



Improving Product Quality & Profit for Smallholder Kenyan Coffee Farmers

Client: Kyle Freedman, Tonny Gitonga

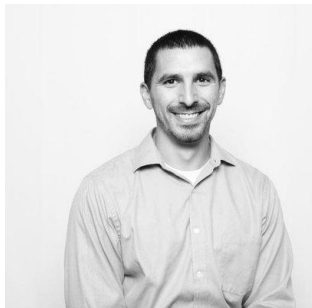
Students: Tracy Corado, Olivia Geoghegan, Alec Schwartz

Project Background

Meet Our Clients:



Tonny Gitonga (Kenya)



Kyle Freedman (U.S.)

Smallholder coffee farmers in Kenya are not earning enough profit to support their livelihood. Despite high demand in the international market for premium beans, farmers are still exiting the industry.

How to increase the quality of coffee beans produced by smallholder farms?

1. Provide an affordable, small-scale roaster to encourage quality monitoring
2. Improve quality control measures during coffee bean processing



Embu, Kenya

Voices of Kamavindi Farmers

“I have *never tasted my own coffee* because of lack of affordable farm based equipment.”

“the millers are *quite a distance* from my farm and it is difficult for me to mill my coffee.”

“*lack of affordable equipment* to hull, roast grind and brew.”

Farmers surveyed expressed they would be willing to pay between
\$40-\$70 USD
for a small-scale roaster

Methodology

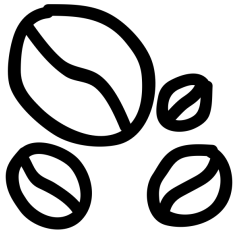
What did we do?

1. Performance Analysis of several small-scale roasters on the market
2. Research on coffee processing and identify potential areas for farmers to improve quality control



Performance Analysis

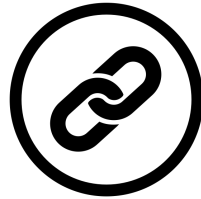
Metrics/Considerations



Chaff Removal



Simplicity



Durability



Safety



Cost

Performance Analysis:

Probat Roaster

Cost: \$5,000+

Features:

Long History

Chaff Remover

Individual air, heat, and cooler controls to change the type of roast

Can do multiple roasts at once



Pros



Cons



Performance Analysis:

Barwell Rotating Arm Roaster

Cost: \$100

Features:

Can roast 4-24oz at a time

Consistent mixing arm

Variable Time/Temp parameters

Slower come-up time for heat

Beans visible



Pros



Cons



Performance Analysis:

Air Crazy Popcorn Popper

Cost: \$20

Features:

3oz of beans at a time

Beans rotated by air

No temp control, just an on/off switch

Fast (3 minutes)

Heats up quickly

Electric



Pros



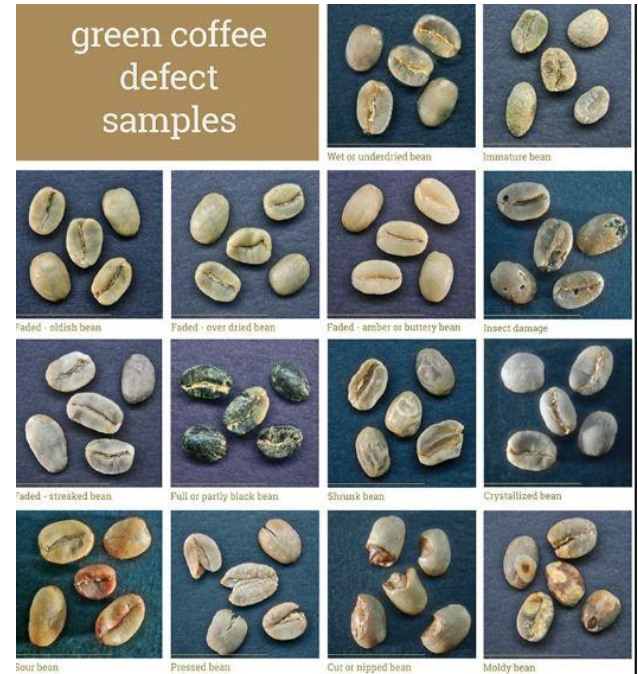
Cons

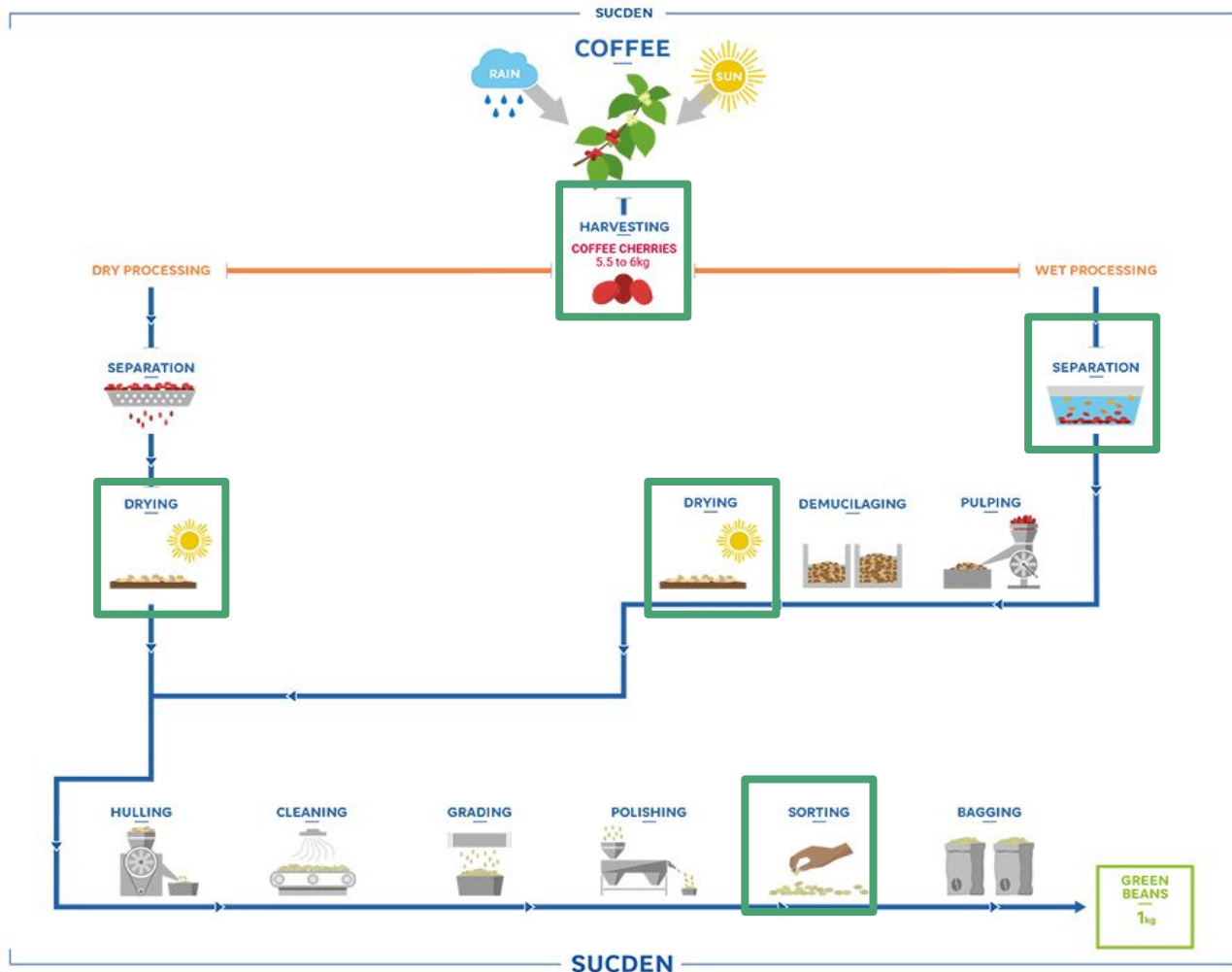


Sorting

Sorting is important for maximizing quality and is less costly and simpler than changing agricultural practices

Selling multiple grades of coffee could potentially fetch a higher overall price





Final Recommendation



Air Popper Design



Modifications to improve ventilation and durability



Investigate quality control measures and work with farmers to make improvements