Case Study: Introduction

Rodrigo Ulloa - Sárbith Aguilar - Xaimarie Hernández - Adnan Abdullahi - Leroy Vargis - Raghav Jeevendra
Case Study Outline

- Problem to Solve
- Initial Case Study Parameters
- Proposed Methodology
- Case Study Overview
- Case Study Inputs
Problem to Solve

- Mismatch Between Supply and Demand
- Not enough Information
- Lack of Tools for Decision-Making
- Little Knowledge of Market Opportunities
- Small Level of Coordination
- Small Value Captured by Growers for their Products
Initial Case Study Parameters

- Coverage: Arizona and New Mexico
- Initial Basket of Products:
  - Tomatoes - Green Beans
  - Lettuce - Bell Pepper
Proposed Methodology

- Identify Market Opportunities
- Assess Production Potential
  - Climate Conditions
  - Production and Logistics Costs
- Obtain High-Level Production Plan
- Deploy the Opportunity to Specific Agents
### Case Study Overview

#### Opportunity Identification
- Market Intelligence
- Trends Identification
- Prices and Volumes Prediction
- Is the opportunity capturable?

#### Region Assessment
- Where can it be produced?
- Are there enough growers?
- Is the required logistics available?
- Are the resources available (capital)?

#### Yield and Price Estimates
- Consider climate conditions to **estimate yields**
- Obtain **price estimates** for the opportunity
- Consider **complementary** producing regions

#### Generate a Plan
- Run **optimization models** to determine:
  - Where to produce?
  - When to plant?
  - When to harvest?
  - How to articulate the logistics?
  - How to allocate resources/investment?

#### Analyze and Deploy Decisions
- Analyze the plan
- Identify partnership candidates:
  - Growers
  - Transportation
  - Logistics
  - Consumers
- Negotiation and Coordination
Case Study Inputs

5 Locations:
- Phoenix, AZ
- Tucson, AZ
- Albuquerque, NM
- Las Cruces, NM
- Santa Fe, NM

4 Initial Crops:
- Tomatoes
- Lettuce
- Green Beans
- Bell Peppers

Market Opportunity:
Two identified opportunities: **Celery** and **Cauliflower**
Case Study: Introduction

Rodrigo Ulloa - Sárbith Aguilar - Xaimarie Hernández - Adnan Abdullahi - Leroy Vargis - Raghav Jeevendra
Opportunity Identification

- Initial Set of Products:
  Tomatoes - Green Beans - Lettuce - Bell Peppers

Why did we selected this? Add information (Imports, Prices, etc.)

Add historical production
Adnan’s

- Vegetables take up a sizeable share of the crop production Market in Arizona.

- Vegetables grossed at $1,009,125,000 making up 33% of Total Crop sales in Arizona (NASS 2017).

- Vegetables are a logical choice due to the huge share of the market they occupy.

- Vegetables sold in Maricopa makes up 14% of total Vegetable sales in Arizona (NASS 2017).
Lettuce recorded a total of 72,411 Acres (NASS 2017)

Interestingly not all the initial FFAR crops are harvested heavily

Perhaps price of the produce also influenced selection?
Opportunity Identification

- Opportunity:
  - Celery

![Google Trends Chart](image1.png)

![Celery Price 2018 Chart](image2.png)
Xaimarie

- Opportunity:

**Cauliflower**

Google Trends

Cauliflower Price 2018

[Graph showing the price of cauliflower over time]
Information Collection

- Available Production Regions
  - Agronomic: Weather, Yields, Water
  - Growers/Land: Capital, Land Availability, Expertise
  - Logistics: Capacities, Costs

ASU Arizona State University
Strategic Planning Stage

- Run Optimization Models:

  - Traditional Farming
  - Regional Assessment
    - Environmental Characteristics
    - Available Resources
  - Micro-Farmer
  - Small-Farmer
  - Institutions

  Decisions
  - Market selection
  - Crop selection
  - Investment selection
  - Farmer selection

  Market Analysis
  - Price trends
  - Consumption trends

  Food Service
  Local Market
  Regional Surveys
  Transactions
Results

- Planting Schedule:
- Harvesting Schedule:
- Costs Distribution:
Compatibility

- Red represents pairs that are not compatible
- Yellow represents pairs that are compatible

<table>
<thead>
<tr>
<th>Common name</th>
<th>Storage temperature (℃)</th>
<th>Relative humidity (%)</th>
<th>Ethylene production rate</th>
<th>Ethylene sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomatoes</td>
<td>10 to 13</td>
<td>90 to 95</td>
<td>Very low</td>
<td>High</td>
</tr>
<tr>
<td>Bell pepper</td>
<td>7 to 10</td>
<td>95 to 98</td>
<td>low</td>
<td>Low</td>
</tr>
<tr>
<td>Lettuce</td>
<td>0</td>
<td>98 to 100</td>
<td>Very low</td>
<td>High</td>
</tr>
<tr>
<td>Cucumber</td>
<td>10 to 12</td>
<td>85 to 90</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Green beans</td>
<td>4 to 7</td>
<td>95</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Celery</td>
<td>0</td>
<td>98 to 100</td>
<td>Very low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>0</td>
<td>95 to 98</td>
<td>Very low</td>
<td>High</td>
</tr>
</tbody>
</table>
Next Steps

- Feasibility Analysis
- Partners Identification & Allocation
- Agents Coordination (Contracts)
- Articulation and Monitoring
Case Study in AZ and NM

Rodrigo Ulloa - Sárbith Aguilar
Case Study Outline

- Opportunity Identification
- Information Collection
- Strategic Planning Stage
- Results
- Next Steps
Why do we need these Inputs?

- Implement the input into the planning tools that have been developed throughout the years
- Use this information to provide growers with critical decisions
PRODUCTION

- Product Demand
- Hectares to Plant
  - Amount to plant per crop
- Quality demanded
- Cost of technology