



The Voice of the **Off-Grid Solar Energy** Industry

EMPOWERING WOMEN FARMERS WITH SOLAR-POWERED SOLUTIONS IN RURAL INDIA

CASE STUDY: OORJA SOLUTIONS



ABOUT THIS CASE STUDY

Women experience energy-poverty differently to men, and the roles they play in the agricultural and food-systems value chains are unique. These differences drive how individuals use Productive Use of Renewable Energy (PURE) technologies, what they need and aspire to, and how the technology can affect their life. Currently, there is limited understanding of the distinct characteristics of women's roles in PURE value chains - yet companies who do so are better placed to serve the needs of women, reach new customers and grow their business. In 2024, GOGLA set out to examine how PURE companies can improve their performance by building gender-inclusive businesses that meet women's energy needs.

This case study demonstrates how detailed customer insights can transform business models to better serve women customers in the PURE sector. It describes the business models deployed by Oorja and the opportunities they create for women consumers in the solar irrigation ecosystem. With support and research carried out by Distill Inclusion, data collected from Oorja's customers has informed the development of two customer persona profiles that capture the diverse needs, challenges and aspirations of their women customers.

Oorja's customers can be farmers, micro-entrepreneurs or agro-processors. By better understanding the diversity of needs, the role their products play and how impact differs in different value chains, Oorja have been able to identify critical pain points for women and find opportunities to improve their product offerings, financing models, and support services. What was learned from their women customers is now also being used to inform strategic decisions and product development across all customer segments.

The customer personas can be used as an inspiration for other companies offering similar product ranges or serving similar customer segments, to better understand and serve their existing or prospecting customer base.

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INTRODUCTION

Oorja is pioneering the concept of “Farming as a Service” at the intersection of sustainable agriculture and clean energy. Oorja is transforming the lives of smallholder farmers, with a particular focus on empowering women in agriculture. Their innovative solar-powered irrigation and milling services are revolutionizing farming practices and livelihoods in rural communities, especially in the eastern part of Uttar Pradesh. As a Farming as a Service company, Oorja provides essential agricultural services on a pay-per-use basis, making modern farming techniques accessible to those who need them most. Their solar-powered solutions are designed to significantly increase crop yields and income for low-income communities, including small and marginal farmers, low-income households, and women farmers, when linked to productive activities on their farms.

Oorja’s pay-per-use model, requiring only a small membership fee and no capital investment, makes modern farming technologies accessible to smallholder farmers. This approach allows farmers, especially women, to access reliable and affordable irrigation, diversify crops, and increase yields without the burden of equipment ownership. Initially tying registration to land ownership, Oorja quickly recognized this excluded many women. They adjusted their approach, removing the land ownership requirement and mandating that at least two out of every 15 registered members at each project site where solar pumps are installed must be women.

The impact of Oorja’s services is significant. By replacing diesel-powered pumps with solar energy, they reduce

carbon emissions and ease the physical burden on women farmers who previously relied on male family members to operate heavy equipment. However, Oorja faces challenges in the socially conservative areas where they operate, where entrenched gender norms often limit women’s participation in farming. Despite these obstacles, Oorja remains committed to inclusivity, continually adapting their services and outreach to empower women farmers in these communities.

HOW OORJA’S SOLAR PUMP HELPS WOMEN PURSUE

THE ASPIRING AGRI-ENTREPRENEUR

Sex	Female
Age	30-45 years old
Location	Village
Family	Married with 4-6 members in the family
Education	Primary or some secondary education

BACKGROUND

Born into a farming family, she embraced the opportunity to work with her husband on his farm but was mindful of the community skepticism. The solar pump revolutionized her approach, enabling efficient irrigation and crop diversification. It freed up time for exploring new ventures and boosted her confidence. Her family now sees her as a decision-maker, and her success has inspired community respect and interest in sustainable farming.

LIVELIHOOD JOURNEY AND IMPACT OF SOLAR PUMP

The Aspiring Agri-Entrepreneur, usually works on her husband’s farm to support the household income. She has some knowledge about farming and is keen to learn and do more. Her husband consulted her when investing in the pump, but the decision was his. She leverages the solar pump to diversify crops, improve yields, and explore new business ventures. The pump significantly reduces irrigation time and labor, allowing for better farm management and

cultivation of high-value crops. This leads to increased profits, gradually improving household income and assets.

However, she faces numerous challenges. Access to affordable capital, limited knowledge of advanced techniques, and balancing traditional roles with entrepreneurial ambitions pose significant hurdles.

In addition, she has limited input on decisions related to farm growth, assets are registered in male family members names, and there is some community skepticism about her expanded role in farming.

Despite these obstacles, the solar pump catalyzes positive change. It not only improves farm productivity but also enhances her status in the community. As she navigates these changes, she’s reshaping her livelihood, pushing boundaries, and striving for greater economic independence, embodying the transformative potential of appropriate agricultural technology for women farmers.





■ KEY JOURNEY ELEMENTS

- **Awareness:** Learns about Oorja's solar pumps through the company's sales agent or community networks
- **Consideration:** Discusses with husband, evaluates benefits against current irrigation methods
- **Purchase Decision:** Husband decides to adopt Oorja's services, signs up for Pay-Per-Use model
- **Usage:** Begins using solar pump, irrigates crops more efficiently, explores crop diversification, utilizes time saved for other farm activities
- **Challenges:** Limited decision-making authority, community skepticism about expanded role, balancing traditional responsibilities with new opportunities

■ CHALLENGES & PAIN POINTS

- **Farming knowledge and skills:** She herself has limited knowledge of advanced farming techniques and farm management as a business
- **Technology:** Some concerns about long term maintenance and durability of the pumps; would also like more capacity
- **Decision making:** Limited decision-making authority despite active farm involvement
- **Asset ownership:** Land and businesses are registered in the name of male family members
- **Gender roles:** Expected to prioritize household responsibilities; community may not be supportive of her being active in farming.

Livelihoods / Income sources	Details
Primary Income	Farming
Secondary Income	Small business

Assets / Resources	Details
Technology	Owns or has access to a smart phone
Other assets	Land but not in her name; Approx 5-15 bighas

Financial Services Use
Has access to bank loans (through SHG) and MFIs
Prefers to use personal savings before taking a loan. Though family has taken agriculture loan
Open to taking loans for farm improvement investment

Networks and Information Sources
Part of informal farmer groups or networks and has access to agriculture input suppliers
Mentions using smartphone and social media for agriculture information
Relies on a combination of traditional (family, friends) and modern (company representatives, agricultural extension workers) sources

OPPORTUNITIES FOR OORJA TO SUPPORT THE ASPIRING AGRI-ENTREPRENEUR

- Targeted Communication:** Develop marketing materials that showcase women in active farming roles to challenge stereotypes
- Joint Decision-Making Support:** Provide tools and information that encourage joint husband-wife decision-making in adopting new technologies
- Women’s Networking:** Facilitate connections among women farmers using Oorja’s services for peer support and knowledge sharing
- Flexible Usage Models:** Develop options that allow for gradual increase in usage as the farmer expands her operations





HOW OORJA’S SOLAR PUMP HELPS WOMEN IMPROVE

THE STABILITY-FOCUSED FARMER

Sex	Female
Age	45-55 years
Location	Village
Family	Widowed or married with 7-10 members in the family
Education	No formal education

BACKGROUND

A lifelong farmer, she inherited the profession from generations before. The solar pump eased her physical burden, ensuring consistent crops and income for the family. It allowed her to continue farming despite age, securing her family’s stability. While not dramatically changing their lives, it provided reliability and modest improvements, reinforcing their traditional farming lifestyle.

LIVELIHOOD JOURNEY AND IMPACT OF SOLAR PUMP

The Stability-Focused Farmer comes from a farming background and works on her family’s farm. The focus is on consistency and stability of income. Her son or other family members made the decision about using the solar pumps which she was initially skeptical about. After several people around her began to use it, she saw that adopting the solar pump could ease hardships and stabilize operations rather than dramatically change her approach. The pump reduces physical labor, ensures more consistent yields,

and modestly increases cultivated area, improving overall quality of life and enabling continued farming despite age or physical limitations.

Her financial journey is characterized by cautious investment and steady cost reduction, with modest income increases prioritized for household expenses and children’s education. However, she faces significant challenges, including adopting to new technology, concerns about long-term maintenance, limited capital for major changes, limited mobility, financial dependency, and literacy barriers.

Despite these hurdles, the solar pump provides crucial support, allowing her and her family to maintain their livelihood with greater ease and reliability. It represents a tool for stability and incremental improvement in a challenging agricultural landscape, particularly for older women farmers.



■ KEY JOURNEY ELEMENTS

- **Awareness:** Hears about Oorja's services from other farmers or village elders
- **Consideration:** Discusses potential benefits with family members, especially adult children
- **Membership Decision:** Son or other family members decide to adopt Oorja's services
- **Usage:** Uses solar pump for irrigation, focusing on maintaining current crops and experiencing reduced physical labor
- **Challenges:** Skepticism towards new technology, limited understanding of the Pay-Per-Use model.

■ CHALLENGES & PAIN POINTS

- **Technology use:** Often skeptical of new technology and have a harder time with adopting it; has concerns about long term reliability of the pump
- **Capital:** Limited access to capital as she is often financially dependent on male family members
- **Mobility:** Often have lower mobility either as a result of social norms or health issues
- **Resilience:** Vulnerability to crop failures or market fluctuations despite improved irrigation

Livelihoods / Income sources	Details
Primary Income	Farming
Secondary Income	Livestock or labour

Assets / Resources	Details
Technology	Limited personal use of smartphones, often relying on younger family members
Other assets	May have other assets such as a posho mill or small plot of land

Financial Services Use
Relies on personal saving and informal lending networks
Less likely to have access to formal banking services
Prefer not to take financial risks including investing in new technologies

Networks and Information Sources
Heavy reliance on family members, especially male family members or adult children
More likely to trust information from traditional sources (other farmers, elders in the community)
Limited direct use of technology for information; may rely on younger family members for tech-based information
Some mention of getting information from company representatives who visit the village

OPPORTUNITIES FOR OORJA TO SUPPORT THE STABILITY-FOCUSED FARMER

- Women centric technology education:** Develop women-only, hands-on training sessions with pictorial guides to overcome skepticism and literacy barriers. Focus on practical operation and benefits of the solar pump.
- Intergenerational Engagement:** Create programs that involve both older women farmers and their adult children in learning about the technology, bridging the gap between traditional and modern farming methods
- Simplified Pay-Per-Use Model Explanation:** Develop clear, visual materials explaining the Pay-Per-Use model in simple terms, emphasizing how it aligns with seasonal farming needs and potential cost savings.
- Peer Demonstration Network:** Establish a network of successful women users to demonstrate the pump’s benefits to potential new users, leveraging the trust in community knowledge sharing.



CONCLUSION

As Oorja continues to expand its reach, it's not just providing irrigation – it's cultivating a new generation of empowered farmers, particularly women, in rural India. Their solar-powered milling service could further support farmers by providing affordable and accessible post-harvest processing within their communities, opening up new market opportunities. By providing accessible, affordable, and sustainable energy services, Oorja is energizing local economies, paving the way for more inclusive and sustainable agricultural practices, and demonstrating the transformative potential of the Farming as a Service model in addressing rural poverty and gender inequality

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