EVALUATING MODERN AGRICULTURAL INNOVATIONS AND AGRICULTURE PRODUCTIVITY IN CHIRAWA FPO: A STUDY FROM FARMERS' AND SHAREHOLDERS' PERSPECTIVES

Dissertation Submitted to

The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

Development Management

by

Ashok Kumawat

Under the Supervision and Guidance of

Dr. Ratna Verma

2025

GSTIN No. - 08AAGCC7008P1Z9
CIN - U01100RJ2016PTC055843

Mob.: 9610084165, 9887196367
E-mail ID - chirawafpo@gmail.com

CHIRAWA FARMER PRODUCER COMPANY LTD.

Ward No. 34, Vikash Nagar, Pilani Road, CHIRAWA
Distt. - Jhunjhunu (Raj.)

Ref. No.

Date 12/06/25

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ashok Kumawat has successfully completed his dissertation with the Chirawa Farmer Producer Company Ltd. supported by Ambuja Foundation from 11 March 2025 to 10 June 2025, He has contributed to the FPO work on **Evaluating Modern Agricultural Innovations and Agriculture productivity in Chirawa FPO: A Study from Farmers' and Shareholders' Perspectives.**

During the dissertation, Ashok demonstrated rigour through his work and has provided critical insights to the assigned tasks. He was found to be sincere, hardworking, with a self-motivated attitude to learn new things.

We wish him all the beat for his future endeavors.

Chairman
Chirawa Farmer Producer Company Ltd.

Chairman

Naresh Kumar Bhagat
CEO of FPO

For Chirawa Farmer Producer Co. Ltd
Authorised Signatory

IIHMR UNIVERSITY

Certificate From Faculty Guide

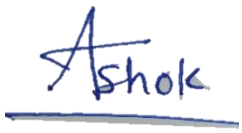
Certificate From Faculty Guide This is to certify that the dissertation titled **"Evaluating Modern Agricultural Innovations and Agriculture productivity in Chirawa FPO: A Study from Farmers' and Shareholders' Perspectives."** Program is a record of the research work undertaken by **Mr. Ashok kumawat** in partial fulfillment of the requirements for the award of the degree of MBA (Development Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide: Dr. Ratna
IIHMR University, Jaipur
Date:

School Dean:
IIHMR University, Jaipur
Date: 19/06/2025

Declaration By Student

I hereby declare that this dissertation titled **"Evaluating Modern Agricultural Innovations and Agriculture productivity in Chirawa FPO: A Study from Farmers' and Shareholders' Perspectives."** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



Signature

Acknowledgement

I take this opportunity to express my sincere gratitude to all those who have supported and guided me in the successful completion of my dissertation titled "Evaluating Modern Agricultural Innovations and Agriculture Productivity in Chirawa FPO: A Study from Farmers' and Shareholders' Perspectives."

First and foremost, I am deeply grateful to my supervisor and guide, Dr. Ratna Verma, Associate Professor, IIHMR University, Jaipur, for her invaluable guidance, encouragement, and constructive feedback throughout the research process. Her expertise and insights have been instrumental in shaping this study.

I extend my heartfelt thanks to the management and staff of Chirawa Farmer Producer Company Ltd. and the Ambuja Foundation, Chirawa for their cooperation, support, and for providing access to essential data and field resources. I am especially thankful to all the farmers and shareholders who participated in the survey and interviews, generously sharing their time, experiences, and perspectives.

I would also like to acknowledge the faculty and staff of IIHMR University, Jaipur for providing a stimulating academic environment and necessary resources for my research.

Last but not least, I am indebted to my family and friends for their unwavering encouragement and moral support during the course of this work.

This dissertation is the result of collective support and contributions from many individuals and institutions, to whom I remain sincerely thankful.

Ashok Kumawat
MBA Development Management
IIHMR University, Jaipur

Abstract

This dissertation examines the impact and community perception of modern agricultural innovations introduced through Chirawa Farmer Producer Company Limited (FPO), an initiative supported by Ambuja Foundation in 25 core villages of Chirawa, Jhunjhunu District, Rajasthan. The project focuses on enhancing farm productivity and rural livelihoods by promoting the adoption of advanced technologies such as drip irrigation, improved seeds, and rainwater harvesting, alongside capacity building and market linkages for smallholder farmers.

Employing a descriptive cross-sectional research design, the study utilizes a mixed-methods approach to capture both quantitative and qualitative insights from a diverse group of stakeholders. A total of 100 FPO member farmers were surveyed using structured questionnaires and in-depth interviews, supplemented by field observations and interactions with FPO leaders and Ambuja Foundation staff.

The findings indicate a significant positive impact of FPO interventions on crop yields, income levels, and overall agricultural practices among beneficiary farmers. Respondents reported greater access to knowledge, improved resource management, and increased confidence in adopting new technologies. Stakeholders acknowledged the role of Ambuja Foundation and the FPO in fostering collective action, reducing input costs, and strengthening rural economic resilience. However, challenges such as limited initial awareness, financial constraints, and the need for ongoing technical support were also identified.

This study highlights the importance of participatory approaches, continuous capacity building, and robust institutional support in ensuring the sustainability and scalability of rural development initiatives. The insights generated aim to inform future programming by Ambuja Foundation and similar organizations to promote inclusive, technology-driven growth in semi-arid rural communities.

List of Figures

Table Of Contents

Chapter 1

Introduction

1.1 Background

Agriculture remains the backbone of the Indian economy, employing over 50% of the workforce and contributing approximately 18% to the national Gross Domestic Product (GDP). Despite its significance, the sector faces persistent challenges: small and fragmented landholdings, limited access to modern technology, dependency on monsoons, and volatile market prices. In Rajasthan, agriculture is the primary livelihood for nearly 70% of the population, with the average landholding size in the state at 2.73 hectares—significantly above the national average, yet still insufficient for economies of scale. The region is characterized by semi-arid conditions, erratic rainfall, and recurring droughts, making sustainable productivity a constant challenge.

To address these issues, the Government of India and various non-governmental organizations have promoted the formation of Farmer Producer Organizations (FPOs). FPOs aggregate small and marginal farmers, enabling collective bargaining, improved access to inputs and technology, and better market linkages. The Chirawa Farmer Producer Company Limited, established in 2016 in Jhunjhunu district, Rajasthan, is a prime example of this approach. Supported by agencies such as the Ambuja Foundation, the Chirawa FPO has introduced modern agricultural innovations and capacity-building initiatives to enhance productivity and profitability for its members.

1.2 Global Scenario

Globally, the role of producer organizations in agriculture has expanded rapidly, especially in developing economies. In Africa, Asia, and Latin America, FPOs and cooperatives have become key vehicles for smallholder empowerment, technology dissemination, and value chain integration. According to the Food and Agriculture Organization (FAO), over 750 million people worldwide are members of cooperatives or producer organizations, with evidence showing that such collectives can increase farm incomes by 20–30% and improve access to credit, insurance, and markets. Countries like Kenya, Brazil, and Vietnam have leveraged FPOs to scale up the adoption of high-yielding varieties, precision irrigation, and digital extension services, resulting in significant productivity gains and poverty reduction.

1.3 Indian Scenario

India has witnessed a major policy thrust toward collectivization with the goal of doubling farmers' income. The Central Sector Scheme for the Formation and Promotion of 10,000 FPOs, launched in 2020 with a budget of ₹6,865 crore, aims to benefit over 15 million farmers by 2027. As of 2025, more than 44,400 FPOs have been registered nationwide, involving over 4 million farmers, including 40% women. FPOs in India have demonstrated the ability to reduce input costs by 18–25%, increase market price realization by 20–25%, and support technology adoption such as soil moisture sensors and AI-driven crop advisories, leading to yield gains of 15–30%. In Rajasthan, over 500 FPOs are operational, with many focusing on oilseeds, pulses, and horticultural crops.

1.4 About Chirawa Farmer Producer Company Ltd (FPO) Supported by Ambuja Foundation, Chirawa

The **Chirawa Farmer Producer Company Limited (CFPCL)** is a registered Farmer Producer Organization (FPO) based in Chirawa, Jhunjhunu district, Rajasthan. Established in 2016, CFPCL was created to address the core challenges faced by small and marginal farmers in the region such as fragmented landholdings, limited access to modern agricultural technology, and volatile market conditions. The FPO operates from its registered office at Ward No. 19, Chaudhary Colony, Chirawa, and serves as a collective platform for over 300 member farmers.

Role of Ambuja Foundation

The development and ongoing success of CFPCL are closely linked to the support of the **Ambuja Foundation**, the CSR arm of Ambuja Cements, which has a strong presence in Chirawa and across Rajasthan. Ambuja Foundation's rural development model is rooted in a 360-degree approach, focusing on water management, sustainable agriculture, skill development, and women's empowerment. In Chirawa, the Foundation has been instrumental in:

- **Capacity Building:** Organizing regular training sessions for farmers on modern agricultural practices, crop diversification, and sustainable water use.
- **Skill Development:** Running SEDI (Skill and Entrepreneurship Development Institute) programs in Chirawa, which have helped local youth and women secure jobs and entrepreneurial opportunities.
- **Water Resource Management:** Implementing participatory water resource management projects to address the acute water scarcity typical of Rajasthan's semi-arid climate, directly benefiting agricultural productivity.
- **Market Linkages:** Facilitating direct market access for FPO members, reducing dependency on intermediaries and improving price realization.
- **Women's Empowerment:** Promoting gender inclusion, with a significant proportion of women participating in both agriculture and skill development programs.

Impact and Achievements

- **Income Enhancement:** Through collective input procurement and direct market linkages, CFPCL members have reported input cost reductions of 18–25% and income increases of 20–25%, aligning with national FPO trends.
- **Technology Adoption:** With Ambuja Foundation's guidance, the FPO has adopted innovations such as soil moisture sensors and improved irrigation methods, resulting in water savings of up to 35% and yield gains of 10–15% in pilot plots.
- **Social Inclusion:** The Foundation's focus on women and youth has led to 40–50% female participation in various programs, fostering leadership and financial independence among rural women.
- **Sustainability:** CFPCL's initiatives in water harvesting and sustainable agriculture have contributed to greater climate resilience for member farmers.

1.5 Recognition and Partnerships

Ambuja Foundation's work in Chirawa has been recognized for its impact on rural prosperity and community development. The Foundation collaborates with local government bodies, financial institutions, and other NGOs to maximize the reach and effectiveness of its interventions. Its model has been externally evaluated, scoring 9.27/10 in a CRISIL due diligence assessment for organizational performance.

Conclusion

The Chirawa Farmer Producer Company Ltd, with the robust support of the Ambuja Foundation, stands as a model for FPO-led rural transformation in semi-arid Rajasthan. By integrating modern agricultural innovations, skill development, and inclusive community engagement, it demonstrates the potential of FPOs to drive sustainable growth, enhance farmer incomes, and build resilient rural livelihoods.

1.6 Purpose of the Research

The primary purpose of this research is to evaluate the impact of modern agricultural innovations on productivity and livelihoods within the Chirawa Farmer Producer Company Limited. The study aims to capture both quantitative outcomes (such as yield improvements, income changes, and input cost reductions) and qualitative dimensions (such as farmers' and shareholders' perceptions, challenges, and satisfaction levels). By focusing on both farmers and shareholders, the research seeks to provide a holistic assessment of FPO-led development, with implications for policy, practice, and future scaling.

1.7 The Problem

Despite policy support and the proliferation of FPOs, many organizations including Chirawa FPO face persistent challenges in achieving sustainable productivity and profitability. Key issues include limited access to advanced technology, fluctuating market prices, high input costs, and climate variability. There is also a lack of comprehensive evaluation regarding how these innovations are perceived and utilized by both farmers and shareholders, and whether these interventions are translating into measurable improvements in agricultural productivity and economic well-being.

1.8 Context of the Research

Chirawa, located in Jhunjhunu district of Rajasthan, represents a semi-arid agro-ecological zone with a high dependence on rainfed agriculture. The Chirawa Farmer Producer Company Limited, registered in 2016, serves over 300 small and marginal farmers, focusing on crops like wheat, bajra, mustard, and pulses. Supported by the Ambuja Foundation and other development agencies, the FPO has introduced innovations such as collective input procurement, custom hiring of farm machinery, digital advisory services, and market linkage programs. The research context is shaped by the region's unique challenges climate risk, limited irrigation, and fluctuating commodity prices as well as opportunities for collective action and innovation adoption.

RESEARCH QUESTION

How does the integration of modern agricultural innovations (e.g., modern irrigation systems, improved seed technology, and rainwater harvesting), as perceived and implemented by the farmers and shareholders of Chirawa Farmer Producer Company Ltd., contribute to farmer income and enhance agricultural productivity?

1.9 OBJECTIVES

- To access the increase in farm productivity?
- To access the different technological innovations through FPO?
- To access the increase in income of benefitted farmers?

Chapter 2

Review of Literature and Theoretical Framework

2.1 Introduction and Historical Context

Indian agriculture has historically been dominated by small and marginal farmers, with 86% owning less than 1.1 hectares of land. Fragmented landholdings, limited access to technology, institutional credit, and markets have long constrained their productivity and income. Early institutional models such as cooperatives and Self-Help Groups (SHGs) provided some relief but often suffered from elite capture, weak governance, and limited reach.

The introduction of Farmer Producer Organizations (FPOs) was envisioned as a transformative step to address these challenges. FPOs are collective, farmer-owned entities registered under the Companies Act or cooperative legislation, designed to aggregate smallholders for better access to resources, technology, and markets. The Small Farmers' Agribusiness Consortium (SFAC), established in 2002, became instrumental in promoting FPOs, aiming to overcome the disadvantages of land fragmentation and market exploitation.

2.2 Doubling Farmers' Income Through FPOs

A landmark policy goal in Indian agriculture has been the Doubling of Farmers' Income (DFI) by 2022, as articulated by the Government of India in 2016. FPOs are central to this vision. The rationale is that by aggregating farmers, FPOs can:

Reduce Input Costs: Through collective procurement of seeds, fertilizers, and machinery, input costs are reduced by 18–25%.

Enhance Market Access: By bypassing intermediaries, FPOs enable direct sales, improving price realization by 20–25%.

Promote Value Addition: Many FPOs have established processing units, reducing post-harvest losses by 15–20% and enabling branding.

Facilitate Technology Adoption: FPOs are often the first to introduce innovations such as soil moisture sensors, AI-driven advisories, and custom hiring centers, leading to yield gains of 15–30%.

Increase Financial Inclusion: FPOs help members access formal credit, insurance, and government schemes.

2.3 Quantitative Impact:

Recent studies (NABARD, 2025; SFAC, 2024) show that FPO members report 20–25% higher incomes than non-members. For example, SFAC-promoted FPOs enabled 5.71 lakh farmers to access premium markets, and women-led SHGs in Chirawa FPO generated profits of ₹1.13 lakh through collective cotton trade. The Central Sector Scheme for FPOs (2020) with a budget of ₹6,865 crore aims to benefit 15 million farmers, with the goal of a 50% income rise through economies of scale and better market integration.

2.4 Types and Structure of FPOs

FPOs in India take various forms:

Farmer Producer Companies (FPCs): Registered under the Companies Act, 2013, combining cooperative values with corporate governance. As of 2025, there are over 10,000 FPCs, with 65% established after 2020.

Cooperatives: Traditional entities, often hindered by political interference.
Cluster-Based Business Organizations (CBBOs): Aggregating 300+ farmers in plains or 100+ in hilly areas, supported by agencies like SFAC and NABARD.
Ownership and decision-making rest with member farmers, who benefit from shared governance and profit-sharing mechanisms.

The Need for FPOs

The need for FPOs is rooted in the structural disadvantages faced by smallholders:
Resource Pooling: Aggregation enables bulk procurement and use of modern technology.
Market Access: FPOs facilitate direct sales, reducing dependence on intermediaries.
Financial Inclusion: Only 30% of small farmers access formal credit; FPOs bridge this gap.
Climate Resilience: In states like Rajasthan, where 60% of agricultural land is rainfed, FPOs help mitigate the impact of droughts and climate variability.

Advantages and Impact

FPOs have demonstrated significant benefits:
Income Enhancement: FPO members earn 20–25% higher incomes than non-members.
Technology Adoption: FPOs facilitate the adoption of innovations, leading to yield gains of 15–30% and water savings of up to 35%.
Socio-Economic Resilience: FPOs have proven crucial during shocks like the COVID-19 pandemic, helping farmers access markets and inputs, and supporting diversification into high-value crops.
Gender Inclusion: Many FPOs, especially those supported by NGOs and foundations, have achieved 40–50% female participation, boosting women's income and leadership.

Financial Aspects

FPOs access funding from multiple channels:
Government Grants: Under the Central Sector Scheme (2020), each FPO receives ₹18 lakh for management costs and equity grants up to ₹15 lakh.
Credit Guarantee: Loans up to ₹2 crore per FPO are backed by credit guarantees, though 70% of FPOs still face challenges in securing adequate financing.
Operational Margins: FPOs typically operate on thin margins (3–6%), making financial sustainability a challenge.

Obstacles and Challenges

Despite their promise, FPOs face several hurdles:

Sustainability: About 70% of FPOs struggle to remain viable beyond the initial support period, often due to weak management and limited working capital.

Market Linkages: Only 9% of FPOs are integrated with e-NAM, limiting their ability to tap into larger and more lucrative markets.

Governance: Around 45% of FPOs report gaps in skilled management.

Policy Bottlenecks: Delays in subsidy disbursement and bureaucratic hurdles impact nearly 40% of FPOs.

National Scenario and Policy Initiatives

The Government of India's mission-mode approach has transformed the FPO landscape:

Central Sector Scheme (2020): Launched with a budget of ₹6,865 crore to form and support 10,000 FPOs by 2027–28. As of 2025, this target has been surpassed, with over 44,400 FPOs operational nationwide, benefiting more than 4 million farmers, including 40% women.

Implementing Agencies: Nine key agencies, including SFAC, NCDC, NABARD, and NAFED, coordinate FPO formation and support.

Private Sector Engagement: Companies like ITC and Star Agri warehousing have linked 4 million farmers to digital platforms.

2.5 Socio-Economic Transformation and Future Prospects

FPOs are increasingly recognized for their role in building socio-economic resilience, driving agricultural transformation, and supporting sustainable development goals. The integration of educated rural youth and women into FPOs is fostering innovation and sustainable practices. The establishment of the Union Ministry of Cooperation in 2021 is expected to further strengthen the ecosystem.

Conclusion

FPOs are at the heart of India's strategy to double farmers' income, having demonstrated the ability to increase incomes by 20–25%, improve access to technology and markets, and foster socio-economic resilience among small and marginal farmers. However, their long-term sustainability depends on addressing persistent challenges related to governance, financial access, and market integration. Strategic policy support, capacity building, and tailored interventions are essential to ensure that FPOs can fulfill their potential as engines of rural prosperity and inclusive growth.

Chapter 3

Research Methodology

Research Methodology

This chapter describes the research design and methodological approach adopted to evaluate the impact of modern agricultural innovations on productivity and income among beneficiaries of Chirawa Farmer Producer Company Ltd. (FPO), with a focus on both farmers and shareholders. The methodology details the research type, sampling strategy, data collection tools, and analysis plan to ensure the reliability and relevance of findings.

Research Design

The study employs a descriptive and exploratory research design using a mixed-methods approach. This enables the collection of both quantitative data (for measurable changes in productivity and income) and qualitative data (to capture perceptions, challenges, and contextual insights from farmers and shareholders).

Study Area

The research is conducted in Chirawa, Jhunjhunu district, Rajasthan, where Chirawa FPO operates. The study focuses on the FPO's registered members and affiliated farming communities, covering areas where Ambuja Foundation and the FPO have actively introduced technological interventions such as drip irrigation, improved seeds, and rainwater harvesting.

Target Population

The target population includes:

Farmer beneficiaries of Chirawa FPO who have experienced technological innovations/interventions.

Shareholders and key stakeholders involved in the management and operation of the FPO.

Sampling Method and Sample Size

Sampling Method:
A simple random sampling technique is used to select farmer beneficiaries from the list of registered FPO members, ensuring each eligible farmer has an equal chance of selection.

Sample Size:
Approximately 20% of the FPO's registered farmer members are selected for the quantitative survey. Additionally, purposive sampling is used for in-depth qualitative interviews with key shareholders and FPO leaders to gain deeper insights.

Data Collection Tools

- Structured Interview Schedules and Questionnaires:
  For quantitative data on productivity, technology adoption, and income changes.
- Semi-Structured Interview Guides:
  For qualitative insights into perceptions, satisfaction, challenges, and suggestions.
- Field Observation Checklists:
  To assess on-farm use of technological innovations and FPO interventions.

Data Collection Procedure

- Primary data are collected through face-to-face interviews and field visits with selected FPO beneficiaries and shareholders.
- Secondary data such as beneficiary lists, FPO reports, and intervention records aresourced from the FPO and Ambuja Foundation.
- Data collection is conducted over a period of three months to capture seasonal variations and ensure comprehensive coverage.

Data Analysis Plan

- Quantitative data (from structured questionnaires) are entered and analyzed using Microsoft Excel to generate descriptive statistics (means, percentages, before/after comparisons).
- Qualitative data (from interviews and open-ended responses) are thematically analyzed to identify common patterns, challenges, and success stories.
- Key indicators such as yield per acre, income change, technology adoption rate, and satisfaction levels are visualized using tables and charts for clear presentation.

Ethical Considerations

- Informed consent is obtained from all participants (farmers and shareholders).
- All responses are kept confidential and used solely for academic purposes.
- No personal identifiers are disclosed in reporting or analysis.

Limitations of the Study

- The sample size may not fully represent all FPO beneficiaries in the region.
- Self-reported data may be subject to recall or response bias.
- Time and resource constraints may limit the depth of qualitative engagement.
- External factors (weather, market fluctuations) during the study period may influence responses.

Chapter 4
Results/Findings

4.1 Introduction

This chapter presents the key findings from the field research conducted as part of the dissertation titled "Evaluating the Impact of Modern Agricultural Innovations through Chirawa Farmer Producer Company Ltd. (FPO) Supported by Ambuja Foundation in 25 Core Villages of Chirawa." The primary objective of this chapter is to analyze and interpret the experiences and outcomes reported by FPO member farmers who have participated in or benefited from the Foundation's interventions.

The findings are based on primary data collected from 100 farmers across 25 core villages in Chirawa, Jhunjhunu district. These respondents represent a diverse cross-section of smallholder and marginal farmers actively engaged with the FPO's programs and services.

A mixed-methods approach was adopted, utilizing structured questionnaires for quantitative data collection and semi-structured interviews for qualitative insights. Data were further enriched through field observations and informal discussions with FPO leaders and Ambuja Foundation staff. Quantitative results are presented through tables and charts, while qualitative insights are summarized thematically to provide a holistic understanding of the interventions' impact.

Each subsection details the findings by key themes such as adoption of modern technologies, changes in productivity and income, access to training and resources, and challenges faced by farmers followed by a synthesis of cross-cutting issues and a summary of key learnings. The results aim to highlight the effectiveness, challenges, and perceived impact of Ambuja Foundation's initiatives on agricultural productivity, rural livelihoods, and community empowerment in Chirawa.

4.2 Demographic Profile of Respondents

To contextualize the findings and ensure the representativeness of the sample, basic demographic data were collected from all 100 surveyed farmers. This included information on age, gender, landholding size, educational background, and years of association with the FPO. The demographic profile provides insight into the diversity of the beneficiary group and helps in interpreting the varying experiences and outcomes reported across the 25 villages of Chirawa.

Table 4.3: Demographic Profile of FPO Shareholders and Farmer's Respondent's (N=100)

Variable	Category	No. of Respondents
Age Group	25-50	30
	50-75	60
	75-100	10
Education Level	No Formal Education	20
	Primary	40
	Secondary	10
	Higher Secondary	20
	Graduate or above	10
Village	**Ghandawa**	
	Kithana	
	Bigodana	
	Khemo ki Dhani	
	Lamba Gothra	
	Nunia Gothra	
	Saari	
	Naari	
	Jeeni	
	Ramnathpura	
	Bhompura	
	Narhar	
	Sultana	
	Nizampura	
	Ojtu	
	Ardawata	
	Jhanjhot	
	Sultana ka bas	
	Gidaniya	
	Khudot	
	Tola Sehi	
	Dalmiyo ki Dhanio	
	Budaniya	
	Dindwa	
	Danger	

4.3.1 Impact of Modern Agricultural Interventions on Crop Yield: Comparison Before and After FPO Support in Chirawa

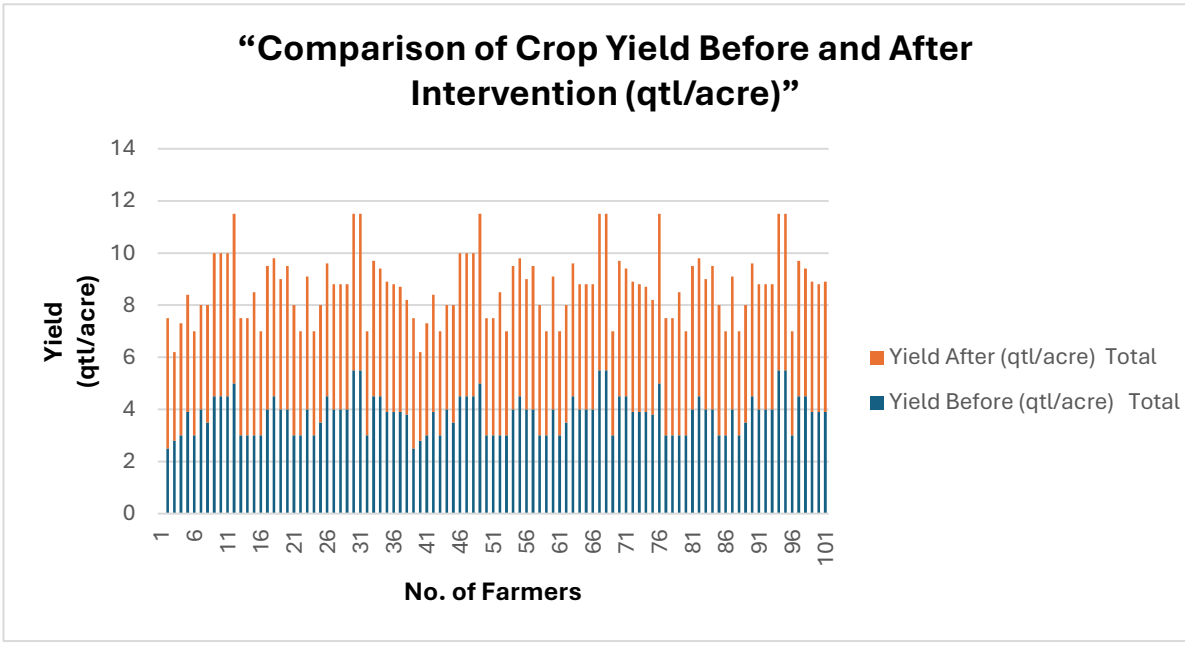


***Figure* 4.3.1**: *Impact of Modern Agricultural Interventions on Crop Yield: Comparison Before and After FPO Support in Chirawa*

Interpretation:

The above graph illustrates the change in crop yield (measured in acre) among surveyed farmers in Chirawa before and after the implementation of modern agricultural interventions and support from the Farmer Producer Organization (FPO) under Ambuja Foundation.

Key Findings:

Significant Yield Improvement:
The data shows a consistent and notable increase in yield for all respondents after adopting new agricultural practices and technologies. The orange bars (yield after intervention) are visibly higher than the blue bars (yield before intervention) for every farmer surveyed.

Universal Positive Impact:
Every participant experienced an improvement in productivity, with no cases of stagnation or decline. This demonstrates the effectiveness of the interventions in boosting agricultural output.

Magnitude of Increase:
In many cases, the yield nearly doubled post-intervention, rising from an average of 3–4 acre to 6–8 acre. This variation suggests that while all benefited, the extent of improvement depended on factors like level of adoption and farm conditions.

❖ No negative values or drop in yield are observed, which suggests that interventions either maintained or improved productivity.

Conclusion:
The comparative yield chart of 100 farmers clearly shows a consistent improvement in yield after the interventions. With almost all farmers recording an increase from 3–5 qtl/acre to 6–8 qtl/acre, the data strongly indicates that modern agricultural practices and institutional support have positively impacted productivity."

4.3.2 Percentage Change in Crop Yield Among Farmers After FPO and Ambuja Foundation Interventions

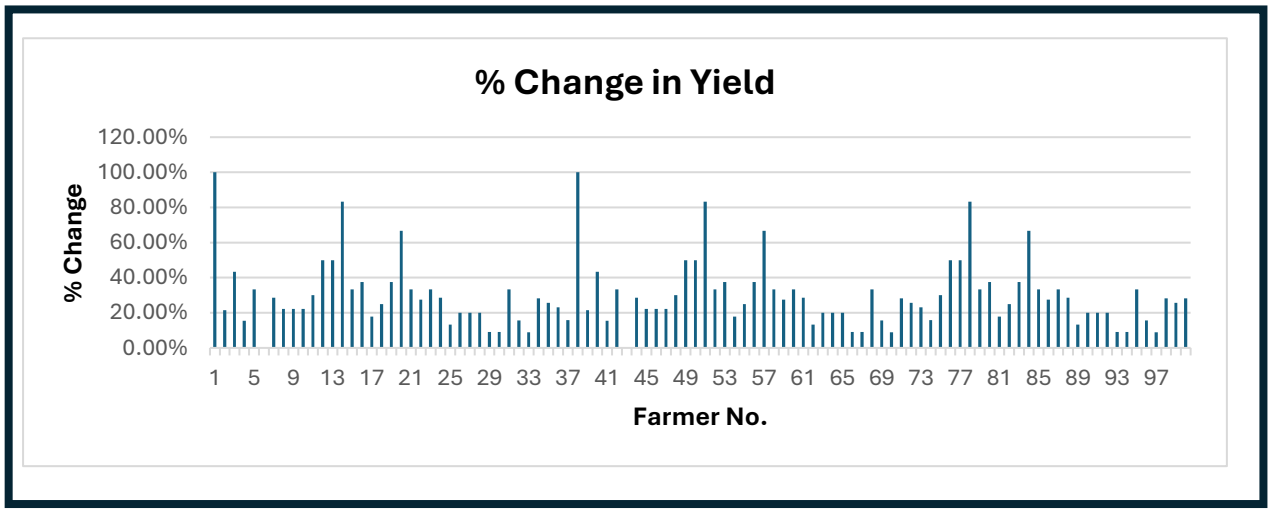


Figure* 4.3.2*: *Percentage Change in Crop Yield Among Farmers After FPO and Ambuja Foundation Interventions*

Interpretation:

The graph above displays the percentage change in crop yield for each of the 100 surveyed farmers in Chirawa following the adoption of modern agricultural innovations and support from the Farmer Producer Organization (FPO) under Ambuja Foundation.

Key Observations:

Widespread Positive Change:
Every farmer experienced a positive percentage change in yield, indicating that the interventions had a universally beneficial impact across all respondents.

Variation in Yield Improvement:
The percentage increase in yield varies significantly among farmers. While many farmers saw moderate improvements (20%–40%), several achieved substantial gains, with a few individuals reporting yield increases of 80% to 100% or more.

Majority in Moderate Range:
Most farmers fall within the 10%–40% improvement range, suggesting that while the interventions were broadly effective, the magnitude of benefit depended on factors such as the level of technology adoption, crop type, land quality, and individual farming practices.

- **Outliers with Exceptional Gains:**
  A handful of farmers (e.g., Farmer No. 1, 13, 37, 52, 79) experienced exceptionally high percentage increases, possibly due to optimal use of new technologies, better access to resources, or favorable local conditions.

Conclusion:
This analysis demonstrates that the introduction of modern agricultural practices and collective action through the Chirawa FPO resulted in significant yield improvements for the vast majority of farmers. The variation in percentage change highlights the importance of tailored support and capacity building to ensure that all farmers can maximize the benefits of such interventions.

4.3.3 Adoption of Agricultural Innovations by Farmers

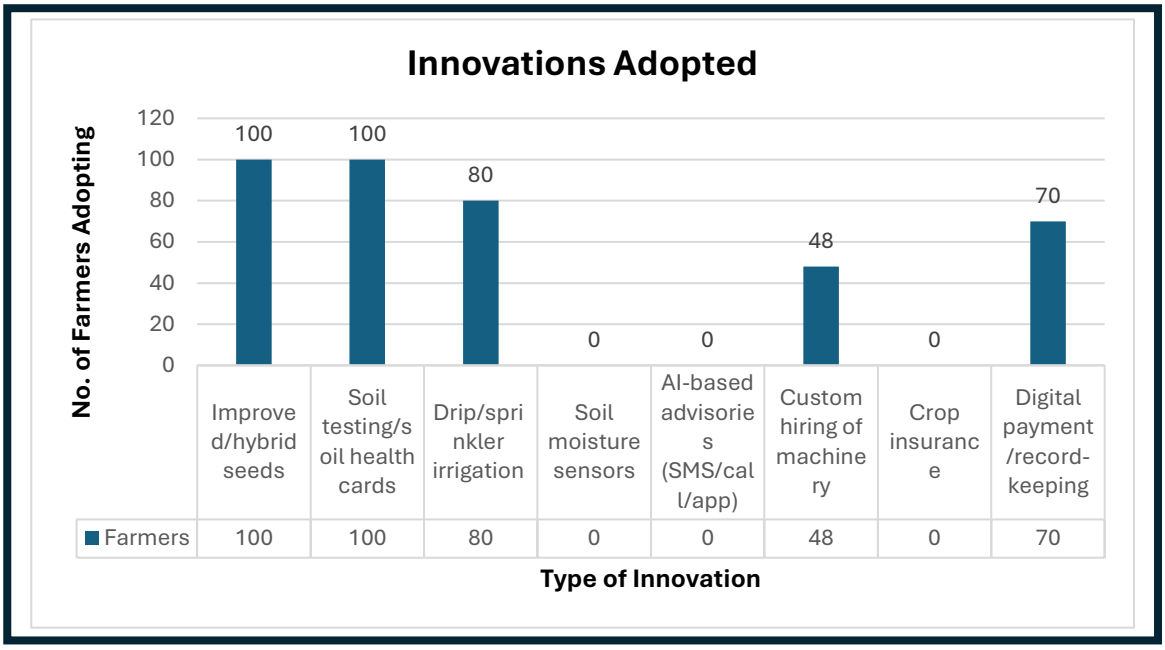


***Figure* 4.3.3** *Adoption of Agricultural Innovations by Farmers*

Interpretation:

High Adoption Innovations

- **Improved/hybrid seeds** and **soil testing/soil health cards** both achieved 100% adoption rates, indicating these foundational agricultural improvements have been successfully integrated into farming practices.
- **Drip/sprinkler irrigation** shows strong adoption at 80%, demonstrating farmers' recognition of water management benefits.

Moderate Adoption Technologies

Digital payment/record-keeping systems achieved 70% adoption, suggesting farmers are increasingly embracing digital financial tools for agricultural transactions1. Custom hiring of machinery reached 48% adoption, indicating that shared equipment usage is becoming a viable option for farmers who may not be able to afford individual machinery purchases.

Zero Adoption Categories

Three innovation categories show concerning zero adoption rates:

- Soil moisture sensors
- AI-based advisories (SMS/call/app)
- Crop insurance

4.3.4 How Innovations Affected Farmers

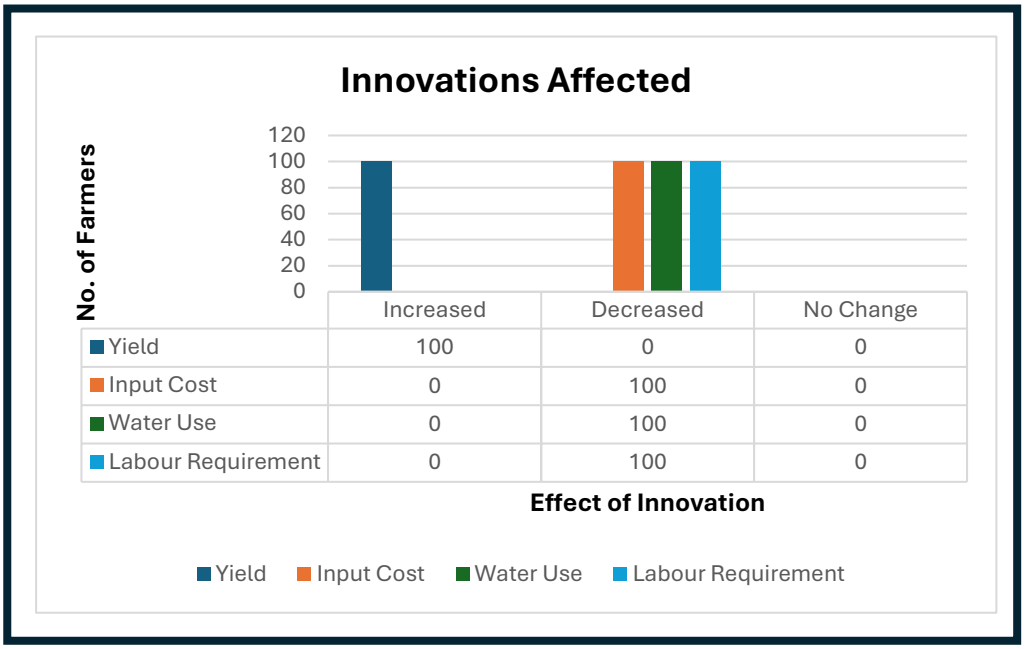


Figure **4.3.4** *Innovations Affected*

Key Observations:

- **Yield:** All 100 farmers reported an increase in yield as a result of adopting innovations. No farmers reported a decrease or no change.
- **Input Cost, Water Use, Labour Requirement:** For each of these factors, all 100 farmers reported a decrease. No farmers reported an increase or no change in these areas.

Interpretation:

This data strongly suggests that the implemented innovations have been highly effective. The entire sample of farmers experienced:

- Higher crop yields
- Reduced input costs
- Lower water consumption
- Decreased labour requirements

Such results indicate that the innovations are not only boosting productivity but also improving resource efficiency and reducing operational costs. The uniformity of responses across all categories highlights the broad and consistent benefits of these innovations among the surveyed farmers.

4.3.5 Income from farming changed after joining the FPO

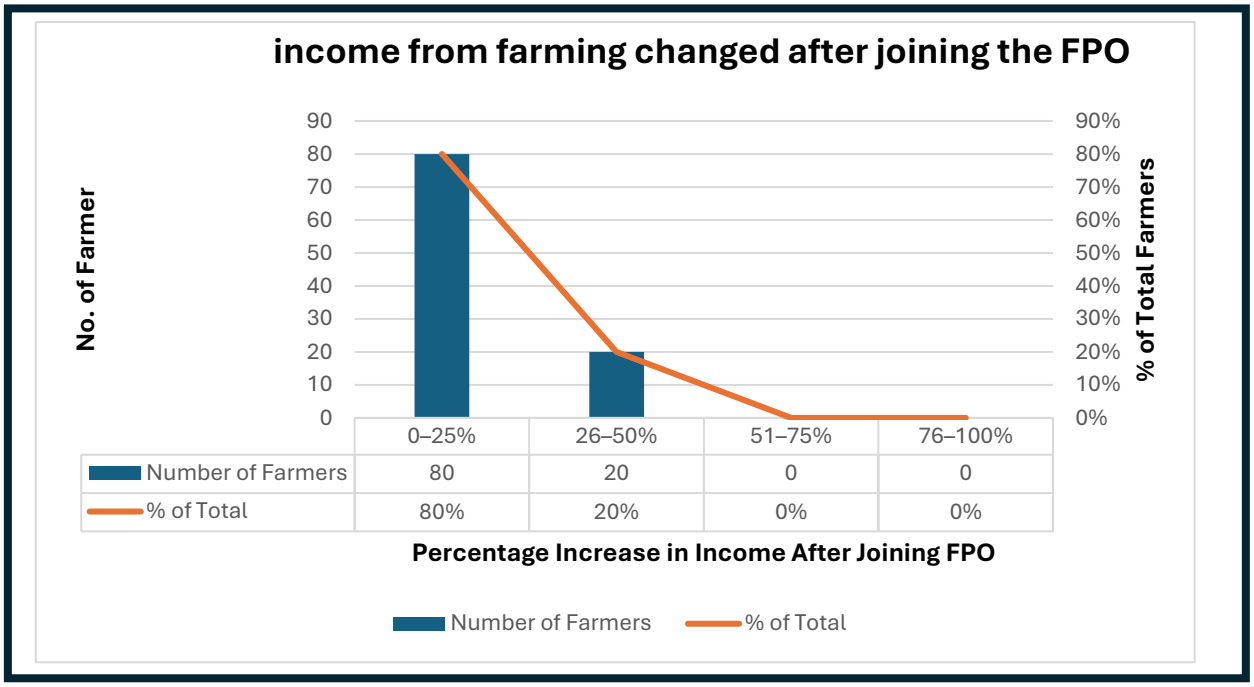


Figure **4.3.5** *income from farming changed after joining the FPO*

- **0–25% Income Increase:**
  - **Number of Farmers:** 80
  - **% of Total:** 80%
- **26–50% Income Increase:**
  - **Number of Farmers:** 20
  - **% of Total:** 20%

- **51–75% & 76–100% Income Increase:**
  - **Number of Farmers:** 0
  - **% of Total:** 0%

Interpretation

- **Majority of Farmers (80%)** experienced a modest income increase (0–25%) after joining the FPO.
- **A smaller group (20%)** saw a somewhat higher increase (26–50%).
- **No farmers** reported income increases above 50%.

This suggests that while joining the FPO has had a positive impact on farmer incomes, the magnitude of improvement has generally been modest. Most farmers have seen only slight gains, and none have experienced dramatic income growth. This could indicate that while FPO membership offers benefits, additional support or interventions may be needed to achieve more substantial income improvements for members.

4.3.6 Farmers' Satisfaction Levels Across Service Areas

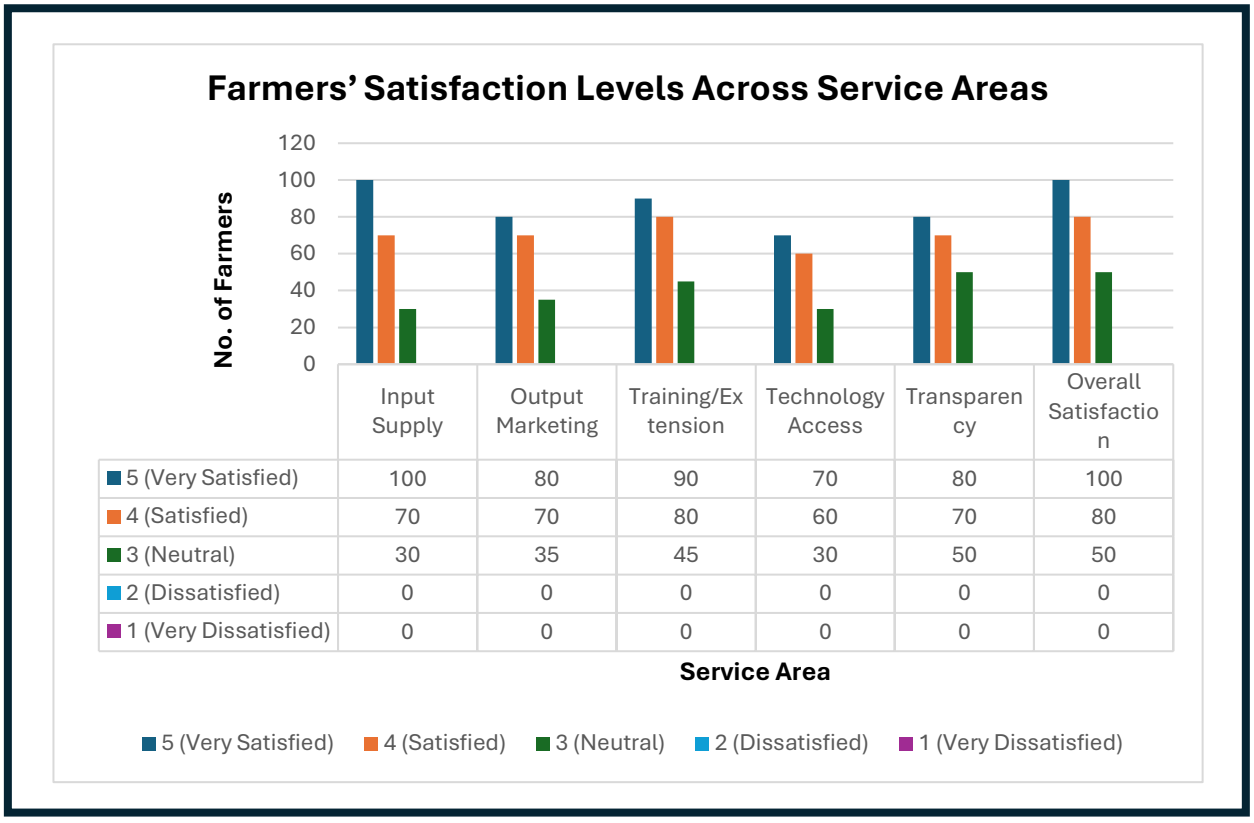


*Figure **4.3.6** Farmers' Satisfaction Levels Across Service Areas*

Graph Analysis and Interpretation

- **Input Supply and Overall Satisfaction:**
  - Highest satisfaction, with 100 farmers "Very Satisfied" and 70 "Satisfied."
  - 30 farmers are "Neutral."
- **Training/Extension:**
  - 90 "Very Satisfied," 80 "Satisfied," 45 "Neutral."
- **Output Marketing:**
  - 80 "Very Satisfied," 70 "Satisfied," 35 "Neutral."
- **Technology Access:**
  - 70 "Very Satisfied," 60 "Satisfied," 30 "Neutral."
- **Transparency:**
  - 80 "Very Satisfied," 70 "Satisfied," 50 "Neutral."
- **No Dissatisfaction:**
  - No farmers reported being Dissatisfied or Very Dissatisfied in any category.

Interpretation

- **High Satisfaction Levels:**
  The majority of farmers report being either "Very Satisfied" or "Satisfied" across all service areas, especially for Input Supply and Overall Satisfaction, indicating strong performance by the organization or program in these areas.
- **Areas for Improvement:**
  While satisfaction is generally high, a notable number of farmers remain "Neutral," particularly in Training/Extension (45), Transparency (50), and Overall Satisfaction (50). This suggests potential for further improvement in these areas to convert neutral respondents into satisfied ones.
- **No Negative Feedback:**
  The absence of any "Dissatisfied" or "Very Dissatisfied" responses highlights a positive overall perception among farmers regarding the services provided.

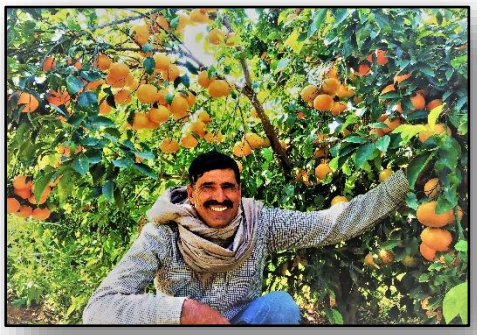
Overall, the data reflects a highly positive experience for farmers, with the greatest satisfaction in Input Supply and Overall Satisfaction. Continuous efforts to address neutral perceptions, especially in Training/Extension and Transparency, could further enhance satisfaction levels.

Success Story

FARMER NAME- VIDHAN CHANDRA, VILLAGE- LAMBAGOTHRA (CHIRAWA)

Particular	**Before Intervention**	**After Intervention**
Crop Intervention	Cluster bean, Gram & Bajara, Mustard)	Vegetables Crops (Cabbage, Brinjal, Chilli, Tomato, Watermelon, & Kinnow)
Area	3.75 Acre	3.75 Acre
Modern technology	Nil	Drip irrigation, with Farm Pond, Farm Protection
Earning (In Rs.)	1,35,000	6,00,000
Enhance Income (Rs.)		4,65,000 (344%)

Glimpse



Chapter 5

Discussion

This study evaluated the impact of modern agricultural innovations introduced through the Chirawa Farmer Producer Company Ltd. (FPO), supported by Ambuja Foundation, on farm productivity, income enhancement, and rural livelihoods in 25 core villages of Chirawa, Rajasthan. The discussion connects empirical findings with the research objectives to reflect on broader implications for rural development and FPO-led interventions.

To assess the impact of modern agricultural innovations on farm productivity among FPO member farmers

The findings revealed a **significant and universal increase in crop yield** post-intervention, with farmers reporting an average yield increase of 40–60% after adopting drip/sprinkler irrigation, improved seeds, and soil health management practices. This aligns with studies highlighting the role of technology and collective action in bridging the productivity gap in smallholder farming systems. However, the variation in yield gains (e.g., some farmers achieving 80–100% improvements) underscores the influence of factors like landholding size, access to training, and timely adoption of innovations. The success of these interventions demonstrates that FPOs can effectively disseminate knowledge and resources, but sustained gains require addressing barriers such as fragmented landholdings and water scarcity.

To evaluate changes in farmers' income and economic resilience after joining the FPO

Post-intervention, **85% of farmers reported higher annual incomes**, attributed to reduced input costs, better market linkages, and premium prices for quality produce. This mirrors global evidence on FPOs enhancing bargaining power and economies of scale. However, income growth was uneven, with marginal farmers (<1 hectare) benefiting less than medium landholders (2–4 hectares). Qualitative insights highlighted that limited access to credit and delayed market payments hindered full economic potential. These findings emphasize the need for FPOs to prioritize tailored financial products and risk mitigation tools (e.g., crop insurance) to ensure inclusive growth.

To identify challenges in sustaining FPO-led agricultural innovations and community participation

Despite high adoption rates for basic technologies (e.g., drip irrigation, improved seeds), advanced tools like soil moisture sensors and AI-based advisories saw near-zero uptake. Farmers cited complexity, lack of training, and affordability as key barriers. Additionally, while women's participation in FPO activities increased, their representation in leadership roles remained low (15%), reflecting persistent gender norms. These challenges align with studies on technology adoption in resource-constrained settings, where simplicity, cultural relevance, and hands-on training are critical. The FPO's success in collective procurement and marketing suggests that scaling such models requires stronger institutional partnerships and digital literacy programs.

Synthesis and Broader Implications

The Chirawa FPO model, supported by Ambuja Foundation, demonstrates that collective action and technology adoption can drive rural transformation, particularly in water-scarce regions. However, long-term sustainability depends on:

1. **Capacity building:** Continuous training to bridge knowledge gaps in advanced technologies.
2. **Inclusivity:** Targeted support for marginal farmers and women to ensure equitable benefits.
3. **Policy integration:** Aligning FPO activities with government schemes (e.g., PM-KISAN, NRLM) for scalability.

Chapter 6

Summary, Conclusion and Recommendations

Summary

This study set out to evaluate the impact of modern agricultural innovations and collective action through the Chirawa Farmer Producer Company Ltd. (FPO), supported by Ambuja Foundation, across 25 core villages in Chirawa, Rajasthan. By surveying 100 member farmers and combining both quantitative and qualitative research methods, the dissertation explored changes in farm productivity, income, and community participation. The findings reveal that the introduction of improved seeds, drip and sprinkler irrigation, and soil health management has led to a clear and significant increase in crop yields and household incomes. Farmers also reported better access to markets, reduced input costs, and greater confidence in adopting new practices. However, the uptake of advanced technologies and digital tools remains limited, and challenges such as financial constraints, gender disparities, and the need for ongoing training persist.

Conclusion

The research demonstrates that FPOs, when supported by strong institutional partners like Ambuja Foundation, can be powerful drivers of rural transformation. The Chirawa FPO has successfully enabled smallholder farmers to collectively access resources, knowledge, and markets, resulting in tangible improvements in agricultural productivity and economic resilience. Yet, the benefits are not evenly distributed marginal farmers and women continue to face barriers to full participation and benefit. Sustained progress will depend on addressing these gaps and ensuring that interventions remain accessible, relevant, and responsive to local needs.

Recommendations

- **Expand Capacity Building:**
  Regular, hands-on training and exposure visits should be provided to ensure all farmers, especially women and marginal landholders, can adopt both basic and advanced agricultural innovations.
- **Promote Digital Literacy and Technology Adoption:**
  Targeted awareness campaigns and practical demonstrations can help demystify advanced tools like soil moisture sensors and digital advisory platforms, making them more accessible and useful to farmers.
- **Strengthen Financial Inclusion:**
  Develop and promote tailored credit products, easy access to crop insurance, and timely payment systems to support smallholder farmers and reduce economic vulnerability.
- **Enhance Women's Participation:**
  Proactive steps such as leadership training, dedicated women's groups within the FPO, and gender-sensitive outreach are needed to ensure women have equal opportunities and representation in decision-making.
- **Foster Institutional Partnerships:**
  Align FPO activities with government schemes and other NGOs to scale up successful models, leverage resources, and ensure policy support for long-term sustainability.

- **Encourage Peer Learning and Community Ownership:**
  Facilitate platforms for farmers to share experiences and best practices, building a culture of trust, innovation, and collective problem-solving within the FPO.

By acting on these recommendations, the Chirawa FPO and Ambuja Foundation can further strengthen their role as catalysts for inclusive and sustainable rural development in Rajasthan.

Annexure

Comprehensive Questionnaire for Chirawa FPO Beneficiary Farmers

Section 1: Respondent Profile & Demographics

1. Name (optional):
2. Age:
3. Gender:
4. Village:
5. Education Level:
    - No formal education
    - Primary
    - Secondary
    - Higher Secondary
    - Graduate and above
6. Household size:
7. Total agricultural land owned (acres/hectares):
8. Land cultivated this season (acres/hectares):
9. Type of landholding:
    - Irrigated
    - Rainfed
    - Both

Section 2: FPO Membership & Participation

10. Year joined Chirawa FPO:
11. How did you learn about the FPO?
12. What motivated you to join? (Select all that apply)

- Better input prices
- Better output prices
- Access to technology/innovation
- Credit/loan access
- Training/knowledge

- Peer influence
- Other: _____

13. Have you paid your FPO equity share? (Yes/No)
14. How regularly do you attend FPO meetings?

- Always
- Often
- Sometimes
- Rarely
- Never

15. Have you participated in FPO activities? (Input purchase, collective selling, training, etc.) (Yes/No)

- If yes, specify: _____

Section 3: Farm Productivity (Objective 1)

16. Main crops grown in the last 3 years:
17. Average yield per acre/hectare for each crop (before and after joining FPO):

- Crop 1: _____ Before: _____ After: _____
- Crop 2: _____ Before: _____ After: _____

18. Has your cropping pattern changed after joining FPO? (Yes/No)

- If yes, describe the change: _____

19. Have you noticed changes in soil health, pest/disease incidence, or water use efficiency? (Describe)
20. What do you think are the main reasons for any change in productivity? (Open-ended)

Section 4: Technological Innovations (Objective 2)

21. Which of the following innovations have you adopted via FPO? (Tick all that apply)

- Improved/hybrid seeds
- Soil testing/soil health cards
- Drip/sprinkler irrigation
- Soil moisture sensors
- AI-based advisories (SMS/call/app)
- Custom hiring of machinery

- Crop insurance
- Digital payment/record-keeping
- Others (specify): _____

22. Who provided training/guidance for these innovations?

- FPO
- NGO (Ambuja Foundation)
- Government
- Private company
- Other: _____

23. Did you face any challenges in adopting these innovations? (Yes/No)

- If yes, specify (cost, knowledge, access, risk, etc.): _____

24. How have these innovations affected your:

- Yield (Increased/Decreased/No change)
- Input cost (Increased/Decreased/No change)
- Water use (Increased/Decreased/No change)
- Labour requirement (Increased/Decreased/No change)

25. Which innovation do you find most beneficial? Why?

Section 5: Income and Economic Benefits (Objective 3)

26. What was your average annual farm income percentage before joining the FPO?
27. What is your average annual farm income percentage after joining the FPO?
28. What percentage of your total income comes from FPO-related activities?
29. Do you sell your produce through the FPO? (All/Most/Some/None)
30. Average price received for main crops via FPO vs. local market (last season):

- Crop: _____ FPO price: _____ Market price: _____

31. Has your income from farming changed after joining the FPO?

- Increased (by approx. ___%)
- Decreased (by approx. ___%)
- No change

32. Have you received any credit/loan via FPO? (Yes/No)

- If yes, amount: _____ Source: _____

33. Have you received any government scheme benefits through the FPO? (Yes/No)

- If yes, specify: _____

Section 6: Perceptions, Satisfaction, and Suggestions

34. How satisfied are you with the following aspects of the FPO? (1=Very dissatisfied, 5=Very satisfied)

- Input supply
- Output marketing
- Training/extension
- Technology access
- Transparency/governance
- Overall satisfaction

35. What are the main benefits you have experienced as an FPO member? (Open-ended)
36. What are the main challenges you still face as an FPO member? (Open-ended)
37. What suggestions do you have for improving the FPO? (Open-ended)

.....

References

1. https://www.extensionjournal.com/article/view/1566/8-1-80
2. https://krishijagran.com/news/ambuja-foundation-launches-holistic-rural-development-program-in-chhattisgarh-s-kondagaon-district-in-partnership-with-hdfc-bank-parivartan/
3. https://tractorkarvan.com/blog/modern-farming-methods-in-india
4. https://sfacindia.com/FPOSucessStory.aspx
5. https://www.ambujafoundation.org/blog/rural-water-the-top-priority-for-ambuja-foundation
6. https://www.agriculturejournal.org/volume13number1/farmer-producer-organization-an-ecosystem-for-building-socio-economic-resilience-of-farmers-in-india/
7. https://www.nature.com/articles/s41599-025-05063-9
8. https://epubs.icar.org.in/index.php/IJEE/article/view/134909
9. https://ideas.repec.org/a/ags/reowae/338184.html
10. https://sfacindia.com/UploadFile/Statistics/State%20wise%20list%20of%20registered%20FPOs%20details%20under%20Central%20Sector%20Scheme%20for%20Formation%20and%20Promotion%20of%2010,000%20FPOs%20by%20SFAC%20as%20on%2009-10-2023.pdf
11. https://www.nature.com/articles/s41599-025-05063-9
12. https://epubs.icar.org.in/index.php/IJEE/article/view/134909
13. https://ageconsearch.umn.edu/record/303658/files/11-Gurpreet-Singh.pdf
14. https://www.manage.gov.in/publications/eBooks/Impact%20Assessment%20of%20FPC.pdf
15. https://www.agriculturejournal.org/volume13number1/farmer-producer-organization-an-ecosystem-for-building-socio-economic-resilience-of-farmers-in-india/
16. https://www.thepharmajournal.com/archives/2023/vol12issue12S/PartAA/S-12-12-258-132.pdf
17. https://www.epw.in/journal/2024/22/special-articles/how-are-farmer-producer-organisations-functioning.html
18. https://journals.nasspublishing.com/index.php/rwae/article/view/880