Innovative Public–Private and Philanthropy Partnership for Local Food Supply-Chain Infrastructure: Countryside Initiative of Cuyahoga Valley U.S. National Park

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Abstract--**In the post-modernist discourse of management of agro-food technology and urban infrastructure planning, unprecedented climate change and sustainability are setting the context for producing and supplying quality local food in highly densely populated urban and suburban regions. There is a seismic shift needed for innovative public and private partnerships governing green infrastructure for local food production.**

This empirical multi-disciplinary case study uses business model innovation theory and green suburban infrastructure framework to examine the Countryside Conservancy Initiative start-up by Cuyahoga Valley National Park (CVNP) for managing urban farming technology and local food production and supply chain. After considering some alternate theoretical frameworks, we use a case study methodology. It is noted that despite various centralized attempts by federal and state governments to stop the decline of agriculture within CVNP, most historic food producing farms in existence since 1800s slipped into disrepair and disuse. The Countryside Initiative of CVNP was established in 1999 with an innovative 3P (public-private-philanthropic) partnership between public sector CVNP, private farms, and a not-for-profit Cuyahoga Valley Countryside Conservancy (CV-CC).

This 3P partnership involved incentivizing 60-year long-term discounted leases for 13 agricultural farm lands, farm residences, and outbuildings to adopt and diffuse technological innovations for culturally intensive fruit and vegetable production, small intensive grazing operations, and small integrated crop-livestock production. Certified organic food production was encouraged, though not mandated.In this study, selection, growth and impact of family farm enterprises in the green suburban infrastructure in NEO region are investigated in the context of a business model innovation for family farmers. Strategic opportunities and challenges are proposed and discussed. Conclusions are left open for future discussion.

I. INTRODUCTION

A. Evolving Challenges in Managing Agro-Food Technology

Effective and efficient management of food and agricultural technology has often been one of mankind's greatest challenges. In the 20th and 21st centuries, an accelerating and persistent population growth and speeding climate change have amplified this techno-managerial challenge. Prior to the World War II, food production was primarily local or regional. Foods including milk and meat were mostly produced on small nearby farms and dairies in harmony with nature. This was dramatically changed after World War II, when a series of technological innovations in farm equipment technology, inorganic pesticide and insecticide technologies, genetic modification of seeds, and other agricultural inputs such as refrigeration and transportation unleashed the Green Revolution. Agricultural yields doubled, and it was estimated in 1970 that from 1945 to 1970 more than one billion people were saved from starvation [2]. But, this also resulted in industrial corporate agriculture and global food supply chains with a highly mechanistic assembly like semi-automated industrial technology system.

Over time, standardized mono-cultures and industrial agriculture technologies innovated in the industrialized West were adopted and diffused all around the world. Today apples we eat in the US may come from China, blueberries from New Zealand, asparagus from Peru, and soybeans from Brazil. A food logistics and sourcing study by the Leopold Center for Sustainable Agriculture at Iowa State University discovered that 16 fruits and vegetables consumed in Iowa traveled more than 25,000 miles from farm to fork. The same vegetables and fruits grown locally traveled 716 food miles [2].

The potential problems with globalization of food production and supply chain was brought to the world's attention by E.F. Schumacher in his 1973 book ***Small is Beautiful***. Schumacher proposed that appropriate intermediate technology rather than high-technology intensive agriculture was better suited for sustainable growth and production of food in most parts of the world. This was later combined with Robert Rodale's work at the Rodale Institute to promote soil regenerating agriculture and back-to-the-land small scale organic farmers [2]. Initially, many small organic farmers had a hard time selling the food they produced to local consumers, and these farmers were forced to can their food a lot.

Consumer attitudes changed dramatically in the 1980s. In 1986, McDonald's corporation announced plans to build a standard modular fast-food restaurant in Rome's Piazza Spagna. This 'economic and food invasion' outraged an Italian named Carlo Petrini who was passionate about Italy's long tradition of local food production and consumption. He organized the 'Slow Food Movement' in Italy. In his book, ***In Praise of Slowness***, Petrini shared that "We are fighting for the right to determine our tempos." Thousands of consumers joined Petrini, and **Slow Food International** was formed in 1989 in Paris to promote and celebrate local culinary and food diversity. In the 1990s, the innovation of local food production and supply chain was promoted further through the Community Supported Agricultural (CSA) collaborations, whereby consumers pre-purchase a share in the local farmer's upcoming crop of fruits, vegetables, meat

or flowers. Innovative development of a green suburban infrastructure has boosted the rebirth of local food supply chain into a significant breakthrough. Goal of this case study is to explore this innovative techno-managerial approach through the case study of a collaborative initiative in the Cuyahoga Valley National Park in Northeast Ohio of US.

II. THEORETICAL BACKGROUND

A. Supply-Side Alternatives

Recently, environmental and social issues related to quality, safety, and logistics of food produced by the conventional industrial agriculture technologies have become of increasing public concern [8]. The U.S. agro-food supply chain operates through sourcing from: industrial, organic, or local food networks. Researchers have classified these food supply networks based on two dimensions: whether a food is generic or dedicated, and whether a food is standardized or specialized [19]. Thus Coca-Cola was classified as an industrial food product that is generic and standardized. Genetic modified corn, on the other hand, was classified as intellectual food product that is generic but specialized. Organic milk was classified as a market food product that is dedicated and standardized, whereas specialty fresh-baked bread was classified as interpersonal food product that is dedicated and specialized.

Each of these food types may fit differently with either the conventional industrial food hierarchically-integrated system or the alternative sustainable decentralized food network system. The former is driven by efficiency, productivity, price, and profit maximization. The latter is driven by fairness, equity, sustainability, and welfare. Various stakeholders and decision making entities and partners in green suburban infrastructure must consider these theoretical categories in order to select their practices, routines, and policies. For example, sourcing the organic spring lettuces from California has relied on alternative sustainable decentralized food network system [17].

B. Demand Chain Alternatives

In terms of demand chain management, many researchers have noted that consumers prefer locally produced food over nationally or globally produced food [18]. The Hartman Group, based in Bellevue, Washington, surveyed a large number of food consumers and noted that approx. 50% food consumers consider 'local' as food made or produced within 100 miles, and 37% food consumers consider' local' as made or produced within their state [9].

U.S. farmers can market and distribute their food produce to consumers in a variety of ways: (1) farmers' markets, (2) farmers' cooperatives, or (3) community supported agriculture (CSA), and more. Farmers can showcase and sell their food products directly to potential consumers on designated days at designated farmers' market places in many U.S. cities and towns [3]. The food stalls may be set up indoors or outdoors. This helps develop a loyal customer base while improving food quality and reducing warehousing and transportation/logistics costs. The U.S. Department of Agriculture (USDA) maintains a listing of many farmers' markets in different towns and cities in the U.S.

Many farmers' markets may or may not be supported by a farmers' cooperative. The U.S. has a long tradition of agricultural cooperatives, dating back to the 1800s [25]. These cooperatives help farmers to network, share information and resources; leverage their combined bargaining powers as well as their finance borrowing power. In the U.S., farmers' markets are often incorporated under state law as a unique business entity. Farmers' cooperatives receive support from the U.S. Department Agriculture [24]. Thousands of U.S. cooperatives have millions of members, with net income in billions.

The community supported agriculture (CSA) is a relatively new innovation in the U.S. food supply chain. USDA describes CSA as a community of individual consumers who pledge financial support to a suburban farm operation, and share the risks and benefits of the local food production along with the farmer-entrepreneur. Whereas there are many different business models, but typically CSA farmers develop a budget during the winter for the upcoming year, divide the total cost into certain number of shares, and then solicit potential consumers to pledge their financial support. The members may pay their financial pledges at the start of the season or in installments. In return the CSA farmer periodically provides members a portion of the food produce through the summer and fall season. This model relies on trust and face-to-face familiarity. And, the goal is to progress towards a just, equitable, and local food system [14].

These agro-managerial innovations in food production technologies were available to urban farmers and approx. 4 million food consumers in the Cleveland-Akron-Canton community of the Northeast Ohio (NEO) in Mid-Western U.S.

III. METHODOLOGY

We use a case study methodology to examine the techno-management of a highly innovative public-private-philanthropy partnership developing green suburban infrastructure for local food production and supply chain.

A. Case Study: Decision Dilemma of an Agro-tech Manager

In the late 1960s, Cuyahoga Valley-National Park (CV-NP) was created as one of five national urban parks under the ***Parks to People*** initiative [7]. The goal was to develop a green suburban infrastructure, and protect lands from fast encroachment by large-scale agriculture business, so that common people can visit these pristine natural spaces during the day, get rejuvenated by nature, and go home after sunset. In 1974, approx. 33,000 acres were authorized by the U.S. Congress to CV-NP (See Figure-1). This land was sandwiched between Cleveland in the north and Akron in the south, with a population of 4 million within 1 hour drive [12].

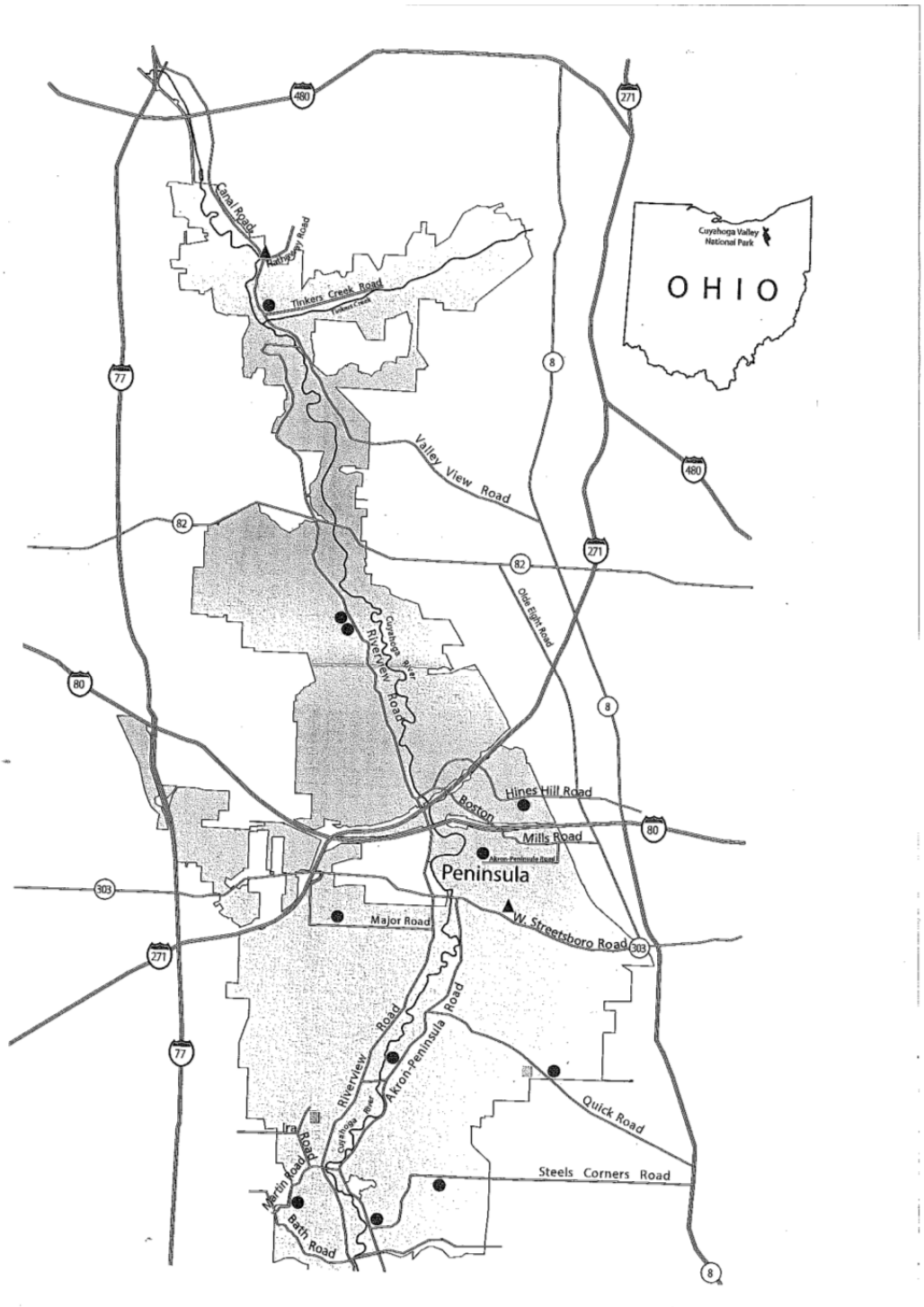

FIGURE – 1: Location of Countryside Initiative of Cuyahoga Valley U.S. National Park

The U.S. Congress allocated more than $200 million to buy land, restore historic structures, and promote healthy activities for the public residing in the 8-county region, and visiting from distances beyond these. It has many historic structures including the boating locks for the **Ohio & Erie Canal**, and the **Cuyahoga Valley Scenic Railway**.

CV-NP Superintendent John P. Debo Jr. started wondering if there was an innovative farming business model to revive and repopulate CV-NP with economically sustainable and thriving farms that would produce healthy organic food locally.

B. Innovating Farming Business Model

Debo asked his assistant **Darwin Kelsey** to research the population of small farms over the past 30 years. They noted that small scale farming had been fast dwindling in Ohio [21]. Between 1950 and 1999, close to 7 million acres of farmland in the state of Ohio had been lost. This was equivalent to about 25% of Ohio's total land [16]. Ohio was the leading 2nd largest state in the United States converting agricultural land into development land. On the other hand, Ohio was trailing 31st in the country in terms of population growth. Such intense loss of farmland reduces air quality and destroys watershed and wildlife protecting habitats in the green infrastructure.

To explore this, Debo took a study trip to England, and discovered that their national parks constituted almost 10% of the nation's landscape. And, they often carried out agriculture within their national parks. On returning to the United States, Debo discussed his observations with associate **Kelsey**, and together they decided that they could leverage a slow but steadily growing interest in the U.S. for organic farming and sustainable agriculture, and innovate urban farming that matches the high standards of sustainability and conservancy of the **National park Service (NPS)**.

Cuyahoga Valley National Park (CV-NP), established in 1974, was chartered per its enabling legislation "for preserving and protecting for public use and enjoyment, the historic, scenic, natural and recreational values of the Cuyahoga River and adjacent lands in the Cuyahoga Valley" [7] This included the rural countryside and the valley's green agricultural infrastructure in the NEO region. Despite various attempts to stop the decline of agriculture within CVNP, most food producing farms, in existence since 1800s, slipped into disrepair and disuse.

IV. RESULT

A. Public – Private – Philanthropy (3P) Partnership For Innovating Green Suburban Infrastructure for Local Food Supply

After extensive market research and a survey of similar attempts to develop green infrastructure in other parts of the U.S., Kelsey proposed a farming business model innovation. This innovative technology management model was to create a public-private-philanthropy (3P) partnership enterprise within a national park. This 3P partnership was to be modeled after the prior successful partnership between the CV-NP and the Cuyahoga Valley Scenic Railroad (CVSR). The innovative new 3P partnership was between the National Park Service as the public partner, small sustainable farmer entrepreneurs as the private partner, and a not-for-profit 501(C) 3 organization as the philanthropic partner.

The role of this philanthropic partner was to do the 'eHarmony' like match-making between the National Park Service's high sustainability standards and conservancy requirements, and the entrepreneurial zeal and innovativeness of the aspiring private farmers. In 1999, marking 25 year anniversary of CV-NP, the **Cuyahoga Valley Countryside Conservancy (CV-CC)** was established as a separate non-profit enterprise with entrepreneurial freedom. The CV-CC was restricted from getting other external sources of funding [5].

B. Vision of CV-CC

The vision of CV-CC was as follows:

"…to fill Northeast Ohio with thriving farming and food entrepreneurs, where farms are viable businesses, farmland is a treasured resource, and local food is commonplace" [5].

CV-CC had four interrelated programs: (a) preservation and conservancy of farmland, (b) creating a new generation of innovative sustainable farmer entrepreneurs, (c) building local food supply system, and (d) creating a community of socially responsible and sustainable citizens in Northeast Ohio.

A Center for Farmland Preservation had been established in 1998 with a $50,000 start-up grant from Gund Foundation of Cleveland to the Western Reserve Resource Conservation and Development Council). It was located in the Cuyahoga Valley. This was merged with CV-CC. See Table – 1 for a chronology of key strategic milestones.

TABLE – 1. CHRONOLOGY OF KEY MILESTONES FOR A FOOD BUSINESS MODEL INNOVATOR

YEAR	STRATEGIC MILESTONE
1999	Cuyahoga Valley Countryside Conservancy established as a 501(C)3 enterprise.
2001	First 3 Historic farms restored and leased.
2001	National Park Service imposed new requirements for environmental impact.
2004	Farmers Markets started.
2005	Second Round of Requests announced; Center for Farmland Preservation merged with CV-CC.
2006	Added Farmland Protection and Educational Programs.
2009	11 restored farms operating sustainable farming.
2014	Seventh Round announcement for 2 more historic farms in preparation.

TABLE – 2. REQUEST FOR PROPOSALS OFFERS AND ACTUAL AWARDS

Round Of Offer	Year	Farms Offered	Farmers Awarded	Farmers Left
I	2001	5	3	0
II	2005	4	2	0
III	2006	2	2	0
IV	2008	3	3	0
V	2009	1	0	0
VI	2011	2	1	1
VII	2014*	2	*	*

Note: * implies future announcement.

Countryside Farm Initiative (CFI) was the core program of CV-CC to rehabilitate the historic farms in CV-NP, and lease these to innovative sustainable farm entrepreneurs. This was to preserve an oasis of historic American family farm life in the middle of rampant industrialization in Northeast Ohio at the core of America's rust-belt. CFI offered hands-on guidance to rehabilitate the selected historic farms, and then not only recruit, select, and lease the best suited family farmers, but also to guide and educate them in managing and running sustainable farming operations on their family farms, wineries, or other sustainable agriculture or gardening related activities.Consulting and training was to be provided to beginner farm entrepreneurs. Access to legal services and other business expertise was offered.

Initially, 85 historic parks were identified within CV-NP. After a preliminary feasibility study of these, 33 of these historic farms were found fit to be salvaged. On a detailed structural study of each of these historic farms, this number was reduced to 14. The plan was to restore and lease these farms in the first phase, and then later develop alternate sustainable uses of the remaining historic farms.

In 1999, the first Request for Proposals (RFP) for sustainable farm leases was announced with an offer to long-term lease 5 family farms for 60 years each [6]. There was widespread interest, and 66 applications were received. Out of these 3 applicants were awarded in 2001. Table–2 shows the RFPs announced for farms to be leased, farms actually awarded, and the farmers left over the subsequent 12 years.

C. Shifting Environmental Regulation

In 2001, the NPS adopted and imposed an altogether new set of standards for environmental protections. CV-CC was forced to redo an extensive and expensive study of environmental impact costing close to $250,000. For four years, leasing of new farms had to be suspended. In 2005, CVCC successfully received the legal approvals needed to resume leasing of historic farms. In 2011, there were 11 historic farms restored and leased to innovative private family framers. In the summer of 2011, RFP was announced to offer 2 more farms. Only one applicant was awarded. Subsequently one farm entrepreneur vacated for personal reasons.

D. Innovative Farm Entrepreneurs

Farming is a tough and demanding entrepreneurial business. It is not only physically challenging, but it can also be emotionally and mentally demanding. Farm entrepreneurs must persist their hard work for a long time before becoming profitable.

The CV-CC farms are leased for 60 years at fair market value rent. Rents of CV-CC farms are based on (A) rental value of agricultural land and buildings, and (B) the rental value of a residence.

To facilitate the farm entrepreneurs, the rental value of the productive land and agricultural component of a farm was benchmarked at 10% of gross farm income. This was reduced by 1% for certified organic producers to 9%. Assuming a slow growth curve, taking 5-10 years to achieve optimum production level, a farm entrepreneur's productive rent component was discounted for the first 10 years. It started at 5% (4.5% for certified organic producers) in the first year, increasing by 0.5% per year for the next 9 years, reaching 10% in year-10. For the rental value of the residences on the leased farms, the raw appraisal was reduced by 50%. It was adjusted annually according to the Consumer Price Index.

Farm entrepreneurs are expected to be full-time residents of the primary farm residence, and are expected to farm their lands actively. Secondary residences on the farm may be used for staff members, interns, or other pre-approved activities.

Aspiring CV-CC farmers were expected to prepare their detailed proposals in response to the RFP announcement [6] and its requirements listed below:

1. The farmer entrepreneur must demonstrate extensive knowledge or experience of farming or business management.
2. The farmer entrepreneur must propose appropriate food production best suited to the selected site. Certified organic food production was preferred but not mandated.
3. Suggest realistic developmental timetable while meet the guidelines for maintaining the historic integrity of the land.
4. The farmer entrepreneur must have the needed financial and human resources.
5. The farmer entrepreneur must carry out farming and other activities in a sustainable manner in conformance with the National Park standards.

6. The farmer entrepreneur promises to protect and respect the historic, natural, archeological, and cultural resources of the leased farm.
7. The farmer entrepreneur must invite and encourage the public and visitors of the National Park to experience their farm property.
8. The farmer entrepreneur must align its efforts with the vision, mission, and goals of Cuyahoga Valley Countryside Conservancy (CV-CC).
9. The farmer entrepreneurs must have clear plans for marketing their produce and services.

The farm entrepreneurs were expected to market their goods by offering a wide range of alternate channels such as community supported agriculture, road-side stands, pick-your-own option, CV-CC Farmers' Markets. They could also offer direct sales to restaurants and individuals. Being located in a National Park, the farm entrepreneurs were expected to offer recreational or educational opportunities to the visitors.

Table – 3 provides the names of farm enterprises selected in each round of RFPs. Given below are selected illustrative examples.

1. Grazeland (Historic Schmidt-Foster Farm)

This farm located at the center of CV-NP in **Boston Heights** was the beachhead on which the prolific CV-CC business model innovation and the green suburban infrastructure of NEO grew. Starting from the beginning of the Countryside Farm Initiative (CFI), this farm was restored and managed by CV-CC director **Darwin Kelsey and his wife Chris**. Darwin and Kelsey use Graceland to experiment and illustrate innovative solutions to the challenges that other farm entrepreneurs associated with CV-CC face. Organic goat meat is raised for regional ethnic markets. They have innovated use of new fencing and shelter materials and designs for farm animals and livestock management. They are experimenting with new wetland and riparian buffers.

2. Sarah's Vineyard (Historic Parry Farm)

Mike Lytz was a school teacher for 30 years [13]. He, his parents, and his grandparents from Old Country in Europe enjoyed making wine at home for family and friends. Mike's wife Margaret loved arts, and displaying arts. When they lost their young daughter Sarah in an auto accident, they dreamed of starting Sarah's Vineyard in her name. When the 1999 RFP was announced, Mike worked passionately to prepare a 100 page long proposal. His proposal was selected as one of the first 3 historic farmlands leased in 2001.

Sarah's Vineyard grows 9 grape varieties, and makes 9 types of wines and wine-blends. Mike makes wine, whereas Margaret keeps books and gives art classes at the winery during the winter months. They host an annual Summer Solstice Wine, Art & Blues Festival. This features 8 other regional wineries beside them. More than 5,000 visitors attend. Their success has been beyond their wildest imagination. Sarah's Vineyard is packed on most days in summer, and most weekends in winter. Recently, they added live music concerts with no cover change. This has become a popular meeting place for many residents of the NEO community. Currently, they are waiting for building approval from CV-CC to add an extension pavilion. Mike and Margaret give much credit for their success to the innovative business model of CV-CC, and the hands on support they receive regularly from Director Darwin Kelsey and his staff associates.

3. Goatfeathers Point Farm (Historic Point Farm)

This is a small but innovative organic livestock operation managed by Terry and Cindy Smith in Boston Township [6]. They were selected according to 2005 RFP round. More than 100 meat goats for ethnic markets and "heritage" turkeys for celebrating Thanksgiving were produced in 2008. This has grown significantly each year since them. They market through Countryside Farmers' Market and direct selling.

TABLE – 3. SELECTED FARM ENTERPRENEUS IN MULTIPLE ROUNDS OF OFFERS

Round Of Offer	Year Farm	Historic	Entrepreneur Selected
I	2001	Schmidt-Foster	Grazeland
		Parry Farm	Sarah's Vineyard
		Vaughn Farm	Spring Hill Farm & Market
II	2005	Duffy Farm	Basket of Life Farm
		Point Farm	Goatfeathers Point Farm
		Welton Farm	Greenfield Berry Farm
III	2006	Grether Farm	Neitenbach Farm
		Garvey Farm	Spicy Lamb Farm
IV	2008	Leyser Farm	Kossuth Farm
		Martin Farm	Brunty Farm
		Gleeson Farm	Canal Corners Farm & Market
V	2009	Vacated 1 Farm	

4. Greenfield Berry Farm (Welton Farm)

Based in Boston Township, environmentalist Daniel and his wife Michele Greenfield have developed a pick-your-own berry farm [6]. In addition to growing some fruits and vegetables, these farm entrepreneurs have planted many acres of blueberries, strawberries, and raspberries. They also produce hickory bark syrup and oat bite snack food with walnuts and honey. Daniel also aspires to hold classes on environmentalism from the nearby education institutes in the region.

E. CV-CC Farmers' Markets

In 2005, after completing the Environmental Impact Study mandated by NPS, three Countryside Farmers' Markets were started on public lands in 2006. The three Farmers' Markets created a community space where all the diverse stakeholders can interact [11]. The entrepreneurial farmers and their families participating in CV-CC trade goods and services directly with consumers and community members, at specific sites on public government-owned lands owned by public-sector CV-NP, and managed by CV-CC non-profit enterprise.

The first CV-CC Farmers' Market was located within the park on a privately owned farm, and it was operated on weekends only [6]. In 5 years, the number of vendors and the number of consumers expanded so dramatically that it had to be moved to a larger space in Howe Meadow, Peninsula in CV-NP. The second CV-CC Farmers' Market was started in the Highland Square neighborhood of West Akron. It operates on some specified weekdays during summer months. The third CV-CC Farmers' Market was operated in Old Trail School located in CV-NP, with curriculum emphasizing sustainability. This operates during winter months on weekends.

F. Local-Food Consumers

In 2006, estimated 1.3 million residents of Cuyahoga County (one of 13 counties in Northeast Ohio), purchased more than $3.4 billion dollars [10]. Only 1% of the food consumed in NEO was locally produced. With the help of business model innovating enterprises such as CV-CC, the consumption of local food is growing rapidly, and NEO is emerging fast as a national leader in the development of sustainable local food and green infrastructure ecosystems.

G. Feeding Low-Income Consumers

In 2009, CV-CC Farmers' Markets started accepting food assistance currency (stamps), through **Ohio Direction card** [6]. This was necessary, because Ohio residents ranked very high in the nation in terms of lack of food security and poverty [4]. The U.S. Department of Agriculture defined food insecure households as those households wherein one or more household members are hungry at times during the year because they cannot afford food. Approximately 15% of American households have marginal, low, or very low food security [17]. In 2011, CV-CC started collaborating with **Wholesome Wave**, a not-for-profit grass-roots organization dedicated to supply wholesome sustainable food to under-served low-income communities through the development of green infrastructure [23].

For the past 15 years, **Darwin Kelsey** has provided a visionary leadership as the Director of CV-CC. He and his 6 staff members have been temporarily based in a house leased by the National Park. He has managed to give birth to CV-CC and sustain its growth for the past decade by gradually diversifying his resources (See Table – 4 for Income and Expense Statement). If he chooses to retire, he will be hard to replace. A new position of Countryside Initiative Coordinator was created recently to supplement the role of the Director.

TABLE – 4. INCOME AND EXPENSE ('000 $) STATEMENT OF COUNTRYSIDE CONSERVANCY

YEAR	Funds Got.	Grants & Sponsors	Other	Projects Income	Total Revenue	Expenses	Net
1999	50.0	100.0	0.6	0	150.6	70.9	- 79.7
2000	65.0	50.0	2.5	0	117.5	143.7	+26.2
2001	75.0	50.0	2.7	0	127.7	157.0	- 29.3
2002	160.0	45.0	10.6	0	215.6	169.4	- 46.2
2003	50.0	96.0	10.8	0	156.8	175.7	+ 18.9
2004	50.0	141.7	14.5	0	206.2	205.4	+ 0.8
2005	100.0	125.0	29.6	0	254.6	270.5	- 15.9
2006	95.0	173.2	36.0	0	304.2	331.0	- 26.8
2007	95.0	231.7	36.0	0	387.0	370.9	+ 16.1
2008	95.0	238.6	72.2	15.1	420.9	361.2	+ 59.7
2009	145.0	123.5	116.0	9.0	395.5	418.7	- 23.2
2010	45.0	271.1	194.3	8.7	519.2	475.1	+ 44.1
2011	198.0	198.3	159.5	0	555.8	550.5	+ 5.3
2012	150.0	270.0	173.1	0	593.1	557.0	+ 36.1

Note: Funds received, Grants and Sponsorships, and other incomes were rounded.

V. CONCLUSION

A. Innovating Local Food Supply-Chain Infrastructure

Development of green suburban infrastructure (GSI) facilitates integrated enrichment of the natural resources and urban human settlements that help develop ecologically friendly management of agro-food technology [10]. Human settlements have often caused irreversible degradation of natural environments. Wild forests are often cultivated for food production into arable lands, high alpine meadows are commercialized into ski slopes, many blogs are drained, and some rivers are dammed or diverted. These human endeavors often destroyed the bio-diversity of plants, bugs, and animals in these cultivated lands.

Until recently, certain suburban regions surrounding highly densely populated urban areas were earmarked as 'green belts,' linear parks, or pastoral open areas [1]. In the post-modernist discourse of urban infrastructure planning, a more radical ecological context is being set by climate change and sustainability. Management of low carbon compliance and carbon investments are likely to drive the development of urban and suburban green infrastructures, according to [22]. Very densely populated urban and suburban areas are going to be hard-pressed for controlling their carbon footprints and emissions. There is an evolution from centrally planned green belts to public and private partnerships governing green infrastructure.

The primary goals of this innovative CV-CC initiative were to sustain the local food producing suburban agricultural infrastructure of CV-NP, and to preserve, sustain, and rehabilitate the remaining food producing agricultural farms. The CI of CV-NP was to promote the adoption and diffusion of the latest innovative sustainable technologies for local food and flower production in the National Park setting. This involved incentivizing 60-year long-term leasing of agricultural farm lands, farm residences, and outbuildings to pioneering individuals through a competitive bid process.

Since 1999, 13 food producing farms have been leased by CV-CC for developing culturally intensive fruit and vegetable production, small intensive grazing operations, and small integrated crop-livestock enterprises. These are also suitable for retail farm stands and local farmers' markets for the suburban residents of the Northeast Ohio with preference for locally produced foods. Furthermore, certified organic food production was encouraged under this innovative initiative, though not mandated. These innovative initiatives and endeavors have dramatically boosted the green infrastructure in the NEO region.

VI. FUTURE INNOVATIVE OPPORTUNITIES AND CHALLENGES FOR REGIONS IN THE U.S. OR ABROAD

The CV-CC is an innovative business model for creating sustainable family farms and local food entrepreneurs in the NEO region of the U.S. There are many new innovative opportunities available to CV-CC and other regions in the future. They can develop a Research, Education, and Demonstration Center in one of the historic farms yet to be rehabilitated. This will centrally locate the workshops and training sessions being currently held by CV-CC in various outside locations. Such a center will also host demonstration gardens of various sizes to show to the NEO community members how they can grow nutritious organic foods in the balconies of their apartments or their backyards [11].

There are a number of challenges facing CV-CC and other such initiatives in the coming year and beyond.

1. How can such business model innovation be improved and scaled up as these continues to grow and mature?
2. Should such initiatives seek higher rents, royalty, or equity in the farm start-ups they select?
3. Should they diversify its funding model and reduce the dependency on the highly bureaucratic government? What new sources of revenue can they seek and add?
4. How can they improve and enhance collaborations with other partner organizations in their region?
5. What is the most effective way to establish and fund the future growth in a Research, Education, and Demonstration Center?

Foreign food technology managers must customize this innovation selectively.

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