acre saved.	
		(b.3) Educating farmers about plant spacing efficiency and post harvest management	(b.3)Farmers were trained to maintain plant spacing efficiency. Fifty three sowing programmes with following specification on spacing were organised Row to Row = 60 cm Plant to plant = 25 cm	

Golf	Approach	Monitorable indicator	Result	Impact
3. Increase in maize yield	(a)Use of quality seeds	(a)Increase in yield	(a)Incremental yield of 9-10 (q/ha)	• Rs 70/qtl saving in cost due to omission of intermediaries • 15 to 20 % saving in fertilizer cost
	(b)Improved cultivation practices	(b.1) Awareness about soil testing (b.2) Specific trainings organised	(b.1) 133 soil testing done under project. (b.2) Fifty five training on nutrient management organised	
4. Improving marketability	(a)Helping farmers to earn good market price for maize	(a.1) Number of procurement meetings organized with buyers (a.2)Price realization due to post harvest management training of farmers	(a.1)27 procurement meetings organized (a.2) In comparison to Dahegaon(Aurangabad district), maize growing farmers in Ahmednagar were progressive and earned better price due to awareness about maintaining moisture content Price of Maize : • Ahmednagar: Rs 950-1100 /qtl • Dahegaon (Aurangabad district) : Rs 900 / qtl	• Farmers who were aware of post harvest management (maintaining appropriate moisture content) earned better price for their produce
5. Strengthening extension services	(a)Development of market oriented extension system for marketing of maize	(a)Impact of extension model "Unimart"	(a) Special services provided under UNIMART model include : Farm advisory services at toll free number, visit at farmer field, ready reference library for farmers, market prices of vegetables & other crops through toll free number Approx 1000 farmers registered under UNIMART	• Increase in farmer confidence due to services provided by UNIMART • Services of UNIMART also provided easy connectivity to farmers for problem solving • Farmers group were created. However, there is need for more intense effort to encourage them take to take some result oriented actions as group activities
		(b) farmer groups formed	(b)Created farmer groups in all beneficiary villages	

Goal	Approach	Monitorable indicator	Result	Impact
6. Enabling end user linkage with starch/ poultry feed industry	(a) Market linkages created	(a) No of procurement meetings organized	(a) 27 procurement meetings organized. Approx 2155 mt of maize procurement done under project	• Market linkages have been the most encouraging factor for farmers in the project. Opening village collection centres and helping farmers fetch better price for their produce is very crucial for success of the project



Activities undertaken by UPL under PPPIAD

Farmer Training



Field Days



Field Demonstrations



Night Shows



UNIMART Extension Model





MONSANTO

PPPIAD PROJECT ON MAIZE BY MONSANTO INDIA LTD

7



7 PPPIAD PROJECT ON MAIZE BY MONSANTO INDIA LTD

A. Project Brief

PPPIAD project in Maharashtra aims at bringing a substantial improvement in maize supply chain by bringing end- to-end solutions to maize growing farmers. Monsanto has been one of the lead partners in the project and aims at providing sustainable agriculture solutions to maize growing farmers. Through PPPIAD project Monsanto provides diversified maize hybrid seed portfolio suited to diverse agro-climatic conditions. The State Government is also playing its part by providing financial support to the farmers. The ultimate goal is to enable farmers to increase maize productivity with integrated efforts of all stakeholders. The PPPIAD project has been undertaken in 10,000 hectares and project activities were put into action for kharif cultivation 2013.

B. Project Objective

Improve the income and thus transform the lives of chosen beneficiaries by offering choice of crops and crop diversification through:

- Ensuring supply of high yielding hybrids.
- Enhanced crop management through MFAS(Mobile farm advisory services).
- Enable end user linkage with starch/ Poultry feed industry.

The project is laid on the foundation that benefits of high yielding seeds with right agronomic practices can significantly increase the productivity.

C. Key stakeholders in the project

Monsanto in consultation with Department of Agriculture, State Government of Maharashtra decided the scope and approach of the project. Monsanto deploys resources on-ground commensurate to the requirement of the project. Department of Agriculture, Government of Maharashtra has a major

role in identifying beneficiaries as per specified criteria in targeted villages. The seed and fertilizer requirements are compiled and purchase order is placed to Monsanto for procurement of high quality corn seeds. Monsanto in conjunction with local Agriculture officers spreads awareness for distribution of high quality corn hybrids as per agreed village wise schedule.

Table 18: PPPIAD project on Maize : Monsanto India Ltd

	Stakeholders	Responsibilities
1	Department of Agriculture	Project sponsor,identification of benefeciaries, distribution of inputs , subsidize the high quality inputs for small and marginal farmers
2	Seed supplier (Monsanto)	Project management, supply of high yielding corn hybrids, crop management support through mobile farm advisory services, field demonstration through centre of excellence trials
		Storage and dispatch of seeds to distribution points
3	End user industry	Marketing linkage with starch, poultry feed industryv

D Research methodology and approach

FICCI study on impact of Maize PPPIAD project in Maharashtra aims at evaluating and documenting major initiatives taken by Monsanto in Maharashtra on improving maize supply chain.

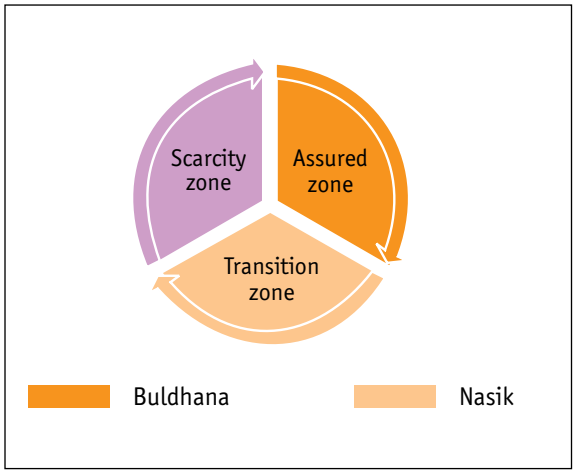
(d.1) Sample composition, sample size and sample area

Table 19: Monsanto PPPIAD project (Kharif 2013) and FICCI primary survey on impact evaluation of project

Monsanto PPPIAD project (Kharif 2013)		Primary survey detail	
Districts	Area under each district	Districts surveyed	Buldhana, Nasik
• Sangli	1600	Villages surveyed: Bhivgaon, Pangrimali, Madh, Khadagri, Vinchur. Khadakmalegaon, Mitsagare, Manur	8
• Nasik	4000	Stakeholders surveyed:	
• Buldhana	3000	• Farmers surveyed	172
• Pune	1400	• Farmers surveyed	172
Total area	10,000 hectare	• Governmentofficials	7
Total farmers	17069	• Company officials	14
		Total sample size	**193**

d.2) Sample area (primary survey)

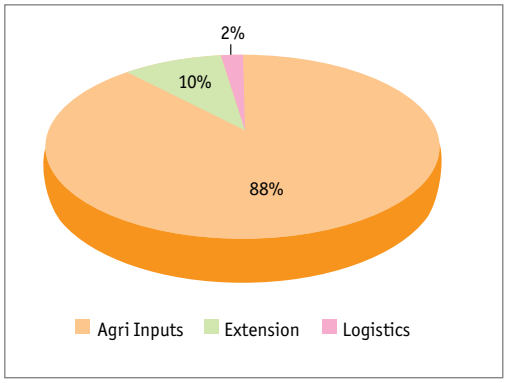
Graph 24: Agro climatic zones and districts covered



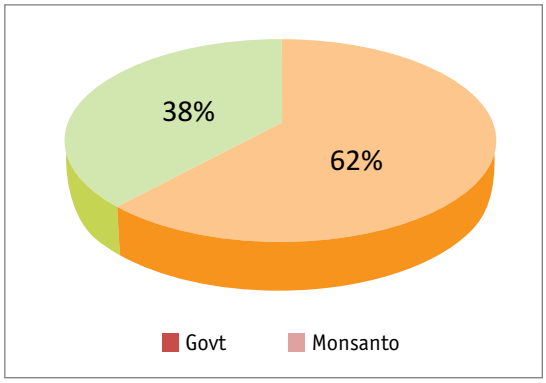
The selection of Buldhana and Nasik region for evaluating the impact of PPPIAD on maize growing farmers was done purposively so as to compare the results between the region which falls under assured zone with one which falls under transition zone in regard to rainfall. Buldhana region which comes assured zone receives approx. 700-900 mm of rainfall. However Nasik comes under transition zone.

(E) Project Components and Project Cost

Graph 25: Project components: Monsanto

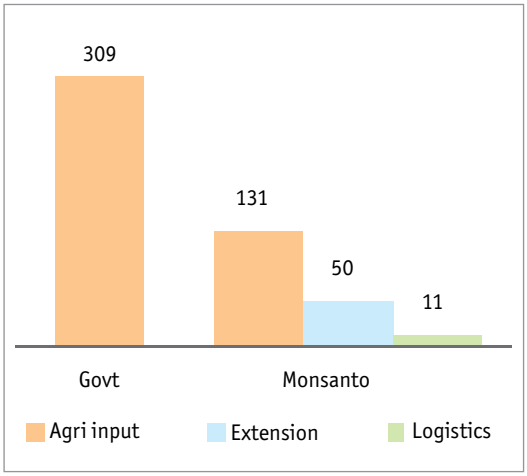


Graph 26: Share of different stakeholders in project



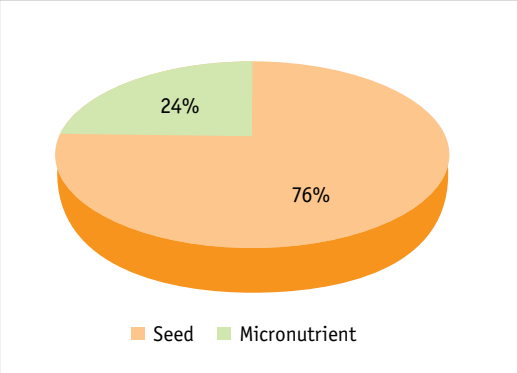
The above graphs shows that out of total project cost of INR 501 lakhs 88% is allocated to Agriculture inputs(which includes seeds and micronutrients), followed by 10% to extension activities and rest 2% for logistics. Monsanto has been focusing on enhancing crop productivity in India over the last 60 years. Monsanto aims at improving the productivity of maize in Maharashtra through extensive extension activities. The increase in acreage of maize in Maharashtra owes to remunerative crop economics, steep commodity prices and shift from open pollinated varieties to hybridization. However, productivity gains have been erratic, primarily due to rainfed growing conditions, lack of proper agronomic management practices, mismatch of right hybrids for rainfed and different soil conditions and use of low yielding hybrids to some extent. PPPIAD project on Maize in Maharashtra aims to improve the productivity of Maize crop through efficient agri extension services and quality agri inputs supply.

Graph 27: Share of stakeholders in different project components

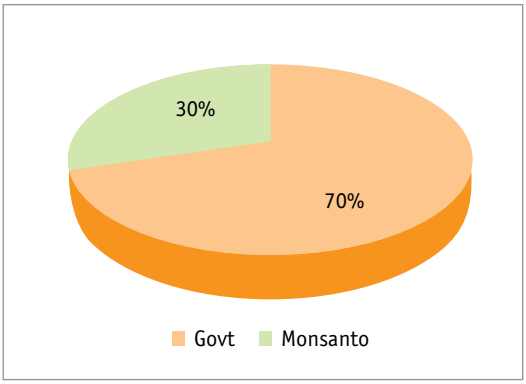


The three key stakeholders in PPPIAD Monsanto project are (a) State Government of Maharashtra contributing (62%)in total project cost, Monsanto contributing (38%) in total project cost. State Government has a major contribution in providing agri inputs whereas Monsanto major contribution is in providing Agri extension, agri inputs and logistics.

Graph 28: Components under Agri inputs



Graph 29: Share of different stakeholders in Agri-inputs



(D.1) Agri Inputs

The graphs shows that out of total cost allocated to Agri inputs approx. 76% is on seeds and rest on micronutrient. State Government of Maharashtra makes a major contribution in supply of agri inputs for maize cultivation under PPPIAD project. Such financial support extended to the farmers has a bearing on the total cost of cultivation. The use of quality inputs at right time is instrumental in increasing the yield per hectare of maize.

Table 20: Characteristics of different hybrid seeds provided by Monsanto India ltd for PPPIAD program

Characteristics of Seed	Grown in PPPIAD covered districts
Pinnacle	
(a) Very popular among the farmers with irrigation (b) Big cob size for good yields, highly responsive hybrid to inputs (c) Starch content is high- good for industry; (d) Big cob size- for good yields, fit for Onion- Maize crop rotation	Nasik, Buldhana, Pune, Sangli
DKC8101	
(a Can tolerate water stress (b) Stable yields even in low inputs (c) Strong roots to tolerate the rainfed conditions better and resulting in higher grain yield in drought conditions. (d) Strong stem, resisting it to lodging resulting better standability to the crop	Nasik, Buldhana, Pune, Sangli
900 M Gold	
(a) Very good yield (b) Good storage quality (c) Can tolerate water stress (d) Stable yield even in low inputs (e) Consistent performance (f) Uniform compact ears, attractive grain color (g) Excellent tip filling	Buldhana, Sangli

The contribution of Monsanto in providing subsidized seeds for PPPIAD project is given in table below.

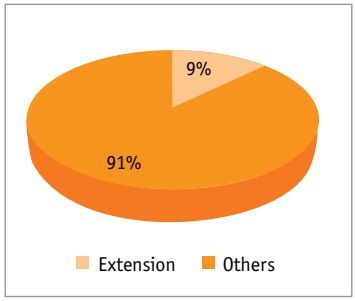
Table 21: Monsanto's contribution in providing subsidized seeds in PPPIAD

Hybrids	Farmer price Rs/kg	Monsanto contribution to prices	Offer price for PPPIAD farmers	Monsanto contribution(%)
Pinnacle	260	100	160	38
900 M	195	61	134	31
Dkc 8101	190	56	134	29

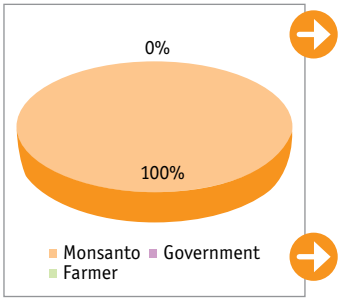
Distribution of inputs to beneficiaries is a major task. Department of Agriculture, Agriculture officials in conjunction with sarpanch of the area ensures the distribution of seeds and vouchers for fertilizers and micronutrient to beneficiaries. Monsanto conducts on-the-spot training sessions for the beneficiaries and also provides product management leaflets along with seeds.

(D.2) Extension Activities

Graph 30: Project cost for extension activities : 50 lakhs



Graph 31: Share of Monsanto in Extension activities



Particular	Amt (lakhs)
Resource and training	9
Beneficiary awareness & distribution support	3
Promotional advisory services	34
Centre of excellence	2
Post harvest support	2

Graph shows that approx. 9% of the project cost is allocated to the extension activities. To achieve the objectives of this project it was crucial to develop extension programs that would be beneficial to farmers for achieving higher yield and improve income of farmers.

The financial support for extension activities is being provided by Monsanto. Centre of excellence farms established in the respective districts generates awareness among farmers on crop management practices and display hybrids suiting to geographies. Post harvest meetings are organised to improve the quality for better prices. Farm advisory information services provides key messages across the cropping cycle through voice messages and SMS on crop management practices and market prices.

(D.3) Logistics Cost

It includes planning and distribution of seeds to the farmers shortlisted by State Government under PPPIAD programme.

The evaluation report aims to provide the impact of PPPIAD project on maize growing farmers based on the results of the primary survey. The next chapter sheds light on the outcomes of the stakeholder interviews undertaken during the survey.

PPPIAD Project on Maize by Monsanto

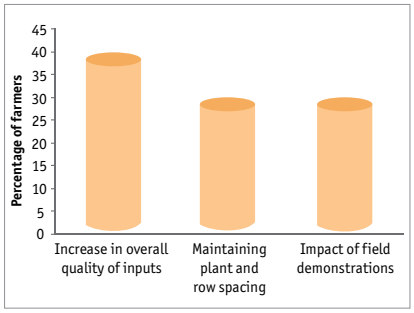
Stakeholder Analysis

1. *Improvement in productivity level of Kharif Maize in PPPIAD covered areas and farmers perception on factors behind such improvement in Buldhana and Nasik district*

Table 22: Average yield (qtl /acre)

	Before PPPIAD			PPPIAD covered areas
	2008-09	2009-10	2010-11	2012-13
Buldhana	12.12	8.76	9.72	24
Nasik	11.56	9.08	13	30

Graph 30: Farmers perception on key interventions that helped in yield improvement significantly



Source: (2008-11) Special Data Dissemination Standard Division, Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India. For year 2012-13: source: FICCI survey

The analysis of Monsanto project in Buldhana and Nasik districts confirmed that production yields of maize have increased during PPPIAD period. When asked about the major factors behind improvement in maize yield, majority of farmers agreed that improvement in availability and quality of agri inputs (primarily seeds) has actually transformed the way they used to do maize cultivation. Few farmers also gave credit to effective field demonstrations that helped them improve the agronomic practices in cultivating maize. Farmers also mentioned about increase in plant population by maintaining plant to plant and row to row spacing, which increased the yield per acre.

2. *Improvement in income of farmer*

Graph 32: Share of different operations(%) in total cost of cultivation in Buldhana and Nasik region

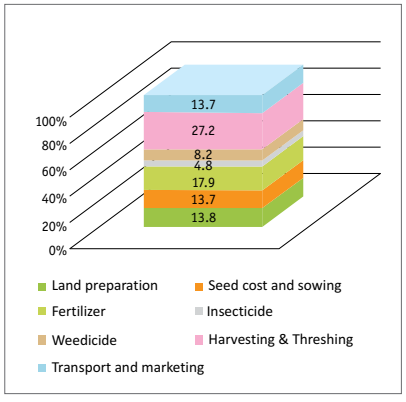


Table 27: Response on what is needed to improve cost of cultivation of maize ?

Short term measures	Education to farmers about primary processing
Medium term measures	Promotion of harvesting equipments for maize
	End to end solutions for maize growing farmers

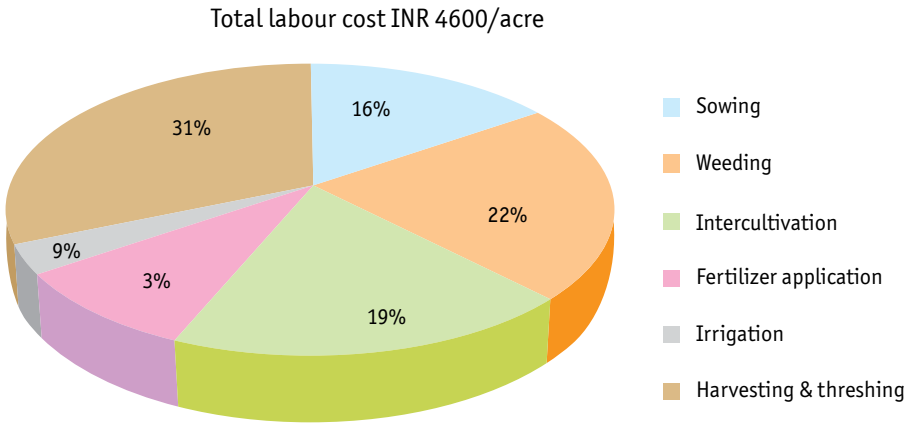
Note: Total cost of cultivation in this exhibit is approx. 14,500/acre
Source: Primary survey, FICCI analysis

The ultimate aim of the PPPIAD project in maize is to improve the income of farmers by adopting modern agronomic practices. Two costliest operations in maize cultivation as per response received by farmers are (a) harvesting and threshing operation (b) expense on fertilizer and insecticide. Monsanto officials were asked on what could be the short and medium term measures that should be considered for decreasing cost of cultivation of maize. The response received is mentioned in the table 27. Besides, improving crop productivity, respondents feel that educating farmers about primary processing will be very crucial.

3. Need of agri machinery for maize cultivation

Farmers were asked about the importance of agri equipment in maize cultivation. As per the response received by farmers harvesting and intercultivation operations are the major labour intensive operations in maize cultivation. Availability of labour during peak harvesting period is the major bottleneck.

Graph 33: Labour cost (percent) in different operations

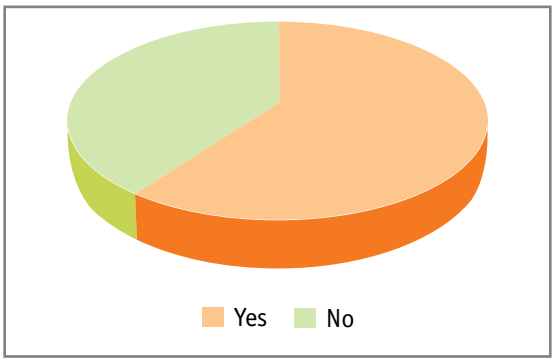


Source: FICCI Survey

4. Farmer perception about provision of Agri inputs

Farmers response was captured on supply of agri inputs under PPPIAD project. As per the discussions held with the farmers, proper planning, timely approval and supply of seeds by June 1 are the three most important efforts that should be taken by State Govt and project leader. When asked about possibility of taking maize cultivation under Rabi season farmers raised concern over scarce sources for irrigation water and storage facilities which restricts them for taking maize crop under Rabi season.

Graph 34: Do you get agri inputs (seeds, fertilizers) at right time for maize cultivation under PPPIAD project



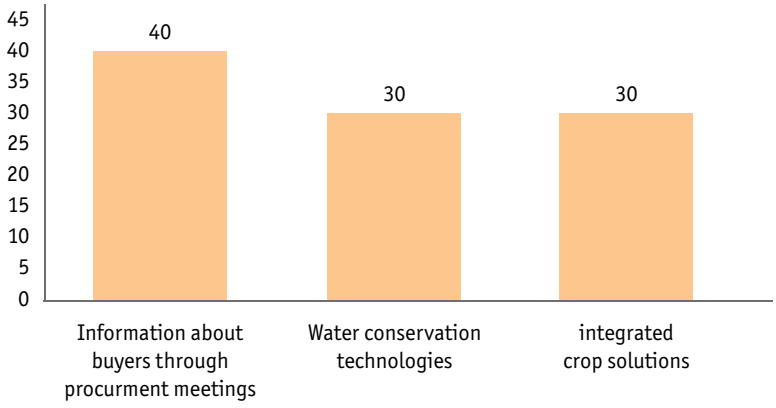
Question	Response by farmers
What is the major recommendation you would give for timely provision of Agri inputs under PPPIAD?	Agri inputs should reach farmers by 1 June for undertaking timely agronomic schedule.
What are top two constraints in undertaking maize cultivation in Rabi?	1. Scarcity of irrigation water 2. Inadequate storage

Source: FICCI Survey

5. Farmer perception about extension model of Monsanto

Farmers were asked about their perception about extension activities undertaken by Monsanto under this project. As depicted in the exhibit, surveyed farmers were satisfied with the new initiatives undertaken in PPPIAD project and extension activities undertaken by Monsanto team. However when asked about what new elements should be included under the extension activities maximum farmers responded that organizing procurement meetings are very crucial as this strengthens market linkage and boost confidence in them.

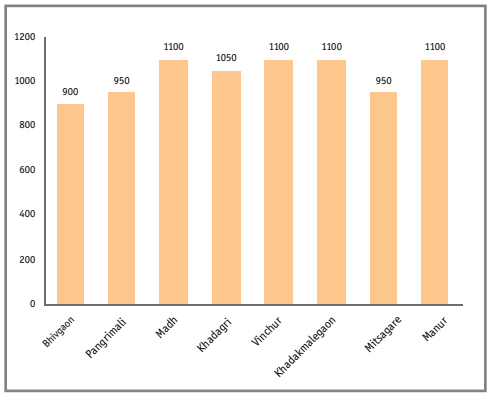
Graph 35: What type of information you think should be included in extension activities on regular basis



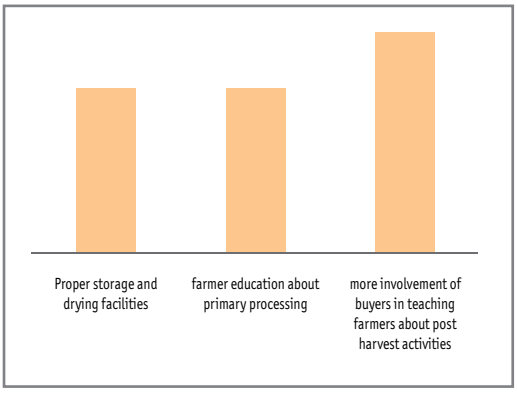
Source: Primary survey, FICCI analysis

6. Farmer perception about marketing of produce

Graph 36:Market price of Maize(Rs/qtl) in different villages of Buldhana and Nasik district



Graph 37: What is needed to help farmers fetch better price for produce?



Source: FICCI Survey

There is huge scope in creating market linkages.Industry officials were asked on what can be the three important steps that can help farmers fetch better price for maize. As per the response received by majority of the respondents, serious involvement of buyers with maize growing farmers is the need of the hour. Farmers should be taught about the marketability aspect of the produce right from the beginning, so that they may not end selling their produce at sub standard price due to lack of knowledge at the mandis.

7. Connectivity to market

One of the core components of the project which determines the actual impact of the project at the ground level is market linkage. Approx 2993 qtl of maize has been procured by different agencies under PPPIAD project.

Table 23: Market linkages

Districts	Villages	Nearest market (mandi)		Approx transport cost	Payment cheque/ cash	Constraints in connecting to market
		Mandi	Distance (km)	Rs/q		1.Waiting time at mandi. 2.Additional transport cost and mandi charges. 3. Delay in payment at mandi. 4.Lesser price than MSP 5. Weighing machines are suspect
Buldhana	Bhivgaon	Deolgaon	6-7	10	Cash	
	Pangrimali	Deolgaon	10	20-35	Cash	
	Madh	Buldhana	21	30	Cash	
Nashik	Khadagri	Vadangli	0.5	20-25	Cash	
	Vinchur	Lasalgaon	5	20	cheque	
	Khadakmalegaon	Lasalgaon	10	30	cheque	
	Manur	Kalwan	2	20-25	Cash	

Source: FICCI Survey

Table 24: Procurement agencies

S.N.	Name	Qty (MT)
1	Sahayadri Agro Vet, Kupwad, Sangli	190
2	Baramati Agro	1600
3	Godrej Agro	650
4	Baramatitalukakharadivikrisangh	168
5	Sandhambhor Poultry	340
6	NAFED	45
	Total	2993

8. Comparative perception of Monsanto officials about farmer adaptability level

Table 25: Comparative perception of Monsanto officials about farmer adaptability level

District Buldhana				
Villages	Farmer adaptability level	Farmer awareness level	Price received by farmers (INR / qtl)	Awareness about primary processing (moisture level)
Bhivgaon	Low	Low	900	Low
Pangrimali	Medium	Medium	950	Low
Madh	High	High	1050	Medium
District Nasik				
Khadagri	High	High	1100	High
Vinchur	High	High	1100	High
Khadakmalegaon	High	High	1100	High
Mitsagare	Medium	Medium	950	Medium
Manur	High	High	1100	High

Monsanto officials were asked about the variation in farmer response and ease of percolation of new technologies in different villages. As per the response received from Monsanto officials only few villages were progressive and witnessed proper adaptability level among farmers.

However, Monsanto officials appreciated the willingness of farmers to learn and acknowledge the support provided from Government officials to introduce new technologies in the area through PPPIAD.

7.3 Monsanto Performance Measure Framework

<table>
<tr><th>Goal</th><th>Approach</th><th>Monitorable indicator</th><th>Result</th><th>Impact</th></tr>
<tr><td rowspan="4">1. Maize development</td><td>(a)Development of varieties for different stress conditions</td><td>(a) Average output received by farmers even in adverse condition</td><td>(a) Even in low rainfall period farmers could attain yield level of approx. 24 qtl/acre.</td><td rowspan="4">• Even in low rainfall period farmers could attain yield of 24 qtl/acre

• Integrated end-to end approach during different phases of cultivation is instrumental in improving overall yield of maize.

• ICT based weather advisory was very beneficial for farmers.</td></tr>
<tr><td>(b) Integrated maize development</td><td>(b)Farmer meetings done during different phases of crop cycle which includes meetings done on pre planting, crop season and post harvesting aspects</td><td>(b) Meetings done at different crop cycle to provide end to end solutions
<table><tr><td>Pre planting</td><td>49</td></tr><tr><td>Crop season</td><td>80</td></tr><tr><td>Post-harvest</td><td>61</td></tr><tr><td>Field demo</td><td>4</td></tr></table>
(b.2) Crop tracker documentation done wherein sowing, crop management practices are captured.</td></tr>
<tr><td rowspan="2">(c)Climate resilient agriculture</td><td>(c.1)Improvement of water-use efficiency. Use of seed that is less water intensive</td><td>(c.1)Hybrids 900M gold and DKC8101 perform better with low inputs. Strong roots tolerate the rainfed conditions better and result in higher grain yield in drought conditions</td></tr>
<tr><td>(c.2)ICT based Weather advisory</td><td>(c.2) 16807 farmers have been covered in the advisory messages services</td></tr>
</table>

<table>
<tr><th>Goal</th><th>Approach</th><th>Monitorable indicator</th><th>Result</th><th>Impact</th></tr>
<tr><td rowspan="2">2. Increase in farmer income</td><td>(a)Better cultivation practices to increase crop yield</td><td>(a.1)Increase in yield of maize</td><td>(a.1) Approx 10 qtl/acre increase in yield</td><td rowspan="2">• Approx 10 quintal/acre increase in maize yield
• Awareness on post harvest management increased.
• Farmers acknowledged the benefits of soil testing.
• Seven percent saving in cost of fertilizers due to soil testing.</td></tr>
<tr><td>(b)Educating farmers to reduce cost of production through modern farming techniques</td><td>(b.1) Number of soil testing done

(b.2) Saving in cost of fertilizers

(b.3)Awareness about post harvest management</td><td>(b.1)124 soil testing done in year 2013 against the target of 50.

(b.2)Less use of urea(7% saving) due to soil test based fertilizer application

(b.3) Sixty one (61) post harvest meetings organized under PPPIAD programme.</td></tr>
<tr><td rowspan="2">3. Increase in maize yield</td><td>(a)Use of quality seeds</td><td>(a.1)Yield increase
(a.2) Distribution of seeds</td><td>(a.1)Incremental yield of 10 qtl/acre.
(a.2) 192875 kg of corn hybrid seed dispatched for PPPIAD farmers in 2013.</td><td rowspan="2">• Incremental yield of 10 qtl/acre due to combined efforts of all stakeholders in developing integrated approach for maize cultivation.</td></tr>
<tr><td>(b)Improved cultivation practices</td><td>(b.1) Awareness about soil testing</td><td>(b.1)<table><tr><th>Soil testing</th><th>Nos</th><th>Cost</th></tr><tr><td>Nasik</td><td>53</td><td>26150</td></tr><tr><td>Buldhana</td><td>30</td><td>13500</td></tr></table></td></tr>
<tr><td rowspan="2">4. Improving marketability</td><td rowspan="2">(a) Helping farmers to earn good market price for maize</td><td>(a) Better prices due to training on primary processing of maize.</td><td>(a.1)In few villages moisture meter is provided under ATMA.

(a.2) Farmers who undertook post harvest management could earn 3-5% better prices.

(a.3) In comparison to Buldhana, farmers in Nasik region were progressive and earned better price due to awareness about moisture content. Price realization of maize in Nasik: 950-1100 q/acre, Buldhana: 900-1050 q/acre.</td><td rowspan="2">• Farmers who adopted post harvest management practices could earn 3-5% better prices.</td></tr>
<tr><td>(b) Characteristics of seed that improved marketability.</td><td>(b) Hybrid seeds like DKC8101 and Pinnacle are in demand by the poultry and Starch industry. Farmers got easy market linkage for produce of these seeds.</td></tr>
</table>

<table>
<tr><th>Goal</th><th>Approach</th><th>Monitorable indicator</th><th>Result</th><th>Impact</th></tr>
<tr><td rowspan="2">5. Strengthening extension services</td><td>(a) Refinement and adoption of existing location specific farming modules</td><td>(a)Centre of excellence (COE) demonstration farms to showcase better cultivation practices.</td><td>(a)Five COE conducted in 4 districts. On each COE, 3 farmer meetings and one field day was organized to train farmer about the right practices. Approx 200 farmers experienced the right cultivation practices at COE farms.</td><td rowspan="2">• Mobile advisory service is making farming easy for maize growing farmers, as we see number of farmers increasing the usage of this service year on year.

• Farmers registered under MFAS can get input information about farm location, crops/hybrids grown, soil type, irrigation source, price trends. This enables them to mitigate risk through preventive remedies.

• By using toll free numbers , farmers could get direct access in terms of advise, technology etc. Such easy communication and easy solution to problems is improving the lives of farmers.</td></tr>
<tr><td>(b) Development of market oriented extension system for marketing of maize</td><td>(b) Mobile services for faster dissemination of technologies.</td><td>(b) Approx 16807 farmers are covered under MFAS(Mobile Farm Advisory services), approx 4046 calls on toll free numbers from project areas have been received
<table>
<tr><td>District</td><td>call</td></tr>
<tr><td>Buldhana</td><td>1261</td></tr>
<tr><td>Nashik</td><td>1761</td></tr>
<tr><td>Pune</td><td>362</td></tr>
<tr><td>Sangli</td><td>662</td></tr>
</table></td></tr>
<tr><td>6. Enabling end user linkage with starch/ poultry feed industry</td><td>a. Creation of market linkages</td><td>a. Increased involvement of producers and buyers</td><td>a. Approx 2993 MT qty procured by creating end user linkage.</td><td>• PPPIAD had a very positive impact on farmers who could get buyers for their produce under the project.</td></tr>
</table>

Activities undertaken by Monsanto under PPPIAD

Field Days



Post harvest management



Mobile farm advisory services



Seed distribution



Centre of excellence



Field demonstration





DUPONT PIONEER

PPPIAD PROJECT ON MAIZE BY PHI Seeds Pvt Ltd

8



8 PPPIAD PROJECT ON MAIZE BY PHI Seeds Pvt Ltd

A. Project Brief

Maize is one of the main crops grown in Maharashtra. However there is difference in yield levels of the crop from district to district. Currently, farmers in the select area use low yielding seed varieties of maize and lack technical knowhow- as a result the productivity per acre is low. Through PPPIAD project PHI Seeds Pvt Ltd, along with its partners in the project & Department of Agriculture makes an effort to improve the farm productivity in corn in the select blocks of Jalna, Ahmednagar, Dhule, Sholapur & Osmanabad districts.

B. Project objectives and activities

PHI Seeds Pvt Ltd (Pioneer) proposes a project with specific objective of improving productivity of Maize in Maharashtra. Pioneer is committed to supply quality seeds for demonstration and extension services to the beneficiaries. Pioneer's wide range of hybrid Maize has the potential to give improved yield with the limited available resources of the farmers and with sound agronomy services to farmers.

Project objectives

1. Productivity improvement (by minimum 20-25%) through use of quality seeds, other inputs and improved cultivation practices.
2. Training and enhancement of knowledge.
3. Introduction of mechanization and cultural operation to address cost effective cultivation
4. Developing post harvest linkage with other partners in the maize value chain.

C. Research approach and methodology

FICCI study on impact of Maize PPPIAD project in Maharashtra aims at evaluating and documenting major initiatives taken by Pioneer in Maharashtra on improving maize supply chain.

C.1 Sample composition and sample size

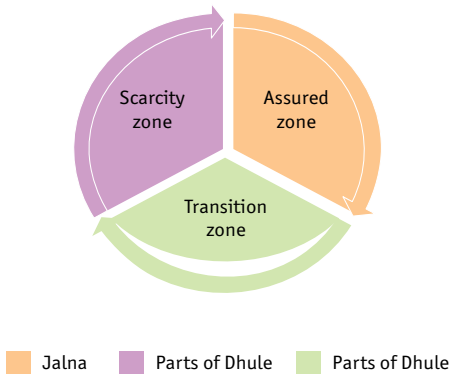
Table 27: Pioneer PPPIAD project on Maize (Kharif 2013) and detail of primary survey

Pioneer PPPIAD project (Kharif 2013)		Primary survey detail	
Name of districts	Area under each district	Districts surveyed	Jalna, Dhule
• Jalna	3000	Villages surveyed: Borgaonkhadak, Tandulwadi, Nimgul, War	4
• Satara	1200	Stakeholders surveyed:	
• Nandurbar	1600		
• Dhule	1600		
• Shoplapur	1600		
• Osmanabad	1000	• Farmers surveyed	116
Total area	10,000 hectare	• Government officials	2
Total farmers	10000	• Company officials	6
		Total sample size	124

C.2 Sample Area

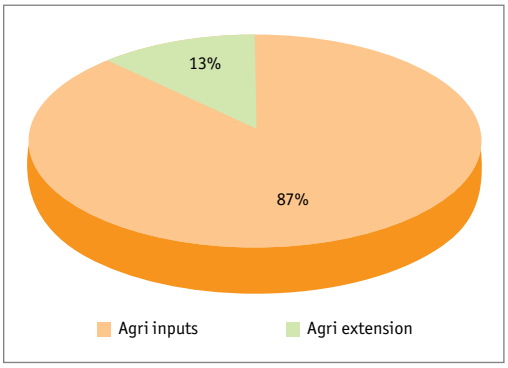
For conducting evaluation study on impact of PPPIAD, the selection of districts was done on basis of rainfall pattern. Jalna district which falls under assured rainfall zone receives approx. 700-900 mm of rainfall. However partly Dhule comes under transition and partly under scarcity zone with comparatively less rainfall.

Graph 38: Agro climatic zones of Maharashtra and districts covered under primary survey

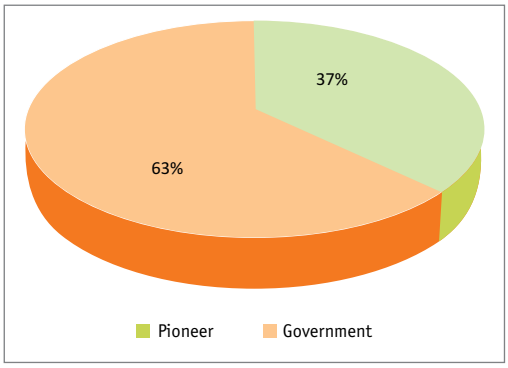


D. Project Components and Project Cost

Graph 39: Project components: PHI Seeds Pvt Ltd



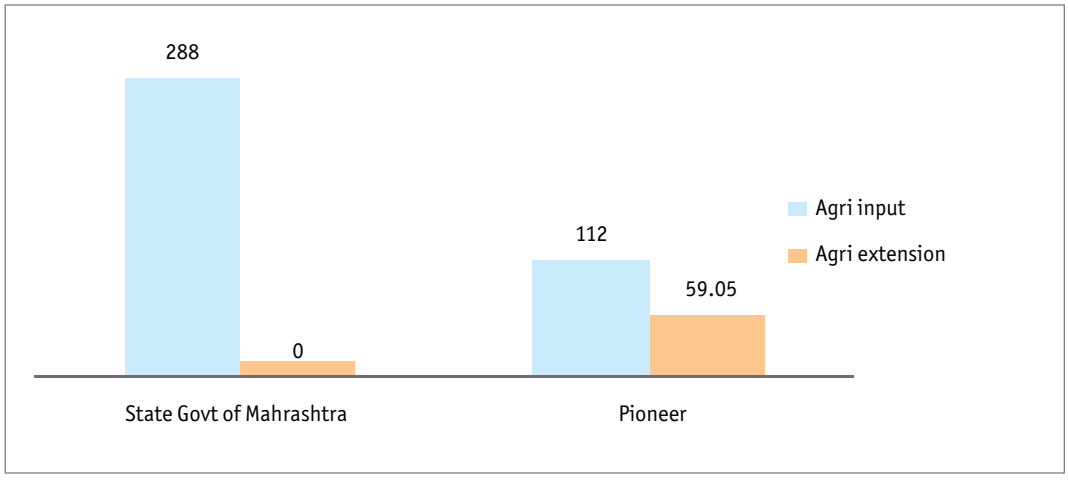
Graph 40: Share of different stakeholders in Project: 2013-14



PHI Seeds Pvt Ltd led PPPIAD project aims at increasing productivity of maize in Mahrashtra by disseminating best of technologies. The total project cost is INR 459 lakhs. As evident in graph, State Government of Mahrashtra and PHI Seeds Pvt Ltd are the two major stakeholders in the project. While Pioneer on one hand contributes 37% in total project cost, State Governmnet of Mahrashtra provides financial contribution of 63% in total project cost.

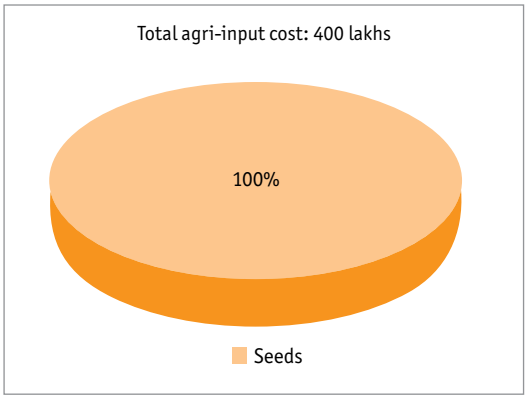
Provision of agri inputs and extending knowledge through extension services are the two core components of the project. State Governmnet of Mahrashtra provides financial support for agri inputs whereas Pioneer provides financial support for agri inputs and agri extension services.

Graph 41: Share of stakeholders in different project components(in lakhs)

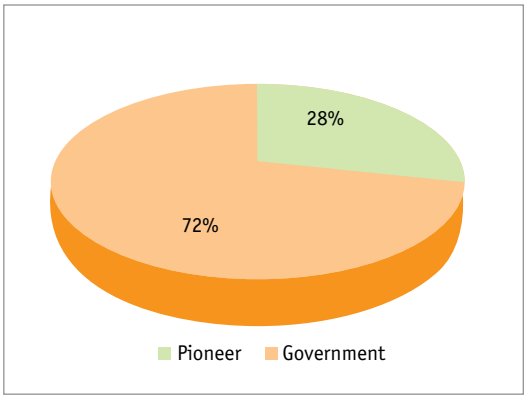


D.1 Agri Inputs: State Government of Mahrashtra provides financial support for provision of agri inputs to maize growing farmers in the project. Agri inputs provided by government includes supply of hybrid seeds. Agri inputs are provided free of cost for 1 acre of land per farmer. Agriculture officers, Department of Agriculture and sarpanch of the villages streamlines the distribution of seeds, fertilizers and other inputs to beneficiaries.

Graph 42: Components under Agri-input



Graph 43: Share of different stakeholders in Agri-inputs



PHI Seeds Pvt Ltd. provides seeds for PPPIAD project at subsidised rates. Maize seeds which costs Rs. 200/ kg is sold at a subsidised cost of Rs. 144/ Kg to State Governmnet of Mahrashtra for the farmers under the PPPIAD project. The seed provided under this programme is P305 hybrid developed by PHI seeds Pvt. Ltd. and is suitable for the rain-fed conditions of the project area. The P305 hybrid are high yielding seeds with great tolerance against drought, pests and diseases. The seeds give a high yield even in scarcity of irrigation water thus having more consistency in yield. The dark orange flint grain produced from this hybrid helps to fetch a good price in the market.

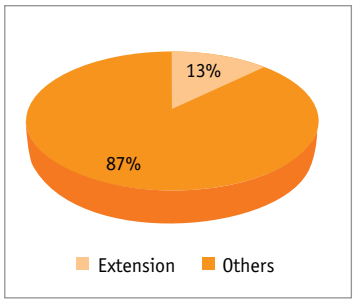
Table28: Contibution of Pioneer & Government in seed cost

Hybrid Name	Price(Rs./Kg)	PHI Seeds pvt. Ltd. Contribution (Rs./Kg)	Government Contribution (Rs./Kg)
P 3502	200	56	144

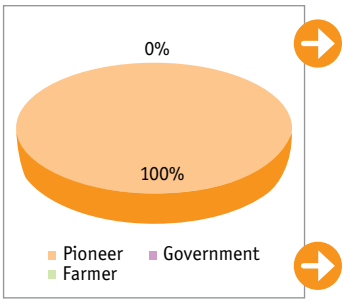
D.2 Extension Services:

The amount allocated for extension activities under PPPIAD project signifies that Pioneer aims at improving the productivity of Maize in Maharashtra through extensive extension activities. The extension activities of the Pioneer includes pre harvest, sowing and post harvest meetings, providing training kits etc.

Graph 44: Expenditure on extension activities: 59.06 lakhs



Graph 45: Share of Pioneer in Extension activities



Particular	Amt (lakhs)
Resource and training	37.3
Beneficiary awareness	15.3
Advisory services	4.96
Post harvest support	1.5

Table 29: Detail of Extension activities undertaken during project

Sr. No	Activity	Unit & Description	Jalna	Dhule
			Achievement	Achievement
1	**TRAININGS**			
a	District Cordinator Training	(1 Pre and 1 In field)	2	2
b	MDR Training	(1 Pre and 1 In field)	6	4
c	Training Kit	(1 kit per person)	3	2
2	**FARMER TRAININGS**			
a	Pre Sowing	(1 meeting/200 Ha)	15	8
b	Sowing	(1 meeting/200 Ha)	15	8
c	Top Dressing	(1 meeting/200 Ha)	15	8
d	Silking	(1 meeting/200 Ha)	8	6
e	Literature, take aways	(1/farmer or HA)	3000	1600
3	**ACTIVITIES SCHEDULED**			
A	In field plant population training	(2/Block)	4	4
b	Cultivation practice campaign (days)	No.of Days (30)	8	5
c	Field Days/Crop Shows	(4/Block)	17	15
4	Procuring agency facilitation and joint meetings	(1/Block)	0	1

PPPIAD Project on Maize by PHI Seeds Pvt Ltd

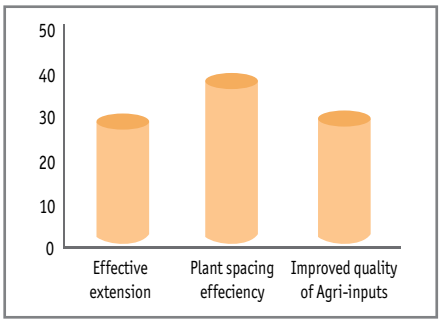
Stakeholder Analysis

1. Improvement in productivity level of Maize in PPPIAD project and farmer's perception on key interventions that helped in yield improvement significantly

Table 30: Maize productivity (Q/acre)

	Before PPPIAD			In PPPIAD covered area
	2008-09	2009-10	2010-11	2012-13
Jalna	6.3	8.4	11.6	27
Dhule	5.4	9.2	13.6	28

Graph 46: Farmer's perception on key interventions that helped in yield improvement of Maize(Jalna, Dhule)



Source: (2008-11) Special Data Dissemination Standard Division, Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India. source: FICCI survey(for yield in year 2012-13)

The primary survey of Pioneer project on Maize in Dhule and Jalna district confirmed that production yields of Maize have increased during PPPIAD period. When asked about major factors behind improvement in yield, majority of farmers agreed that education and awareness about crop management practices such as maintaining plant to plant and row and row spacing had major impact on plant population and increase in yield. Farmers also mentioned about effective extension services and improved quality of agri inputs as major factors behind yield improvement of Maize. The farmers, who were earlier reluctant to grow corn because of the possible risks and costs involved, have also started growing corn because of the support and extension services of the PHI Seeds Pvt. Ltd.

2. *Improvement in income of farmers*

Graph 47: Farmer's perception on key interventions that helped in yield improvement of Maize (Jalna, Dhule)

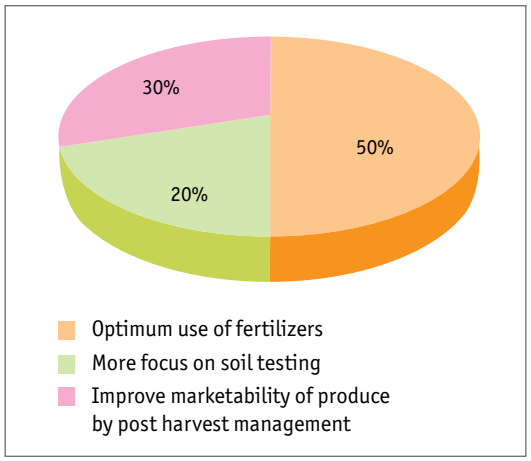


Table 31: Share of different operations in total cost of cultivation

Operation	Percent (%)
Land preparation	8.4
Seed cost and sowing	15
Fertilizer	16
Insecticide	4.5
Weedicide	6.3
Harvesting& Threshing	39
Transport and marketing	13

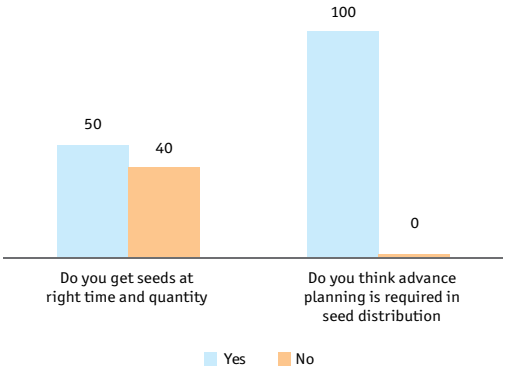
Source: FICCI survey

As mentioned in the table, two of the most expensive operations in cultivation of Maize are (a) harvesting and threshing cost and (b) secondly, cost of fertilizers. Officials of Pioneer were asked on what can be the two most fruitful steps that should be taken to decrease the cost of cultivation. The immediate solutions as mentioned by respondents are (a) educating farmers about post-harvest management (b) optimum usage of fertilizers by adopting soil testing (c) increasing the use of mechanized equipment such as maize planter and maize harvester to tackle the increasing shortage of labour during planting and harvesting period can decrease the overall cost of labour.

Table 32: Impact of PPPIAD project on Agri-inputs

	Agri –input	Old practice	PPPIAD
1	Seeds	Low yield	P-3502, high yielding
2	Irrigation	flood	Water management tips for critical stages
3	Agrochemicals	unbalanced	Soil testing
4	Agri equipment	manual	Scope for improvement
5	Extension services	negligible	Intensive
6	Micronutrients	negligible	Zinc supplied as major micronutrient

Graph 48: Farmer response on availibility of seeds under PPPIAD project

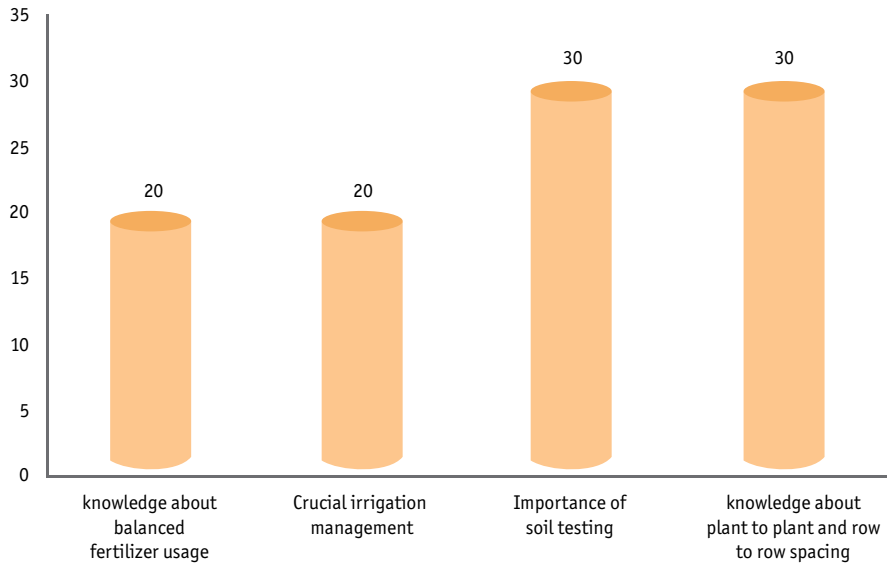


Farmers appreciated the joint efforts taken by State Government of Maharashtra and PHI Seeds Ltd in providing end-to-end solutions under PPPIAD for maize cultivation. Availability of high yielding seeds have major bearing on improving the productivity of maize.When asked about timely availability of seeds, farmers expressed concern on advance planning for seed distribution.

3. Farmer perception about extension model of PHI seeds Pvt. Ltd.

Farmers were asked about the perception of PPPIAD project and extension activities undertaken by PHI Seeds Pvt. Ltd. under PPPIAD project. As depicted below, surveyed farmers were satisfied with the new initiatives undertaken in PPPIAD project and extension activities undertaken by PHI Seeds Pvt. Ltd. team. Farmers were asked about the new elements that should be included under the extension activities. Majority of the farmers suggested linkages to procurement companies should be enhanced so as to strengthen their market linkage and to get an assured market for their produce. They have also suggested that soil testing should be encouraged and results should be well communicated on time to the farmers which would help them in deciding the dose of fertilizers.

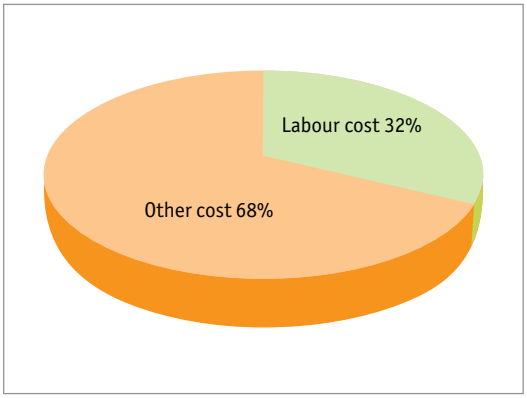
Graph 49: Impact of Extension activities on maize growing farmers in Jalna and Dhule



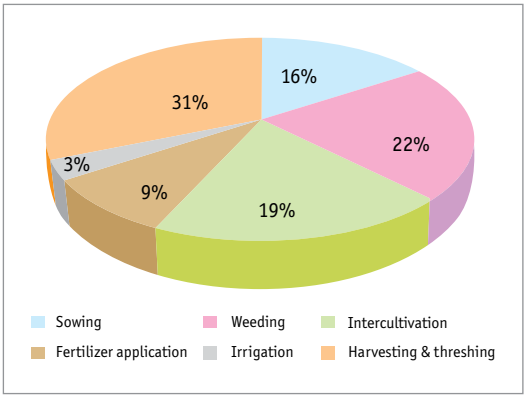
4. *Status of farm mechanization in Maize*

Farmers were asked about the importance of agri equipments in maize cultivation. As per the response received by farmers harvesting and weeding plus intercultivation operations are the major labour intensive operations in maize cultivation. Availability of labour during peak harvesting period is the major bottleneck. The share of labour cost in total cost of cultivation in maize is approx. 32%. This points towards the immense scope for introducing agri equipments in maize cultivation considering the concerns of labour shortage during peak period.

Graph 50: Cost of labour in total cost of cultivation (Jalna and Dhule district)



Graph 51: Cost of labour(%) in different operations. *Total labour cost(INR/ acre= 6400)*

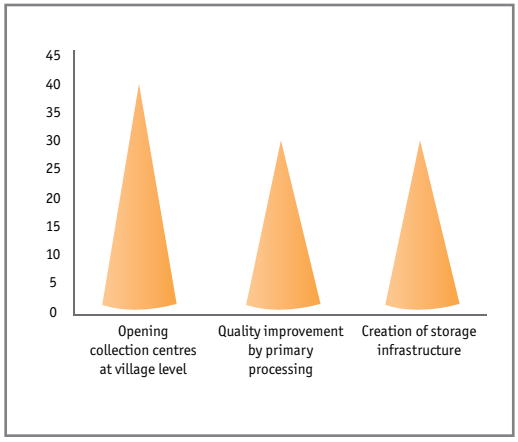


5. *Improving the marketability of produce*

Table 33: Market linkages

Villages	Nearest mandi	Distance km	Transport mode	Approx transport cost (Rs/Q)
Jalna district				
Borgaon khadak	Hasnabad	7	Tractor	15
Tandulwadi	Shillod	15	Tractor	20
Dhule district				
Nimgul	Dhule	20	Tractor	25-30
War	Dhule	10	Tractor	20

Graph 52: What should be done to improve marketability of produce



Besides improving productivity of crop by supplying high yielding seed varieties to farmers, PPPIAD project also provides equal importance to marketing aspects of the crop. The three major suggestions given by officials of PHI seeds Pvt Ltd for improving marketability of produce includes (a) promoting collection centers at village level which not only saves the transport cost for farmers but also simplifies the marketing procedure (b) secondly, ensuring consistent quality of maize by educating farmers about primary processing which would decrease the rejections at the procurement level(c) thirdly, creation of storage infrastructure at village level can help farmers earn a better price in the market, by selling when the prices rise.

6 Creation of market linkages under PPPIAD

Table 34: Pioneer PPP Corn Procurement Details 2013

Procurers	beneficiary farmers	Procured in qtls
Universal Starch Factory Dondaicha	303	13023.1
Sandabhor Poultry Farm	19	530
Private Player Contribution	322	13553.1
Gov. Corn Purchasing Centre,Bhoom	39	1764
Shri Khandoba Panan Sahkari Sanstha, Andur Tal. Tuljapur	52	1306
Govt. Corn Purchasing Centre, Solapur d	35	1367
Govt Procurement Centre	126	4437
Grand Total	448	17990.1

Quality produce as required by purchasers not only assures market for farmer produce but also helps them earn better market price. Direct procurement from buyers help farmers reduce the cost of intermediaries and indirectly raise farmer income. Creation of market linkages, besides improving crop productivity is one of the major component of the PPPIAD project

7. Comparative perception about farmer adaptability level in different districts(relative)

PHI seeds Pvt. Ltd. officials were asked about the variation in farmers' response and ease of percolation of new technologies in different villages. As per the responses from PHI seeds Pvt. Ltd. officials, the farmer's adaptability level varies across districts and even across villages. Some villages as mentioned below were progressive and witnessed better adaptability level as compared to others. However, the willingness to learn can be seen in farmers.

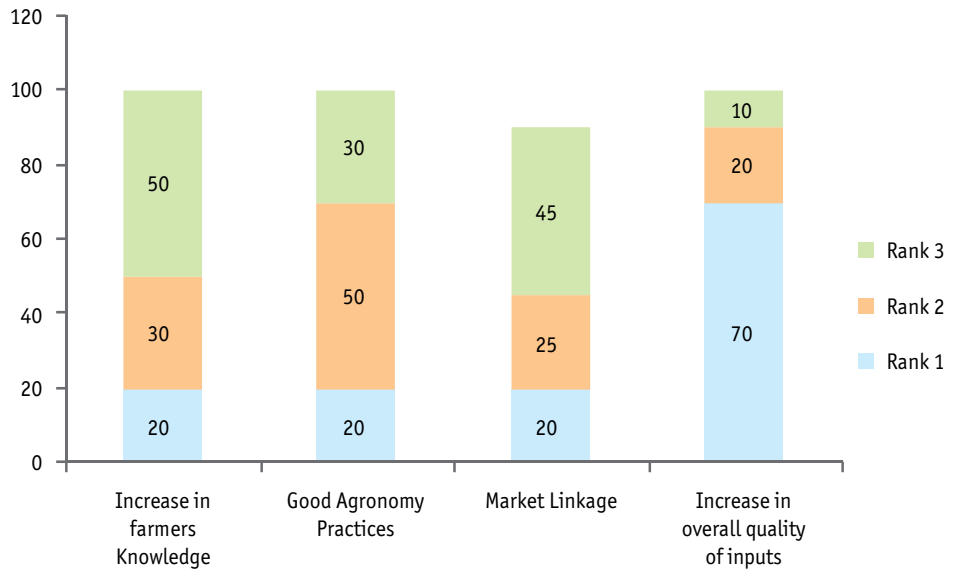
Table 35: PHI seeds Pvt. Ltd. perception on farmer adaptability level

Village under district	Farmer adaptability level	Farmer awareness level	Avg yield (qtl/ acre)	Price received by farmers (INR / qtl)	Awareness about primary processing (moisture level)
District Jalna					
Borgaonkhadak	Medium	Medium	24	1100	Medium
Tandulwadi	Low	Low	23	1100	Medium
District Dhule					
Nimgul	High	High	30	1150	High
War	Medium	Medium	25	1000	Low

8. *Farmer'sperception on working with PHI Seeds Pvt. Ltd. under PPPIAD*

During evaluation of the project the farmers were asked to comment on the major benefits and attributes of the program as they perceived and also to rank them.Farmers ranked assured availability of quality inputs as the most important attribute of the PPPIAD project. The next important attributes was package of good agronomy practices followed by increase in farmer's knowledge and market linkages. They felt that the new production techniques disseminated by the company, which also included improved seed variety and a package of practices, has resulted in improvement in yield of corn and maintenance of quality at the farmer's end.

Graph 53: Farmer'sperception on working with PHI Seeds Pvt. Ltd. under PPPIAD

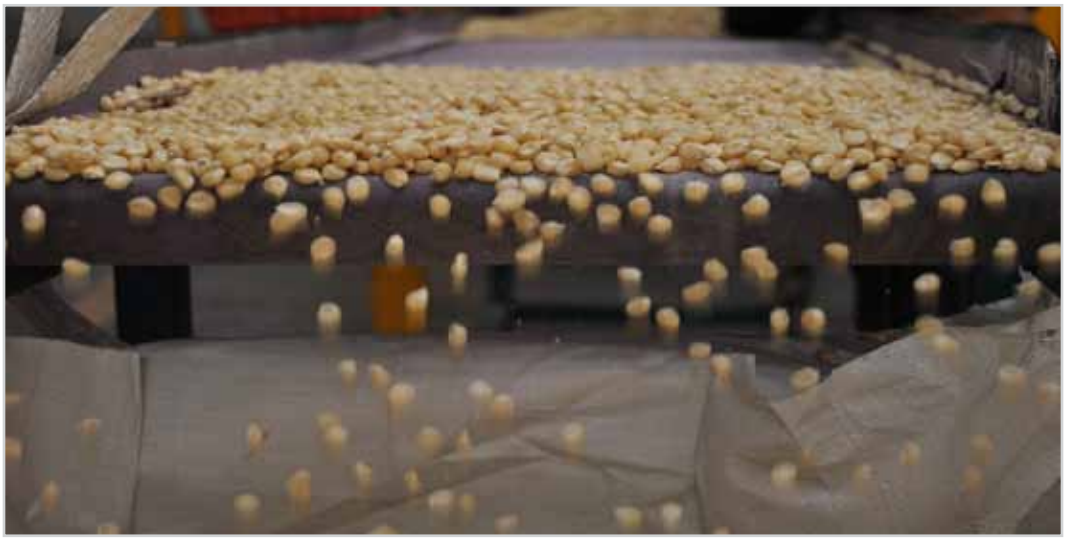


8.3 PHI Seeds Pvt Ltd Performance Measure Framework

Goal	Approach	Monitorable indicator	Result	Impact
1. Maize development	a. Development of varieties for different stress conditions(rainfed, drought etc)	a. Average output received by farmers even in adverse condition	a. P 3502 is suitable for the rain-fed conditions Even in low rainfall areas average yield received in Jalna and Dhule is as under • Jalna 27 qtl /acre • Dhule district: 29 qtl/acre	• Even in low rainfall period, yield of 25-27 qtl/acre was received. • Farmer trainings at each crop stage helped in improving maize cultivation. • Quality seeds and extension services were core components of the project. However, there is need for more focus on educating farmers about water harvesting technologies and water management tips at critical stages of crop cycle.
	b. Integrated maize development, with end-to end solutions	b. Farmer trainings during pre-planting, planting and post harvest phases of maize cultivation.	(b.1) 50 pre sowing training with focus on educating farmers about maintaining plant to plant and row to row spacing. (b.2) 30(Thirty)post harvest meetings organized.	
	c.Climate resilient agriculture	c. Use of seed that is less water intensive	(c.1)The P305 hybrid are high yielding seeds with great tolerance against drought, pests and diseases. The seeds give a high yield even in scarcity of irrigation water thus having more consistency in yield.	

Goal	Approach	Monitorable indicator	Result	Impact
2. Increase in farmer income	a. Better cultivation practices for increasing crop yield	a. Increase in yield of maize	a. Approx 10 qtl/acre increase in maize yield	• Rs 70/qtl saving in cost due to omission of intermediaries • 15 to 20 % saving in fertilizer cost • Post harvest meetings focused on educating farmers about maintaining moisture content. Maize grain with optimum moisture content helped farmers fetch better price in market
	b. Helping farmers to earn good market price for maize	(b.1) post harvest meetings organized. (b.2) Procurement of maize as a result of market linkages created during project	(b.1) Thirty post harvest meetings organized. (b.2) Approx 17990 qtl maize procured directly from PPPIAD farmers	
	c. Educating farmers to reduce cost of production through modern farming techniques	c. Decrease in cost of production due to (c.1) Omission of mandi cost by direct selling to procurement companies (c.2)Reduction in cost of fertilizers due to soil testing	(c.1)Saving due to omission of intermediaries was around 6 to 10 % i.e Rs 50 to 70 Rs / qtl benefit to farmers. (c.2)Investment on soil testing in Jalna and dhule district was INR 15000 .Fifty soil testing done. Approx 15 to 20 % saving in fertilizer cost after soil testing.	
3. Increase in maize yield	a. Use of quality seeds	(a.1) Seed distributed in project (a.2) Increase in yield of maize	(a.1) Approx 200 MT seed (P 3052) distributed in project (a.2)Approx10 qtl/ acre increase in maize yield	• Approx 10 qtl/acre increase in maize yield due to improved quality of seeds and modern agronomic practices.
	b. Improved cultivation practices	(b.1)Awareness about soil testing (b.2)Awareness about plant spacing efficiency and usage of micronutrient	(b.1) 50 soil testing done (b.2) 50 pre sowing training with stress on teaching farmers about maintaining plant to plant and row to row spacing.	

Goal	Approach	Monitorable indicator	Result	Impact
4. Improving marketability	a. Helping farmers to earn good market price for their produce	a.1. Providing seeds to farmers which have high marketability a.2 Training farmers on primary processing of maize.	(a.1) The P 3502 hybrid seed gave better market price to farmers. (a.2)Thirty (30) post harvest trainings were organized in PPPIAD covered area.	• Post harvest meetings had a major impact on increasing marketability aspect of the crop as farmers learned the importance of maintaining moisture in the crop.
5. Strengthening extension services	a. Development of market oriented extension system.	a. Technical guidance provided to farmers	a. Farmer dedicated exclusive technical guidance hot line is established to provide farmers technical guidance within 48 hours' time period.	• Field demonstrations had a very positive impact on farmers.
	b. Refinement and adoption of existing location specific farming modules	b. Showcase best management practices in maize cultivation	b. Forty six(46) field demonstrations were conducted which had participation of 2810 maize growing farmers.	
6. Enabling end user linkage with starch poultry feed industry	a. Creation of market linkages	a. Quantity of maize procured by buyers	a. 17990 qtl procured	•Improvement in market linkages was the biggest attraction for farmers under the project.



Activities undertaken by Pioneer under PPPIAD

Farmers Training



Field Days



Field Demonstrations for post harvest management



Hybrid management tips



Digital Moisture meter



Procurement meetings





9 Conclusions and Recommendations



9 Conclusions and Recommendations

Conclusion

There is huge scope to unlock the true potential of maize productivity in Maharashtra by addressing basic issues such as making available good planting material, enhancing usage efficiency of plant health chemicals, encouraging better investment by the farmer in crop cultivation and enhancing the quality and effectiveness of extension and technology dissemination at the farm level. Addressing these issues can take Indian maize to global standards not only in terms of the quantum of production but in productivity levels as well.

The careful observation of initiatives undertaken by three companies brings out an interesting point that these projects were not mere productivity related but had huge diversity in terms of benefits to farmers such as agri input minimization, resource conservation, better extension services and market linkages.

There is a dire need to keep this momentum going for strengthening the maize value chain of the country. Few recommendations for scaling and broad basing such initiatives are as under:

Recommendations

Improving crop production and productivity

1. **Meticulous planning for timely supply of seeds to farmers**

   PPPIAD project has encouraged farmers to select and adopt improved maize varieties, but timely availability of quality seeds at affordable prices to farmers is equally important.

   It is estimated that quality of seed accounts for 20-25% of productivity. The efficacy of other agricultural inputs such as fertilizers, pesticides and irrigation is also determined by the quality of the seed used. Hence timely availability of quality seeds at affordable prices to farmers is necessary for achieving higher crop productivity and production. During the

discussion, farmers suggested that the seeds of maize should reach them by 1 June to avoid delay in sowing.

2. **Increasing area under Rabi maize by water conservation and judicious use of water**

Maize demand is even throughout the year,however supply is skewed with 77 per cent of production in kharif season. Discussion with farmers revealed that scarcity of water for irrigation is the major hurdle in taking the maize crop in Rabi season. PPPIAD project should include water management advisory services at critical crop stages and disseminating water harvesting technologies as one of the major components under extension programme.

3. **Promotion of custom hiring model to increase the reach of mechansiation to small and marginal farmers**

Labour accounts for 35-40 percent of the total variable cost of maize production.Increasing cost of labourand scarcity of labour during peak season are the two major bottlenecks in maize cultivation.Farm mechanization solutions such as promotion of maize planter and maize harvester can address the issues of scarcity of farm labour during sowing and harvesting stage.

Custom hiring models should be propagated so that such machines could reach small and marginal maize growing farmers.

4. **Increasing the soil testing capacity and promotion of integrated nutrient management among farmers**

To deliver specific recommendations for balanced use of fertilizers, there is a need to increase soil testing capacity. Firstly, soil testing capacity of various mobile/static soil testing laboratories should be encouraged. This should be followed by promotion of integrated nutrient management advocating soil test based balanced and judicious use of chemical fertilizers.

Improving post harvest management and marketing

5. **Extensive extension activities on post harvest management as a joint effort of agri input companies and purchasing companies:** Buyers do not get consistent quality of maize especially in terms of the grain size and moisture content, especially during the kharif season. Therefore, rejections occur frequently due to maize not being of the required quality.

Advisory services should be promoted not only by agri input companies, but also by the buyers. Buyers should be involved in such PPPIAD projects right from the beginning so that post harvest losses from farmer's end could be reduced.

6. **Development of market infrastructure to reduce post harvest wastages:** Among cereals, maize crop has highest post-harvest and storage losses at 20 per cent. Proper development of the market infrastructure for cleaning, drying, grading and storage will reduce post-harvest losses. Small steps such as installation of moisture meters in vicinity can help farmers in measuring the quality of their produce.

7. **Promotion of maize dryers:** The high moisture content of the grains is one of the core bottlenecks in marketability of the maize. Installation of maize dryers at market yards/ mandi/ procurement centers can help farmers get better quality and price for their produce. Also community shared infrastructure for higher capacity and lowering operational cost should be encouraged for such machines.

8. **Opening direct procurement centers at the village level:** PPPIAD project has taken a very appreciable and result oriented effort by organizing farmer- buyer meetings to create market linkages for farmers. Agri input companies at the farmer-end and purchasers at the processing and marketing end need to define their roles in further strengthening the entire value chain of maize. One such effort can be opening of direct procurement centers at village level during the season which can play a big role in building confidence among farmers.

9. **Promote collective marketing by encouraging farmers to organize themselves in Farmer group:** Stakeholders working with government should encourage farmers to form strong farmer associations and producer organizations that will assist them to pool produce together for bulk marketing, strengthening linkages, enforcement of quality standards, accessing extension services, credit and marketing information. This will generate economies of scale, improved quality and help farmers get good market prices.

10. **Creation of scientific storage godowns through rural godown scheme can prevent distress sale of maize immediately after harvest:** Most of the smallholders sell their produce immediately after harvest, invariably realizing lower prices. Else, they store maize in by traditional methods in jute bags. Rural Godown Scheme initiated by the Directorate of Marketing and Inspection should be included as part of PPPIAD projects to construct scientific storage godowns in major maize growing areas.

11. **Encouraging warehouse receipt systems for pledge financing:** To meet the immediate financial requirements, the farmers are often compelled to sell their produce immediately after harvest, when the prices are low. To avoid such distress sale, Government of India, promoted Pledge Finance through a network of rural godowns and negotiable warehouse receipt system. Through this scheme, small and marginal farmers can get immediate financial support to meet their requirements and retain the produce till they get remunerative price. NWR systems should be promoted under the project.

12. **Use of ICT in marketing information:** Marketing Information is essential for producers in planning production and market led production. PPPIAD project should increase the marketability of produce by empowering farmers with knowledge through ICT services.

13. **Climate smart agriculture:** Scientific basis to maintain soil health needs to be promoted aggressively.PPPIAD scheme has been successful in encouraging farmers about judicious use of fertilizers based on soil health. However, such efforts should not end with scheme. More such projects should be analyzed; studied and implemented that has helped farmers in becoming more resilient to stresses and future shocks in agriculture. Stakeholders should propose projects on developing indicators for early warning systems and surveillance in agriculture.

14. **Certification of farmers.** Farmers who could obtain improved yield of maize by adopting modern agronomic practices under the project should be awarded and certified, so as to create an environment of competitiveness and creation of new pool of skilled farmer.



Annexure 10

UPL: List of Respondents Annexure 1

S. No.	Name of Farmer	Village	Taluka	District
1	Agnerajendra Narayan	Ekarwe	Radhna	Ahmed Nagar
2	Yadve Gyaneshwar Damodar	Ekarwe	Radhna	Ahmed Nagar
3	Bhawar Matharam Bawaji	Ekarwe	Radhna	Ahmed Nagar
4	Tangar Shankar	Ekarwe	Radhna	Ahmed Nagar
5	Sarangdhar Murlidhar	Ekarwe	Radhna	Ahmed Nagar
6	Daltrai Vasantrao Dhanvate	Ekarwe	Radhna	Ahmed Nagar
7	Dada Ganaji Vatekar	Ekarwe	Radhna	Ahmed Nagar
8	Omkar Namdev Bhawar	Ekarwe	Radhna	Ahmed Nagar
9	Sitaram Yadav	Ekarwe	Radhna	Ahmed Nagar
10	Shivaji Bhawar	Ekarwe	Radhna	Ahmed Nagar
11	Chandrakant Angre	Ekarwe	Radhna	Ahmed Nagar
12	GorLaxman Board	Ekarwe	Radhna	Ahmed Nagar
13	Naresh Rakhmaji Garvw	Ekarwe	Radhna	Ahmed Nagar
14	Subhash	Ekarwe	Radhna	Ahmed Nagar
15	Subahs Bharaman	Ekarwe	Radhna	Ahmed Nagar
16	Chandrakant Angre	Ekarwe	Radhna	Ahmed Nagar
17	Shankar kale	Ekarwe	Radhna	Ahmed Nagar
18	Adhasaheb Ramrao Devkar	Takri	Kopargaon	Ahmed Nagar
19	Balasaheb Poojaji Devkar	Takri	Kopargaon	Ahmed Nagar
20	Gorakh Sahkari	Takri	Kopargaon	Ahmed Nagar
21	Anil Karbhari Somse	Takri	Kopargaon	Ahmed Nagar
22	Datrashai Garpan Devkar	Takri	Kopargaon	Ahmed Nagar
23	SopanRamrao Devkar	Takri	Kopargaon	Ahmed Nagar
24	Sambhaji Baburam Devkar	Takri	Kopargaon	Ahmed Nagar
25	Suresh Baburao Devkar	Takri	Kopargaon	Ahmed Nagar
26	Jagannath Devkar	Takri	Kopargaon	Ahmed Nagar
27	Pranap Bapurao Devkar	Takri	Kopargaon	Ahmed Nagar
28	Badrinath Jagannathdevkar	Takri	Kopargaon	Ahmed Nagar
29	Chagan Chauhan Devkar	Takri	Kopargaon	Ahmed Nagar
30	Nemichand Tarakchand	Takri	Kopargaon	Ahmed Nagar

S. No.	Name of Farmer	Village	Taluka	District
31	Sahebrao Madhavdhar	Takri	Kopargaon	Ahmed Nagar
32	Babasaheb Ramdas	Takri	Kopargaon	Ahmed Nagar
33	Abu Chagan Devkar	Takri	Kopargaon	Ahmed Nagar
34	Arjun Badhchaur	Takri	Kopargaon	Ahmed Nagar
35	Rabso Aachan Devkar	Takri	Kopargaon	Ahmed Nagar
36	Sandeep Ashok Mathkar	Takri	Kopargaon	Ahmed Nagar
37	Sachin Datrashaidevkar	Takri	Kopargaon	Ahmed Nagar
38	Pramod Chaburao Devkar	Takri	Kopargaon	Ahmed Nagar
39	SangramMadhukarDevkar	Takri	Kopargaon	Ahmed Nagar
40	Yashbant Pandurang Devkar	Takri	Kopargaon	Ahmed Nagar
41	SapanHaribhadru Tarhe	Padegaon	Kopargaon	Ahmed Nagar
42	Ambahas Chiman Shinde	Padegaon	Kopargaon	Ahmed Nagar
43	Santosh Eknath Shinde	Padegaon	Kopargaon	Ahmed Nagar
44	Manoj Chandrakanth Shinde	Padegaon	Kopargaon	Ahmed Nagar
45	Pandhrinath Sukhdev	Padegaon	Kopargaon	Ahmed Nagar
46	Vithal Gavre	Padegaon	Kopargaon	Ahmed Nagar
47	Lakshman Fakira Shinde	Padegaon	Kopargaon	Ahmed Nagar
48	Prakash Kishan Shinde	Padegaon	Kopargaon	Ahmed Nagar
49	Santosh Shinde	Padegaon	Kopargaon	Ahmed Nagar
50	Changdev Shinde	Padegaon	Kopargaon	Ahmed Nagar
51	Bhau Saheb Shinde	Padegaon	Kopargaon	Ahmed Nagar
52	Sukhdev Ramne Thakre	SawanGaon	Kopargaon	Ahmed Nagar
53	Gaikavwar Nitin	BhramanGaon	Kopargaon	Ahmed Nagar
54	Bhashkar Sukhdev Mahske	Padegaon	Kopargaon	Ahmed Nagar
55	Ashok Parasram Shinde	Padegaon	Kopargaon	Ahmed Nagar
56	Jadhav Vijay Sahurao	Padegaon	Kopargaon	Ahmed Nagar
57	Shindesuryabhan Namdev	Padegaon	Kopargaon	Ahmed Nagar
58	Bawasaheb Bhausaheb Usre	Padegaon	Kopargaon	Ahmed Nagar
59	Bawasaheb Nanasaheb Gunaj	Padegaon	Kopargaon	Ahmed Nagar
60	Pokhar Kachau Pawar	Padegaon	Kopargaon	Ahmed Nagar
61	Rajendra Baburam Kawre	Padegaon	Kopargaon	Ahmed Nagar
62	Vinayak Machindra Teke	Wari	Kopargaon	Ahmed Nagar

S. No.	Name of Farmer	Village	Taluka	District
63	Vikas Chhabanrao Shinde	Wari	Kopargaon	Ahmed Nagar
64	Vasant Bhagwat Teke	Wari	Kopargaon	Ahmed Nagar
65	Machindra S Teke	Wari	Kopargaon	Ahmed Nagar
66	Pandit Vithhal Veer	Wari	Kopargaon	Ahmed Nagar
67	Suryakant Vasant Teke	Wari	Kopargaon	Ahmed Nagar
68	Shivani Khandav Teke	Wari	Kopargaon	Ahmed Nagar
69	Changdeo S Shirsath	Wari	Kopargaon	Ahmed Nagar
70	Rahul Madhukar Teke	Wari	Kopargaon	Ahmed Nagar
71	Rajendra Dyaneshwar	Wari	Kopargaon	Ahmed Nagar
72	Sudam Anandrao Teke	Wari	Kopargaon	Ahmed Nagar
73	Vithhal Suryabahan Teke	Wari	Kopargaon	Ahmed Nagar
74	Sagar Ramdas Teke	Wari	Kopargaon	Ahmed Nagar
75	Gabhave Shamrao Laxman	Ranjangaon	Kopargaon	Ahmed Nagar
76	Dillip Karbhari	Wari	Kopargaon	Ahmed Nagar
77	Gorde Laxman Eknath	Wari	Kopargaon	Ahmed Nagar
78	Goohave Balase Dattatney	Wari	Kopargaon	Ahmed Nagar
79	Godhave Ramesh Dattatve	Wari	Kopargaon	Ahmed Nagar
80	Godhave Ratinath Sarkam	Wari	Kopargaon	Ahmed Nagar
81	Kashav Bebapatil Vithhal	Wari	Kopargaon	Ahmed Nagar
82	Godhave Yadav	Wari	Kopargaon	Ahmed Nagar
83	Godhave Bebasash Mukund	Wari	Kopargaon	Ahmed Nagar
84	Godhave Sopanerao Laxman	Wari	Kopargaon	Ahmed Nagar
85	Pandharinath Devaji Manghate	Dahegaon	Kannad	Aurangabad
86	Govind Tukaram Khamat	Dahegaon	Kannad	Aurangabad
87	Ajinath Ramchandra Wane	Dahegaon	Kannad	Aurangabad
88	Vishawnath Tukaram Manghate	Dahegaon	Kannad	Aurangabad
89	Gulabsingh Mahasingh Sonwe	Dahegaon	Kannad	Aurangabad
90	Mahesh Sampat Manghate	Dahegaon	Kannad	Aurangabad
91	Bhikan Govbind Rao Goraade	Dahegaon	Kannad	Aurangabad
92	Bhaskar Vithhal Wade	Dahegaon	Kannad	Aurangabad
93	Ganesh Bhanikrao Manghate	Dahegaon	Kannad	Aurangabad
94	Pralhad Luknu Wade	Dahegaon	Kannad	Aurangabad

S. No.	Name of Farmer	Village	Taluka	District
95	Bhikkan Fakirrao Saluke	Dahegaon	Kannad	Aurangabad
96	Vithhal Sonparu Dubel	Dahegaon	Kannad	Aurangabad
97	Raju Sadashiv Vani	Dahegaon	Kannad	Aurangabad
98	Gyaneshwar Kachru Vani	Dahegaon	Kannad	Aurangabad
99	Vasant Raoba Khargave	Dahegaon	Kannad	Aurangabad
100	Eknath Vithhal Akale	Dahegaon	Kannad	Aurangabad
101	Govinda Pandu Gorade	Dahegaon	Kannad	Aurangabad
102	Shivaji Bhagaji Vani	Dahegaon	Kannad	Aurangabad

List of Govt. Officials

S.No.	Name	Designation
1	Chavan Digambare	Agriculture Assistant
2	Daram Saheb	Agriculture Assistant

List of UPL Officials

S.No.	Name	Designation
1	Rajendra Barote	District Coordinator
2	Maroti Kasture	Manager
3	Suryakant	District Coordinator
4	Sufrkar Bandu	M.D.O.
5	Dileep Murkunde	M.D.O.

MONSANTO: List of Respondents Annexure 2

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
1	14.04.2014	Pandurang N. Kale	NA	Madh	Buldhana	Buldhana
2	14.04.2014	Ravi Dhanawat	NA	Madh	Buldhana	Buldhana
3	14.04.2014	Namdeo M. Kale	NA	Madh	Buldhana	Buldhana
4	14.04.2014	Mohansing R. Nimrot	NA	Madh	Buldhana	Buldhana
5	14.04.2014	Sachin R. Rajgare	NA	Madh	Buldhana	Buldhana
6	14.04.2014	Santosh Suhudu	NA	Madh	Buldhana	Buldhana
7	14.04.2014	Rajiv Rajgare	NA	Madh	Buldhana	Buldhana
8	14.04.2014	Subhash F. Rajput	NA	Madh	Buldhana	Buldhana
9	14.04.2014	Sakharam A. Kale	NA	Madh	Buldhana	Buldhana
10	14.04.2014	Anil TejraoJadhav	NA	Madh	Buldhana	Buldhana
11	14.04.2014	Vishnu S. Wagh	2	Pangrimali	Deolgaon Raja	Buldhana
12	14.04.2014	Pandurang K. Wagh	2	Pangrimali	Deolgaon Raja	Buldhana
13	14.04.2014	Dhulaji Ballaji Wagh	5	Pangrimali	Deolgaon Raja	Buldhana
14	14.04.2014	Bhagwat Ramrao Wagh	7	Pangrimali	Deolgaon Raja	Buldhana
15	14.04.2014	Gangadhar J. Wagh		Pangrimali	Deolgaon Raja	Buldhana
16	14.04.2014	Tulsiram G. Jadhav	2	Pangrimali	Deolgaon Raja	Buldhana
17	14.04.2014	Anand R. Wagh	4	Pangrimali	Deolgaon Raja	Buldhana
18	14.04.2014	Manjatamwagh	3	Pangrimali	Deolgaon Raja	Buldhana
19	14.04.2014	Laxman Shamrav Wagh	2	Pangrimali	Deolgaon Raja	Buldhana
20	14.04.2014	Shiwaji Dundeo Giram	4	Pangrimali	Deolgaon Raja	Buldhana
21	14.04.2014	Vasanta Jayawantra Wagh	3	Pangrimali	Deolgaon Raja	Buldhana
22	14.04.2014	Govinda B. Shinde	2	Bhivgaon	Deolgaon Raja	Buldhana
23	14.04.2014	Gajanan G. Shelke	5	Bhivgaon	Deolgaon Raja	Buldhana
24	14.04.2014	Vishwas S. Mule	2	Bhivgaon	Deolgaon Raja	Buldhana

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
25	14.04.2014	Bhayaji Jankiram Shinde	10	Bhivgaon	Deolgaon Raja	Buldhana
26	14.04.2014	Ravi J. More	14	Bhivgaon	Deolgaon Raja	Buldhana
27	14.04.2014	Hanuman Ramdas Amate	5	Bhivgaon	Deolgaon Raja	Buldhana
28	14.04.2014	Vishnu Bhagwan Shinde	2	Bhivgaon	Deolgaon Raja	Buldhana
29	14.04.2014	Vijay Rambhav Mule	2	Bhivgaon	Deolgaon Raja	Buldhana
30	14.04.2014	Murlidhar J. Sirsat	1	Bhivgaon	Deolgaon Raja	Buldhana
31	14.04.2014	Rajendra Bairagi	7	Bhivgaon	Deolgaon Raja	Buldhana
32	14.04.2014	Vishnu A. Amate	3	Bhivgaon	Deolgaon Raja	Buldhana
33	14.04.2014	Janasdhan D. Shinde	5	Bhivgaon	Deolgaon Raja	Buldhana
34	14.04.2014	Sabjerao A. Shinde	5	Bhivgaon	Deolgaon Raja	Buldhana
35	14.04.2014	Baburao D. Mule	2	Bhivgaon	Deolgaon Raja	Buldhana
36	14.04.2014	Devlal D. Mule	3	Bhivgaon	Deolgaon Raja	Buldhana
37	14.04.2014	Fwanand S. Mule	1	Bhivgaon	Deolgaon Raja	Buldhana
38	14.04.2014	Seshrav Asaram Mule	1	Bhivgaon	Deolgaon Raja	Buldhana
39	14.04.2014	Sanjay A. Shinde	4	Bhivgaon	Deolgaon Raja	Buldhana
40	14.04.2014	Ramnarayan Bhaurav More	4	Bhivgaon	Deolgaon Raja	Buldhana
41	14.04.2014	Babasaheb Ramrao Khule	5	Bhivgaon	Deolgaon Raja	Buldhana
42	14.04.2014	Ramdas W. Khule	3	Bhivgaon	Deolgaon Raja	Buldhana
43	14.04.2014	Badhrinath Manikrav Shinde	4	Bhivgaon	Deolgaon Raja	Buldhana
44	14.04.2014	Rangnath K. Matale	1	Bhivgaon	Deolgaon Raja	Buldhana
45	14.04.2014	Santosh Sahebrao Sirsat	2	Bhivgaon	Deolgaon Raja	Buldhana
46	14.04.2014	Raghunath V. Shindhe	2	Bhivgaon	Deolgaon Raja	Buldhana
47	14.04.2014	Baburao R. Londhe	2	Bhivgaon	Deolgaon Raja	Buldhana

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
48	14.04.2014	Madhu S. Mule	2	Bhivgaon	Deolgaon Raja	Buldhana
49	14.04.2014	Shorakhnath B. Londhe	2	Bhivgaon	Deolgaon Raja	Buldhana
50	14.04.2014	Raghunath V. Shindhe	2	Bhivgaon	Deolgaon Raja	Buldhana
51	15.04.2014	Kailash Bhaskar Jadhav	NA	Vinchur	Niphad	Nasik
52	15.04.2014	Laxman B. Dubey	NA	Vinchur	Niphad	Nasik
53	15.04.2014	Rajendra R. Dubey	NA	Vinchur	Niphad	Nasik
54	15.04.2014	Baburao Kanhaiyalal Jadhav	NA	Vinchur	Niphad	Nasik
55	15.04.2014	Vasant Kisan	NA	Vinchur	Niphad	Nasik
56	15.04.2014	Nanasaheb R. Dubey	NA	Vinchur	Niphad	Nasik
57	15.04.2014	Sahebrao P. Dubey	NA	Vinchur	Niphad	Nasik
58	15.04.2014	Shankar K. Sathgude	NA	Vinchur	Niphad	Nasik
59	15.04.2014	Gorakh Shankar Shelkhe	NA	Vinchur	Niphad	Nasik
60	15.04.2014	Subhash Shankar Shelkhe	NA	Vinchur	Niphad	Nasik
61	15.04.2014	Nivriti Balkrishan Dubey	NA	Vinchur	Niphad	Nasik
62	15.04.2014	Gyaneshwar Fakirrao	NA	Vinchur	Niphad	Nasik
63	15.04.2014	Nanasaheb Sudhakar Shinde	NA	Khadakmalegaon	Niphad	Nasik
64	15.04.2014	Sanjay N. Shinde	NA	Khadakmalegaon	Niphad	Nasik
65	15.04.2014	Gyaneshwar Laxman Shinde	NA	Khadakmalegaon	Niphad	Nasik
66	15.04.2014	Nivriti Chandrabhan Shinde	NA	Khadakmalegaon	Niphad	Nasik
67	15.04.2014	Kiran Dashrath Shinde	NA	Khadakmalegaon	Niphad	Nasik
68	15.04.2014	Babasaheb Shankar Shinde	NA	Khadakmalegaon	Niphad	Nasik
69	15.04.2014	NivritiSampat Shinde	NA	Khadakmalegaon	Niphad	Nasik
70	15.04.2014	Sharad Sampatrao Shinde	NA	Khadakmalegaon	Niphad	Nasik
71	15.04.2014	Sahebrao Gangadhar Kanhe	NA	Khadakmalegaon	Niphad	Nasik
72	15.04.2014	Mahesh Ashok	NA	Khadakmalegaon	Niphad	Nasik
73	15.04.2014	Dr. Shinde	NA	Khadakmalegaon	Niphad	Nasik
74	15.04.2014	Anil Parsram Shinde	NA	Khadakmalegaon	Niphad	Nasik
75	15.04.2014	Yogesh Vinayak	NA	Khadakmalegaon	Niphad	Nasik
76	15.04.2014	Sambhaji Shantaram Kakote	NA	Khadagri	Sinnar	Nasik
77	15.04.2014	Subhash Narhari Buchkule	NA	Khadagri	Sinnar	Nasik

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
78	15.04.2014	Kishor Ullam Dhake	NA	Khadagri	Sinnar	Nasik
79	15.04.2014	Deepak Arun Kakote	NA	Khadagri	Sinnar	Nasik
80	15.04.2014	Ganesh Bhaskar Dhake	NA	Khadagri	Sinnar	Nasik
81	15.04.2014	Babasaheb Rangnath Dhake	NA	Khadagri	Sinnar	Nasik
82	15.04.2014	Sanjay Madhav Kakote	NA	Khadagri	Sinnar	Nasik
83	15.04.2014	Satish Govind Kakote	NA	Khadagri	Sinnar	Nasik
84	15.04.2014	Yogesh Rangnath	NA	Khadagri	Sinnar	Nasik
85	15.04.2014	Kiran Haribhao Dhake	NA	Khadagri	Sinnar	Nasik
86	15.04.2014	Rajendra Bapurao Dhake	NA	Khadagri	Sinnar	Nasik
87	15.04.2014	Somnath Dagu Geete	NA	Khadagri	Sinnar	Nasik
88	15.04.2014	Kashinath Sukhdev Geete	NA	Khadagri	Sinnar	Nasik
89	15.04.2014	Sharad Laxman	NA	Khadagri	Sinnar	Nasik
90	15.04.2014	Ashok Bajirao Kakote	NA	Khadagri	Sinnar	Nasik
91	15.04.2014	Shantaram Kakote	NA	Khadagri	Sinnar	Nasik
92	15.04.2014	Mandas Parasram Kakote	NA	Khadagri	Sinnar	Nasik
93	15.04.2014	Suresh Vishnu Kakote	NA	Khadagri	Sinnar	Nasik
94	16.04.2014	Ganesh Vasant Pawar	NA	Manur	Kalwan	Nasik
95	16.04.2014	Pratik Subhash Pawar	NA	Manur	Kalwan	Nasik
96	16.04.2014	Dhananjaykarbhari Borse	NA	Manur	Kalwan	Nasik
97	16.04.2014	Popat Baraku Pawar	NA	Manur	Kalwan	Nasik
98	16.04.2014	Namdeo Dattu Pawar	NA	Manur	Kalwan	Nasik
99	16.04.2014	Pravin Shivaji Borse	NA	Manur	Kalwan	Nasik
100	16.04.2014	Jagannath Suresh Pawar	NA	Manur	Kalwan	Nasik
101	16.04.2014	Karbhari Kashiram Pawar	NA	Manur	Kalwan	Nasik
102	16.04.2014	Umang Ravindra Pawar	NA	Manur	Kalwan	Nasik
103	16.04.2014	Mahendra Prakash Pawar	NA	Manur	Kalwan	Nasik
104	16.04.2014	Ravindra Eknath Pawar	NA	Manur	Kalwan	Nasik
105	16.04.2014	Keda Bajirao Jadhav	NA	Manur	Kalwan	Nasik
106	16.04.2014	Mahendra Kailas Pawar	NA	Manur	Kalwan	Nasik
107	16.04.2014	Tukaram Dattu Pawar	NA	Manur	Kalwan	Nasik
108	16.04.2014	Prabhakar Mansaram Borse	NA	Manur	Kalwan	Nasik

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
109	16.04.2014	Sambhaji Lala Pawar	NA	Manur	Kalwan	Nasik
110	16.04.2014	Shamrao Bhikan Deore	NA	Manur	Kalwan	Nasik
111	16.04.2014	Bhila Rambhau Khairnar	NA	Manur	Kalwan	Nasik
112	16.04.2014	Daulat Rambhau Khairnar	NA	Manur	Kalwan	Nasik
113	16.04.2014	Nandu Bhikan Jadhav	NA	Manur	Kalwan	Nasik
114	16.04.2014	Pratap Mansaram Borse	NA	Manur	Kalwan	Nasik
115	16.04.2014	Meghnath Jagannath Pawar	NA	Manur	Kalwan	Nasik
116	16.04.2014	Rajendra Pandharinath Pawar	NA	Manur	Kalwan	Nasik
117	16.04.2014	Khanderao Revaba Borse	NA	Manur	Kalwan	Nasik
118	16.04.2014	Vasant Laxman Bagul	NA	Patvihir	Kalwan	Nasik
119	16.04.2014	Kiran Santosh Pawar	NA	Manur	Kalwan	Nasik
120	16.04.2014	Gotiram Jayram Pawar	NA	Manur	Kalwan	Nasik
121	16.04.2014	Damu Pandit Gangurde	NA	Manur	Kalwan	Nasik
122	16.04.2014	Valu Hiraman Pawar	NA	Manur	Kalwan	Nasik
123	16.04.2014	Arun Narayan Tithe	NA	Manur	Kalwan	Nasik
124	16.04.2014	Prabhakar Jagannath Borse	NA	Manur	Kalwan	Nasik
125	16.04.2014	Ramdas Kisan Gangurde	NA	Manur	Kalwan	Nasik
126	16.04.2014	Vilas Balu Pithe	NA	Manur	Kalwan	Nasik
127	16.04.2014	Nana Vishnu Aher	NA	Manur	Kalwan	Nasik
128	16.04.2014	Ramakant Bapu Aher	NA	Manur	Kalwan	Nasik
129	16.04.2014	Radu Baburao Gangurde	NA	Manur	Kalwan	Nasik
130	16.04.2014	Hiraman Motiram Chaudhari	NA	Manur	Kalwan	Nasik
131	16.04.2014	Dayaram Bhimrao Pawar	NA	Manur	Kalwan	Nasik
132	16.04.2014	Jogendra Prakashrao Pawar	NA	Manur	Kalwan	Nasik
133	16.04.2014	Dhyaneshwar Karbhari Pawar	NA	Manur	Kalwan	Nasik
134	16.04.2014	Nitin Krushna Gangurde	NA	Manur	Kalwan	Nasik
135	16.04.2014	Ganesh Vinayak Pawar	NA	Manur	Kalwan	Nasik
136	16.04.2014	Bhika Deeman Pawar	NA	Manur	Kalwan	Nasik
137	16.04.2014	Dilip Nana Pawar	NA	Manur	Kalwan	Nasik
138	16.04.2014	Akshay Shivaji Khairnar	NA	Manur	Kalwan	Nasik
139	16.04.2014	Vasant Sampat Kasar	6	Mitsagare	Sinnar	Nasik
140	16.04.2014	Bhanudas Laxman Kasar	5	Mitsagare	Sinnar	Nasik

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
141	16.04.2014	Aashgasaheb Suryabhan Kasar	4	Mitsagare	Sinnar	Nasik
142	16.04.2014	Sunil Kisan Kasar	3	Mitsagare	Sinnar	Nasik
143	16.04.2014	Vasant Yadav Kasar	6	Mitsagare	Sinnar	Nasik
144	16.04.2014	Baburao Chatur	5	Mitsagare	Sinnar	Nasik
145	16.04.2014	Dinkar Durgaji Chatur	4	Mitsagare	Sinnar	Nasik
146	16.04.2014	Babasaheb Janardan Kasar	10	Mitsagare	Sinnar	Nasik
147	16.04.2014	Kondaji Shankar	6	Mitsagare	Sinnar	Nasik
148	16.04.2014	Madhukar Shankar	5	Mitsagare	Sinnar	Nasik
149	16.04.2014	Gorakshnath Madhav Chatur	4	Mitsagare	Sinnar	Nasik
150	16.04.2014	Hiraman Durgaji Chatur	2	Mitsagare	Sinnar	Nasik
151	16.04.2014	Jayant Gorakshnath Kasar	3	Mitsagare	Sinnar	Nasik
152	16.04.2014	Ganpat Bhao	2	Mitsagare	Sinnar	Nasik
153	16.04.2014	Ashok Chatur	5	Mitsagare	Sinnar	Nasik
154	16.04.2014	Sunil Ashok Chatur	4	Mitsagare	Sinnar	Nasik
155	16.04.2014	Baban Dinkar Diwekar	2.5	Mitsagare	Sinnar	Nasik
156	16.04.2014	PopatGanpat	8	Mitsagare	Sinnar	Nasik
157	16.04.2014	Nana Kisan Tanpure	2.5	Mitsagare	Sinnar	Nasik
158	16.04.2014	Kisan Nana Tanpure	3	Mitsagare	Sinnar	Nasik
159	16.04.2014	Sharad Ganpat	2	Mitsagare	Sinnar	Nasik
160	16.04.2014	Balaji Jadhav	9	Mitsagare	Sinnar	Nasik
161	16.04.2014	Ashok Chanbhan Chatur	3	Mitsagare	Sinnar	Nasik
162	16.04.2014	Bhausaheb Ganesh Chatur	3	Mitsagare	Sinnar	Nasik
163	16.04.2014	Rajendra Nana Tanpure	2	Mitsagare	Sinnar	Nasik
164	16.04.2014	Anna Mohan	3	Mitsagare	Sinnar	Nasik
165	16.04.2014	Rahul Arjun Wagh	7	Mitsagare	Sinnar	Nasik
166	16.04.2014	Kishor Nivriti Wagh	5	Mitsagare	Sinnar	Nasik
167	16.04.2014	Sanjay Nana Chatur	5	Mitsagare	Sinnar	Nasik
168	16.04.2014	Kailash Madhav Chatur	4	Mitsagare	Sinnar	Nasik
169	16.04.2014	Madhav Popat Kasar	10	Mitsagare	Sinnar	Nasik
170	16.04.2014	Vishnu Narayan Kasar	10	Mitsagare	Sinnar	Nasik
171	16.04.2014	Ramkisan Gangadhar Vani	6	Mitsagare	Sinnar	Nasik
172	16.04.2014	Shankar Chandrabhan Chatur	5	Mitsagare	Sinnar	Nasik

GOVERNMENT OFFICIALS

S.No.	Name	Designation
1	R. B. Kale	Agri- supervisor
2	R. V. Patil	Agri- supervisor
3	Shah Saheb	Agri- supervisor
4	B. G. Patil	Agri- supervisor
5	Sanawane B. B.	Agri- supervisor
6	Y.G. Chavan	Agri- supervisor
7	Mahale Saheb	Agri- supervisor

MONSANTO OFFICIALS

S.No.	Name	Designation
1	Rakesh Dubey	General Manager (Policy & Industry Affairs)
2	Jitendra Joshi	Manager
3	Parag Sabnis	Territory Sales Manager
4	Nilesh Gawade	Territory Sales Manager
5	Dhanesh Kumar	Territory Sales Manager
2	Akshay V. Muley	MDO
6	Nitin Baste	MDO
7	Kantilal Kakad	MDO
8	Anil Phad	MDO
9	Popat Phad	MDO
10	Paruin Tadatade	MDO
11	Rahul Thakare	MDO
12	Shrikant Kedare	MDO
13	Hemant Deore	MDO

PIONEER: List of Respondents Annexure 3

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
1	17.04.2014	Krishna Ramrao Parwe	18	Borgaonkhadak	Bhokardan	Jalna
2	17.04.2014	Shivaji Bhika Parwe	50	Borgaonkhadak	Bhokardan	Jalna
3	17.04.2014	Rajendra Sheshrao Parwe	10	Borgaonkhadak	Bhokardan	Jalna
4	17.04.2014	Shivaji Manikrao Parwe	6	Borgaonkhadak	Bhokardan	Jalna
5	17.04.2014	Janardhan Sahebrao Parwe	4	Borgaonkhadak	Bhokardan	Jalna
6	17.04.2014	Sahebrao Bhagu Vyavhare	7	Borgaonkhadak	Bhokardan	Jalna
7	17.04.2014	Vishnu Ambadas Vyavhare	6.5	Borgaonkhadak	Bhokardan	Jalna
8	17.04.2014	Kashinath Shamrao Parwe	15	Borgaonkhadak	Bhokardan	Jalna
9	17.04.2014	Ganesh Nanarao Parwe	5	Borgaonkhadak	Bhokardan	Jalna
10	17.04.2014	Ramesh Parasram Vyavhare	5	Borgaonkhadak	Bhokardan	Jalna
11	17.04.2014	Bhaskar Sandu	4.5	Borgaonkhadak	Bhokardan	Jalna
12	17.04.2014	Shrirang Sandu	4.5	Borgaonkhadak	Bhokardan	Jalna
13	17.04.2014	Ramesh Laxman Parwe	20	Borgaonkhadak	Bhokardan	Jalna
14	17.04.2014	Narayan Agaji Vyavhare	5	Borgaonkhadak	Bhokardan	Jalna
15	17.04.2014	Vishnu Bhawrao Parwe	9	Borgaonkhadak	Bhokardan	Jalna
16	17.04.2014	Bhimrao Hawke	12	Borgaonkhadak	Bhokardan	Jalna
17	17.04.2014	Ramdayal Darak	20	Borgaonkhadak	Bhokardan	Jalna
18	17.04.2014	Vithal Sonaji Kesbhat	8	Borgaonkhadak	Bhokardan	Jalna
19	17.04.2014	Pandit Hawke	5	Borgaonkhadak	Bhokardan	Jalna
20	17.04.2014	Narayan Vyavhare	6	Borgaonkhadak	Bhokardan	Jalna
21	17.04.2014	SantukraoParwe	10	Borgaonkhadak	Bhokardan	Jalna
22	17.04.2014	Bhagwan Anapawre	5	Borgaonkhadak	Bhokardan	Jalna
23	17.04.2014	Raosaheb Baburao Parwe	4.5	Borgaonkhadak	Bhokardan	Jalna
24	17.04.2014	Fakeerba Vyavhare	15	Borgaonkhadak	Bhokardan	Jalna
25	17.04.2014	Subhash Parwe	25	Borgaonkhadak	Bhokardan	Jalna
26	17.04.2014	Ashok Ganpat	6	Borgaonkhadak	Bhokardan	Jalna
27	17.04.2014	Sanjay Parwe	5.5	Borgaonkhadak	Bhokardan	Jalna
28	17.04.2014	Sachin Ambadas Parwe	5	Borgaonkhadak	Bhokardan	Jalna
29	17.04.2014	Ganesh Laxman Gadekar	6	Borgaonkhadak	Bhokardan	Jalna
30	17.04.2014	Sahebrao Shejuk	2.5	Borgaonkhadak	Bhokardan	Jalna

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
31	17.04.2014	Gangadhar Ambadas Vyavhare	5	Borgaonkhadak	Bhokardan	Jalna
32	17.04.2014	Shamrao Bandu	5	Borgaonkhadak	Bhokardan	Jalna
33	17.04.2014	Subhash Vyavhare	6	Borgaonkhadak	Bhokardan	Jalna
34	17.04.2014	Tezrao Shejuk	2.5	Borgaonkhadak	Bhokardan	Jalna
35	17.04.2014	Ananda Shejuk	3	Borgaonkhadak	Bhokardan	Jalna
36	17.04.2014	Samadhan Ramrao Parwe	2.5	Borgaonkhadak	Bhokardan	Jalna
37	17.04.2014	Rameshwar Parwe	6	Borgaonkhadak	Bhokardan	Jalna
38	17.04.2014	Bhaorao Parwe	5	Borgaonkhadak	Bhokardan	Jalna
39	17.04.2014	Prabhakar B. Sawant	5	Tandulwadi	Bhokardan	Jalna
40	17.04.2014	Raosaheb Daspute	8	Tandulwadi	Bhokardan	Jalna
41	17.04.2014	Tezrao Shivram	3	Tandulwadi	Bhokardan	Jalna
42	17.04.2014	BhagwanChikte	5	Tandulwadi	Bhokardan	Jalna
43	17.04.2014	Sanjay Narayan Chikte	5	Tandulwadi	Bhokardan	Jalna
44	17.04.2014	Gyaneshwar Sawant	5	Tandulwadi	Bhokardan	Jalna
45	17.04.2014	Suresh	12	Tandulwadi	Bhokardan	Jalna
46	17.04.2014	Yadavrao	6	Tandulwadi	Bhokardan	Jalna
47	17.04.2014	Dadarao Yadavrao	5	Tandulwadi	Bhokardan	Jalna
48	17.04.2014	Vijay Yadavrao	5	Tandulwadi	Bhokardan	Jalna
49	17.04.2014	Anurag Suresh	4	Tandulwadi	Bhokardan	Jalna
50	17.04.2014	Manirag Suresh	4	Tandulwadi	Bhokardan	Jalna
51	17.04.2014	Madhavrao Damodar Fuke	5	Tandulwadi	Bhokardan	Jalna
52	17.04.2014	Shankar Damodar Fuke	4	Tandulwadi	Bhokardan	Jalna
53	17.04.2014	Dadarao Daspute	5	Tandulwadi	Bhokardan	Jalna
54	17.04.2014	Shankar Laxman	6	Tandulwadi	Bhokardan	Jalna
55	17.04.2014	Daukat Sampat Chiktey	6	Tandulwadi	Bhokardan	Jalna
56	17.04.2014	Devidas Dadarao Chiktey	10	Tandulwadi	Bhokardan	Jalna
57	17.04.2014	Anil Pundlikrao Sawant	8	Tandulwadi	Bhokardan	Jalna
58	17.04.2014	Laxman Bhimrao Sawant	7	Tandulwadi	Bhokardan	Jalna
59	17.04.2014	Dinesh Kaduba Sawant	4	Tandulwadi	Bhokardan	Jalna
60	17.04.2014	Yogesh Kaduba Sawant	12	Tandulwadi	Bhokardan	Jalna
61	17.04.2014	Sachin	3	Tandulwadi	Bhokardan	Jalna

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
62	17.04.2014	Sudhakar	5	Tandulwadi	Bhokardan	Jalna
63	17.04.2014	Shankar	10	Tandulwadi	Bhokardan	Jalna
64	17.04.2014	Suresh Puri Narayan Puri	5	Tandulwadi	Bhokardan	Jalna
65	17.04.2014	Ganeshpuri Narayan	4	Tandulwadi	Bhokardan	Jalna
66	17.04.2014	Ananda Narayan Sawant	4	Tandulwadi	Bhokardan	Jalna
67	17.04.2014	Pandit Tezraochikte	3	Tandulwadi	Bhokardan	Jalna
68	17.04.2014	Gangadhar Chikte	7	Tandulwadi	Bhokardan	Jalna
69	17.04.2014	Rameshar Gangadhar	10	Tandulwadi	Bhokardan	Jalna
70	17.04.2014	Shamrao Chikte	8	Tandulwadi	Bhokardan	Jalna
71	17.04.2014	Digamber Tezrao Chikte	3	Tandulwadi	Bhokardan	Jalna
72	17.04.2014	Dattu Tezrao Chikte	3	Tandulwadi	Bhokardan	Jalna
73	17.04.2014	Gajanan Rangnath Chikte	9	Tandulwadi	Bhokardan	Jalna
74	17.04.2014	Sunil	10	Tandulwadi	Bhokardan	Jalna
75	17.04.2014	Anil Radhakishan Chikte	15	Tandulwadi	Bhokardan	Jalna
76	17.04.2014	Krishna Chikte	2	Tandulwadi	Bhokardan	Jalna
77	17.04.2014	Sahebrao Chikte	6	Tandulwadi	Bhokardan	Jalna
78	17.04.2014	Ambadas Sahebrao Chikte	4	Tandulwadi	Bhokardan	Jalna
79	17.04.2014	Badrinath Gangadhar	2	Tandulwadi	Bhokardan	Jalna
80	17.04.2014	Vilas Shreerang Chikte	2.5	Tandulwadi	Bhokardan	Jalna
81	18.04.2014	Motilal Girdhar Wagh	5	War	Dhule	Dhule
82	18.04.2014	Ramsingh Kalusingh Rajput	2.5	War	Dhule	Dhule
83	18.04.2014	Dinesh Indersingh Rajput	1	War	Dhule	Dhule
84	18.04.2014	Ajabsingh Makhansingh Rajput	7	War	Dhule	Dhule
85	18.04.2014	Yuvraj Indrusingh Rajput	2.5	War	Dhule	Dhule
86	18.04.2014	Ashok G. Patil	2	War	Dhule	Dhule
87	18.04.2014	Bharat Bhika Marathe	3	War	Dhule	Dhule
88	18.04.2014	Pradeep Indrasingh Rajput	5	War	Dhule	Dhule
89	18.04.2014	Bhimrao Nago Patil	1	War	Dhule	Dhule
90	18.04.2014	Premsingh B. Rajput	4	War	Dhule	Dhule
91	18.04.2014	Gulabsingh B. Rajput	2	War	Dhule	Dhule

S. No.	Date	Name of Farmer	Land holding size for Maize (Acres)	Village	Taluka	District
92	18.04.2014	Nilesh Gulabsingh Rajput	2	War	Dhule	Dhule
93	18.04.2014	Amarsingh Rajput	1.5	War	Dhule	Dhule
94	18.04.2014	Dinesh P. Rajput	2	War	Dhule	Dhule
95	18.04.2014	Pankaj Rajendru Koli	2	War	Dhule	Dhule
96	18.04.2014	Nago Dhondu More	1.5	Nimgul	Dhule	Dhule
97	18.04.2014	Dattu Sukdev More	4	Nimgul	Dhule	Dhule
98	18.04.2014	Devidas Vasant Patil	2	Nimgul	Dhule	Dhule
99	18.04.2014	Navneet Prahlad More	1.5	Nimgul	Dhule	Dhule
100	18.04.2014	Devsingh Hilal Rajput	2	Nimgul	Dhule	Dhule
101	18.04.2014	Kishor Mohan Chauhan	3	Nimgul	Dhule	Dhule
102	18.04.2014	Dilip Natu More	2.5	Nimgul	Dhule	Dhule
103	18.04.2014	Yuvraj Ananda Rajput	4	Nimgul	Dhule	Dhule
104	18.04.2014	Ajit Ravindru Rajput	3	Nimgul	Dhule	Dhule
105	18.04.2014	Ramrao Nathu Patil	2	Nimgul	Dhule	Dhule
106	18.04.2014	Nimba Daulat Patil	3	Nimgul	Dhule	Dhule
107	18.04.2014	Tushar Pandharinath Patil	2	Nimgul	Dhule	Dhule
108	18.04.2014	Shivaji Dhondu More	2.5	Nimgul	Dhule	Dhule
109	18.04.2014	Digambar Hemraj Marathe	2.5	Nimgul	Dhule	Dhule
110	18.04.2014	Kailas Daulat Ahire	2.5	Nimgul	Dhule	Dhule
111	18.04.2014	Vijay Dayaram More	2	Nimgul	Dhule	Dhule
112	18.04.2014	Ankush Baburao More	2	Nimgul	Dhule	Dhule
113	18.04.2014	Pandurang Dattu More	2.5	Nimgul	Dhule	Dhule
114	18.04.2014	Nanabhau Nathu Patil	2	Nimgul	Dhule	Dhule
115	18.04.2014	Yuvraj Budha Patil	2.5	Nimgul	Dhule	Dhule
116	18.04.2014	Yuvraj Baburao Marathe	2	Nimgul	Dhule	Dhule

GOVERNMENT OFFICIALS

S.No.	Name	Designation
1	Raosaheb Daspute	Krishisevak
2	Dinkar Sakharam Wanve	Krishisevak

PIONEER OFFICIALS

S.No.	Name	Designation
1	Hemendra Patil	RAG
2	Mandar Nigade	Territory Business Lead
3	Mangesh Pakdhane	Territory Business Lead
4	Mukunda Pabale	MDR
5	Raju Pande	MDR
6	Chetan Rajput	MDR

Notes



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