Food Miles
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>3</td>
</tr>
<tr>
<td>Community Background</td>
<td>3</td>
</tr>
<tr>
<td>Consumer Background</td>
<td>4</td>
</tr>
<tr>
<td>Competition &amp; Alternatives</td>
<td>4</td>
</tr>
<tr>
<td>Target Markets</td>
<td>4</td>
</tr>
<tr>
<td>Environment Analysis</td>
<td>5</td>
</tr>
<tr>
<td>Industry Background</td>
<td>5</td>
</tr>
<tr>
<td>Mark-Up of Price</td>
<td>5</td>
</tr>
<tr>
<td>Assumptions &amp; Risks</td>
<td>5</td>
</tr>
<tr>
<td>Business Description</td>
<td>6</td>
</tr>
<tr>
<td>Cooperative Structure</td>
<td>6</td>
</tr>
<tr>
<td>Relationship with Farmers</td>
<td>6</td>
</tr>
<tr>
<td>Operations Plan</td>
<td>7</td>
</tr>
<tr>
<td>Marketing Plan</td>
<td>7</td>
</tr>
<tr>
<td>Implementation &amp; Expansion</td>
<td>8</td>
</tr>
<tr>
<td>Pilot Program: 2 Months</td>
<td>8</td>
</tr>
<tr>
<td>Expansion Within New Delhi</td>
<td>8</td>
</tr>
<tr>
<td>Expansion Beyond New Delhi</td>
<td>8</td>
</tr>
<tr>
<td>Financial Plan</td>
<td>8</td>
</tr>
<tr>
<td>Start-up Costs</td>
<td>8</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>9</td>
</tr>
<tr>
<td>Social Impact</td>
<td>9</td>
</tr>
<tr>
<td>Appendix A: People</td>
<td>10</td>
</tr>
<tr>
<td>TERI University – New Delhi</td>
<td>10</td>
</tr>
<tr>
<td>University of Minnesota – Minneapolis</td>
<td>10</td>
</tr>
<tr>
<td>Mentors</td>
<td>10</td>
</tr>
<tr>
<td>Appendix B: References</td>
<td>11</td>
</tr>
<tr>
<td>Works Consulted</td>
<td>11</td>
</tr>
<tr>
<td>Appendix C: Financial Plan</td>
<td>12</td>
</tr>
<tr>
<td>Appendix D: Survey Results</td>
<td>14</td>
</tr>
<tr>
<td>Appendix E: Maps &amp; Miscellaneous Information</td>
<td>15</td>
</tr>
</tbody>
</table>
Executive Summary

A growing problem in New Delhi and the rest of India is the price of vegetables. The price of produce at the market is anywhere from four times to ten times the price the farmer receives, and the price can fluctuate rapidly, sometimes doubling over a period of days.\textsuperscript{[1,2,3]} Food Miles, a collaboration between students at TERI University in New Delhi and at the University of Minnesota in Minneapolis, is a business that will mitigate the effects on the wallets of New Delhi consumers and increase the income of farmers in the region.

Food Miles is a service that buys produce from farmers on the Yamuna River floodplain. The high quality, affordable produce will be conveniently delivered to consumers’ homes. Food Miles is a cooperative business. The farmers are part owners; they have a say in how the business is run and how profits are distributed. This ensures buy-in from the farmers and provides them fair compensation for their work and effort.

Food Miles will begin delivering produce on a regular basis to two resident welfare associations (RWAs) near the floodplain where the produce is grown. The members of these associations are busy professionals who have little time to go to the markets or retail stores, and who do not want to spend their hard-earned money on overpriced, low quality vegetables. Food Miles will eliminate both of these concerns.

Community Background

Food Miles’ team members selected the community on the Yamuna River floodplain for the Acala Challenge. The farmers are located on a floodplain in the middle of New Delhi, surrounded by residential and commercial areas. They are mainly sharecroppers or land-lease holders who tend to plots of approximately 5 acres. Most of their family members farm, and few of the children attend school. During monsoon season (July-September), the river often floods, and members of the community may live and seek work elsewhere.

The farmers reported the need for additional income as their main problem in multiple surveys and interviews. A major factor that prevents them from earning more is the price they receive for their produce at markets (mandis).

The farmers run into problems selling their produce in the current system. The vegetables are picked from the field when they are ripe and are transported to the markets within twenty-four hours. The farmers can either sell their produce in person at weekly street markets, or they can sell it to wholesalers at the large mandis. At the street markets, the farmers bear the risk of not selling all their produce, but they can get a slightly higher price for their vegetables. At the mandis, they receive a lower price for their produce, as
low as one tenth of the retail price, but they are able to sell all their vegetables in one transaction.

Farmers receive uncertain, low prices relative to the value of their vegetables and incur high labor and transportation costs in doing so.

Food Miles offers farmer-members a dedicated market for their produce as well as higher prices than they would receive at mandis purchased directly from their fields.

**Consumer Background**

**Competition & Alternatives**

New Delhi residents buy vegetables from large wholesale markets (e.g. Azadpur Mandi), smaller weekly street markets, retail stores, and hawkers. Residents prefer the convenience of retail stores but find that the prices are too high. The markets offer lower prices, but visiting them during operating hours – from 6am until the evening for the few wholesale markets, but only a few hours during that range for weekly street markets - is difficult for residents with busy schedules.

**Target Markets**

Food Miles’ primary customers are members of RWAs within New Delhi. RWAs are civic organizations with voluntary, paid memberships that represent the residents of certain locales. Many RWAs are located in apartment complexes. Food Miles will be targeting RWAs because they have a concentration of involved consumers who actively participate in community welfare.

While street markets and grocery stores are a part of day-to-day life in Delhi, not all residents have the time to visit them. Food Miles offers the aspect of convenience for families where all of the adults are employed, as well as for single residents with jobs and less time to regularly visit markets.

Vegetable consumers in New Delhi value cost, convenience, freshness, and variety in their produce. Rarely does one source offer all of these values.

Food Miles will deliver produce that is fresh, convenient, and affordable directly to its customers.
Environment Analysis

Industry Background

The supply chain for vegetables consumed in New Delhi begins with farmers cultivating the produce by hand in small plots owned or leased from local landholders. New Delhi, a city of over 22 million, procures the majority of its vegetables from outside the city limits. Produce comes from several nearby states and, in some cases, from outside the country.[6]

The produce supply chain has been the subject of much research and debate. Many problems have been attributed to the complicated process (see the adjoining figure).[6] The produce travels from farmers to agents, wholesalers, distributors, retailers, and finally to the consumer. In some cases, produce has exchanged hands eight times before it reaches the consumer.[7]

Mark-Up of Price

Individual farmers have little power to affect the prices they receive at the mandis. For example, a farmer might receive 3 INR/kg when he sells cauliflower to a dealer at the mandi. This price allows for little margin for the farmer to survive and does not compensate him well for his time, risk, and travel. The dealer sells the cauliflower for 5 INR/kg to a retailer, who, after travelling a few miles with the produce, marks the price to 20-25 INR/kg.[7]

The overall mark-up of prices varies based on a large number of factors, including the current supply of that vegetable at the market, the growing season, and the overall quality. There is no pattern to the mark-up; it is all at the retailers’ and vendors’ discretion.[8]

Assumptions & Risks

The biggest assumption is that RWA members will subscribe to the delivery service. That is, will customers value the convenience of delivery over other aspects like self-selecting vegetables or interacting with people at the markets? Food Miles will test this value by offering packages with pre-set selections of vegetables, based on availability. If many customers express a desire to select their own produce, Food Miles may implement an ordering system. Another assumption is that customers will want this service, even though it does not completely replace their need to go to the market.

An important risk to consider is that the farmers on the floodplain may leave for up to three months each year if the Yamuna River is flooded. Food Miles would have to purchase vegetables from other farmers within the region and ensure that the quality of the produce remains the same. This would also add to the transportation costs.
Business Description

Cooperative Structure

India is very familiar with cooperatives. The country’s cooperative movement is the largest in the world. There are both agricultural cooperatives and food delivery services in New Delhi. However, there are no businesses that combine these two aspects. Food Miles will be the first of its kind, delivering vegetables from a cooperative style business.

Food Miles is set-up as a cooperative; the farmers who supply produce to it are part owners. This is key for building farmer trust and ensuring long-term competitiveness. They will have a say in decisions, and farmers will benefit from the cooperatives’ profit sharing: 20% of profit is returned to the farmers, in proportion to how much they sell to Food Miles. The structure of the cooperative is beneficial for Food Miles, the farmers who sell to Food Miles, the Yamuna community, and the employees. As can be seen in Figure 2, the profits will be split among the different parties. The profit-sharing structure not only provides social benefits to the community, but it also incentivizes the farmers to sell to Food Miles and the employees to work towards the good of the business.

Relationship with Farmers

Food Miles must have a solid, trusting relationship with the farmers. The farmers are the foundation of the business and they are trusted to supply the company with the vegetables of the highest quality.

Food Miles wants to ensure the farmers’ continued commitment, which is why they are invited to be members of the cooperative and they will be paid more for their produce than they would receive at markets.
Operations Plan

Procurement
Food Miles will have a buyer present at the farmers’ fields during the day to purchase and pack the produce as it is picked and brought in. Since storage is limited, the vegetables will be packaged and delivered immediately to customers.

Delivery
The delivery people will go to the fields to exchange empty packages for full packages of vegetables. Then they will go directly to the RWAs to deliver the produce. As part of the pilot program, Food Miles will test different drop-off points, for example at each apartment or at a central location, as well as test frequency of delivery: daily, several times per week, and once-weekly delivery patterns.

Relationship with Drivers/Salespeople
The delivery drivers for Food Miles are also the salespeople. Food Miles will contract with the owners of various forms of transportation to deliver the vegetables from the floodplain fields to the RWA customers in New Delhi. The drivers will also receive sales training. Given the variety of transportation forms available and the different factors that affect cost, Food Miles will match the route with the best form of delivery. Given the proximity of RWAs to the floodplain fields and the distance to the wholesale markets, Food Miles has a great advantage in transportation cost over both the farmers and the consumers.

Storage and Sales
One of the unique aspects of Food Miles is that it requires almost no storage. Since the buyer will be at the fields all day, he will be able to pack individual containers. These containers will go directly to the driver and from the driver to the front doors of our consumers. Food Miles will make a point to keep the vegetables fresh through rapid delivery.

Marketing Plan
Pricing Strategy
Food Miles plans to sell vegetables at prices higher than weekly street markets but lower than retail stores. Food Miles will test various pricing strategies, including subscription fees and bulk discounts. Food Miles will also test various strategies for payment: cash, credit cards, pre-payment with varying terms, automatic electronic payments, and mobile bank transfers.
Promotion & Advertising

Food Miles’ promotional strategy will be to send sales people to RWA meetings and to introduce the delivery service at those meetings. In order to solicit new business, Food Miles may offer discounts for new customers.

Food Miles will test conducting the business primarily through the RWA: the officials and residents will advertise our service within the association, collect the names (and possibly the payments) from customers, and then provide them to us during deliveries.

Implementation & Expansion

Pilot Program: 2 Months

Food Miles can start out small and will be easy to scale up in the future. Several farmers on the floodplain have already expressed their support of this proposal, and more than fifty residents of New Delhi have responded favorably to initial surveys.

Food Miles intends to send a member from the University of Minnesota team to India to work with the TERI University students to implement this plan:

1. Form a cooperative with a select group of farmers.
2. Hire and train a buyer and two delivery drivers.
3. Select two RWAs and find and enroll fifty or more residents at each.
4. Determine a delivery schedule for these RWAs based on their locations and desired delivery frequencies (i.e., daily, weekly).
5. Purchase produce from the farmers and deliver to the RWAs.
6. Collect feedback from customers and improve the service.

Expansion Within New Delhi

As Food Miles expands, it will look to serve more customers from the initial RWAs. Next, Food Miles will duplicate its service at other RWAs around New Delhi. As business increases, more floodplain farmers can become members of the cooperative. With more farmers participating, Food Miles can offer a wider variety of vegetables. Food Miles will also be attractive to a variety of other consumers in New Delhi, such as student dormitories, hotels, and restaurants.

Expansion Beyond New Delhi

Eventually the Food Miles delivery service will expand to use the entire output of the floodplain farms. Food Miles will have to consider purchasing produce from other farms around New Delhi, or moving on to other cities in India.

Financial Plan

Start-up Costs

The start-up costs come from the initial legal and advertising costs, and the cost to send two Steering Committee members from the United States to New Delhi, and needed basic materials.
<table>
<thead>
<tr>
<th>Object</th>
<th>Quantity</th>
<th>Price per (USD)</th>
<th>Subtotal (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable scales</td>
<td>3</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td>Containers/boxes</td>
<td>300</td>
<td>3</td>
<td>900</td>
</tr>
<tr>
<td>Office supplies</td>
<td></td>
<td></td>
<td>250</td>
</tr>
<tr>
<td>Airfare, lodging, and stipend for two US committee members</td>
<td>2</td>
<td>3,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Legal costs</td>
<td></td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>Training &amp; Uniforms</td>
<td></td>
<td></td>
<td>1,400</td>
</tr>
<tr>
<td>Advertising</td>
<td></td>
<td></td>
<td>1,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>10,200</td>
</tr>
</tbody>
</table>

### Operating Costs

The majority of Food Miles’ expenses will be the operating costs and costs of goods. The main operating costs will be the salaries for the employees. Currently, the average rickshaw driver earns about 200 INR/day (approximately 4 USD). The driver will also work as the sales representative and distribute Food Miles to consumers. Food Miles will pay the delivery drivers 600 INR/day (12 USD), an increase on the average income, to ensure fair compensation and long-term loyalty.

### Social Impact

On the surface, it appears that Food Miles is only paying farmers more for their produce. However, the social benefits run much deeper. By helping the farmers organize into a cooperative, Food Miles is bringing the community together and allowing them to collaborate. For example, they can more easily work together to share materials, equipment, and the cost of transportation. With the added income from selling their produce to Food Miles, farmers will be able to hire more day laborers; this will allow their children the time to attend school.

The cooperative business structure will also allow the profits to return to the community. Food Miles has decided that 20% of the profits will go back to the farmer-members. 5% will go to the other employees, and 25% will be used for education. It is up to the farmer-members to decide how the education profits are used, either for themselves or for their children. The remaining 50% of profits will be reinvested in the business.

### Conclusion

Food Miles is a cooperative business providing fresh vegetables direct to middle-class consumers and fulfilling a social mission of improving the lives of its farmer members. Food Miles will be successful because the business proposition: 1) aligns with community needs, 2) has the support of community leaders, 3) is a research-supported strategy, and 4) is based on realistic financial assumptions about expenses and revenues.
Appendix A: People

TERI University – New Delhi

Martand Shardul is a Computer Engineer by training and has prior work experience with Franconnect Inc in the franchising domain. He is currently pursuing a master’s degree in Sustainable Development Practice.

Sudatta Patnaik is currently pursuing Masters in Sustainable Development Practice from The Energy and Resources Institute, New Delhi. She holds bachelor degree in Sociology from BJB College, Bhubaneshwar. She has interned with CRY India.

Salomi Nautiyal is a master’s student in Sustainable Development Practice. She obtained her graduate degree in Mechanical and Automation Engineering from Indira Gandhi Institute of Technology.

Chandra Prakash Kamana has a bachelor’s degree in Mechanical Engineering with an emphasis in Green Building Design. He is currently working on a master’s degree in Sustainable Development Practice.

Purna Prasad Chapagai is pursuing a master’s degree in Sustainable Development Practice. He will be graduating in July 2012. He was a bio-chemistry teacher for 6 years in Bhutan. He received Bachelors in Secondary Education (B.Ed.) from Samtse College of Education, Bhutan.

University of Minnesota – Minneapolis

Kristi Anderson is an undergraduate studying Civil Engineering. She will be graduating in the spring of 2013.

Amy Blenker is a master’s student in Urban and Regional Planning, with a concentration in Economic and Workforce Development. She received her bachelor’s degree in American Studies from Carleton College.

K Brook Jacobson is a graduate student studying Environmental Engineering for the Peace Corps Master’s International Program. She received her bachelor’s degree in Chemistry, with a minor in Sustainability Studies, in the spring of 2010 from the University of Minnesota.

Sara Saboonian is a master’s student in Sustainable Design in Architecture. She received her Master of Architecture degree from Art University in Tehran.

Andrew Smith is an undergraduate studying Supply Chain Operations. He is minoring in Applied Economics and Global Studies. He will be graduating in the spring of 2012.

Mentors

Deepti Chatti is presently working as a Research associate in Water Resources Policy and Management department of TERI. She received her Master’s in Environmental Engineering from Stanford University and a Bachelor’s in Civil Engineering from Osmania University.

Judd Eder first participated in the Acara Challenge in 2010 as a member of the BioServ project. He received a BS in Chemical Engineering from Iowa State University and a MBA from the Carlson School of Management.
Appendix B: References


Works Consulted

“Agricultural Cooperatives” http://agriculture.indiabizclub.com/info/agriculture_cooperatives


## Appendix C: Financial Plan

### Market Estimates

<table>
<thead>
<tr>
<th>INR/Month</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Communities</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Average People per Community</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>% Participation</td>
<td>5%</td>
<td>8%</td>
<td>12%</td>
<td>8%</td>
<td>12%</td>
<td>10%</td>
<td>12%</td>
<td>14%</td>
<td>16%</td>
<td>18%</td>
<td>19%</td>
</tr>
<tr>
<td>Total Participation</td>
<td>100</td>
<td>160</td>
<td>240</td>
<td>320</td>
<td>480</td>
<td>600</td>
<td>720</td>
<td>840</td>
<td>960</td>
<td>1080</td>
<td>1140</td>
</tr>
</tbody>
</table>

### Income INR

<table>
<thead>
<tr>
<th></th>
<th>Kg per subscriber/delivery</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg Deliverys/month</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Avg Consumer Price/kg</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total Income INR</td>
<td>24000</td>
<td>38400</td>
<td>86400</td>
<td>115200</td>
<td>230400</td>
<td>288000</td>
<td>345600</td>
<td>403200</td>
<td>460800</td>
<td>518400</td>
<td>547200</td>
</tr>
</tbody>
</table>

### Expenses INR

<table>
<thead>
<tr>
<th></th>
<th>Avg Supplier Price/kg</th>
<th>6</th>
<th>6</th>
<th>6</th>
<th>6</th>
<th>6</th>
<th>6</th>
<th>6</th>
<th>6</th>
<th>8</th>
<th>8</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Veg Expense</td>
<td>4800</td>
<td>7680</td>
<td>17280</td>
<td>23040</td>
<td>46080</td>
<td>57600</td>
<td>69120</td>
<td>80640</td>
<td>122880</td>
<td>138240</td>
<td>145920</td>
<td></td>
</tr>
<tr>
<td>Buyer Wages</td>
<td>20,000</td>
<td>25,000</td>
<td>30000</td>
<td>30000</td>
<td>30000</td>
<td>30000</td>
<td>30000</td>
<td>30000</td>
<td>30000</td>
<td>30000</td>
<td>30000</td>
<td></td>
</tr>
<tr>
<td>Delivery Man Wages</td>
<td>12000</td>
<td>12000</td>
<td>12000</td>
<td>12000</td>
<td>12000</td>
<td>18000</td>
<td>18000</td>
<td>18000</td>
<td>18000</td>
<td>18000</td>
<td>18000</td>
<td></td>
</tr>
<tr>
<td>Packaging Materials</td>
<td>800</td>
<td>1280</td>
<td>2880</td>
<td>3840</td>
<td>7680</td>
<td>9600</td>
<td>11520</td>
<td>13440</td>
<td>15360</td>
<td>17280</td>
<td>18240</td>
<td></td>
</tr>
<tr>
<td>Start-up Incentives</td>
<td>3000</td>
<td>1800</td>
<td>2400</td>
<td>2400</td>
<td>4800</td>
<td>3600</td>
<td>3600</td>
<td>3600</td>
<td>3600</td>
<td>3600</td>
<td>1800</td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td></td>
</tr>
<tr>
<td>Total Variable Expenses INR</td>
<td>47,600</td>
<td>54,760</td>
<td>71,560</td>
<td>78,280</td>
<td>108,060</td>
<td>126,300</td>
<td>140,240</td>
<td>153,680</td>
<td>197,840</td>
<td>215,120</td>
<td>215,960</td>
<td></td>
</tr>
</tbody>
</table>

### Operating Income INR

-23600 -16360 14840 36920 122340 161700 205360 249520 262960 303280 331240

### Operating Income USD

-472 -327.2 296.8 738.4 2446.8 3234 4107.2 4990.4 5259.2 6065.6 6624.8

### Start-up Expenses USD

10200

### Overall Cashflow USD

-10672 -10999.2 -10702.4 -9964 -7517.2 -4283.2 -176 4814.4 10073.6 16139.2 22764
Appendix D: Survey Results

Number of respondents: 55

Occupations:
- Student - 22
- Business / Service - 17
- Housewife - 12
- No response - 4

Where do respondents purchase vegetables? (May select multiple)
- Weekly street markets - 22
- Wholesale markets - 7
- Retail stores - 24
- Hawkers/vendors - 18
- No response - 5

How often do respondents purchase vegetables?
- Once a week - 21
- 2-3 times per week - 24
- Every day - 2
- Never / other / no response - 8

Are respondents satisfied with the quality of vegetables they purchase?
- Yes - 21
- Most of the time - 7
- Some times - 18
- No - 15
- No response - 3

Would respondents want a home delivery service for vegetables?
- Yes - 48
- No - 5
- No response - 2

Would respondents pay extra for a home delivery service?
- Yes - 43
- No - 8
- No response - 4

How much would respondents be willing to pay for a home delivery service?
- Average of 65 INR over 28 responses
Appendix E: Maps & Miscellaneous Information

The line from the farming community to the Azadpur Mandi is approximately 16.5 km, and the line from the community to Gazipur Mandi is approximately 4.5 km.

The area of the floodplain farms is approximately 6 km².