

*Farming in Philadelphia:
Feasibility Analysis and Next Steps*



Prepared for:

Institute for Innovations in Local Farming

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Farming in Philadelphia: Feasibility Analysis and Next Steps is presented to the Pennsylvania Department of Community and Economic Development and the Commonwealth of Pennsylvania Commonwealth Financing Authority by the consultant team and the Institute for Innovations in Local Farming.

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Introduction

The Institute for Innovations in Local Farming (IILF), a 501(c)(3) nonprofit corporation, received a grant from the Pennsylvania Department of Community and Economic Development (DCED) to assess the feasibility of developing a network of commercial, chemical-free farms in Philadelphia that would provide the basis for a future agricultural economy in the City. This feasibility analysis assesses the economic, environmental and community impacts of such an agricultural economy on the City. IILF retained Urban Partners to complete this feasibility study, with supplementary information to be provided by IILF and other participants.

Much of this report and analysis is based on and extrapolated from experiences at the Somerton Tanks Demonstration Farm (STF), which is housed at the Philadelphia Water Department (PWD) Somerton Tanks facility in Northeast Philadelphia. Managed by IILF, STF is seen as a possible model to be replicated at multiple Philadelphia sites.

The IILF/PWD Partnership

STF is a product of the partnership between the PWD—a public agency--and the non-profit IILF. In 2001, PWD and IILF merged their strategic planning and agriculture expertise to work toward their shared vision of a greener, healthier City, to help protect the city's waterways and to attract sustainable agriculture businesses to Philadelphia. It was felt that what had held back urban agriculture in the past was the inability of urban farmers to sustain themselves economically. IILF and PWD believed that a true experiment in the economics of urban farming would provide valuable information to advance the progress of urban agriculture in Philadelphia.

IILF's Mission, Goal and Role

IILF's mission is to encourage the establishment of a sustainable agricultural industry in Philadelphia. IILF's goal is for Philadelphia to reap the economic, environmental and community benefits that sustainable agriculture can bring to the City and its neighborhoods. IILF's role with regard to development of urban farming in Philadelphia has been to create the STF in conjunction with PWD, to employ the farmers and to oversee the management of the Farm; to raise funds; to promote the concept of urban farming; and to begin to research land opportunities for commercial farming. IILF has recruited farmer interns for STF and provided agricultural and small business development training to the interns. Regarding land for farming in Philadelphia, IILF has sought to work with the City and other landholders to identify appropriate sites and to encourage public or community entities to sell or lease suitable sites to farmers. IILF is a small, all-volunteer organization with no paid staff.

PWD's Role

In 1999, PWD began exploring whether commercial chemical-free farm businesses could be economically successful on small parcels of urban land, such as the lawns surrounding PWD facilities. The Department decided to explore this possibility by creating a commercial vegetable farm on its Somerton Tanks property. In the resulting partnership with IILF, PWD's role includes planning, fundraising, implementing and overseeing the project. As landlord, PWD leased the land to the Institute for \$1.00 and provided a wide variety of in-kind contributions yearly. Based on this four-year-old successful experiment, PWD is encouraged that an agriculture economy can succeed in Philadelphia and the Department is actively working to lay the groundwork for this.

Executive Summary

The Institute for Innovations in Local Farming (IILF) received a grant from the Pennsylvania Department of Community & Economic Development to assess the feasibility of developing a network of commercial, chemical free farms in Philadelphia. IILF retained Urban Partners to complete this feasibility study with much of the analysis based on experiences of the Somerton Tanks Demonstration Farm (STF) at the Philadelphia Water Department (PWD) Somerton Tanks site in Northeast Philadelphia—a joint effort of PWD and IILF since 2001. The IILF/PWD partnership aims to help cultivate a rebirth of commercial agriculture in Philadelphia through the efforts of dedicated, entrepreneurial urban farmers using specialized agricultural techniques to meet market demand. Based on the SPIN (Small Plot Intensive) growing approach pioneered by Wally Satzewich and Gail Vandersteen in Saskatoon, Saskatchewan, IILF's model of urban agriculture aims to support full-time occupational farmers on one-half to one-acre farms.

The Somerton Tanks Demonstration Farm Experience

STF had slightly more than ½ acre of growing space planted three to four times annually with 60 different vegetables. Another ¼ acre was used for pathways, parking, and farm structures (processing station, storage shed, portable toilet, and cooler). From a 2003 start-up, STF operated stably from 2004 to 2006 with a full-time wife-husband farmer team aided by part-time labor or a part-year assistant farmer. Aiming to achieve sales of \$50,000 in five years, STF grossed \$52,000 in its third year & \$68,000 in the fourth.



Products were sold to four market segments: four outdoor Farmers Markets (\$36,900 in 2006; 50% of total sales); Community Supported Agriculture (CSA) shares; Restaurant/Wholesale Outlets; and an on-site farmstand. The farmers' experience yielded these insights: (1) clustered farms would help reduce farmer isolation; (2) productivity increased annually and had not yet peaked; and (3) net income of \$55,000 (2007 dollars) would make the business sustainable and satisfying. In 2006, operating costs were \$69,600, including \$39,700 for the two farmers' wages and \$11,500 for the assistant farmer's labor.

Economic Feasibility of Commercial Farming in Philadelphia

Can a farm be a sustainable Philadelphia business? Are there candidate entrepreneurs interested in farming? Is there sufficient economic demand for the high-quality products of multiple farms to allow for expansion? Are there sufficient sites available for farms?

The answer, in short, is yes.

A farmer couple or other two-farmer group with the productivity from five years experience can produce \$120,000 annually. The resulting \$60,000 in net income places a two-farmer household above the Philadelphia median household income. \$120,000 in sales exceeds the STF experience (\$68,000 in 2006) and is accomplished through increased farm and farmer productivity (\$20,000); expanded use of part-time labor (\$13,000); and extending the production area or season (\$19,000) through use of hoop houses, minimal additional acreage planted in low-labor crops, and adding highly valuable shoot production.

Projected Income & Expense: Urban Commercial Farm at Optimal Operation

Annual Operations For Two Full-Time Farmers (2007 Prices)

Revenue:

Farm Market Revenues	\$72,000	
CSA Shares/Restaurant/Wholesaler Sales	\$48,000	
Total Revenues		\$120,000

Operating Expenses:

Supplies, Irrigation & Utilities	\$13,500	
Vehicle Lease, Insurance & Operations	\$13,000	
Equipment Amortization, Purchase & Repair	\$9,100	
Farmer's Market Fees & Marketing	\$5,700	
Employee Labor	\$18,700	
Total Non-Farmer Expenses		\$60,000

Net Farmer Income (Including Health Insurance) \$60,000

Assuming the gradual introduction of farm businesses within Philadelphia, there is sufficient interest among serious farming candidates to find ten successful entrepreneur-farmer couples or other two-farmer groups in the next six years. The current level of local chemical-free farming has only begun to scratch the surface of economic demand for these high-quality products. \$500,000 in production from four new farms by 2010 would only capture 5% of this demand; ten new farms introduced by 2013 would capture less than one-ninth of this potential. There appears to be sufficient interest by governments and non-profit organizations which own larger vacant parcels in Philadelphia to provide a stream of farm sites over a period of several years. Accessing these opportunities in the public sector will require a policy priority for farming to use portions of long-term open space and for disposition of publicly-assembled property.

Economic & Fiscal Benefits of Commercial Farming in Philadelphia

The development of a Philadelphia agricultural economy will have major economic and fiscal benefits for the City and the Commonwealth. Ten Philadelphia farms with \$120,000 in annual sales each by 2013 will have a **total annual direct and indirect economic impact of \$2.466 million** and will support **46 full-time equivalent positions, including 42 located within Philadelphia and 39 held by City residents**. Ten new farms will **generate \$145,000 in annual tax revenues** (measured in 2007 dollars)—\$89,700 for the City and \$55,200 for the State.

Summary of Annual Tax Benefits Generated by Ten Farms in Philadelphia

	For City of Philadelphia	For State of Pennsylvania	Total City & State
Taxes on Wages & Salaries	\$21,500	\$19,500	\$41,000
Sales Taxes	\$4,100	\$23,700	\$27,800
Business Taxes	\$44,800	\$12,000	\$56,800
Real Estate & Use Taxes Paid On Business Property	\$19,300		\$19,300
Total Annual Tax Benefits	\$89,700	\$55,200	\$144,900

Capital Investment Needed to Encourage Commercial Farming

IILF's total costs at STF were \$48,900 for utilities, fencing, site preparation, equipment and production structures. The STF experience suggests that additional investment in more effective all-weather shelters and a permanent bathroom are warranted. The costs of preparing new farms that meet these standards are estimated at \$81,000 for a single farm. Greater efficiency can be achieved with costs estimated at \$135,000 for a cluster of four farms through lower fencing costs and shared restroom facilities. Farm equipment and required production structures are estimated at \$15,200 per farm. Individual farmers may also choose to add hoop houses for extended season farming and office/storage structures.

The most effective model for further farm development assumes that public agencies or non-profits would be responsible for identifying approximately \$135,000 for infrastructure improvements to create a cluster of four small farms. Individual farmers would each finance \$15,000 to \$34,000 of equipment. When this cluster is fully occupied, a second cluster of six farm sites would be developed at a somewhat higher total preparation cost of \$165,000 in 2007 dollars.

Four-Farm Infrastructure & Equipment Financing Model

	<i>Cluster of Four Farms:</i>		
	Public/Non-Profit Investment	Total Farmers Responsibility	Per Farmer Responsibility
Site Preparation	\$135,000		
Farm Equipment & Required Production Structures		\$60,800	\$15,200
Optional Production Structures		\$76,000	\$19,000
Total Investment (4 Farms)	\$135,000	\$136,800	\$34,200

Furthering the Agricultural Economy in Philadelphia

The analysis above demonstrates the feasibility of encouraging the development of a network of farms in Philadelphia and that the most effective way to kick-start this potential is with a focus on clustering several farms in one location. Key steps in advancing this agenda include:

- Developing a **policy commitment to farming** in Philadelphia;
- **Identifying a site** for a first cluster of four farms;
- Identifying an **organization to manage** the legal & physical interests in the site;
- Securing **funds for site preparation** and other land-related activities;
- Identifying a **lender to provide financing for individual farmers**;
- Retaining the **involvement of IILF** as a promoter and as a technical assistance source; and
- When the first cluster is nearing full occupancy, **developing a second cluster for six farms**.

With initial organizing of a stakeholders/advisory committee in 2008, the goal is to have several commercial farms clustered in a first Farm Business Incubator/Farm Park with full occupancy by four farms by 2010 and a second Farm Business Incubator fully occupied with six farms by 2013. After that date, additional farms may follow.

Background

Urban agriculture has been most often thought of as an add-on activity for a community non-profit organization or as community gardening. It is traditionally associated with social causes such as growing food to feed the poor or creating farming jobs for the unemployed. The unfortunate reality is that most of these socially based urban farms either fail or continually struggle to survive. Generally they are kept alive with the help of government or private sector subsidies.

Small-Scale Farming in Pennsylvania

Unfortunately, the situation is not much different for many of the nation's small family farms. Throughout the U.S. development pressures are forcing agricultural lands and metropolitan areas into ever closer proximity with tragic results for farmers. Pennsylvania family farm operations are threatened by problems such as conflicts posed by rampant development and rising land values that make it more profitable to sell to developers than to continue farming. While the state's farmland preservation program is among the most effective in the country, there has been less success at preserving the actual farm businesses.

According to the U.S. Census of Agriculture, Pennsylvania lost more than 2,000 farms and more than 74,000 farming acres between 1998 and 2002. Of the 58,105 farms remaining in Pennsylvania in 2002, only 4.2% utilized more than 500 acres; more than three out of eight of these farms used less than 50 acres. Nearly 92% of Pennsylvania farms were owned by individuals or families.

Models for Farm Entrepreneurship in Philadelphia

The IILF/PWD partnership aims to help cultivate a rebirth of commercial agriculture in Philadelphia – a city where farming has long since been absent. Analysis of the STF experience highlights the potential for dedicated, entrepreneurial urban farmers to create successful farm businesses by using specialized agricultural techniques and growing to meet market demand. A new emphasis on these very same points may also be key to preserving rural and suburban farms businesses throughout Pennsylvania.

IILF's model of urban agriculture is based on the SPIN (Small Plot Intensive) growing approach pioneered by Wally Satzewich and Gail Vandersteen in Saskatoon, Saskatchewan. For Satzewich and Vandersteen, this organic-based farming model has meant growing high-value, multiple crops intensively on approximately 25 leased residential backyard plots totaling half an acre. More largely, SPIN farming models can support fulltime occupational farmers on one-half to one-acre farms that generate \$50,000 to \$65,000 in gross sales, as well as part-time farmers seeking leisure satisfaction and a little extra cash (\$10,000 to \$20,000 in sales) operating a 5,000 square foot part-time hobby plot. Wally Satzewich serves as the agricultural advisor to STF.

Other efforts at supporting farming entrepreneurship are being actively pursued nationally. One of the most prominent is the Intervale Center in Burlington, Vermont. Intervale is a multi-faceted farm support operation including Intervale Compost Products, the largest compost operation in Vermont; Intervale Community Farm, Vermont's first community-supported agriculture (CSA) effort; and Intervale Small Farm Incubator, launched in 1994 to expand farming and assist young farmers through affordable land, equipment, greenhouses and irrigation. Intervale has now evolved to a collection of 13 independent farms--all certified organic. There are three categories of farms: incubator farms are the newest farms and receive business planning support, mentoring and reduced prices for land and equipment; enterprise farms have operated for at least three years; while mentor farms are mature farms which have been operating for

at least five years and take on the role of mentoring incubator farms. The 13 farms range in size from 1 acre to 65 acres.

Consumer Benefits

Beyond the obvious benefits of creating sound farm businesses, urban agriculture can address other challenges of the modern world such as the realities of finite energy resources, climate change, food security and public health and nutrition crises. Re-orienting food production so that it is more locally based helps mitigate oil-based price escalation and supply disruptions due to food contamination-based recalls. Increasing the supply of local nutritious food encourages healthier diets.

Perhaps most importantly, it is the consumers themselves who are becoming central players in the current rise of urban agriculture. Many consumers understand the serious crisis being bred by the loss of local farms. They are growing concerned about the health and environmental consequences of the chemical additives used in conventional farming. They want to know how their food was grown and who grew it. And many are willing and able to pay premium prices if necessary for this direct connection to fresh, high-quality food.

The Somerton Tanks Demonstration Farm Experience

The IILF/PWD partnership at Somerton Tanks Farm sought to demonstrate how a commercially viable farm can be created and operated on small parcels of land in the City and to assess the feasibility of that approach.

The Site and the Field

Somerton Tanks Demonstration Farm is located in a relatively densely populated neighborhood of Northeast Philadelphia. The site houses two PWD water tanks containing 5,000,000 gallons each. The tanks are surrounded by grassy lawn. One section of this lawn was dedicated to the STF demonstration farm. This area allowed for slightly more than ½ acre of growing space with additional space for small pathways. This growing space is composed of 280 beds that are planted an average of three to four times each season. The farm grows 100 varieties of 60 different types of vegetables.

The pathways, parking and farm structures take up an additional ¼ acre of space. These farm structures are: a three sided processing station (made of tarps) in which the vegetables are cleaned, washed and prepared for market and which also serves as the shaded location for farmer breaks, respite from sun and rain and for paperwork; a walk-in cooler; and a storage shed. PWD provided portable toilet facilities. All told, the farm footprint was approximately three quarters of an acre.

Surrounding that footprint is grassy lawn. The entire site is bordered by an 8' chain link fence. Outside the fence is additional PWD land which informally functions as community green space. This green space abuts the back yards of neighboring houses.

The Farmers

In 2003, the Institute hired a professional farmer to build and run the Farm. Three farmer trainees from Philadelphia were selected to work with the farmer and to learn the small plot intensive farming methods and techniques being used at Somerton Tanks Demonstration Farm. Towards the end of that first year, after the farm was up and fully functioning, the farmer left. Day-to-day operations of the farm were transferred to two farmer trainees who capably ran the farm to a successful season's end.

In 2004, one of the trainees became head farmer. She and her spouse ran the farm with additional limited labor from volunteers. In 2005, IILF hired one of the volunteers as a six-month paid intern. In 2006, the same person was hired for six months as assistant farmer. The farmers' were highly entrepreneurial and their energy and creative skills were fundamental to the success of the Somerton Tanks Demonstration Farm.

Farming Method

As noted above, the Small Plot Intensive (SPIN) method, created by Wally Satzewich in Canada, is the farming method on which Somerton Tanks Demonstration Farm was built. SPIN was reputed to be especially effective for maximizing yield and revenue on sub-acre land bases. The basic premise of SPIN is to grow high-valued, diverse crops densely on sub-acre land bases. From the Canadian experience, it was reported that \$50,000+ in gross sales could be produced from a half-acre using the SPIN method. Based on this information, STF set a goal to achieve gross sales of \$50,000 within a five-year period. In its third year, STF grossed \$52,000 and in the fourth year it grossed \$68,000.

The Growing Season

For 2003, 2004 and 2005, farming was mainly performed from mid- March through the end of October--the warm weather growing season. An inconsequential amount of hearty winter vegetables were harvested during the outlying months. In 2005, the addition of the unheated 90' x 14' hoop house helped extend the growing season into late fall, early winter and early spring. Because of start-up problems, the hoop house didn't become reliably functional until late winter of 2006. The 2005 results (more than \$50,000 in sales—see below) were achieved within a 9-month growing season on a growing space of slightly less than one-half acre. In 2006, cold weather growing was increased outside of the hoop house with extensive use of agricultural cloth and late plantings of cold hardy crops. For 2006, sales were also increased through expanding the growing space to slightly more than one-half acre.



The Markets

Because STF was an experiment the project's farmers were encouraged to learn about and utilize all potential sales channels. While this "test tube" approach provided much beneficial information it also limited farm revenue to some degree. Independent farmers choose their own markets based on personal and professional preferences and financial goals and would not be limited by any experimental approaches. STF products were sold to four market segments: Farmers Markets; Community Supported Agriculture Shares (CSA's); Restaurant/Wholesale Outlets; and an On-Site Farmstand.

Farmers Markets

The farmers sold at four outdoor Farmers Markets. One was utilized during the cold weather season and three during the warm weather season. The markets were located in Old City, Center City, South Philadelphia, and West Philadelphia. Farmers Market revenues grew to \$36,900 in 2006. At 50% of farm sales, this represented the largest growing segment of the farm's revenue.

The CSA

CSAs are a way for specific households and other members of the food buying public to create a relationship with a farm and to receive regular allotments of produce. By making a financial commitment to a farm, people become "members" (or "shareholders," or "subscribers") of the CSA. This financial investment is paid in late winter or early spring thus providing essential cash to cover the farm's startup expenses. Members receive a weekly basket of fresh produce for the warm weather season. Members share the risks and the bounty with the farmer. In 2006, Somerton Tanks Farm included a 46-member (22-week) CSA that brought in \$24,900 in revenue for the farm. This represented approximately one third of the farm income. The CSA had become so popular over the years that by 2006 there was a waiting list.

Wholesale Markets - Restaurants, Caterers and Other Outlets

The farm in 2006 generated a modest amount of revenue - \$5,800 - from wholesale markets. This marketplace was, in general, a less desirable one because it usually involves lower prices and higher volumes. Given that the Farm's yield was almost always sold out at retail outlets, these markets were used as a last resort or during times when the retail markets were not available.

On-Site Farmstand

During the 2004 and 2005 seasons, an on-site farmstand was open to the community one afternoon a week. The revenue produced was low relative to the labor and attention the farmstand required. It is thought that the farmstand business might have been more financially rewarding had there been more time and effort given to developing a reliable customer base. Since the produce was in great demand at the other venues, the farmstand was closed for the 2006 season.

Farmer Work Experience

Urban Partners independently interviewed the four-year farmer couple as well as the intern who worked on the farm part-time as a volunteer in 2004 and as a full-time paid trainee for six months per year in 2005 and 2006. Key issues raised from the work experience were these:

- the actual farming experience was very satisfactory. These farmers were highly motivated to produce high-quality produce
- the Somerton Tanks Farm site was also viewed as very successful as a farm property. There were limited conflicts with neighbors, security concerns were minimal, and the topography was suitable for farming
- the farmer couple were very pleased with customer interaction at the farmers' markets. As a result, they slowly steered their market share toward this outlet
- the farmer couple found the home to work commute draining. They attempted to move closer to the farm, but found housing costs nearby too high. The location to which they ultimately moved reduced the commute to about 20 minutes, but they were not pleased with the new neighborhood
- even with the shorter commute, the couple spent long days on site. Going home for protection from the elements in changeable weather, for occasional shaded rest or other routine purposes was impractical and meant lost productivity. The farmers identified the need for a small protected office/shed on-site to accommodate breaks and provide foul weather protection

- the location of a single farm at Somerton Tanks eventually became viewed as isolating. The farmers had few peers with whom to socialize and share farming experiences (both technical and social/operational)
- it was difficult to obtain farming supplies in Philadelphia
- the farmers put in such long hours farming and marketing that they felt they were unable to enjoy the City's amenities. They felt that much of their discomfort and dissatisfaction would be eliminated if they were able to live very close to or on the farm site.
- the farmers felt Philadelphia's cost of living – especially the taxes and insurances -was high for the income they had achieved thus far
- the farmers' felt that with each year's experience they were learning how to run the business more efficiently thus producing more crops and revenue without significantly increasing labor. The farmers felt that a net income of approximately \$55,000 (in 2007 dollars) would make the business sustainable and satisfying. With increasing productivity, they anticipated reaching that income in the next year or two.

Economics of Operation

In total STF has been in operation for four years. Urban Partners examined IILF's documentation concerning the history of the Somerton Tanks Farm and analyzed the evolving economics of that prototype. Much of 2003 was spent building the farm, learning about the marketplace, and getting familiar with the growing techniques. **Table 1** shows the revenues and operating expenses for the Farm beginning in 2004. In 2004, the farm grossed \$38,800 with operating expenses of \$47,500 and by 2006 the farm grossed \$68,000 with operating expenses of \$69,800. IILF met these shortfalls through grant and private funding. From the beginning, farmer compensation was based solely on production, encouraging a highly entrepreneurial relationship between IILF and the farmers. In 2006, this became even more entrepreneurial as the farmers' assumed responsibility for all operating expenses except vehicle insurance.

Revenue has come from the four major sources noted above: Community Supported Agriculture Shares (CSAs), restaurant/institutional sales, on-site farm stand sales, and sales at farmers' markets. As shown on Table 1, Farmers' Market revenues have been the largest growing segment, now representing more than half of sales. Our interviews suggest that this reflects the preference of the Somerton Tanks Farm farmers during this period and not any limitations on market demand in the CSA or restaurant/catering market segments.

Over the three-year period, gross revenue increased by an average of about \$15,000 per year. These yearly increases are attributed to experiential learning and a growing familiarity with farming in general, improved soil fertility, the farmer's application of their own creative growing and marketing techniques, increasing demand for locally grown and organic food and the farm's well earned reputation for fine vegetables.

Table 1
Income & Expense History--2004-2006
Somerton Tanks Farm
July, 2007

	2004	2005	2006
Revenue:			
Community Supported Agriculture Shares	\$15,700	\$23,800	\$24,900
Farm Market Revenues	\$12,700	\$19,600	\$36,900
Restaurant/Wholesaler Sales	\$7,600	\$6,500	\$5,800
Farmstand Sales & Other	\$2,800	\$2,800	\$400
Total Revenues	\$38,800	\$52,700	\$68,000
Operating Expenses:			
Growing Supplies & Irrigation	\$2,900	\$3,500	\$5,100
Sales Supplies	\$900	\$1,700	\$1,400
Vehicle Insurance	\$5,400	\$5,000	\$4,300
Vehicle Operations & Repair	\$1,600	\$3,000	\$3,000
Equipment Purchase & Repair	\$1,800	\$2,900	\$1,900
Marketing	\$900	\$200	\$400
Farmer's Market Fees	\$1,000	\$1,500	\$2,300
Employee Labor--Part-Time	\$0	\$10,200	\$11,500
Business Liability Insurance			\$200
Other	\$600	\$0	\$0
Total Non-Farmer Expenses	\$15,100	\$28,000	\$30,100
Net Farmers Wages	\$32,400	\$37,500	\$39,700
Total Expenses	\$47,500	\$65,500	\$69,800

Additionally, at the end of the 2005 warm weather season an experimental unheated 14' x 90' hoop house was constructed on the slightly less than ½ acre footprint to begin experimenting in colder months. Despite the fact that the plastic blew away twice during the first three months thus ruining most of the crops each time, the hoop house produced approximately \$2,000 in gross sales for 2006.



Better ways to install the plastic were applied after each storm and the hoop house withstood strong winds for the rest of the year. Given these initial problems and given the expectation for a multi-year learning curve to maximize productivity, it is likely that per hoop house productivity can be increased beyond this \$2,000 base revenue.

In 2006, all operating costs totaled \$69,800. The largest operating expense is the farmers' wages. The STF farmers received the payment in the form of a percentage of the gross revenue from the field. In 2006, their wages were \$39,700. During the outdoor season, the farmer couple required labor totaling approximately 1,200 hours beyond their own efforts. This was provided by the assistant farmer in 2006 at a cost of \$11,500. Other major operating expenses included growing supplies; vehicle insurance, operations, and repair; and farmers' market fees. PWD charged IILF \$1.00/year for land rental which included electricity, water and other minor expenses.

It should be noted that in 2003 and 2004 a few volunteers were used. In 2005 and 2006 volunteer labor was intentionally minimized to a few hours a week to obtain more realistic labor data. However, it is important to point out that it is routine for conventional farms to utilize free labor from family and friends, especially during peak seasons. Table 1 shows the gross income and operating expenses for 2004, 2005 and 2006.

There is no indication that the current level of production has touched the limits of product demand from the farmers' market, CSA, or restaurant/catering segments.

In summary, this demonstration farm has been very successful but has not reached its maximum revenue. In fact, the farm has just begun to hit its stride. All things being equal, with continued experiential learning and an increased emphasis on season extension and more effective growing techniques, we believe STF could reach sustainability in its seventh year.

Future of Somerton Tanks Farm

The STF farmer couple have purchased a home on a little more than an acre of land outside of Philadelphia on which they have started their own farm. Therefore they will not return to work at STF in 2007. During 2007, the Philadelphia Water Department undertook major maintenance work on the water tanks at the site. As a result farming was suspended for 2007. This work is expected to continue through 2008. Future plans for the farm had not been decided at the time of this writing.

Economic Feasibility of an Agricultural Economy in Philadelphia

The economic feasibility of developing an agricultural economy in Philadelphia through expanded farming in patterns similar to the Somerton Tanks Farm prototype is dependent on four factors:

- Can a commercial, chemical-free farm be a sustainable Philadelphia business?
- Are there candidate entrepreneurs interested in pursuing these farming opportunities in Philadelphia?
- Is there sufficient economic demand for the high-quality products of multiple farms to allow for expansion of this model?
- Are there sufficient sites available for such commercial farms?

Sustainable Business Potential

All start-up businesses are driven by the interest of the entrepreneur in (1) the value of the output of the business, (2) the satisfaction that comes with engaging in the day-to-day work process, and (3) the sense of independence and personal control of business decision-making. The entrepreneur undertaking a commercial farming operation shares in these interests. But the sustainability of an entrepreneurial business ultimately depends on the ability of the entrepreneur to generate sufficient net income to remain committed to the activity and the lifestyle associated with it.

As with any small business, the sustainability of a commercial farming business in Philadelphia depends on the ability of the farmers to generate such sufficient net income. The Somerton Tanks Farm experience during the 2004 to 2006 period provides some guidance in making the case for how a farm business in Philadelphia could achieve this level of sustainability.

Between 2004 and 2006, gross farm income (total sales) grew by an average of \$15,000 annually. Much of this revenue growth came from more effective utilization of the original farmed area. This clearly indicates that productivity gains were achieved. Both the farmer couple and IILF officials believe that further productivity increases are likely. This view is further reinforced by a review of the SPIN farmer's experience in Saskatoon, where current levels of productivity (\$18 to \$20 of output per hour of farmer labor) exceed the Somerton Tanks Farm. Increased farmer productivity will yield higher gross revenue (total farm sales) and net farmer income (return after expenses).

As shown on Table 1, revenues grew during the 2004 to 2006 period to \$68,000. Non-farmer operating expenses grew to \$30,100, resulting in net operating income of \$37,900. If STF had been operating as a purely entrepreneurial venture, this \$37,900 would have been the net income to the farmers. The farmer couple viewed net income of approximately \$55,000 in 2006 dollars plus health benefits as sufficient to maintain their permanent interest.

On **Table 2**, we examine the likely annual income and expenses for an independent small plot intensive farm in Philadelphia. This analysis is based on an extrapolation of the operating conditions observed at the Somerton Tanks Demonstration Farm. This analysis focuses on prototype farmers similar to the STF farmers—a farmer couple or other pair of two full-time farmers working year-round. However, unlike the 2004-2006 Somerton Tanks Farm operation, in this analysis the farmer receives no on-going operational subsidy.

Table 2
Projected Income & Expense
Urban Commercial Farm at Optimal Operation
November, 2007

	Annual Operations For Two Full-Time Farmers (2007 Prices)
Revenue:	
Community Supported Agriculture Shares	\$35,000
Farm Market Revenues	\$72,000
Restaurant/Wholesaler Sales	\$12,000
Farmstand Sales & Other	\$1,000
 Total Revenues	 \$120,000
Operating Expenses:	
Growing Supplies & Irrigation	\$7,800
Sales Supplies	\$3,200
Vehicle Insurance	\$4,500
Vehicle Operations & Repair	\$5,500
Equipment Purchase & Repair	\$4,000
Marketing	\$800
Farmer's Market Fees	\$4,500
Employee Labor	\$18,700
Water, Electricity, Port-o-Potty, & Phone	\$2,500
Truck Lease or Loan Payment	\$3,000
Amortization of Start-Up Investment	\$5,100
Business Liability Insurance & Other	\$400
 Total Non-Farmer Expenses	 \$60,000
 Net Farmer Income (Including Health Insurance)	 \$60,000

This analysis assumes farmers with five years of experience. Based on the Somerton Tank Farm, we believe farmers can achieve productivity approximately 20% greater than the productivity seen in the prototype from the farmer couple with four years experience in 2006. Comparing the farm's 2006 sales with the farmers' reports of their time expended and their use of the part-time farmer, we conclude that they produced about \$16 to \$17 of product per hour of effort in 2006. A 20% increase in productivity (measured in 2007 prices) means that the farmer can produce \$20 of product per hour of labor, assuming that the farmer is actively engaged in the distribution of product, especially through farmers' markets. Hired labor is assumed to be 80% as productive.

Because STF was a pioneer farm with experimental and educational purposes, the efforts to maximize revenue were sometimes negatively impacted by these additional priorities. All conditions being more or less equal, future farm businesses that are not burdened by these conflicting purposes may need less than five years to achieve these higher levels of productivity.

Aside from being able to learn from the experiences of STF and of other pioneering urban farmers, new commercial farmers will also be able to rely on increasing market demand for the foreseeable future because of growing public awareness about the importance of local farms and of the value of chemical

free products. Finally, since entrepreneurs are by definition independent and often highly creative thinkers, we can assume that some future farmers will develop new and better methods to increase productivity.

In this analysis, we assume that, at 2007 prices, an experienced farmer couple or other pair of full-time farmers can grow sufficient product to achieve \$120,000 in annual sales. Based on the 2006 STF experience (\$68,000 in production), this \$52,000 in additional annual production would be achieved by:

- increased farm and farmer productivity (\$20,000);
- expanded use of part-time labor (\$13,000); and
- extended production area/season (\$19,000).

The analysis above discusses the expectations of more productive use of the two farmers' time as well as their part-time labor. Based on two full-time farmers during the long season plus 1200 hours part-time labor, this should result in a gross production increase of \$20,000 in sales. Expanded use of part-time labor (an additional 800 hours) would add \$13,000 to total production.

Extended production can be achieved in a variety of ways, such as:

- (1) more extensive use of **hoop houses in the winter season**. In the STF experience, a standard size 1,300 square foot hoop house can be used to grow high value cold weather crops planted directly in the field, such as salad greens. The STF farmers added \$2,000 in income from a single hoop house despite the learning issues detailed above. More extensive and effective use of hoop houses in the winter could add up to \$20,000 in income from multiple hoop houses;
- (2) planting an **additional quarter to half acre in low-maintenance crops** such as potatoes, tomatoes, cucumbers, garlic, onions, shallots, and summer squash during the long growing season. These less labor-intense crops could provide balance to the higher-valued, more labor-intense crops currently being produced and add \$20,000 to \$32,000 to gross revenue; and/or
- (3) adding **highly-intensive shoot production, such as pea and sunflower shoots, in green house flats** in the spring and fall. One hoop house dedicated to shoot production could produce 2,000 flats of shoots at \$15 per flat, spread over 20 marketing weeks. Pea shoot production would be concentrated in very early spring, spring, early summer, late fall, and early winter; sunflower shoots would focus on spring, summer, and fall. This could add up to \$30,000 in additional income.

Alternatively, it is standard practice for one or both farmers to supplement income with a second job during the off-season.

Note that this farm business model is based on specific assumptions about a variety of business operational decisions that will be made by the farmers. It is intended to illustrate the potential viability of farm business models. Specific farmers can, and likely will, make somewhat different decisions about target markets, crops, length of farming season, use of hired labor, and other factors.

On Table 2, the two farmers are assumed to work an average of 45 hours per week each for a 38 week prime growing season and to be able to handle multiple hoop houses in the winter season (with hired labor assistance). 2,000 hours of hired labor is assumed at \$8.50 per hour plus 10% payroll taxes. It is also assumed that the farmers pay Philadelphia business taxes approximating \$4,000 annually (6% to 7% of net income) and health insurance from the "Net Farmer Income."

For this analysis, we have assumed the availability of capital financing for start-up costs and capped the farmers' payments for amortization of these costs at \$5,100 per year. Based on these assumptions, the farmer couple or other pair of two full-time farmers with 2,000 hours hired labor can achieve sales of \$120,000. Operating expenses (including labor) are \$60,000, leaving \$60,000 for the two farmers. After deducting business taxes and health insurance from this amount, an effective net income of about \$52,000 remains for the farmer couple or other pair of two full-time farmers. This income level would be achieved by productive farmers with five years experience.

This net income appears to meet the stated long-term income goals of the previously involved farmers at STF. Depending on the relationship of the two full-time farmers, this income level could also exceed median income for Philadelphia residents. For a farmer couple or other two-person household, a \$52,000 income is at the 65th-percentile for two-person Philadelphia households or 130% of the median for two-person households. For a three-person household, this income level is at the 58th-percentile or 115% of median. If the two participants in the farming operation reside in different households, dividing this net income will result in less financial return per household, but may be offset by the incomes of other members of the households.

Whether these levels of income will result in long-term sustainability will depend on many factors that are difficult to foresee, including these:

- Can increasing experience of the farmers (beyond the assumed five years) result in further productivity gains?
- Will income aspirations rise for the farmers as they accumulate more experience in the business or as their families grow?

The short-term conclusion is that an efficiently-managed farming operation appears to be an economically sustainable small business provided low-cost land, start-up capital, and the proper technical supports are available.

Documented Farmer Interest

Without any active solicitation, over the past few years IILF has received roughly 50 expressions of interest from potential farmers seeking to set up commercial farms in Philadelphia. Many of these inquiries may come from individuals with comparatively romantic notions of farming as a profession and lacking a true understanding of the reality of the long, hard hours of labor involved. IILF has reviewed these candidates utilizing a series of factors required for successful farmers and narrowed the list to 10-12 seemingly qualified persons. Active solicitation of farming candidates through farm journals and web sites would likely generate many additional serious applicants.

The experienced farmers and the aspiring new farmers who worked with or been in contact with IILF express interest in Philadelphia-based farming for the following reasons:

- They desire to have a business that is close to their current or intended Philadelphia residence.
- They have an entrepreneurial spirit and desire for the independence they attribute to farming.
- Urban farming would provide them with the benefits of city living while still practicing their chosen profession.
- They have a true love for the environment and for chemical free farming as a technique that is in sync with nature. Several have come from families with relatives who farm and have absorbed values that highly regard the growing process.
- They have a desire to work in an occupation that they perceive as nurturing to the earth.

- They have a desire to produce healthy, high-quality, organic products. This interest is also tied to a desire to interact with customers sharing those values. Some have specific interest in growing certain products such as flowers and herbs.
- They have a desire to work outdoors and in harmony with the natural cycles.

We should also note that the professional and social climate for farming in Philadelphia is improving. Aside from a long running experimental farm in Kensington, the STF farmers in 2004 to 2006 were relative pioneers and as such had few local professional peers with whom they felt they could share experiences and discuss problems. They specifically noted the difficulty in developing and maintaining a social/technical peer group and emphasized that farming and living in Philadelphia can be socially isolating. The long working hours, especially during the peak season, minimized opportunities for social interaction.

This will probably not be the case for future farmers as the situation is rapidly changing. A group composed of farmers, aspiring farmers and interested individuals has recently formed the Philadelphia Urban Farmers Network (PUFN). This new group has a membership of approximately 50 individuals. (These individuals are in addition to the 50 individuals who contacted IILF regarding their interest in setting up farms in Philadelphia.) PUFN's expressed purpose is to address some of the political, technical and social hurdles that confront urban farmers. The development of this peer network will greatly reduce issues of social and professional isolation.

We should also note that farm expansion in Philadelphia is more likely to be constrained by the potential pace of affordable land availability. The on-going stream of inquiries (including experienced farmers) and the improving social/professional climate for farmers in Philadelphia makes it reasonable to conclude that *there is sufficient farmer interest to accommodate ten new Philadelphia farms during the next six years, if farm sites can be identified.*

We must, however, raise a caution concerning long-term farmer interest. Farmers typically build equity in their businesses through investment in capital improvements and the increased property value of their land, often for alternative uses such as housing development. The style of intensive farming targeted by IILF for small Philadelphia sites does not require substantial capital investment. In addition, the policy objective of retaining land permanently for farming operations will restrict the ability of the farmer to gain equity through transfer of the land for other uses, such as housing development. Therefore, it will be essential to develop an alternative method of equity appreciation for the farmers to encourage their long-term involvement.

Sales Market Potential

Within the small range of available product (up to \$68,000 in 2006) covered in this experience, overall demand for these farm products provides no limitation on growth of Philadelphia farming. Over the three-year period, Somerton Tanks Farm sales have included a mix of direct contracted sales to individuals (CSAs), farmer's market sales, on-site sales, and sales to restaurants and wholesalers. Since the STF farmer couple that operated the farm during the 2004-2006 period preferred the interaction with customers available at farmers' markets, they gradually evolved a sales profile that emphasized this outlet.

In 2005 and 2006, vegetables were generally sold before they were planted; rarely were there any unsold crops after harvest. Anecdotal information about demand in the CSA and restaurant/institutional segments suggest that these sales could also be grown significantly depending on the interests of individual farmers. There was a waiting list for CSA membership. Expressions of interest from large markets, such as Whole

Foods, had to be turned down.

To assess any potential upper limit to this expansion, we have considered the likely overall demand for produce at farmers' markets in Philadelphia. The 1.5 million Philadelphians generate over \$3 billion in purchases at food stores and supermarkets annually. At least 11% of this (or \$330 million) is for fresh produce and fruits. Studies produced for the U. S. Department of Agriculture indicate that farmers' markets now account for about 2% of U.S. produce sales and that this segment is growing at an average rate of about 10% per year.



Applying these averages to Philadelphia, the market for produce at farmers' markets would appear to be at least \$6.6 million annually and growing. This demand is more than 90 times the anticipated farmers market sales of the prototype sustainable farm shown on Table 2. This calculation also ignores the potential for locally-grown, chemical-free produce being marketed by local community groceries.

The aggregate demand for locally-grown produce in the City of Philadelphia alone is *at least 90 times the potential production of a single prototype commercial farm* described above. If four new prototype farms of this scale were created in Philadelphia by 2010, collectively they would only capture 5% of this demand. If *a total of ten new farms were introduced by 2013, they would capture less than one-ninth of this potential demand.*

Potential Farming Sites In Philadelphia

Site Selection Criteria

IILF has identified several criteria for evaluating new farm sites in Philadelphia, including:

- Size--to have growing space of at least ½ acre, the site must range from approximately ¾ to 1 acre in size. The additional space is necessary to accommodate structures such as storage shed, hoop houses, processing station, other workspace and parking.
- Topography/other physical conditions—relatively flat terrain is considered basic. The site should have good drainage and not be susceptible to flooding. Farming can be done on a slope or even

possibly on a hillside but issues of soil and water runoff become considerations under those conditions.

- Soil condition— soil samples and analysis should show that the soil is within the range of Pennsylvania agricultural soil averages or that the soil can be improved to achieve this range through the use of organic inputs such as composting and cover cropping. (While this report is not intended to address brownfields, there are circumstances in which some brownfields are suitable for farming.)
- Sunshine--the site should routinely have access to full sun.
- Utility access--the site should ideally have existing hookups to water and electric service; if not, site improvement costs for these services need to be relatively inexpensive.
- Relationship to community and nearby residences—support of neighbors, community associations, and elected officials is critical. In addition, if the farm site is adjoined by residences, a buffer between the farm and those residences may be essential to avoid conflicts over noise, working hours, etc.
- Buffer from adjacent uses--in some situations a buffer may be necessary to protect the organic nature of the field. This would be most relevant where chemicals are applied or emitted by neighboring residential or commercial uses. The need for and size and type of buffer would be determined on a case-by-case basis. Large buffering requirements may greatly expand the size of site needed. Guidelines provided by Pennsylvania Organic will be used in these circumstances.
- Relationship to adjacent non-residential uses—certain adjacent activity can also negatively impact farming. Ideally adjacent uses would have minimal nighttime lighting and low traffic volume on adjacent streets. If these conditions do not exist, an additional open space or other buffer may be necessary.
- Vehicle access—access must be available for a van or similar sized vehicle
- Perceived security—given that farmers’ work is mainly outdoors and their products are outdoors the neighborhood should offer a reasonable sense of safety for the farmer and the farm.
- Site access--nearby public transit access is desirable.
- Low-cost site control—available either through gift, long-term lease, or with acquisition assistance.
- Term of site availability—the site should be available for long-term use as an urban farm to compensate the farmers for their investment of time and funds in the land.
- Zoning and other land use controls—farming use should be an allowable long-term use for the site.

Candidate Site Research

The following information is the result of IILF’s research into specific potential site availability for farm use. This research was not fully comprehensive nor was it targeted to achieve control of specific sites at this time. Instead, the objective was to determine the following:

- (1) Do sites exist in Philadelphia that would be appropriate for the type of commercial farms being analyzed here? How common or rare are these sites?
- (2) On what basis are these sites likely to be available? Purchase? Lease? Co-venturing?
- (3) What public policies would be necessary to assure that sites are available?
- (4) What costs are likely to be associated with purchase or lease of available sites? What is typical land cost? Would environmental remediation be necessary to make properties suitable for farming? At what cost?
- (5) Is it reasonable to conclude that appropriate sites can be made available over the next few years to incrementally accommodate new commercial farms in Philadelphia?

A basic assumption of the IILF/PWD partnership, begun in 1999, was that the over-abundance of vacant lots and abandoned land in Philadelphia would translate into inexpensive or even free land for commercial farmers. However, since that time two key land-related processes have been actively underway in Philadelphia. The first is the City's Neighborhood Transformation Initiative; the second is a rapidly growing housing market that has driven up land pricing.

Neighborhood Transformation Initiative: Beginning in 2000, the Street administration set reducing blight as a top priority. The administration created the Neighborhood Transformation Initiative (NTI) to address the problem and a program was developed to demolish blighted buildings and to green the remaining vacant lots. One key component of NTI is the public acquisition of numerous parcels of land in previously blighted neighborhoods.

NTI staff supported IILF's search for potential farmland by reviewing the range of sites assembled through demolition activity. NTI staff presented this material to IILF, PWD and Urban Partners and reviewed available mapping to identify candidate farm sites that might be available for minimal cost. Sites likely to be attractive for large-scale residential and commercial development were excluded, as were individual properties below IILF's minimum size criteria. A short list of approximately 15 candidate sites was developed and IILF officials and Urban Partners consultants conducted on-site evaluations. In general, *the configuration of those sites and/or the close proximity to occupied residences made them unsuitable for this commercial farm initiative.*

Housing Market Forces: At the same time demand for real estate began to rise in Philadelphia as mortgage rates declined to record lows. Real estate developers began purchasing the desirable vacant land and land values skyrocketed. A review conducted of the last 80 recorded real estate transactions for vacant land in the City of Philadelphia in 2006 found that the price of vacant land ranged from \$11,000 per acre to more than \$10 million, depending on location and size. Two-thirds of sales were between \$170,000 per acre and \$3.3 million per acre, with the median sales price right at \$1 million per acre. This pricing suggests that *market rate acquisition of land for commercial farms is infeasible.*

We should also note that for the purposes of this research, brownfields sites were not considered although some could be suitable for certain types of farming such as raised beds or hydroponics.

Zoning & Land Use Regulation: Elements of agricultural uses are allowed in many Philadelphia zoning classifications. There do not appear to be any zoning classifications that expressly prohibit agriculture. All residential districts explicitly allow agriculture (but not animal husbandry), but sales of agricultural products are not permitted. Agriculture is permitted in most commercial districts and sales of farm products are allowed in some of these districts. Agriculture is also permitted in L-4 and L-5 industrial districts. In general, publicly-owned sites are not subject to these zoning restrictions.

It seems reasonable to conclude that land use restrictions will *allow commercial farming enterprises in many locations with landowner and community approval. The form of this approval will either be by-right for privately owned properties in certain zoning districts, through use variance for others, or through public approval of leases on long-term publicly-owned sites.*

Based on these analyses, IILF and Urban Partners shifted focus to discussions with public and non-profit landowners with shared interest in farm expansion. This focus strongly coincides with the actual ownership patterns for larger parcels of vacant land in Philadelphia. A review of Philadelphia property records identified 317 parcels of vacant land of three acres or greater (see **Table 3**). These 317 parcels include a total of 12,632 acres, or nearly 15% of the entire area of the City of Philadelphia.

Of these 317 parcels, 81 (totaling more than 6,000 acres) are owned by the City of Philadelphia or related agencies--a few of which are assigned to Fairmount Park. However, it should be noted that most of the parcels that constitute Fairmount Park's 4,180 acres are NOT included here, as they are classified as recreational or public use. As will be discussed below, some of these recreational parcels also could provide appropriate farm sites.

Table 3
Vacant Land Parcels of 3 Acres+
June, 2007

Ownership	No. of Parcels	Acreage
City of Philadelphia & Related Agencies	81	6,145
Other Governments	21	696
Railroads	32	404
Electric Utility*	18	3,145
Non-Profits with Environment-Related Mission	5	75
Colleges, Hospitals & Religious Organizations	15	94
Philadelphia Industrial Development Corporation & Financed Businesses	24	583
For-Profit & Other	121	1,490
Total	317	12,632

* There may be an error in public records concerning the acreage of certain utility-owned parcels

Other governments own 21 of these parcels (nearly 700 acres), the Philadelphia Industrial Development Corporation is involved in ownership of 24 parcels either directly or through financing activities for private businesses, and five parcels are owned by non-profit organizations with environment-related missions. The remaining 186 parcels are owned by railroads (32), the electric utility (18), colleges, hospitals and religious organizations (15), and other for-profit entities (121).

The concentration of large-parcel vacant land ownership with public entities provides the opportunity for potential shared-mission efforts to identify farm sites. Some of the parcels owned by non-profits with environment-related missions offer additional potential. Pursuing this avenue, IILF, PWD and/or Urban Partners met or had phone interviews with staff of Fairmount Park, Awbury Arboretum, Schuylkill Center for Environmental Education, the City Commerce Department, the Overbrook Environmental Education Center, and the Salvation Army, as well as additional discussions with the City's NTI staff.

Most of these organizations indicated interest in working to make property available as potential farm sites. One non-profit landholder has since leased land to a commercial food coop for a commercial farm modeled after STF. Some non-profit landowners have potential sites, but lack board consensus to use the land in this manner or require utility connections which will raise the cost of site preparation. Another non-profit social services agency plans to use a portion of a recently-acquired 12 acre site for a farm, modeled after STF, to produce commercial products and to provide vegetables for the facility's nutrition education and healthy cooking programs. Several parcels, currently in public agency inventories or soon to be acquired, have been identified as possibly available as farm sites.

This round of inquiries has identified ***strong interest from many organizations with parcels of land appropriate for farm sites in making these parcels available for this use.*** It appears reasonable to

conclude that over a period of several years, long-term leases can be secured for multiple farm sites on properties designated for long-term open space through one mechanism or another. *The quantity of potentially available land greatly exceeds likely demand for farm sites in the next five to ten years.* However, *various legal and organizational requirements will need to be met before these parcels can be delivered* to urban farmers on terms that will assure economically feasible farming opportunities.

Organizational and Policy Factors

Potentially available land for farm sites falls into three categories:

- (1) **Long-term public open space.** Many publicly-owned parcels are intended to remain in permanent open space use. These parcels include many portions of Fairmount Park (Fox Chase Farm, for instance); a portion of the Bartram's Garden property; certain property adjacent to airports, especially Northeast Airport; and other parcels. Many of these parcels could become long-term farm sites, as one type of open space.
- (2) **Parcels subject to public disposition.** Through NTI, sheriff's sales, lien foreclosure, and other real estate activities, the City of Philadelphia has accumulated an estimated 30,000 parcels in public ownership, which are not intended for long-term public use. The City intends on disposing of these parcels within a framework of public policy objectives. As noted above, most of these parcels are poor farm site candidates; however, some parcels would be appropriate.
- (3) **Non-profit parcels available for joint mission programming.** Though much smaller in number, several vacant parcels appropriate for farm sites are held by non-profit organizations with missions that potentially could make these sites available for long-term farming activities.

Long-Term Public Open Space as Farm Sites. Certain properties of the City of Philadelphia are intended to remain in long-term open space use. Many of these lands surround public buildings and are very small, irregularly shaped parcels separated from each other by many miles. Some of these sites have security requirements that make it undesirable to permit access to non-employees. However, other properties are fragments of large open space masses such as Fairmount Park, Bartram's Garden, and the Northeast Airport. Since these properties are intended for long-term open space, many of them could be committed to long-term farming use. *These candidate open space properties offer the best potential as farm sites in the City.*

One obstacle to long-term farming use is the City Charter, which limits direct City property leases to one year. However, various mechanisms have been developed over the years (mostly through the Philadelphia Authority for Industrial Development) to make such properties available for long-term lease. To utilize these mechanisms for long-term farm leases at low cost, several factors would need to be present:

- The City administration and departments owning or using the lands (Fairmount Park, Public Property, Water, Airport) would need to establish programs and policies for farm use of their excess open space lands.
- Specific sites would need to be identified as candidate farm locations.
- These properties would need to be transferred through the established mechanisms to provide the opportunity for long-term farm use.
- The long-term financial stability of candidate farmers would need to be established to justify these long-term leases. (We should note that many urban farming candidates would find it difficult to meet this standard early in their farming careers.)
- In the absence of demonstrated long-term farmer financial stability, a financially stable land-leasing intermediary would need to be committed to take these long-term leases.
- Financing for required site improvements (see below) would need to be secured.

Disposition of Publicly-Owned Sites for Farming. During 2007, the City of Philadelphia's Office of Housing and Neighborhood Preservation (OHNP) consolidated and reorganized property disposition functions for publicly-owned sites, including properties held by the Redevelopment Authority. As noted above, the City and related agencies control more than 30,000 parcels of land intended for some form of redevelopment or public or civic use. OHNP's revised disposition process intends to speed the sale or other disposition of properties to private sector users consistent with public policy and neighborhood plans.

In general, these properties will be sold for fair market value—pricing them beyond economic feasibility as farm sites—unless other compelling public objectives are identified for specific parcels. Also as noted above, while the vast majority of these parcels are not appropriate as farm sites, there are some that would be effective for this use. To capture some of these parcels as farm sites, intervention in this disposition process would need to occur at several levels:

- OHNP would need to adopt policies prioritizing disposition of property for farm use at below market pricing when specific conditions are met.
- Specific sites would need to be identified and prioritized as candidate farm locations.
- A financially stable land-holding non-profit intermediary would need to be identified as the designated entity for disposition of these candidate farm sites. (Note: it is unlikely that, in the face of the massive numbers of properties requiring disposition, OHNP staff can invest the time necessary to work with individual farmers.)
- This intermediary could then develop procedures, consistent with the guidelines determined by OHNP, for ultimate transfer of properties to urban farmers.
- Again, financing for required site improvements (see below) would need to be secured.

Use of Non-Profit or Institutional Open Space for Farming. Several vacant parcels appropriate for farm sites are held by non-profit organizations with missions that potentially could make these sites available for long-term farming activities. The availability of these properties as farm sites requires individual negotiations with these organizations.

Overall Economic Feasibility of an Agricultural Economy in Philadelphia

Based on the individual factors assessed above, we can *conclude that further expansion of commercial farming activity is economically feasible in Philadelphia*. In particular, the feasibility rests on these conclusions:

- a Philadelphia-based farmer couple or other two-farmer group with the productivity that comes from five years of experience can achieve production levels that support a business yielding net income placing a two-farmer household at or above the median income level of all Philadelphia households;
- assuming the gradual introduction of commercial farm businesses within Philadelphia, there is sufficient interest among serious farming candidates to find ten successful entrepreneur-farmer couples or other two-farmer groups in the next six years;
- the current level of local chemical-free farming has only begun to scratch the surface of economic demand for these high-quality products; the perhaps \$500,000 production from four new prototype farms by 2010 would only capture 5% of this demand. If a total of ten new farms were introduced by 2013, they would capture less than one-ninth of this potential demand; and
- there appears to be sufficient interest by governments and non-profit organizations which own larger vacant parcels in Philadelphia to provide access to a stream of farm sites over a period of several years. Effectively accessing these opportunities in the public sector will require encouraging public agencies to prioritize farming as a use for portions of long-term open space areas and for disposition of property assembled through NTI and other public development activities. Accessing opportunities with non-profit owned parcels will require direct negotiations with these organizations and the establishment of joint mission programming.



Economic & Fiscal Impacts of a Philadelphia Agricultural Economy

The development of an agricultural economy in Philadelphia will have substantial economic and fiscal benefits for the City and the Commonwealth of Pennsylvania. The analysis presented here considers the impacts of development of ten farms of the scale reviewed above. It is anticipated that ten such farms can be developed within Philadelphia by 2013.

Economic Impact

The overall economic impact of the development of these ten farms in Philadelphia is derived from two interrelated components:

- the **direct economic impact** of ten new farms in the City; and
- the **indirect economic activity** stimulated by this direct spending which can be traced through the regional economy.

The total direct and indirect economic impact of ten new farms in Philadelphia is \$2.466 million dollars annually (see Table 4).

Table 4
Annual Economic Impact of
Ten Farms in Philadelphia
(In 2007 Dollars)

Direct Economic Impact

Individual Farm Economic Impact	\$120,000
Total Direct Economic Impact (Ten Farms)	\$1,200,000

Indirect Economic Impact

Indirect Impact of an Individual Farm	\$126,600
Total Indirect Economic Impact (Ten Farms)	\$1,266,000

Total Economic Impact	\$2,466,000
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Direct Economic Impact

The direct economic impact of a single prototype farm is \$120,000 annually based on its estimated total sales and measured in 2007 dollars. The development of ten such farms will have a **direct economic impact of \$1.2 million annually.**

Indirect Economic Impact

Assessing the indirect economic impact of these expenditures is complex and involves tracking the additional rounds of spending within the region induced by businesses and their employees as a result of this direct farming activity. Utilizing the U. S. Department of Commerce's RIMS II multipliers for a

portion of Pennsylvania with a more active agricultural economy than now exists in Philadelphia, we estimate that the appropriate economic multiplier for indirect economic activity resulting from direct farming activity in Philadelphia is 1.055. Applying this multiplier to the direct farming activity results in a **total indirect economic impact of \$1.266 million annually.**

Employment Impact

Creation of an agricultural economy in Philadelphia will also have an important employment impact. Each prototype farm is estimated to generate three jobs—two for the farmers and one full-time equivalent in hired labor. For ten farms this results in 30 full-time jobs annually (see **Table 5**).

Table 5
Employment Impacts of
Ten Farms in Philadelphia

	Within Region	Within Philadelphia	Philadelphia Residents
Employment Impact			
Direct Farm Employment (Ten Farms)	30	30	30
Indirect Employment Impact	16	12	9
Total Employment Impact	46	42	39

All these jobs are located within Philadelphia and will likely be filled by Philadelphia residents. The **indirect economic impact of this agricultural economy will result in the creation of an additional 16 full-time equivalent positions.** Because this indirect economic activity is more diffuse—both in terms of industrial sectors and location of employment—this employment is believed to be spread more broadly throughout the region. We estimate that approximately 12 of the 16 full-time equivalent positions supported by this indirect economic impact will be located within Philadelphia and that 9 will be filled by City residents.

Totaling these direct and indirect economic impacts, we estimate that an agricultural economy in Philadelphia will support a **total of 46 full-time equivalent positions annually, including 42 located within Philadelphia and 39 held by City residents.**

Tax Revenue Impact

Ten new farms in Philadelphia will **generate approximately \$145,000 in tax revenues annually** (measured in 2007 dollars)—\$89,700 in increased tax revenue for the City of Philadelphia and \$55,200 for the Commonwealth of Pennsylvania (see **Table 6**).

Table 6
Summary of Annual Tax Benefits
Generated by Ten Farms in Philadelphia

	For City of Philadelphia	For State of Pennsylvania	Total City & State
Taxes on Wages & Salaries	\$21,500	\$19,500	\$41,000
Sales & Hotel Taxes	\$4,100	\$23,700	\$27,800
Business Privilege Taxes	\$41,300		\$41,300
Net Profits Taxes	\$3,500		\$3,500
Real Estate Taxes Paid On Business Property	\$12,400		\$12,400
Use & Occupancy Taxes Paid On Business Property	\$6,900		\$6,900
State Corporate & Other Business Taxes		\$12,000	\$12,000
Total Annual Tax Benefits	\$89,700	\$55,200	\$144,900

Wage Tax Revenue Impact

The 46 annual full-time equivalent jobs supported directly and indirectly by these ten farms are estimated to generate wages and salaries of \$636,000 annually (see **Table 7**). Of this \$636,000 in wages and salaries, an estimated \$520,000 is earned within Philadelphia--\$390,000 by Philadelphia residents.

Table 7
Annual Wage & Salary Impacts of
Ten Farms in Philadelphia
(2007 Dollars)

	Within Region	Within Philadelphia	Philadelphia Residents
Wage & Salary Impacts			
Farm Payrolls	\$170,000	\$170,000	\$128,000
Indirect Wage & Salary Impacts	\$466,000	\$350,000	\$262,000
Total Wage & Salary Impacts	\$636,000	\$520,000	\$390,000

This employment results in an estimated \$21,500 in wage tax revenue for the City of Philadelphia and another \$19,500 in income tax revenue for the Commonwealth of Pennsylvania (see **Table 8**).

Table 8
Annual Taxes on Wages & Salaries
Generated by Ten Farms in Philadelphia

	Total Paid Within Philadelphia Region	Total Paid Within Philadelphia	Total Paid To Philadelphia Residents	Total Paid Within Philadelphia To Non-Philadelphia Residents
Total Direct Wages & Salaries	\$170,000	\$170,000	\$128,000	\$42,000
Total Indirect Wages & Salaries	\$466,000	\$350,000	\$262,000	\$88,000
Total Wages & Salaries	\$636,000	\$520,000	\$390,000	\$130,000
Wage Taxes Paid To City of Philadelphia		\$21,500	\$16,600	\$4,900
Income Taxes Paid To State of Pennsylvania	\$19,500			

Sales and Hotel Tax Impact

Additionally, sales taxes directly and indirectly resulting from the economic activity of the ten farms is estimated to generate another \$27,800 in increased public revenue, including \$4,100 in revenue collected by the City of Philadelphia and \$23,700 in revenue collected by the Commonwealth of Pennsylvania (see **Table 9**). These revenues include hotel taxes on indirect economic activity and gasoline taxes on direct farm vehicle use.

Table 9
Sales Tax & Hotel Tax Benefits
Generated by Ten Farms in Philadelphia

	Total	Total Paid To City of Philadelphia	Total Paid To State of Pennsylvania
Direct Economic Activity			
Sales Taxes On Farm Purchases	\$15,800	\$2,300	\$13,500
Gasoline Tax	\$4,500		\$4,500
Total Sales Taxes On Direct Economic Activity	\$20,300	\$2,300	\$18,000
Indirect Economic Activity			
Sales Tax On Taxable Indirect Economic Activity	\$6,270	\$570	\$5,700
Liquor Tax On Indirect Economic Activity	\$120	\$120	
Hotel Tax	\$1,110	\$1,110	
Total Sales Taxes On Indirect Economic Activity	\$7,500	\$1,800	\$5,700
Total Sales Taxes	\$27,800	\$4,100	\$23,700

Business and Real Estate Tax Impact

Of the \$2.466 million in total direct and indirect economic impact, \$2.295 million is estimated to support private for-profit business activity, including \$1.857 million in business activity within Philadelphia (see **Table 10**). This for-profit business activity will annually generate an estimated \$64,100 in additional business and property tax revenue for the City of Philadelphia and \$12,000 for the Commonwealth of Pennsylvania (see **Table 11**).

Table 10
Annual For-Profit Business Activity
Generated by Ten Farms in Philadelphia
(2007 Dollars)

	Within Region	Within Philadelphia
For-Profit Business Activity		
For-Profit Business Activity Due To Farms	\$1,200,000	\$1,200,000
Indirect For-Profit Business Activity	\$1,095,000	\$657,000
Total For-Profit Business Activity	\$2,295,000	\$1,857,000

Table 11
Annual Business Tax & Real Estate Tax Benefits
Generated by Ten Farms in Philadelphia

	Within Region	Within Philadelphia
For-Profit Business Activity		
For-Profit Business Activity Due To Farms	\$1,200,000	\$1,200,000
Indirect For-Profit Business Activity	\$1,095,000	\$657,000
Total For-Profit Business Activity	\$2,295,000	\$1,857,000
Annual Business Privilege Taxes Paid		\$41,300
Annual Net Profits Taxes Paid		\$3,500
Annual Real Estate Taxes Paid On Business Property		\$12,400
Annual Use & Occupancy Taxes Paid On Business Property		\$6,900
State Corporate and Other Business Tax Paid	\$12,000	

An Agricultural Economy in Philadelphia: Environmental, Nutrition and Food Security Impacts

This section of the analysis was prepared by the Philadelphia Water Department to detail environment, nutrition, and food security benefits and impacts of an expanded agricultural economy in Philadelphia.

Environmental Benefits and their Economic Impact

There is considerable research showing that chemical free agriculture produces many environmental gains such as reduction of storm water runoff, reduced greenhouse gases and reduced urban heat island effect. A PWD analysis of land-use scenarios, including grass, showed that a farm field is considerably more effective in absorbing water runoff from a one inch rainfall. The field showed a maximum runoff of up to approximately 2,300 gallons while the grass covered lot showed a maximum runoff of up to approximately 4,100 gallons.¹

Approximately 60% of Philadelphia neighborhoods are served by combined sewers and these systems are often negatively impacted by storms resulting in flooding and the release of untreated wastewater into the waterways. Establishing farmland on vacant, abandoned and underutilized public land in these neighborhoods can help to avoid costly construction of new treatment facilities to remedy these problems. The degree to which water runoff avoidance decreases the need for new treatment facilities would depend on the amount of farm acreage and where the acreage is located. In these combined sewer areas, assuming significant acreage, the savings could range from a minimum of \$.50 per avoided gallon to a maximum of \$12.00 per avoided gallon.²

Vegetable fields reduce the greenhouse effect by absorbing and retaining toxic gases such as carbon dioxide. This pollution reduction activity can occur to a greater degree on chemical free SPIN-based crop land than on other green space scenarios because of the density of the plants, crop rotation, the planting of cover crops during off seasons and the health and texture of the enhanced soil. In hot weather these crop fields serve as heat sinks and function to put water back into the air. This process reduces the urban heat island effect by cooling the surrounding air.³ All these environmental benefits can reduce the need for public or business sector investment into costly pollution control mechanisms and the possible penalties for non-compliance.

Many of these environmental gains translate into multifaceted and significant economic benefits. In fact, “in every community studied, farmland has generated fiscal surpluses to help offset the shortfall created by residential demand for public services. This is true even when the land is assessed as agricultural land rather than as its potential for residential or commercial land.”⁴

¹ Glen Abrams, Urban Watersheds Planner, PWD Watersheds Unit, December 13, 2006 conversation, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

² Howard Neukrug, Manager, PWD Watersheds Unit, February 1, 2007 conversation, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

³ Dr. Paul Hepperly, Agronomist, Research Manager, Rodale Institute, 4/21/06 and 5/31/06 conversations, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#), cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

⁴ Cost of Community Services Studies, American Farmland Trust, Farmland Information Center, November 2002, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

Nutritional Benefits

Many Philadelphians do not have easy access to affordably priced fresh vegetables and fruits. Poor nutrition and hunger are problems with sometimes dire health and economic consequences that can affect not just families but the entire community. Skyrocketing health care costs put nutrition related illnesses such as diabetes and obesity in a bold light. Local farms would help address this issue.

Malnutrition affects many poor children in the US and the elimination of malnutrition would produce significant economic benefits. If they had their nutritional needs met, “poor children would be capable of a 10% to 30% higher mental achievement” which translates into higher achievement in each grade, less repeated grades, fewer drop outs and resulting higher lifetime earnings for these future adults”⁵.

Even when vegetables are available they are not necessarily as nutritious as we would hope. Much of Philadelphia’s food is imported from across the country and around the world. It is commonly accepted wisdom that food travels an average of 1500 miles to get to our kitchens. Many of these varieties of food are selected and grown to withstand the stress of long-distance transportation. Food that is grown locally is believed to have higher nutritional value (and better taste) because it is fresher and because it is not grown with travel durability as a key requirement.

According to the Center for Disease Control and Prevention, in 1995 the direct health care costs of obesity nationwide were estimated at \$70 billion.⁶ The lack of healthy food in some of our poorer communities is a major contributing factor to this epidemic which in turn contributes significantly to diabetes, heart disease and other costly and dangerous ailments. Furthermore, “...research supports the conclusion that adults who are not adequately nourished are at risk of nutrition-related disease, which in turn reduces their ability to earn and increases the costs of health care... If adults are not able to pay for health care, the public pays.”⁷

Food grown in organically improved soil can contain significantly more nutritional value than conventionally grown food because organic soil provides the plants with more available water and minerals.⁸ And foods grown without chemical inputs have a much lower chance of causing incidental toxic ingestion.

Food Security

The predicted decrease of global oil supply, increased world oil demand and the resulting increase in oil prices provide a compelling case for encouraging urban farming. These factors will dramatically increase production and transportation costs for food grown conventionally because modern agri-businesses and conventional multi-acre farms are dependent on oil based products such as herbicides, pesticides and fossil fuel for tractors, long distance trucking and other combustion engine equipment. Additionally, much of that food is pre-packaged for shipment, most often in oil-based plastic wrap.

According to the WorldWatch Institute, “Researchers estimated that local and regionally sourced meals

⁵ B. Popkin and R. Lidman, Economics as an Aid to Nutritional Change, The American Journal of Clinical Nutrition 25: March 1972, p. 336-337, cited in N.J. Weissman and E.F. Wolff, The Economic Impact of the Environmental Benefits of Greenspace

⁶ Creating A Healthy Environment: The Impact of the Built Environment on Public Health, Richard J. Jackson, Chris Kochtitsky, Centers for Disease Control and Prevention, Sprawl Watch Clearinghouse Monograph Series, p. 9, cited in N.J. Weissman and E.F. Wolff, The Economic Impact of the Environmental Benefits of Greenspace

⁷ Bonnie Braun, Nutrition Education: A Strategy in Welfare Reform; Presented at the Nutrition Education for Diverse Audiences Conference, Houston, Tx; February 1997, p.6, cited in N.J. Weissman and E.F. Wolff, The Economic Impact of the Environmental Benefits of Greenspace

⁸ Dr. Paul Hepperly, Agronomist, Research Manager, Rodale Institute, 4/21/06 and 5/31/06 conversations, cited in N.J. Weissman and E.F. Wolff, The Economic Impact of the Environmental Benefits of Greenspace

entailed four to 17 times less petroleum consumption and five to 17 times less carbon dioxide emissions than a meal bought from conventional food chains.”⁹ The Somerton Tanks Demonstration Farm model has a greatly reduced reliance on fossil fuel as compared to a conventional farm model. Along with the total elimination of oil based herbicides and pesticides, the Somerton methods eliminate most combustion engine farm activities and the close proximity to urban markets dramatically reduces trucking.

Much of the food Philadelphian’s eat will be greatly impacted by the future economic reality of oil. Despite the abundance of Pennsylvania farms, more often than not, the major super markets in Pennsylvania import food from outside of the state.¹⁰ And even most Pennsylvania farms rely heavily on oil-based production. The predicted impact of continued food importation under a peak oil scenario is significantly higher food prices and food shortages for communities that do not have ready access to local or chemical free farms.

According to the Delaware Valley Regional Planning Commission (DVRPC) “a major change in the global energy regime will soon impact the economy...there will be great economic opportunities to exploit...therefore, as our primary objective, economic development strategists should start shifting resources into initiatives to steer the region through this transition.”¹¹ The report goes on to say that “Increased oil and transportation costs will eventually be passed on to consumers...”¹² and that “households, especially working and lower middle-class households, would not only be spending a greater portion of their budgets on essentials like transportation and heating fuel...but also they would be spending more on essentials such as food due to the indirect costs of oil.”¹³

To prepare for this eventuality, and to make planning decisions that turn this potential food security crisis into a regional advantage, DVRPC suggests that local “organic farming is an emerging economic opportunity...” because “as both the market for these products and the costs of “high-input” agribusiness increases, low-input farming may become a feasible economic development strategy.”¹⁴ “The pressure of resource constraints could also spur new industries and clusters of industries that become the engine of our regional economy.”¹⁵ A strong urban farm economy could be the magnet to attract larger food related businesses to the region and the City.

Additionally, DVRPC points out that the food service sector is a major part of our current economy, coming in 7th in the top 10 growth industries in Southeastern Pennsylvania. This industry has added 3,000 new jobs to our region since 2000. “Rather than having the (food) inputs of this industry shipped in from elsewhere, we could strive to retain some food industry dollars locally by promoting local agriculture...Locally raised food and organic farming are quickly becoming profitable agriculture alternatives.”¹⁶ Growth in this basic industry can benefit spinoff business activity in food processing; farm machinery sales, service, and repair; and food products wholesaling industries.

Farmlands in and around Philadelphia stand to become major economic forces in Philadelphia’s economy and welfare. Locally grown chemical free foods are often viewed as specialty items, relatively unaffordable to the masses. But as the price of conventionally grown, long distance food edges higher,

⁹ Food Democracy: Nourishing a Fundamental Freedom, World Ark, January/February 2006 edition, www.heifer.org, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

¹⁰ Kyle Nagurny, Director of Market Development, PA Department of Agriculture, conversation August 15, 2006, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

¹¹ Delaware Valley Regional Planning Commission’s report A “Post-Global” Economic Development Strategy, March 2006 p. 9, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

¹² Delaware Valley Regional Planning Commission’s report A “Post-Global” Economic Development Strategy, March 2006 p. 11

¹³ Delaware Valley Regional Planning Commission’s report A “Post-Global” Economic Development Strategy, March 2006 p. 12.

¹⁴ Delaware Valley Regional Planning Commission’s report A “Post-Global” Economic Development Strategy, March 2006 p. 31, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

¹⁵ Delaware Valley Regional Planning Commission’s report A “Post-Global” Economic Development Strategy, March 2006 p 14, cited in N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#)

¹⁶ Delaware Valley Regional Planning Commission’s report A “Post-Global” Economic Development Strategy, March 2006 p. 30

locally grown chemical free foods will become less expensive in comparison and demand will rise. Having an adequate supply of farms and farmland will help keep local vegetable and fruit pricing relatively stable in the face of these economic shifts. Regional policy makers are attempting to stem the loss of the region's once abundant farmland. Philadelphia can take a leadership role by developing and implementing agriculture policy for urban farms and farmland.¹⁷

Securing existing farms and farmland and increasing the number of local, chemical-free farms translates into reliable access to fresh, more nutritious vegetables that will be less impacted by the cost of gasoline and other petroleum-based products such as herbicides and pesticides.

Other Public Benefits

The ongoing maintenance of urban green space requires significant public cost. While the City must pay to mow and clean conventional public spaces, these basic functions would be performed by the entrepreneurial farmers at their own expense.

These savings to government in reduced maintenance costs can be significant. Based on the Philadelphia Water Department's practice of 17 annual mowings and a unit cost of \$200 per half acre per mowing, *ten three-quarter acre farms operating on former public open space area would result in annual savings in public operating costs of more than \$50,000* for mowing alone.

¹⁷ N.J. Weissman and E.F. Wolff, [The Economic Impact of the Environmental Benefits of Greenspace](#) p.12

Capital Investment Needed to Encourage Commercial Farming

IILF's experience with the Somerton Tanks Demonstration Farm has provided a practical understanding of the infrastructure and equipment requirements for commercial farming in Philadelphia. Much of the labor cost associated with site preparation has proven to be effectively completed by the farmers including soil sampling, soil enhancement and composting, and the planting of cover crops.

At Somerton Tanks, the Philadelphia Water Department provided in-kind services for water and electrical hook-ups, fencing, and other expenses at an estimated value of \$37,000. With these supports, out-of-pocket costs at Somerton Tanks Farm for IILF totaled \$3,500 for site preparation and \$8,400 for initial equipment and production structures (see **Table 12**). The total costs and in-place value of infrastructure and site preparation is estimated at \$48,900.

Table 12
Start-Up Infrastructure & Equipment
Somerton Tanks Farm
July, 2007

Site Improvements In Place (Est. Value)	
Fencing	\$17,000
Water & Electric Hookups & Miscellaneous Other	\$20,000
Total Site Improvements In Place	\$37,000
IILF Site Preparation	
Irrigation	\$2,000
Soil Preparation--Tilling, Compost & Fertilizer	\$1,500
Total IILF Site Preparation	\$3,500
IILF Farm Equipment & Production Structures	
Storage Shed	\$1,000
Post Harvesting Processing Station	\$1,200
Cooler	\$3,500
BCS Rototiller--Used	\$1,500
Portable Farmstands (2)	\$1,200
Total IILF Farm Equipment & Structures	\$8,400
Total IILF Expenditures	\$11,900
Total Infrastructure In-Place Value & Expenditures	\$48,900

The most expensive site preparation cost is fencing. This suggests that significant savings could be achieved through clustering of farms to minimize total fencing requirements.

Input from the Somerton Tanks farmers, noted above, suggests the value (perhaps necessity) of adding a more effective all-weather shelter and permanent bathroom to the site. Small structures can be purchased

in kit form for on-site assembly in sizes from 100 square feet up to 250 square feet. We estimate the cost of such a small structure delivered to the site and assembled at \$7,000. A small on-site bathroom facility would cost perhaps \$35,000 and could serve multiple farmers.

Table 13
Start-Up Infrastructure & Equipment Requirements
Commercial, Chemical-Free Farming In Philadelphia
November, 2007

	Single Farm	Cluster of Four Farms	Per Farm in Cluster
Site Preparation Requirements:			
Fencing	\$17,000	\$35,000	
Irrigation	\$2,000	\$8,000	
Water & Electric Hookups	\$12,000	\$28,000	
Soil Amendment	\$1,500	\$6,000	
Restroom Facilities	\$35,000	\$35,000	
Contingency (20%)	\$13,500	\$23,000	
Total Site Preparation	\$81,000	\$135,000	\$33,750
Farm Equipment & Required Production Structures:			
Storage Shed	\$1,000		\$1,000
Post Harvesting Processing Station	\$2,500		\$2,500
Cooler	\$3,500		\$3,500
Rototiller	\$4,500		\$4,500
Portable Farmstands	\$1,200		\$1,200
Contingency (20%)	\$2,500		\$2,500
Total Farm Equipment & Structures	\$15,200		\$15,200
Optional Production Structures:			
Hoop Houses (6)	\$12,000		\$12,000
Office/Storage Structure	\$7,000		\$7,000

On **Table 13**, we estimate the costs of preparing a property for a single farm and for a cluster of four commercial farm sites. Site preparation costs total \$81,000 for a single farm and \$135,000 for a cluster of four farms. The efficiencies of farm clustering are obvious in the lower fencing costs and feasibility of shared restroom facilities. Beyond that the costs of farm equipment and required production structures are estimated at \$15,200 per farm. We also assume here that individual farmers may choose to add hoop houses for extended season farming and an office/storage structure.

On **Table 14**, we show one approach that supports the on-going feasibility of the small farm model. This approach is based on the following principles:

- that grants to public agencies or non-profit organizations will be utilized to support major infrastructure and site preparation including the shared restroom
- that individual farmers will own and be responsible for financing their own equipment, hoop houses, and office/storage structures—though it may be necessary to develop a financing vehicle to support those purchases.

Under these assumptions, public agencies/non-profits would be responsible for identifying approximately \$135,000 for infrastructure improvements to create a cluster of four commercial farms. Individual farmers would finance \$15,000 to \$34,000 of equipment with payments in the \$2,200 to \$5,100 per year range. Note that these amortization payments are included on Table 2 in the basic farm feasibility analysis. A second cluster of six farm sites could be developed at a somewhat higher site preparation cost of \$165,000 in 2007 dollars. Some of these start-up expenses could be mitigated through formation of a farming cooperative.

Table 14
Four-Farm Infrastructure & Equipment Financing Model
Commercial, Chemical-Free Farming In Philadelphia
November, 2007

Cluster of Four Farms:

	Public/ Non-Profit Investment	Total Farmers Responsibility	Per Farmer Responsibility
Site Preparation	\$135,000		
Farm Equipment & Required Production Structures		\$60,800	\$15,200
Optional Production Structures		\$76,000	\$19,000
Total Investment (4 Farms)	\$135,000	\$136,800	\$34,200
Farmer Finance:			
Total Investment/Debt	\$34,200		
Annual Payment (10 Year Finance)	\$5,100		

Together, a six-year program to establish one cluster of four farms and a second cluster of six farms would require a phased investment of about \$300,000 in grant funding for infrastructure and site preparation and as much as \$350,000 in loan capital to finance the ten farmers.

Furthering the Agricultural Economy in Philadelphia

The analysis above demonstrates the feasibility of expanding commercial farms in Philadelphia. This emerging entrepreneurial industry can be of great potential value to Philadelphia and the Commonwealth. Commercial farming can become the foundation of a large and vibrant, revenue producing agricultural economy in the City. The analysis also suggests that the most effective way to kick-start this potential is by clustering several commercial farms at one location in a Farm Business Incubator/Farm Park.

Furthering this expansion of an agricultural economy in Philadelphia requires a series of key actions:

- **Developing a policy commitment to commercial, chemical-free farming in Philadelphia.** Public agencies need to prioritize the development of commercial, chemical-free farms on appropriate sites. Public policy should give priority to investments in this sector and the utilization of appropriate publicly-owned open space as commercial farms. Non-profit organizations also need to prioritize the development of commercial, chemical-free farms on appropriate sites.
- **Identifying sites for a first cluster of four farms and a second cluster of six farms.** This public policy commitment needs to be translated into the commitment of land for a first cluster of four commercial farms. Depending on the location of this property and its adjacent uses, this parcel needs to be anywhere from five to eight acres. Ideally, in identifying the location for this first cluster of farms, a second location for a cluster of six farms could also be tentatively secured.
- **Identifying an organization or agency to manage the legal and physical interests in the site.** This organization would be the prime lessee of the parcel, would manage site preparation activities, and would sublease to individual farmers.
- **Securing funding for management of site preparation and other land-related activities.** The managing organization will need to support necessary staff time and expenses.
- **Securing capital funds for site preparation.** This first site would require approximately \$135,000 in funding to complete site preparation for four commercial farms.
- **Identifying a lender to provide financing for individual farmers.** This lender may also require some supplemental capital for these loans.
- **Retaining the involvement of IILF** as a promoter of the concept and as a technical assistance source. IILF's on-going role will include: (1) work with the Philadelphia Water Department to create and oversee the work of an Agricultural Advisory Committee (see below); (2) assist in farmer recruitment and technical support; and (3) encourage government and non-profit policy commitments to developing an agricultural economy in Philadelphia.

Initiating these efforts can be accomplished by forming an Agricultural Advisory Committee that should include representatives of the City Administration; key City agencies (Philadelphia Water Department, Fairmount Park); interested state representatives and/or senators; interested City Council members; the Office of Housing and Neighborhood Preservation; Neighborhood Gardens Association/Philadelphia Land Trust; representatives of the Philadelphia farmer community; the state departments of Agriculture, Environmental Protection, Community and Economic Development, and Conservation and Natural Resources; Penn State University; US Department of Agriculture Natural Resources Conservation Service; local foundations; and IILF.

Operating with the support of this broader committee, the managing organization or agency would implement this commercial farm expansion plan over six years. Annual objectives include:

2008

- Recruit pivotal stakeholders. PWD has been holding conversations with pivotal stakeholders including PA Department of Agriculture, PA Department of Environmental Protection and the US Department of Agriculture Natural Resources Conservation Service. They have enthusiastically endorsed the concept of an agricultural economy in Philadelphia and have agreed to participate in an Advisory Committee focused on stimulating the development of farms.
- With the approval of the new City administration an Agricultural Advisory Committee is formed composed of select stakeholders.
- The Committee develops Agricultural Policy and with the cooperation of the Mayor and City Council the policy is institutionalized.
- The Committee develops capital budget for a prototype Farm Business Incubator/Farm Park and develops operational budget for staff/agency to develop and manage it.
- The Committee identifies and secures financial commitments for Farm Business Incubator/Farm Park capital and operational budgets and for staff/agency budgets.
- The Committee identifies the organization or agency and staff responsible for the development of and management of the Farm Business Incubator/Farm Park as well as procedures for farmers to access individual small parcels outside of the Incubator context. The agency and staff will develop and maintain an Agriculture Land Bank of parcels that have limited market appeal or are unsuitable for market development and that fit the criteria for potential commercial farming ventures.
- The organization's or agency's staff develops operational policies and operational procedures, including land use protocols and farmer financial and non-financial responsibilities, for the Farm Business Incubator/Farm Park. The agency and staff will select two parcels: one parcel of approximately five acres on which to develop a prototype Farm Business Incubator/Farm Park that will house four farms and one parcel of approximately six acres that will house six additional farms.

2009

- The organization's or agency's staff complete site acquisition, preparation and infrastructure for the first Farm Business Incubator/Farm Park
- The organization's or agency's staff will conduct local and national recruitment of entrepreneurial farmers to occupy Farm Business Incubator/Farm Park, screening and select farmer applicants for Farm Business Incubator/Farm Park
- Leases are signed with selected farmers to establish farm businesses at Farm Business Incubator/Farm Park.

2010

- The prototype Farm Business Incubator/Farm Park is fully occupied with four farms.
- Site acquisition, preparation and infrastructure are completed for the second Farm Business Incubator/Farm Park.

2011

- The organization or agency will conduct a local and national recruitment of entrepreneurial farmers to occupy the second Farm Business Incubator/Farm Park and will undertake screening and selection of farmer applicants for Farm Business Incubator/Farm Park.
- Leases are signed with selected farmers to establish farm businesses at Farm Business Incubator/Farm Park

2012

- The second Farm Business Incubator is occupied by three farms.

2013

- The second Farm Business Incubator is fully occupied with six farms
- The Committee and the City Administration determine the next steps in the development of the Agricultural Economy. Once these two clusters totaling ten farms have been developed, additional opportunities could be identified to further expand commercial, chemical-free farming in Philadelphia.