

MustOil

Oil Content Measurement for Farmer Empowerment

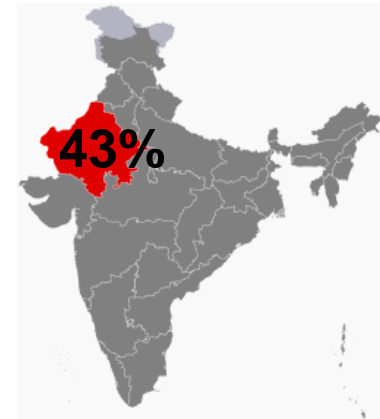
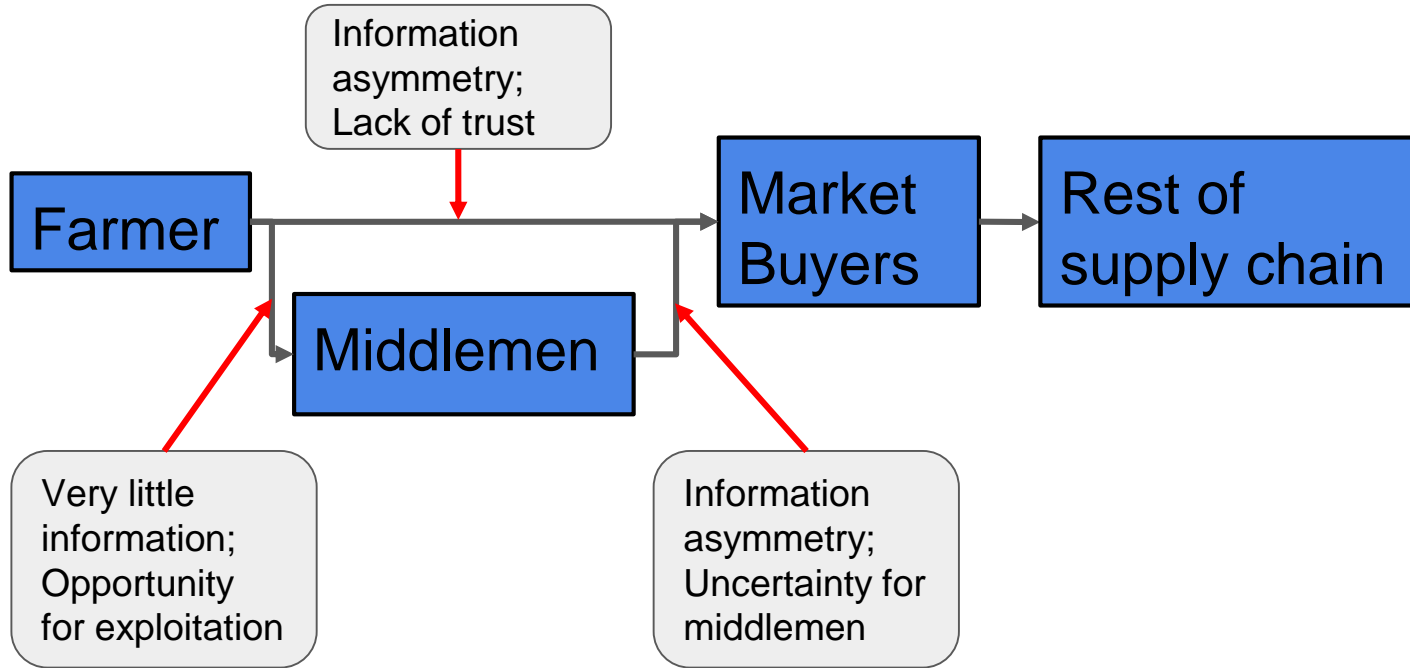
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Agenda

- Background
- Problem statement
- Proposed Action
- Technical Feasibility
- Implementation
- Impact
- Q&A



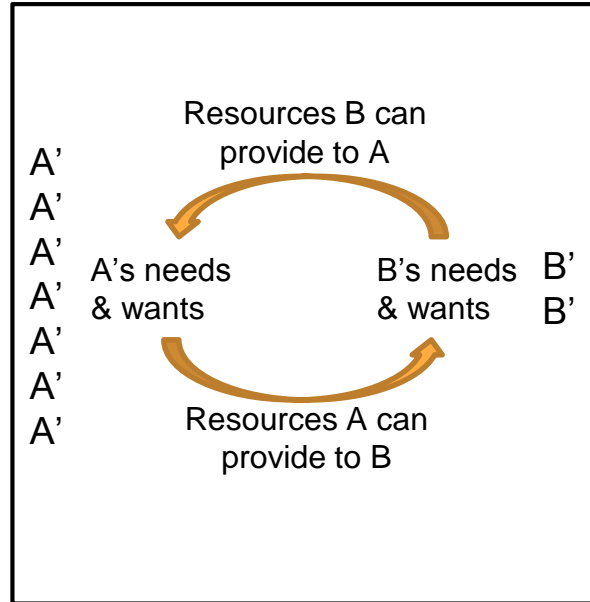
Market: Mustard Seed, Rajasthan



Power dynamics of the Mustard Seed Negotiation

Farmers (Producers)

- I. Mobility limitations
(dependency on market makers)
- II. Crop is sole source of revenue
- III. Wants highest possible revenue



Market (Buyers)

- I. Power of choice (Small # of markets, many farmers)
- II. Can pivot to other crops
(want margins)
- III. Wants lowest costs and highest profit

Reference: Emerson, R. (1962) Power-Dependence Relations, *American Sociological Review*

Mustard oil content



- Equipment is very expensive ~\$24,000 CAD
- Owned by government/private people at markets & farmers do not trust measurement
- Reinforces powerless position of farmers

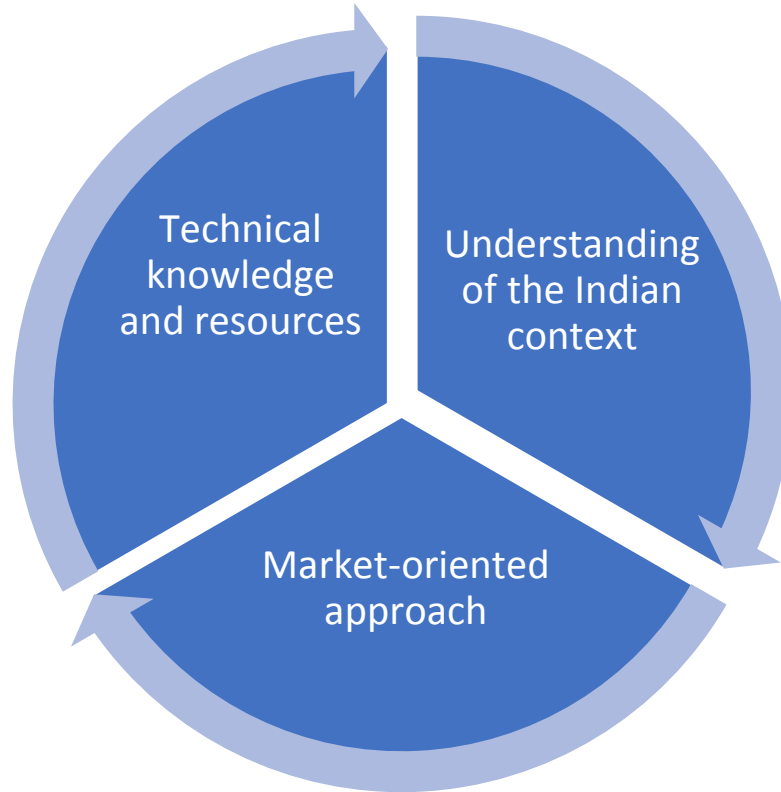
Change in Government Policy

In 2017, the Indian federal government did not enact a promised Minimum Sale Price. Farmers were placed in an even weaker negotiation position.

Oil content (%)	Proposed Minimum Sale Price (Rs. per 100kg)	Reported sale price	% yearly income lost (1 Tonne harvest)
35	3600	2800 to 3400	2% to 17%
42	3982		
53	4283		

Some markets recorded prices as low as Rs 2800

Core Competencies



Problem statement

Mustard farmers ***do not know the quality*** of their crop before marketing it, which gives them ***very little bargaining power*** with middlemen or buyers at the marketplace.

We propose an ***inexpensive, reliable, and simple*** technique that farmers can use to ***assess the oil content of their mustard seeds*** before negotiating a price with buyers.



Proposed Action



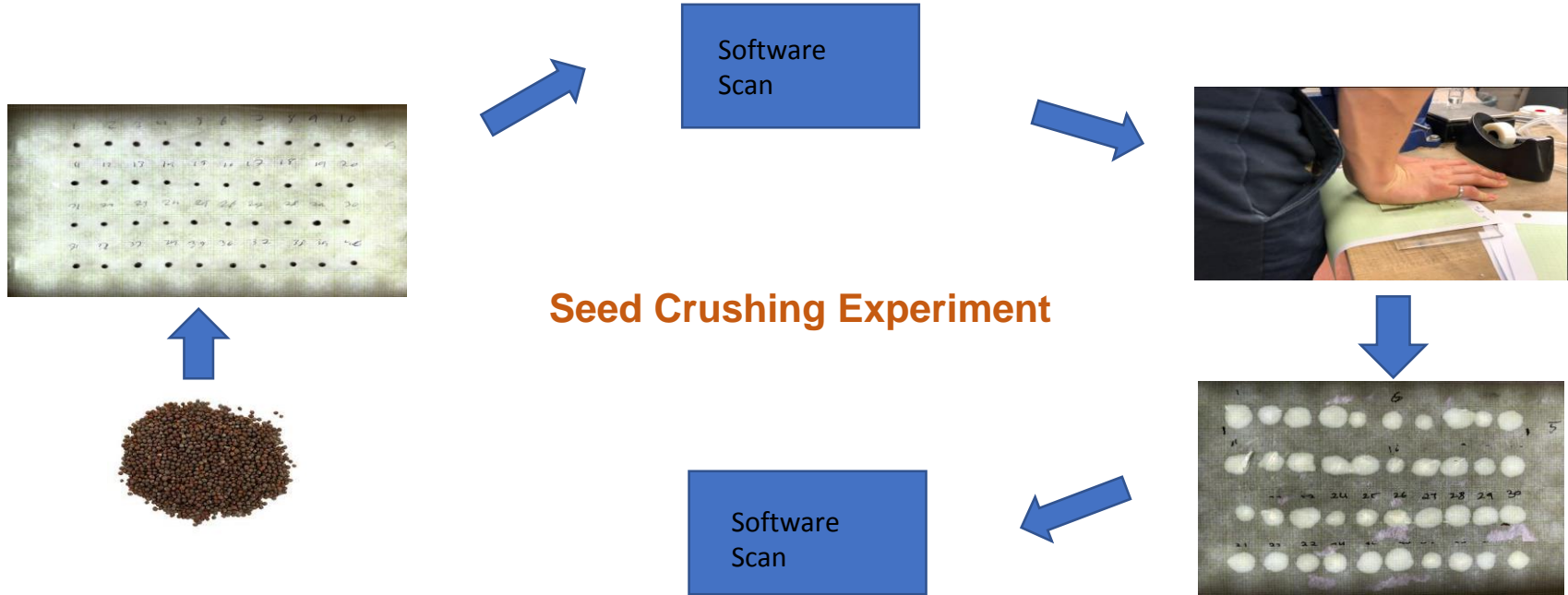
Technical
Feasibility

Implementation

Impact

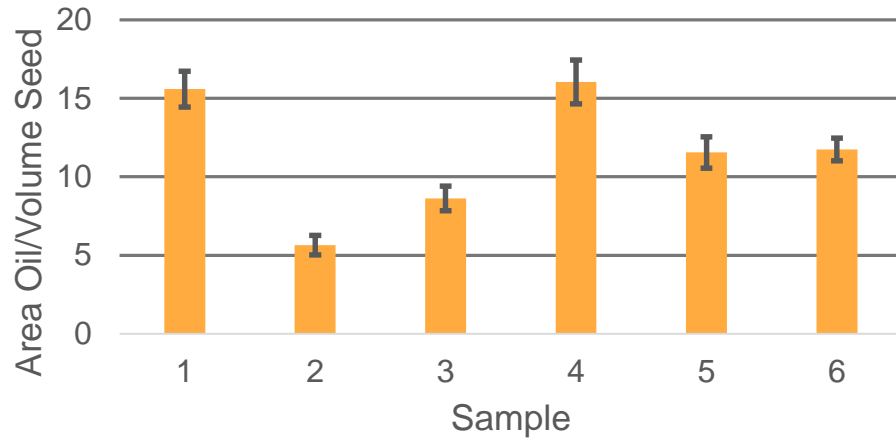
We argue that a low-cost measurement system for oil content is *technically feasible*, *implementable in the Rajasthani context*, and will *improve food security* for farmers.

Technical Feasibility

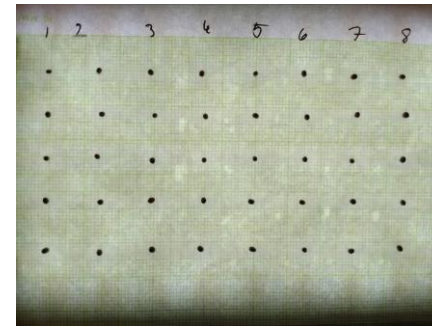
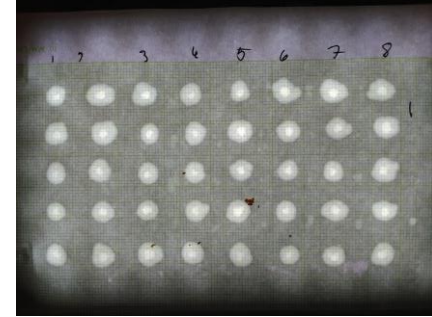


Technical Feasibility

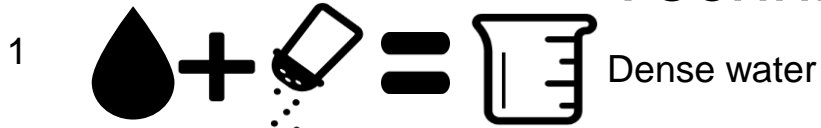
Oil Content



$$\frac{\text{Area Oil}}{\text{Volume Seed}} =$$



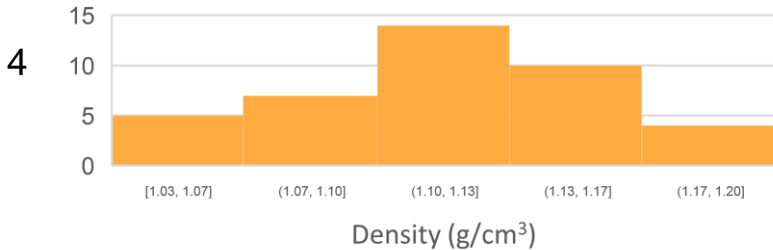
Technical Feasibility



2 Count number of floating and sunk mustard seeds

3 Repeat for various concentrations (densities)

Density Distribution



Density Experiment



5 Convert density to oil content

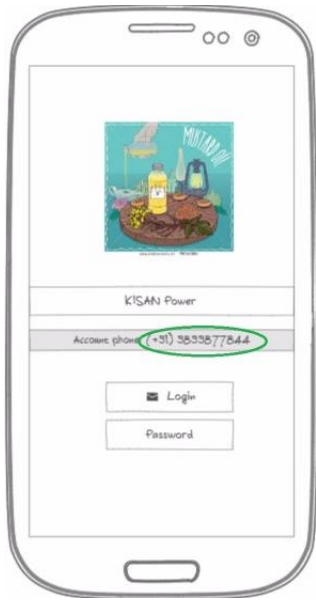
Proposed Implementation in Indian context

Potential partners: ICAR, Sehgal, KVKs



Proposed Implementation in Indian context

How we implement: app-based



Phone App



Record Pic



Analyze Oil



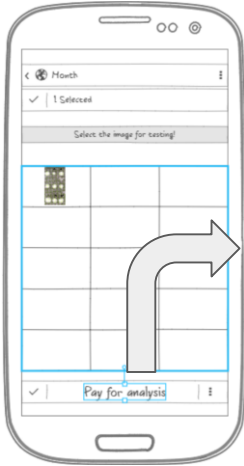
Report Data



Proposed Implementation in Indian context

Possible channels to monetize and fund the initiative:


1. Pay-per-use model



The smartphone screen shows a 'Month' header, a '1 Selected' status, and a 'Select the image for testing' prompt. Below is a grid with one image selected. A 'Pay for analysis' button is at the bottom. An arrow points from the grid to a box containing '10 ₹' and a hand icon clicking a green dollar sign.

10 ₹

2. Subscription Model



The graphic shows gift boxes above a price tag of '₹ 90'. Below the price tag, it lists 'FULL YEAR SUBSCRIPTION', 'Unlimited Photos', 'Access to all market prices', and 'Negotiation training'. A 'BUY NOW' button is at the bottom.

₹ 90

FULL YEAR SUBSCRIPTION


Unlimited Photos

Access to all market prices

Negotiation training

BUY NOW

3. Advertisement model



The smartphone screen shows a 'Load done! Your sample has been tested!' message, a pie chart, and '91 Consist 15%' and 'Accuracy 92%' text. Below is a table with columns 'Seed Type', 'Company', and 'Bases'. A blue box with 'Your Company name here for only 600 Rupees!' has an arrow pointing to the table.

Load done! Your sample has been tested!

91 Consist 15%

Accuracy 92%

Seed Type	Company	Bases
Yellow	Kanhu	600

Your Company name here for only 600 Rupees!

Impact on Negotiations

- 1) Information can “level the playing field” in negotiation. Experiments in India show that:

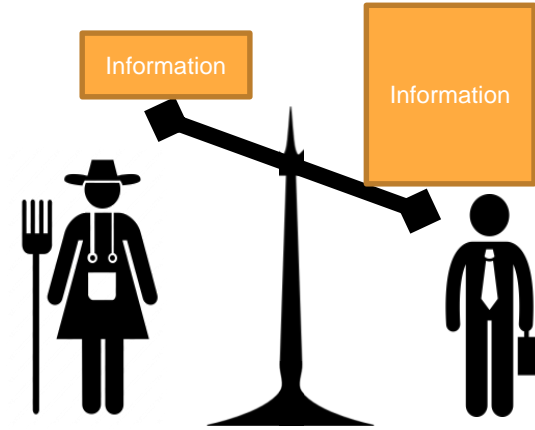
“Middlemen make higher offers when the farmer is informed”

- Mitchell, T. 2011 Middlemen, Bargaining and Price Information: Is Knowledge Power?

- 2) Information about quality is necessary for farmer cooperation



- 3) Information can benefit middlemen as well: it gives an estimate of the market price they will receive



Impact on food security

Farmer receives fair price

Farmer income increases

Increase certainty in income

Government incentives for high-oil mustard are effective

Food security for farmer

Increase stability of mustard market

Farmers grow higher-oil mustard

Food security for farmer and public

Decrease processing costs

Food security for public

Thank You

We would like to thank the following people for their help with our project:

Dr. Kiruba Krishnaswamy

Dr. Levente Diosady

Dr. Yu-Ling Cheng

Dr. Anita McGahan

Dr. Suzanne Jackson

Dr. Erica DiRuggerio

Dr. Joseph Wong

Dr. Brian Silverman

Dr. Amy Bilton

Dr. Elisa McGee

Mr. Pawan Kumar

“So never lose an opportunity of urging a practical beginning, however small, for it is wonderful how often in such matters the mustard-seed germinates and roots itself”
- Florence Nightingale