Insertion of Small Farmers into Technology-enabled, Rapid-response Fresh Food Supply Chains: Overview of Project

Sponsored by

The Foundation for Food and Agricultural Research (FFAR)

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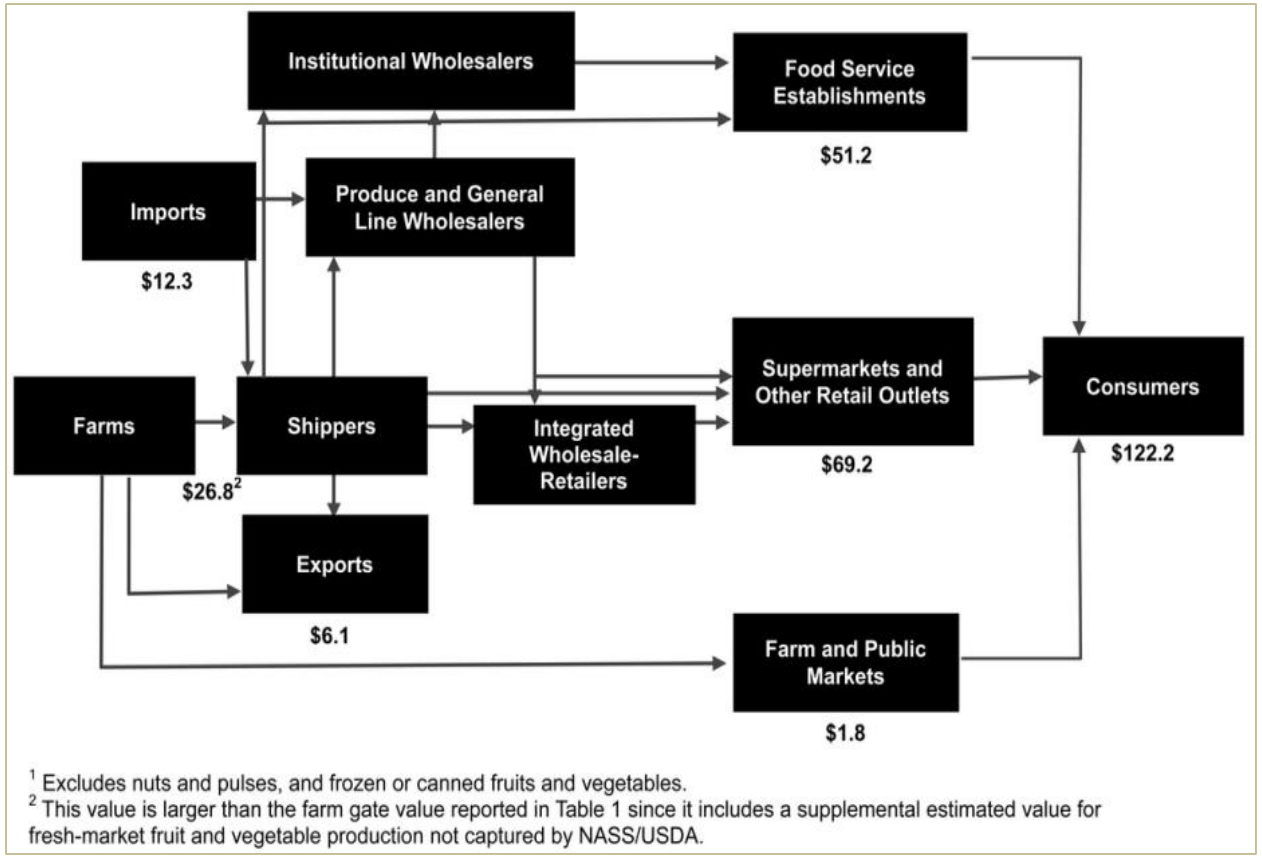
Agenda

- Current Situation and Motivation
- Vision
  - Study
  - Environment Implementation
- Objectives and Expected Outcomes
- Framework Design
- Products
- Activities
  - Supply
  - Demand
  - System Architecture
- Previous Research
- Research Team

Current Situation in fresh produce supply chain

- Growers (in particular small) capture a low margin of the value chain of their products
- Presence of non-value added intermediaries
- Lack of coordination in the SC results in high levels of wasted food
- Non-participating regions/growers with the potential of take part in the fresh food SC and other high value crops
- Disruptive technologies and strategies in marketing and distribution channels
- Customer demand changing dynamically
- Scarcity of farm labor
- Lack of efficient channels for the direct participation of investment capital

Supply Chain Actors(2010)



[1] Excludes nuts and pulses, and frozen or canned fruits and vegetables.
[2] This value is larger than the farm gate value reported in Table 1 since it includes a supplemental estimated value for fresh-market fruit and vegetable production not captured by NASS/USDA.

About $0.20 of each $1 spent by the consumers get to the grower

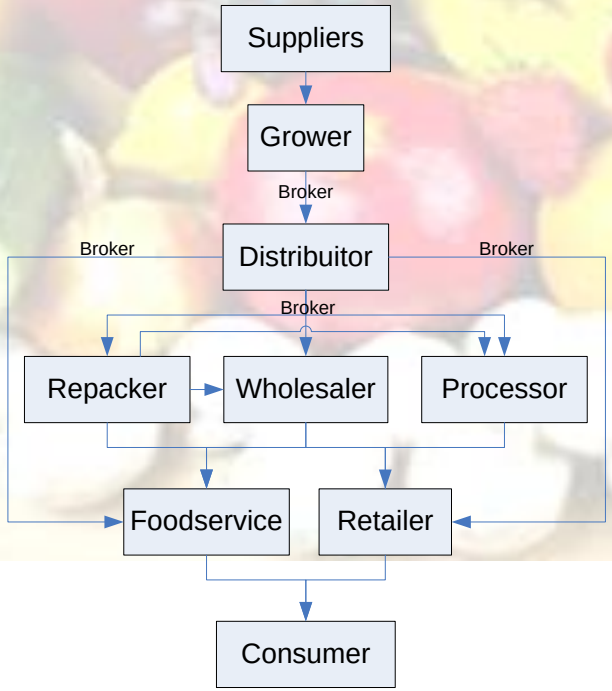
Opportunities:

- Logistics (~18%)
- Distribution (~15%)

*** In billions of dollars**
*** McLaughlin et. al., FreshTrack 1997,1998,1999, 2001; Cook, 2003, 2010**

Fresh Supply Chain characteristics

- Long cycle times, perishability, high variability and other special conditions (temperature controlled, compatibility, marketing practices) make the fresh supply chain very complex→ up to 50% of the product is lost when the product reaches the consumer



- There are many players in the fresh produce SC
- This increases costs and lead time, and reduces flexibility
- The grower has narrow profit margins even though the complete chain does not

Benefits Sought and Specific Goals

1. Better returns for growers,
2. greater availability of affordable, nutritious food for consumers, and
3. Reduction of food waste throughout the SC.

Goals of the FFAR Project:

1. Increase the value chain margin captured by the farmer from the current 20% to at least 30%, by directly shipping products closer to final demand points.
2. Increase direct sales from farms of Arizona and New Mexico.

Overall Objectives of the FFAR project

1. Provide small growers with market intelligence and planning tools to reach the optimal markets at the right time with the right product and the least waste;
2. Develop automated logistics coordination/negotiation tools that allow small growers to efficiently reach the final consumer; and
3. Create a research, development and deployment roadmap for the efficient participation of micro and small growers in emerging markets such as direct-to-consumer produce channels led by Amazon Fresh, Instacart or Walmart Grocery, among others.

Vision

Catalyze the emergence of efficient, rapid-response supply chains based on the efficient utilization of market intelligence, information technology, negotiation, coordination and planning tools encapsulated in an integrated decision environment.

This will:

- Help small growers capture higher margins of the fresh produce value chain
- Reduce food waste at different supply chain echelons

Strategy

1. Exploit current and future ubiquitous information conditions and advances in decision systems and computing capabilities
2. Create automated integrated decision platforms that will assist in the formation of virtual supply partnerships to fulfill market opportunities with minimal food waste.
3. Provide information transparency to the market
4. Provide a more leveled field to small farmers to compete in the new market conditions

Vision of the Environment Implementation

The envisioned environment will:

- Continuously get relevant data from available sources of data and information
- Identify current and future market opportunities
- Provide a platform that serves as a fresh food information-clearing house
- Give growers and their logistics agents access to the same supply chain information
- Enable efficient grower-to-market transactions

Project Segmentation

Three main focus areas for development:

1. Origin (supply) logistics
   - Automated decision support tools that allow growers (individually or as a group) to efficiently address market demand signals
2. Destination (demand)Logistics
   - Distribution planning tools that satisfy identified market demand, while also reducing waste
3. ESCAP = Efficient Supply Chain Coordination Platform
   - Market Intelligence, Opportunity Discovery/Assignment, Planning and Coordination Platform
   - Development of storage, articulation, communication and opportunity matching algorithms and protocols

Objectives and Expected Outcomes

Objective #1:

Implement a scalable, connected, multi-module decision system platform in which market intelligence and supply chain planning tools will be hosted, enabled, and deployed

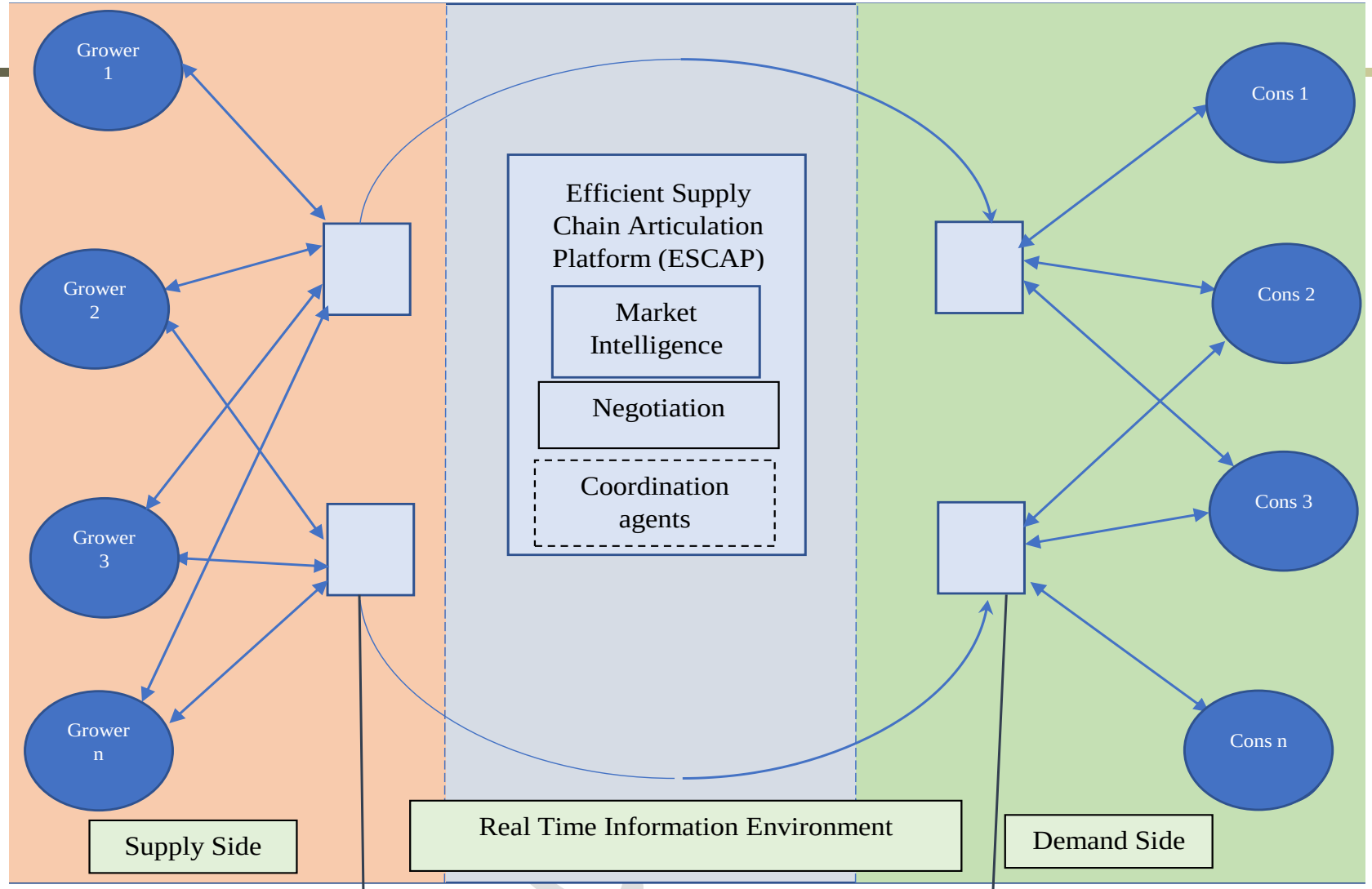
Objective #2:

Explore and construct automated logistics monitoring and coordination tools

Objective #3:

Create a research, development, and deployment roadmap for incentivizing micro and small grower participation in emerging high-value markets (including direct-to-consumer produce channels led by Amazon Fresh, Instacart or Walmart Grocery, etc.)

Structure of envisioned environment



Strategy for development of decision support environment

1. Application and adaptation of previously developed models to current situation of four weather complementary regions of New Mexico and Arizona
   - Identify current conditions (crops, weather, logistics infrastructure, etc.)
   - Identify additional growers and other SC stakeholders
   - Identify most attractive markets and products
   - Run and validate models
   - Assess potential benefits
   - Present benefits to farmers and other SC stakeholders
2. Develop initial central platform with limited functionality
   - Identify data relevant to growers and other SC stakeholders
   - Develop the front/back end of platform
   - Test and make it available to reduced group of people
   - Make it available to the general public as a prototype
3. Develop a beta prototype of the central platform
4. Develop a beta prototype of the supply side platform
5. Develop general design of the demand side platform

Chronology of main products

1. Targeted regions and (farmers and SC) partners identification (< 2 months)
2. Assessment of supply logistics and infrastructure for identified regions (6 months)
3. Assessment of current and projected demand logistics (6 months)
4. Initial data dictionaries of market and logistics data streams (6 months)
5. Initial platform for market and logistics data (12-16 months)
6. Open access agronomic-potential module (12 months)
7. Open access planting and planning module (12 – 16 months)
8. Initial market intelligence and analytics module (18 months)
9. Develop a beta prototype of the supply side platform (24 months)
10. Initial market negotiation platform (24- 26 months)
11. Develop general design of the demand side platform (30 months)
12. Prototype of integrated platform (24 – 32 months)
13. Final research roadmap for vision implementation (30 months)
14. Final Report 36 months (from 2/2019)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Other activities

- Development of general perishability models
- Characterization of cold supply chain
- Traceability systems