

Potluck in the BEAR'S (Gar)Dens: An Investigation into Campus Farming to Develop the Urban Agriculture Plan for Brown University

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Prologue:

I believe passionately in urban agriculture and its power to foster sustainable development. Urban agriculture provides an important educational tool in ensuring recognition of food security as a serious issue and in promoting a more local and healthy food culture. I believe that urban agriculture has great potential to help solve hunger problems as well as to provide a space for communities to gather and share experiences together. In addition, I have been involved with various environmental communities both at and away from Brown University, and these experiences have suggested to me that the (urban) sustainable agriculture movement is growing. In particular, student-run farms on university campuses are burgeoning across the country and internationally.

At Brown, a renaissance in the local food movement and sustainable agriculture has arrived. Brown Dining Services has opened a new line in the Ratty Cafeteria dedicated to locally grown food and education about the sustainable food movement. A new farmers market has graced Brown's campus, allowing faculty, staff, students, and local residents to buy healthy produce from the farmers who raised them themselves. And a number of Environmental Studies classes have focused on projects related to local food and sustainable agriculture.

Moreover, several of my colleagues are invested in sustainable agriculture, promoting local food, and working the land. A number of campaigns, in addition to monthly vegan potlucks, in Brown's Environmental Action Network have involved supporting the local food movement in Rhode Island and at Brown. A separate organization has formed, SuFI- The Sustainable Food Initiative- to promote sustainable food and to learn about sustainable agriculture through a group independent study project. Individuals have gotten involved in urban agriculture independently as well. There are student coordinators who run the community garden at the Urban Environmental Lab, other students volunteer at the Southside Community Land Trust, a non-profit leader in urban agriculture, and still others have taken their own initiative and work with local farmers. Hence, from my experiences, I have concluded that students at Brown are interested in sustainable agriculture and are willing to invest their personal, extracurricular time in the effort.

I have been inspired by these students and they have motivated me throughout this thesis process to establish an urban garden system at Brown that is run by the students who care so much about these issues on both an intellectual and personal level. I would like to thank them for their dedication to building sustainable communities, which I know they will continue to do wherever they go after their years in college.

I would also like to take this time to thank Caroline Karp, my advisor, for encouraging me to think critically about this project and for her ongoing support. I must thank my two additional readers, Kurt Teichert and Steve Hamburg, both of whom have helped me to further develop my ideas and challenged some of my beliefs. In addition to all of the faculty and staff at the Center for Environmental Studies, I would like to give special thanks Patti Ann-Caton for her help with many different aspects of this thesis. Also, I appreciate all of the universities, students and faculty who participated in my surveys and those who have given me additional time of theirs to conduct interviews. Lastly, I would like to thank my family, for their ongoing encouragement to put my ideas on paper and work on issues that I care about deeply. I owe a muchisimas gracias to my brother, Seth, in particular, for helping me decide on my thesis topic.

It is my hope that this thesis will result in the creation of an archipelago of urban, organic gardens, named the BEAR'S garDen Archipelago, which stands for the Brown Environmental Agricultural Research Station Demonstration. Although Brown is not an agricultural school, hosting student-run gardens is certainly within its mission and of great interest to its constituents for both academic and extra-curricular pursuit. This garden system could serve many purposes at Brown, as I will discuss.

Thank you.

Executive Summary:

This study looks at the feasibility of establishing an urban, student-run farm at Brown University. First, I look at the value of urban agriculture and campus farms generally; then I examine the experiences of campus farms at 22 other universities, where they are used to create an experiential learning environment and promote sustainability. Interviews with university campus farm managers suggest that campus farming requires a strong commitment, volunteers, paid staff, funding, and a well defined mission statement. Campus farms vary in how they were operated and financed, the destination of the produce raised, and the size of the farm.

I examine the logistics of what a campus farm might entail at Brown, including identification and assessment of candidate sites. I also examine finance and governance issues. I consider possible locations for a farm at Brown based on sunlight, land ownership, and ease of access, size of available parcels. While there is not one large farm site, there are a number of smaller suitable sites for food gardens at Brown that can be integrated into an archipelago of campus gardens, to be known as “The BEAR’S (gar)Den Archipelago”. The sites include: the West House Backyard, the walkway to West House, the front area of the Science Library, the Ratty/Caswell space on Thayer Street, a section behind the V-Dub, the entrance to Hillel, the Swearer Center Backyard, a walkway to the UEL Garden, and Grad Center’s terrace.

I consider the potential costs involved with the creation of campus gardens at Brown and conclude that the direct costs range between \$5,000 and a little over \$560,000. The cost of acquiring the gardens from Brown University would be approximately \$560,000 at prevailing land prices if Brown was willing to sell. This cost represents 97% of the total. At the lower end, the cost of establishing these gardens is \$5,000, which is essentially the cost of labor and soil. The lower end cost assumes that Facilities Management will provide access to the equipment required for farming and that Brown University will provide land free of charge. While there are costs associated with running campus gardens, there are also economic benefits.

I conducted surveys of 40 faculty members and 100 students (20 from the Center for Environmental Studies) to assess interest in the idea of campus-based and run gardens. While only 30% of faculty responded that they would be involved in the proposed garden sites, 50 % of the faculty respondents think that the gardens could enhance some of the classes they have taught and 80% express interest in the facilities. Moreover, the majority of students (73%) are in favor of establishing such urban agricultural facilities, regardless of their academic concentration. Sixty one percent said they would walk 10-15 minutes to visit the gardens, however only 45% saw themselves involved in the gardens in some way.

I interviewed various Brown administrators about the feasibility of the archipelago idea given the University’s *Plan for Academic Enrichment* and ongoing campus planning efforts. Officials in Facilities Management indicate that the archipelago idea is feasible and that they will provide some assistance. In addition, a lead consultant on the Plan 2004/2005 expressed interest in integrating the edible landscape into “The Walk” and the other garden sites involved in the archipelago. Lastly, student-run, farms are blooming on university campuses across the United States, which suggests that the season is NOW for establishing campus gardens; and, ground has already been broken (May, 4 2005). Maintaining this garden and establishing others will build upon the current work that focuses on local food and sustainable agriculture, which has recently cropped up at Brown. Plans for the future of the various garden sites in the Archipelago are already underway and a number of volunteers have already been identified for harvest in the summer and fall of 2005.

I. INTRODUCTION:

History and Trends towards Urban Agriculture

Urban agriculture is defined as “the practice of farming within the boundaries of towns or cities” [1]. Historically, urban agriculture has been used in times of political, social and economic crises to provide communities with nutrition needed to supplement diets and with hope by bringing communities together (Appendix A: History of Urban Agriculture). It is manifested in different forms, from roof-top, hydroponic, backyard and community gardens, to roadside urban-fringe agriculture.

Urban agriculture has proved to be a viable location to grow produce. According to a USDA-NRCS (Natural Resources Conservation Service) study done in 2001, about two-thirds of the total value of agriculture production takes place in or adjacent to metropolitan counties [2]. An estimated 30% of the agricultural output originates within or on the edges of metropolitan areas in the United States [3]. Moreover, 79% of the fruit, 68% of the vegetables, and 53% of the dairy products produced in the United States are grown by U.S. counties defined as “urban influenced” [4]. Agriculture is starting to be redefined in the context of urbanization. It is now seen as a way to restore and remediate storm water, to manage population growth, to contribute to individual community health and well-being and to provide business and economic benefits [5].

A recent report by the United Nations Development Program found that there are more than 800 million urban farmers [6]. It highlighted the growing importance of urban farming, particularly for low-income communities who rely on it for survival. Urban agriculture has been looked to as part of an effort to find solutions to issues of hunger, poverty and food security¹. Health and nutrition advocates are joining with community gardeners, university professionals, emergency food providers, and faith-based communities in city-wide coalitions and food policy councils to maintain and expand urban food security [8].

Governments have started to recognize the potential for local food production in urban areas as an important component of food security. This trend is most prominent in countries such the United States, Germany, the Netherlands, and Canada, where vacant lots are turned into farmland [9]. The federal government has recognized the importance of urban agriculture in the United States. In 1977, the Extension Service of the United States Department of

¹ According to Cornell University’s Food Security Program and The USDA Community Food Security Initiative, food security is defined as when “all persons in a community having access to culturally acceptable, nutritionally adequate food through local, non-emergency sources at all times” (www.cfap.org; <http://www.nal.usda.gov/fnic/etext/000061.html>).

7. Winnie, *Community Food Security: Linking Food, Nutrition and Agriculture*. 2005.

Agriculture (USDA) initiated an “Urban Gardening Program”. This program was intended to promote gardening and nutritional education in various cities throughout the country, and has continued to expand. Also, the federal programs, CETA (Comprehensive Employment and Training Act) and VISTA (Volunteers in Service to America), began to provide a ready source of volunteer labor to help create gardens and teach gardening.

Movement towards Campus Farming

In addition to trends towards urban agriculture, campus farming has become popular. Student interest in local and sustainably grown food has followed the national and international trend [14]. Recently, concern about sources of food among college-age students has become interwoven with caring about the environment. In addition to on-campus environmental campaigns focusing on genetically modified foods and ways to promote more sustainable development locally, nationally, and internationally, students have looked inward at their own food practices. As a result, many universities have agreed to promote sustainable agriculture and local food, sometimes in response to student pressure and sometimes in keeping with institutional philosophies². A major contributor to the increased interest is the push to get local food into the college dining halls. In a recent article “Good-bye, Cryovac” by Corby Kummer, a writer for the Atlantic Monthly Magazine, Kummer stated:

“Not long ago, a college would never have thought to mention food in a brochure or on a school tour- except, perhaps, in a deprecating aside. Now food is a competitive marketing tool, and by the second or third stop on the college circuit parents and students practically expect to be shown the organic salad bar and told about the vegan options and the menus resulting directly from student surveys” [10].

For the past few years, both rural and urban universities have started to grow food on their campus’ land and have looked within for ways to reach greater sustainability. The New Farm, a program connected with The Rodale Institute that provides a site to exchange “farmer-to-farmer know-how”, has a resource directory that lists websites, organizations and publications that promote organic, local, and sustainable agriculture. A part of the directory that was recently added is “A Directory of Student Farms”. Currently, the directory has a total of 48 farms in 25 states listed [11].

Values of Urban Farm, Values of Campus Farms

² A number of efforts have been made to establish gardens within elementary and high schools as well, and/or to create garden clubs as an after school offering. In Providence, there are two people- Stuart Nunnery, the Executive Director of the RI center for Agricultural Promotion and Education, and Kurt Van Dexter, a landscape designer that works with Schoolyard Education Ecology and Design- who are trying to put gardens on every school grounds in Rhode Island by the year 2010 (Van Dexter, 3/31/05).

Urban farms have provided economic, social, and environmental benefits and values to society (Appendix B: Values of Urban Farms). After analyzing historical examples of urban agriculture around the world, it has been concluded that that an urban farm can provide benefits to an improved quality of urban life, including improved nutritional and physical human health, food security and safety, economic development, aesthetics and greening of an urban environment, environmental conservation, and wastewater reuse [12].

Similar to urban farms, campus farms provide individuals and the institution with a number of benefits. Campus farms may have important values to college students and their respective institutions. They can provide a forum that links the land, the campus and the community. These facilities offer the potential for programmatic collaboration and outreach. They offer a site to demonstrate an integrated, sustainable farming system in addition to the development of related curriculum and research. The potential for collaboration with student groups and academic endeavors are endless. For example, engineering student organizations have collaborated with campus garden clubs to develop and implement components for the farm site such as a drip irrigation system [13].

Campus farms build communities just as urban farms do; they often connect students with university staff, faculty, and other community members. And with these cohesive communities, the campus farms assist to find new ways to incorporate the needs of a population with the idea of sustainability. These ideas can be carried away with students in the future and may contribute to the formation and development of personal growth and lifelong behavioral practices.

Thesis Question

My thesis asks the question: *What is the feasibility of establishing an organic, student-run farm at Brown University?* To answer this question, I look at the history and values of urban agriculture and I research campus farms at universities across the country. In addition, I investigate the historic and current agricultural interest at Brown and how a campus farm would be unique from the current forms of urban agriculture associated with Brown, such as the Southside Community Land Trust (SCLT), the UEL Garden and the greenhouse facility. Finally, to conclude whether a farm at Brown is feasible, I examine the necessary criteria, the possible sites, the potential expenses involved and where the money to fund a campus farm could come from, where the food produced will go, and other logistics involved with an urban farm's creation.

II. METHODOLOGY:

Surveys

I surveyed 22 colleges/universities across the United States and collected information related to each school's farms' specific history, operations, and finances. The questionnaire was distributed on two list-serves (campusgreening@campusactivism.org, a campus sustainability network and the Northeast Organic Farmer Association's forum). I also distributed the questionnaire to schools that I identified through information found on the school's website, general internet searches, and word of mouth. I created the criteria for the location of a campus farm based on the responses from this national university questionnaire.

In addition, I conducted two surveys at Brown University- one for faculty and one for students- to determine the extent to which respondents use existing local sites at Brown, have an interest in a campus farm, and whether or not they felt that such a facility could enhance the academic experience and/or quality of life at Brown.

GIS Mapping and Ground Truthing

I used GIS (Geographic Information System) technology³ to map developable land on Brown's campus. With this information, I explored by foot and by bike⁴ to determine whether or not the developable land would be appropriate for a campus farm. To narrow down the potential farm sites, I again used GIS by mapping site criteria gathered from the university questionnaire results.

Interviews

I interviewed farm managers and farm volunteers from universities that currently have campus farms in order to obtain a better sense beyond the questionnaire responses of the day-to-day operations involved in campus farms, including barriers and strategies to achieve

³ However, GIS data could only provide limited information. The data available regarding soil, water access, water access and sun were difficult to obtain for the neighborhood level view that was necessary for this thesis. The Providence Plan and the Rhode Island Geographical Information System (RIGIS) provide GIS layers for the state level, and the city level for some informational layers. However, when looking at small areas like individual streets on Brown University's campus, the specific information on soils and similar information was hard to come by, as that data has been collected and collated on a larger level. According to the James Lucht of the Providence Plan, general site soil data does not go below a quarter-acre; to collect this information I would need a site-level soil survey, which are not cheap. Given that to provide fertile soil without any toxic or chemical contamination new soil would need to be brought into the site, obtaining these layers was not worth it. This made using the GIS tool useful, but only to a certain point.

⁴ Ground truthing was useful when the GIS map would suggest that a site was a vacant lot, when in fact it was a heavily used parking lot with an impermeable surface that would be inappropriate for farming. Also, the "vacant land" was in heavy demand for parking and would not be able to be converted. Furthermore, ground truthing proved useful when the GIS information suggested that a site was completely occupied, when in fact a small part of the parcel could be used and transformed into a farm. Because the GIS layer information available to me was limited, actually going around the campus and seeing what the urban landscape had to offer was necessary.

successful campus farms. I also interviewed staff members at the Southside Community Land Trust (SCLT), an urban agriculture organization in Providence, Rhode Island to better understand the factors involved with growing food in the city of Providence.

In addition, I consulted with professors at RISD and Brown University and members of Brown's Facilities Management to discuss the architectural, engineering and plant life logistics involved in creating a campus farm at Brown. Furthermore, I met with Frances Halsband, the architect who is working on renovating and constructing new facilities at Brown to discuss the feasibility of integrating some of the proposed farm sites into her strategic plan for the campus.

Site Visits

I visited two campus farms- one in a suburban environment and one in an urban environment. These site visits helped to better understand the role that a farm could have at a university campus. It provided further insight beyond responses from the university questionnaire as to the necessary tools, the number of volunteers, and how the farm could fit into the surrounding environment. I also visited the Southside Community Land Trust's "City Farm" to view the arrangement and design of their garden and how to use a small amount of land productively and for educational purposes.

III. OTHER UNIVERSITIES:

STUDENT-RUN CAMPUS FARMS IN THE U.S: BACKGROUND ON UNIVERSITIES.

Institutions with Campus Farms

More than fifty colleges and universities, located in 25 states throughout the U.S. in both rural and urban environment, have provided a farm facility for its students, faculty and surrounding community [11]. Some schools, such as the University of California at Santa Cruz (UCSC) and Hampshire College, have integrated farms into the academic and social lives of their campuses for almost three decades; however, the movement to create campus farms has only gained popularity since the mid 1990s⁵.

National University Questionnaire

The questionnaire that was distributed to universities across the country sought to better understand each campus' farm (Appendix C: University Questionnaire). Questions related to basic farm information and history, such as the size of the farm, the previous land use, the distance from main campus, the property rights, and the reasons for starting the campus farm. The survey also sought information related to the finances and the farm operations were included as well.

Results from the Questionnaire

There were 22 questionnaires returned from various colleges across the country⁶ (Appendix D: List of University Respondents). The responses from each university differed in some ways, but there were some similarities between the campus farms as well (See Appendix E: University Questionnaire Results).

Size: The sizes of the campus farms varied; rural schools generally have larger farms than suburban and urban schools. Although there is a range of farm sizes, most of the campus farms have expanded from their initial size, which can be attributed to their success.

Campus Farm Locations and Size

	Rural	Suburban	Urban	Land Grant
Location	45%	45%	9%	23%
Median area (acres)	15	3	0.75	10

⁵ Stanford University and the College of the Atlantic represent campuses that had established farms earlier in their history but did not revitalize them until the late 1990s.

⁶ The questionnaire was distributed to campuses that I knew had campus farms. After my research was complete, the Rodale Institute published an in-depth index of universities with campus farms. My questionnaire did not reach all of the schools that are included in this index.

Selling Points: Each institution needed to convince its administration and others who would be affected or involved in the farm such as volunteers and faculty members, that a campus farm has an important role. For the University of Wisconsin, among other schools, “It was not hard to sell the idea” (Bridget Holcomb, Survey Response, 11/30/04). The selling points used by the questionnaire respondents for the initial establishment of campus farms were generally similar.

1. Strong student support and pressure
 - a. At Yale, a student survey demonstrated 300+ students would want to work on the farm (Shannon-Dipietro, 1/5/05)
2. Interdisciplinary role of a farm
3. Enhancement of the quality of life from the practice of farming
4. Meeting the objectives of a land grant institution (e.g. Rutgers, Clemson, Cornell, Michigan State, and University of Vermont).
5. Organic agriculture is a growing field that should be demonstrated in college
6. Generous donations aimed at the establishment of campus farms
7. A famous person’s support for a campus farm such as Alice Waters’⁷ support for a farm at Yale and Bill Mckibben’s⁸ support at Middlebury.

Campus Farm Functions: Results from the survey suggest that campus farms serve a variety of functions (See Appendix F: Campus Farm Functions).

Types of Produce: The results to the question of the types of produce grown on campus farms provided a wide range of possibilities (Appendix G: Examples of Produce). Responses varied from basic vegetables to more exotic options. Melina Shannon Dipietro, Associate Director of the Yale Sustainable Food Project, said “We pick crops for their ability to attract people, either because of taste or color/uniqueness. We chose the crops here based on what would be fun for college students to harvest and what they might like to eat” [14]. The size of the farm does not seem to affect whether it produces only vegetables or vegetables, fruits and herbs.

Organic: With the exception of Warren Wilson College, the other 21 schools who responded to the questionnaire attempt to run their farms organically. The reasons learned for universities to use an organic technique for running the campus farms are to avoid dealing with the environmental implications of pesticides and to meet the growing demand for organic foods and to promote sustainability (See Appendix E: University Questionnaire Results).

⁷ Alice Waters is Executive Chef and Owner of a prix fix restaurant Chez Panisse, whose menu changes daily and who buys its food from a network of mostly local farmers and ranchers whose dedication to sustainable agriculture. She has also written a number of books and has started Edible Schoolyard, an educational program, which focuses on teaching the “transformative power of growing, cooking, and sharing food” (<http://www.chezpanisse.com/>).

⁸ Bill Mckibben is a former staff writer for *The New Yorker* magazine and author of a number of books related to environmental issues and is currently doing an experiment of eating locally-grown food for one year.

Budget: The budgets for campus farms differ. The two largest expenses are typically labor, and maintenance. While running a campus farm has its costs, many farms provide an annual income. Income comes from grants, Community Supported Agriculture (CSA)⁹ membership, or produce sales to the university or a farmers market, the public or other businesses. However, not all schools receive profit from their yield. Some colleges give some of their produce to local soup kitchens or to the unpaid volunteers on the farm. Most of the colleges had some kind of combination of all of the above as destinations for the produce (Appendix H: Examples of Operating Budget and Income).

How Funded: The funding required for general operations of a campus farm such as tools, supplies, seeds and labor, were found to be funded by a variety of sources. For example, Yale's farm needs including tools, seeds, and maintenance are funded by the University with initial financial support from donors. Some farms, like Grinnell College in Iowa, receive funding from their student-run Environmental Action Group funds. Much of Stanford University's funding came from student activities fees, until the rules for who could be awarded the funds became more stringent. Michigan State University's (MSU) farm initially received funding from the Kellogg Foundation for research in year-round production methods. MSU also received a USDA Higher Education Challenge Grant.

Furthermore, schools that have established a CSA with their farms use the reliable funding from the membership dues to maintain the farm and purchase tools and other supplies. Also, when classes are associated with and/or run in the farm, the campus farm receives financial support from the institution. At UCSC, there is an apprenticeship course run at the farm. The tuition for the class helps cover many of the farm's expenses. Often times, to pay for the seeds used on campus farms local seed stores make a donation. Other sources of funding include grants, which many acknowledged in their questionnaire responses were not reliable or plentiful.

Number of Workers: The number of farm workers/volunteers varies from campus to campus. On Wesleyan's campus, there are 10-15 workers who each contribute 3-5 hours of labor a week. The amount of labor and time needed obviously changes depending on the season. At Grinnell, student volunteers spend 1-3 hours per week in fall and winter and 20+

⁹ CSAs are an arrangement with a farm to become a member. By paying a membership fee upfront during the winter and spring seasons, individuals, families or institutions earn a share in the farm's upcoming harvest. The share price goes toward growing and distributing local produce and ensuring the ongoing sustainability of the farm without the farmer's fear of having a bad harvest seasons, which otherwise would result in financial struggles and uncertainty for the future of the farm.

hours per week in the summer. The three-acre farm at Rutgers University has a very intensive paid commitment of 50 hours per week during the summer and five to 15 hours per week during the rest of the year.

Visitors: The majority of respondents have found that with the establishment and ongoing sustainability of these campus farms, many visitors are attracted to the site and the idea of sustainable agriculture. Visitors included the volunteer workers, faculty and staff who may own or care for a small plot, specific classes doing research or studying processes that occur in the farm, members of the local community, elementary and high school groups and summer camps, interested students and their friends that they have brought along, participants in sustainable agriculture-related workshops and harvest festivals, and members of the farm's CSA. The larger schools like Rutgers and UCSC had visitors numbering in the thousands. Schools with smaller farms experience approximately 50-150 visitors a year.

Observations from Site Visits- Rural vs. Urban Farms

There are differences between a campus farm in an urban location and one in a more rural one. A site visit to Stanford University's farm, Slow the Plow, and Yale's farm, The Yale Sustainable Food Project Garden, made the distinction evident. Stanford's farm occupies 1.5 acres, but there is opportunity for it to be greatly expanded. Given that the Slow the Plow farm's location is situated in a suburban area and that is a section of the Stanford campus that is currently vacant, open space, with fertile ground, sunlight, and access to water, there is ample room for growth. Stanford's farmland had sufficient room for an orchard, a greenhouse and tool sheds.

In addition to the availability of open, unused space, Stanford's location in Palo Alto, California, allows for a longer growing season. The winter is not brutally harsh, which requires putting the garden "to sleep" in climates such as New England's. Although currently the Stanford Farm is not organized and running to its full potential (Hall, 1/10/05), the Stanford Farm could have different types of produce growing year-round. This characteristic makes Stanford's farm a facility that can be used throughout the entire academic year.

By contrast, Yale University's farm is located in the city of New Haven. Though in the midst of an urban community, The Yale Sustainable Food Project Garden takes up more than $\frac{3}{4}$ of an acre; however, there is not much room for expansion at Yale's farm. To create the farm initially, students had to literally "break ground" and clear dying hemlock trees and shrubs before beginning to plant seeds. Yale students were fortunate to find such a large space in a city that was affordable and offered adequate light, fertile soil and access to water, the

necessary components for a garden to thrive. It transformed a forgotten corner of Yale's Farnam Gardens, which has been operating for more than two decades.

There are differences between establishing an organic farm in a city as opposed to a rural or suburban area; however, similar goals can be achieved. Both locations can provide successful sites for campus farms. For example, Stanford's farm is directly on-campus while Yale's farm was located on a neighborhood plot in New Haven, Connecticut. However visitors and student workers at Stanford and Yale need to walk the same distance¹⁰ of about a 15-minute walk from central campus. Moreover, though smaller than Stanford's farm and other more suburban and rural sites, Yale's farm is extremely productive with over 170 varieties of vegetables, fruits, flowers, and herbs (Shannon-Dipietro, 1/3/05) (Appendix G: Examples of Produce).

Lastly, both the Stanford and Yale campus farms play similar roles and offer analogous benefits, regardless of where they are located. Both farms provide an educational resource to students and other members of the institution and local community, model economically, socially, and ecologically sustainable farming practices, and provide community members with locally and sustainably-produced food.

Barriers to and Strategies for Creating Campus Farm Successes

Although some of the farms have had strong histories of providing a diverse selection of produce to private plot holders, their families, and to students as well as providing a site for agriculture and sustainability-related classes, barriers to creating and maintaining campus farm successes are a reality. The questionnaire responses, site visits and conversations with volunteers provided insight into what these barriers included and strategies that have been and can be useful in coping with these issues (Appendix I: Barriers to and Strategies for Campus Farm Successes).

Academic Uses for Campus Gardens

Other schools have used campus farms for academic purposes; and for many, the academic/research connection was an important selling point in getting the campus farm established. Campus farms have extended academic work to experiential and interactive learner-centered environments; the facilities have helped to bridge theory and practice, offering applied learning (Stokoe, 2/7/05). The campus farms also provide educational lessons in areas such as sustainable land management and land stewardship through demonstration of and participation in

¹⁰ Stanford's campus is more than 1000 acres; therefore, although the Stanford farm is on campus, it is not centrally located.

management of soils and vegetation, ethnobotany through learning regional botanical knowledge, and enterprise management through involving students in the management of a farm enterprise and a small business [15].

In addition to experiential education, campus farms offer a chance for research on various topics, ranging from ecological, nutritional, policy-related, socio-economic issues and environmental dimensions associated with agricultural production. Farms also serve as potential research sites for investigations on various alternative technologies in crop management. There have been a wide variety of classes developed around campus farms; and, some already-existing classes incorporated the facility into the curriculum (Appendix J: A Sampling of Related Classes).

IV. BROWN UNIVERSITY: A Case Study

BROWN'S AGRICULTURAL HISTORY

The Morrill Act and Brown University

Brown has a long agricultural tradition. In 1862, Congress passed the Morrill Act, which was designed to accelerate economic growth by improving technical knowledge related to farming, mining, and industry (Appendix K: The Morrill Act). Its passage reflected a growing demand for agricultural and technical education in the United States [16]. Brown University was a beneficiary of the Morrill Act. In January 1863 the Rhode Island legislature accepted the grant of 120,000 acres in Kansas and transferred the land scrip to Brown University [17]. In return, the Brown Corporation agreed to provide instruction in agricultural and mechanical arts and see to the sale of the Kansas scrip. Although Brown maintained one academic course, which focused on agricultural issues, it was a struggle to fit it into the University's structure. Therefore, instead of Brown receiving the funds from the second Morrill Act (1890), the funds were instead allotted to the newly converted Rhode Island State Agricultural School, which eventually became University of Rhode Island¹¹.

Previous Farmland at Brown University

Aldrich-Dexter Field, which is now the parcel of land used for many of Brown's sports fields and buildings- including the OMAC, the Smith Swim Center, the Pizzitolas Sports Center and Meehan Auditorium, was once the Dexter Asylum farmland (See Appendix L: Photograph of Dexter Asylum/Neck Farm) used to accommodate and support the poor (Appendix M: History of Brown's Farmland).

In addition to the Dexter Asylum, the current location of the Brown Stadium on Morris Avenue, Cypress Street and Elmgrove Avenue was intended to be the Metcalf Botanical Gardens (Appendix M: History of Brown's Farmland). Currently, Mount Hope Farm and Brown University own more than 500 acres in Bristol, RI that include working farmland, abandoned farmland in a variety of successional stages, and other habitats such as wetlands and hardwood forests. Brown University owns this land as a result of a donation from Rudolf F. Haffenreffer, a businessman and brewery owner, who owned the Haffenreffer farm and estate.

Past Agriculture-Related Classes and Work at Brown University

In addition to previous farmland at Brown University, Brown has had a number of programs related to agricultural issues (Appendix N: Past Agriculture-Related Programs at

¹¹ Dartmouth College was also originally supposed to serve as a land grant college until they too realized it wasn't a good match. This decision led to the creation of The University of New Hampshire (UNH). (Stokoe, 1/24/2005)

Brown). In 1985, a group of Brown faculty from various departments received funding from the Francis Wayland Collegium for Liberal Learning to organize an interdisciplinary course that would research world agricultural and hunger issues. The seminar focused on production and equitable distribution of an adequate supply of food without degradation of the environment. Issues such as integrated pest management, political and economic consequences of the Green Revolution, agriculture and landscapes, and soil conservation were discussed, among others [18]. A biology class, Food, Plants and People, which examines the biology of crop plants, the development of agriculture, and agriculture's effects on the environment, was developed based on the Wayland Collegium. In addition, there were several courses related to the issues of agriculture and world hunger as part of The Feinsein World hunger Program that started in 1985 and was directed by Robert Kates. This five-year program explored the social and political problems associated with hunger through courses, seminars, and annual awards to individuals or organizations which have made outstanding contributions in combating world hunger [17].

Brown has offered 165 classes with agriculture-related issues and themes since 1976 (Appendix N: List of Past Agriculture-Related Classes). These classes were listed under various departments, from American Civilization, to Community Health, Biology to History of Art and Architecture. The classes focused on different themes from nutrition, to food and population growth, farmland as place, gardens in China, agriculture in developing countries, and transforming agriculture. In addition, students have used the Group Independent Study Project (GISP) option to create their own classes as a way to further explore agriculture (Appendix O: Past Agriculture-Related Work at Brown).

Brown students from the Center for Environmental Studies have been especially interested in agriculture. Fifteen undergraduate students have written their senior theses on the subject; and, within the past few years the interest amongst students in sustainable, local agriculture issues has burgeoned.¹² Moreover, in Brown University's history, many of its students have been interested in agriculture in other ways than academic and have taken it upon themselves to further get involved in the urban agricultural movement.

The 2004 fall semester showed great promise for Brown's investment in supporting local food and sustainable agriculture. Louella Hill ('04), a graduate from Brown's Environmental Studies Department, won a grant from the EPA and the Rhode Island

¹² As of this writing, a number of other Environmental Studies concentrators have expressed an interest in looking at similar issues.

Foundation to further Brown’s dedication to local food. Hill has worked with Brown Dining, the Environmental Studies Department, and the new student group SuFI, the Sustainable Food Initiative, to build momentum for this movement in and out of the classroom.

WHY A CAMPUS FARM AT BROWN UNIVERSITY

Student and Faculty Questionnaire

The student survey’s target audience was Brown undergraduate student body (Appendix P: Student Survey). The surveys were made available in two locations for students to fill out voluntarily. Twenty surveys were placed in the Urban Environmental Lab, which houses the Center for the Environmental Studies. There were also 80 surveys distributed at the Ratty Dining Hall. They were offered to every student who entered the card swipe center at the main entrance. Participants were asked to fill out the surveys at their convenience, returning them anonymously by way of a specified box upon exiting the Ratty. Out of 100 student surveys distributed in total, 77 were returned. The only identifiable information required was the respondent’s chosen department of study. This information was used to determine whether or not there was a correlation between their academic interests and their interest in a farm facility. The responses reflected a range of disciplines across the student body.

There was a mixed response as to whether or not students were aware of and used the UEL Garden and greenhouse facilities. Less than half of the respondents were aware that either the UEL Garden or the greenhouse existed. More students were aware of the greenhouse facility’s existence than the UEL Garden’s existence. One third of the student respondents visit the facilities with frequency. Although 71 percent responded that their classes never use local sites as a class resource, 65 percent of respondents felt that a campus farm could fit into their academic and extra-curricular experience at Brown.

Percentage of and Extent to which Students Visit the UEL Garden and Greenhouse

n=77 respondents

	No, Unaware of Existence	No	Yes, Once or Twice	Yes, Frequently
Greenhouse Visits	8%	42%	44%	12%
UEL Visits	31%	22%	29%	18%

Although a campus farm does not have to be student-run and half of the respondents expressed that they would not be involved in a campus farm, a significant 73 percent were interested in the establishment of gardens on campus run by students. Similarly, 25 percent of students said that they would spend zero hours in the garden each week and 31 percent of

students said that they would work/volunteer zero hours. However, 40 percent stated that they would spend or work anywhere from 1-2 hours to more than 6 hours a week on a campus farm. A majority of respondents stated that they would visit or work at a campus farm and sixty one percent of students would be willing to walk 10-15 minutes to the campus gardens.

Percentage Level of Involvement in a Campus Farm

n=77 respondents

Not Involved	Not Very Involved	Somewhat Involved	Involved	Very Involved	No response
24%	26%	27%	15%	3%	5%

Weekly Hours at a Campus Farm

n=77 respondents

	0 Hours	1-2 Hours	3-5 Hours	6-10 Hours	More Than 10 Hours	No Response
Percent Time Spending	25	35	22	9	4	5
Percent Time Working	30	44	19	4	3	-

Results to the questions from the student survey suggest that many students are interested in having a campus farm at Brown, for use as an academic facility and for recreational use. However, the primary use cited for a campus farm was for relaxation and community building. In addition, although a campus farm is not required to be organic, 70 percent of respondents felt that it was important or very important that it should be.

Of the 77 respondents, 25 percent provided additional comments to show that they thought that campus gardens were a good idea and could benefit the community. “I think that this is a great idea, despite the fact that my answers reflect that my area of study would not get much use out of it” (Brown Student Survey) commented one student. Many students recognized that although it may not be appropriate for their needs, others would get a lot out of it. Another student wrote:

“I don't want my responses to come off as at all negative- I think establishing a garden/farm for student use is a great idea for Brown, I just would not be one of the people participating in it. But I'm sure others who like growing things/working outdoors, etc. would love it!” (Brown student survey respondent)

Student who did not necessarily have an interest in agriculture thought that gardens could be used in their life at Brown:

“I don't really have an interest in farming and gardening, but I would love to be able to eat the proceeds, and if I had to work there an hour or two a week to get it, I would. Also, if it was right on campus, I would probably go there to read and relax” (Brown student survey respondent).

Other respondents wanted to further express their excitement for the idea, and regretted that they would not have more time to spend at the gardens. One student wrote,

“I think it is an awesome idea. Organic is really important and if I wasn't so busy, I would definitely spend more time there. It's really healthy and relaxing, two things we need at Brown” (Brown student survey respondent).

While this comment is supportive of the project, it brings up an important concern for the establishment of a campus farm: commitment. “I’d like to have a farm, I just wouldn’t be that involved since I’m graduating and busy” (Brown Student Survey) was a similar response that suggests that while students may think that the garden facilities are a great idea, they may be too busy to take responsibility for their maintenance.

There was one “negative” comment from the survey that suggested a lack of interest in the project: “I am from a state where agriculture is a big focus, and so making the effort to travel a far distance to attend Brown, I was hoping to get away from it in truth!” (Brown Student Survey) On the other hand, there were many positive and encouraging statements: “Cool!” “Great idea!” and “What I can I do to help?”

The second survey that was distributed at Brown was emailed to 40 faculty members from various departments based on their potential use of a farm facility (Appendix Q: Faculty Survey) and the current uses of local sites such as the UEL Garden, greenhouse or others for their classes. In addition, I used the course descriptions found on BOCA, Brown’s Online Course Announcement, to discern who may be able to use a farm site. Out of 40 surveys distributed, 18 were returned in the one week response period, March 18-March 25, 2005.

Results from the survey suggested that one third (33 percent) of the faculty members use local sites for their classes; however, even if they do use them, they do not do so often. Although the results from the faculty survey suggest that the proposed sites for a campus farm would probably not change a faculty member’s level of use of local sites, the majority of respondents were interested in the establishment of student-run gardens. As one respondent put it: “the more gardens, the better. I think just seeing gardens- never mind working in them- can educate people in profound ways”.

Although more students showed the relevance and importance that gardens could provide for them during their time at Brown, many of the faculty comments were encouraging and thoughtful. One professor commented at the end of the survey that “I think community gardens are an easy way for Brown to connect with the surrounding community in a positive way. Low cost, low maintenance, and lots of good PR, which they could definitely use at this point” (Faculty Survey Response, 3/21/05). And, in the responses to the question about one’s involvement in helping to establish the gardens, both the majority of faculty and student participants volunteered to support it in some form or another- either by signing an agreement to use the gardens a certain number of times for class, spreading the word to other faculty members or students, or writing a letter in support of the establishment of the gardens.

“I think this is a wonderful, important project and it has my full support. I went to Oberlin College, which not only runs a sustainable agriculture project, but involves students in dining coops, which use mostly natural and organic foods, often local the ways these things added to my education were numerous and invaluable. Hands-on experience with food and agriculture is, I believe, the best way to give students an awareness of the many vital issues involved with producing and consuming food. Not only that, working gardens would add an element to the atmosphere of Brown’s campus that I, for one, would really welcome” (Faculty Survey response, 3/23/05).

What Currently Exists at Brown

Brown University already hosts a greenhouse facility on Waterman Street, a community garden at the Urban Environmental Lab, and it has a close alliance with the SCLT. These two facilities offer opportunities for students to spend time in less urbanized spaces. The greenhouse was started in 1992. It is open to the Brown and greater Providence community for one-time visits or for ongoing academic uses. Fred Jackson, the Greenhouse Manager, tries to be hospitable and hopes that his welcome sign encourages more people to step inside the greenhouse for a visit. Jackson has put great efforts into making sure that the facility is open to the public and a welcoming environment (Jackson, 2/23/05). He states that all types of classes use the facility- art classes, science classes, high schools like La Salle and Moses Brown, and garden clubs. There are a few classes that have been using the greenhouse for years (BI43- Diversity and Adaptation of Seed Plants, BI46- Insect Biology, BI19.6- Plants, Food, and People, and BI19.11- Ethnobotany: Botanical Roots of Modern Medicine). In addition, it is used on a one or two-time basis by a number of miscellaneous classes from RISD and other art classes from Brown. Jackson suggests that even dance classes use the space to integrate flowers and the environment that the facility creates as backdrop for dance videos.

Jackson states that the greenhouse sees a lot of use and many people are interested in working in a greenhouse (Jackson, 2/23/05). The facility is also used by the Brown Learning community and Brown Summer Studies. In addition to serving as a site for education, Jackson also uses the greenhouse to grow vegetables and flowers, some of which are used at the Faculty Club.

In addition to a greenhouse, the community garden at the UEL is another site where agricultural efforts have been made. The UEL Garden began in 1982 with funding from a grant from the Richard King Mellon Foundation for the Urban Environmental Lab. The funding went towards the overall plan for the building, which included creating a garden from a broken-asphalt parking lot adjacent to the building’s structure. According to Harold Ward, the Director/Founder of the UEL, the garden and the UEL were intended to provide a living experience for Environmental Studies concentrators, of which there were about 10 graduating a

year (3/24/05). The building was half resident, half program department and students would work in the greenhouse and the garden as part of living in the building.

Currently however, the UEL Garden is made up of 12 private plots. There are two student workers who are responsible for organizing the Garden, ordering supplies and providing general maintenance. In addition, there are individuals and families from the local community who care for their private plots. Most Brown students use the Garden to relax, to do school work, or to recycle some of their compostable materials from home in the Garden's compost bin. Also, there are a couple of classes that use the UEL Garden for academic purposes: Johanna Schmitt's BI43 Diversity and Adaptation of Seed Plants course uses it for several labs, and Kurt Teichert's ES41 Environmental Stewardship course uses it for one class period.

As previously mentioned, the SCLT has a strong connection with Brown University and its students. Although it is located on Somerset Street, approximately two miles from Brown's central campus, students interested in agriculture commute there. Katherine Brown notes that "many Brown students look to the SCLT's staff for advice or information that may relate to their coursework on independent projects" (Brown, 3/18/05).

Why these Sites Do Not Already Accomplish Such a Need

Although there is already a site for urban agriculture located in front of the Center for Environmental Studies, the UEL Garden does not fulfill the role that a campus farm, similar to those surveyed at other schools, could. The stated purpose of the UEL Garden is to educate the community, to provide a space for horticultural experimentation, and to produce organic food under the management of two student coordinators, however only a limited number of students use the UEL Garden for the classes, and these classes are focused on biology and environmental studies.

Moreover, according to Biz Giancola, one of the UEL Student Garden Coordinators, "There is more demand than the UEL garden can meet. We generally carry a two to six person waiting list" (Giancola, 2/14/05). The demand is greater than the space available; and most of the garden's use is by local community members¹³, students have not been able to take ownership of any of these plots (Caton, 3/17/05). Students are welcome to spend time in the garden and help out the farm managers, but there are not enough plots for students to grow their own food and choose exactly what will be raised in the beds (Caton, 3/17/05).

¹³ The UEL used to ask people to pay dues for using the plots, but it has not done so in a long time; no financial membership dues are necessary (Giancola, 2/14/05).

Lastly, the future of the UEL Garden is uncertain due to the current physical changes going on at Brown and the proposed construction of a walkway¹⁴. The fact that the future of the UEL Garden is indeterminate requires a strategic plan, even if plans have not been finalized. Whether or not the UEL Garden is redeveloped, results from the student and faculty surveys suggest that there is still both a need and desire for urban gardens, run and used by students that would provide students and faculty with hands-on application to theories learned in the classroom.

Similarly, the greenhouse facility serves as a site for demonstration and academic research, however according to Fred Jackson, Greenhouse Farm Manager, there are a number of individuals and groups who want to use the facility and it is difficult to cater to them all in the one facility (Jackson, 2/23/05). At the same time, there are a number of people who do not take advantage of the greenhouse. Moreover, the greenhouse presents different forms plant life; however, it does not offer a demonstration of how to live a sustainable life in a city the way that a campus farm could.

Finally, the Southside Community Land Trust can provide experiences with urban agriculture for some Brown students; however, as expressed through the results of the university questionnaire, (urban) agriculture has the potential to draw in greater interest from the student body if a farm were to be located on campus and if this facility were to have an interdisciplinary mission. Moreover, like many non-profit organizations, the SCLT works on a number of projects and has minimal staff, finances, and time to get all of their work done¹⁵.

Purpose of Production

The proposed urban farm on campus could provide students with a research station, a demonstration site for use by classes, and for enjoyment outside of academic pursuits while at the same time as produce is grown. In addition to these roles, the campus farm could demonstrate a specific form of urban agriculture with a focus on producing crops of different kinds. The purpose of the production would be to offer a demonstration of how food gets from its origin to one's dinner plate. The garden demonstrates that food can grow in an urban

¹⁴ Richard Spies, Executive Vice President for Planning/Senior Advisor to the President, and Nancy Dunbar, Associate Provost met with UEL faculty, staff, students and community gardeners early in the fall of 2004 to discuss rumors about plans to redevelop the space now occupied by the UEL. They calmed some people's nerves regarding the timing of the project or whether or not it would actually happen: "nothing will happen to this garden or this building within the next few years, perhaps not even in three or five years" (Spies, 9/16/04).

¹⁵ SCLT was a useful resource for this thesis; however, the workers were pressed for time when we met because they were always busy and working on a number of projects at the same time.

environment and that food can be grown and consumed locally. Finally, the purpose of the production is to provide food that can be enjoyed and can provide healthy nutrition.

LOCATION

Criteria

One of the greatest challenges of urban agriculture is finding a site for the establishment of a farm. In urban environments, vacant land is rare, expensive and often vacant for a reason—be it because it is contaminated or a size that is unworkable given the surrounding environment’s use and structure. In weighing the relative merits of potential sites for a campus farm at Brown University, criteria was used and evaluated by a weighted ranking.

Distance from central campus (Faunce Arch) was a fundamental characteristic used to determine potential farm sites. Based on the advice and experiences of farms at other universities, a boundary of a 10-15 minute walk from central campus was established (Appendix R: GIS Map of Campus with Quarter-Mile Buffers). The other criteria used were also drawn from the experiences at other schools and by taking into consideration Providence’s urban environment. Particularly in an urban setting, some characteristics of a location are extremely important. These factors acted as a guide to discern and rank between the possible sites identified on “developable land” (Appendix S: Map of Campus Highlighting Developable Land Areas).

The fundamental, minimum criteria for site selection include:

1. Adequate sunlight
2. Potential access to use the land for gardening/agriculture and research
 - a. Public or institutional land, not owned by a private landowner
3. Physical access to the site for visiting the facility

The factors considered to evaluate the relative merits include:

1. Physical factors
 - a. Sunlight (adequate - ideal)
 - b. Access to water
 - c. Soil fertility (no cement/asphalt, impervious surfaces)
 - d. Size of garden space
2. Social Factors
 - a. Consideration of neighbors
 - b. Central Campus
 - c. Potential conflicts, complications, transactions

Identification of Candidate Sites

There are a number of sites at Brown that are located on “developable land” and could serve as locations for the Brown’s campus farm. Some of the sites fit the criteria better than others. All of the sites discussed for a campus farm are less than ½-acre in size; as a result, the campus facility would resemble a garden, rather than a farm. A comparison matrix was used to

determine which sites would be more appropriate (Appendix T: Site Comparison Matrix). The matrix presented the factors and characteristics and gave a value based on my subjective weighting scheme on a one to five scale- one was not ideal and five was ideal. Each of these characteristics was then weighted in value on a scale of zero to one. The weighted value was based upon how important that factor would be in choosing a garden site¹⁶.

The weighted value and characteristic value were assigned based on my best judgment and understanding of the sites. The sunlight factor was weighted heavily. Although each site had “adequate sunlight” given that was one of the basic criteria for narrowing down the potential sites, generally, the more sunlight plants have to grow the better. The factor of potential conflicts, complications, transactions was also ranked with utmost importance because if the potential for some problem to occur is likely, then the site would not be as favorable to one that would be free of such problems. Examples of potential problem include ownership, traffic (trampling on the garden), and security.

The other factors such as consideration of neighbors and soil fertility were not ranked as highly. Acknowledging the surrounding community near to the gardens is necessary to understand how the garden will be used or potential problems that could arise. Specific neighbors to consider include schools, hospitals, and public facilities because of the potential for the activities of the site to interfere with activities of the neighbors and because of the potential for heavy traffic from the neighbors to interfere with the gardens. Soil fertility is important in terms of whether or not the surface is impermeable and whether or not plants can grow; however, in Providence, lead contamination in the soil is a serious issue. Given this fact, new soil will have to be brought into the garden sites in order for food for consumption to be grown.

Finally, access to water and the size of the garden has less importance in establishing urban gardens at Brown. In Providence, water lines are available on almost every street. The proposed garden sites are located close to buildings that have running water. And, urban gardens tend to be small in size, but can be extremely productive nevertheless. Although other campuses in more rural and suburban areas have campus farms of one or more acres, the small garden candidate sites at Brown should not prevent the productivity of the plants nor the education involved in the demonstration and use that the gardens could offer.

¹⁶ In addition to calculating the total scores for each site, a basic sensitivity analysis was performed to see what was a meaningful difference in total score values. This analysis helped to determine a range for the percentage of total that would help establish meaning to the values. The results of the analysis suggested that the range should be roughly rounded to 10 percent increments to have a meaningful difference.

Candidate Sites Include¹⁷:

1. West House and Combined Backyards
2. West House Edible Walkway
3. Science Library Courtyard Quadrants Adjacent to Thayer Street
4. Ratty/Caswell Herb Garden
5. V-Dub Herb Gardens
6. Hillel Entrance
7. Swearer Center Backyard
8. UEL/Angell Street Edible Walkway
9. Grad Center “Rooftop”

The results of the comparison matrix and the sensitivity analysis suggested that while some sites received a higher value than others, each site has some strengths and some weaknesses; and that even with the weighted value, there are exterior factors that need to be considered, such as the political climate and timing of work being done as part of the *Academic Enrichment Plan* was considered. It was necessary to take into account these factors in order to choose sites that could more reasonably be implemented at Brown. A quantitative analysis could not fully decipher which were the best candidate sites.

Results from Ranking the Proposed Garden Sites

The comparison matrix chart resulted in not only identifying candidate sites, but also ranking those candidate sites. The purpose of ranking these garden sites is to decide which sites should be implemented. The total calculated value for a particular site was derived from multiplying the weighted value with the characteristic value and summing this total for each factor. According to this system of arriving at a percentage of the total value, the edible pathway to the West House Garden is the site with the most ideal conditions, with a total calculated value of 16.5 and a percentage total of 79.5%. The Science Library site was scored with a total score of 16.2 and a percentage total of 77.1%. Although there appears to be a difference in the score totals, none of the candidate sites chosen because they fell within the category of the 80% sensitive value were dramatically more or less ideal than the others; and, as discussed earlier in the choosing of the candidate sites, the quantitative difference in the total score values are not true “meaningful” differences.

Moreover, this ranking system does not include other factors such as interest among students, staff and faculty to see a particular garden to fruition. Although the green roof on top of Grad Center received one of the lower calculable values¹⁸ of 14.4 and a percentage total

¹⁷ For an in-depth explanation of the candidate sites, see Chapter IV.

¹⁸ The green roof on top of Grad Center was ranked lowest because of the factor of soil fertility. There is currently no soil on top of the grad center roof/terrace. However, this factor and its weight have less meaning because most of the sites with already existing soil will have to be replaced because of Providence’s lead issue.

value of 68.6%, some students and professors have demonstrated interest in implementing a green roof as demonstrated through a meeting about its implementation and a focus on green roof projects in two classes. Therefore, although it would not even be considered a candidate site according to the quantitative analysis in the comparison matrix, it has been included because of the social value and interest among students and faculty that was discovered upon distribution of the surveys.

Upon figuring out the structural feasibility of establishing a green roof on top of Grad Center by talking with Brown's Facilities Management and engineers and architects from RISD and Brown, interest in the potential to implement such a facility at Brown spread. Student groups and individuals are excited and have already begun to meet about looking at how to make a green roof possible. Hence, although it may have received a lower ranking from the weighting system, other factors need to be considered.

The herb gardens at the V-Dub and Ratty received high rankings. The sites have adequate sunlight and the neighbors are not a major factor of concern (however one of the sites at the Ratty is along the Caswell Dorm on Thayer Street and there are exit doors that enter right onto the garden). The fact that these sites ranked the highest in conjunction with the fact that there is interest from Brown Dining to use the produce from the herb gardens in the cafeteria prove that these sites have great potential for implementation and use.

LOGISTICS

University, Student, Staff Responsibility

A campus garden facility at Brown similar to the campus farms at other schools could provide a site for experiential learning, it could demonstrate urban agriculture, it could promote local, organic agriculture and food, and it could provide produce to the Brown and greater Brown community. However, in order for a garden to provide these benefits, there needs to be a high level of commitment, organization and support. Students will have to understand what their responsibilities are and the work necessary to accomplish the goals of an urban garden. These garden duties should be explicitly divided and distributed.

Most other university farms are student-run with the help of a farm manager. Similarly, at Brown, the campus garden could be student-run, student-used, and student-enjoyed. Given this characteristic, students will have the responsibility to run and maintain the facility in addition to advertise it and events built around it. Lessons from other universities have suggested that there should at least be two students who are paid as student garden managers to work on the garden site and to organize and oversee other students who are volunteering their

time at the garden. Some of these responsibilities could entail watering, weeding, general maintenance, harvesting and delivery of food to Dining Services. Also, many of the herbs harvested in the growing months of summer will need to be preserved for use during the school year, when it is primarily non-growing season. While this responsibility is quite large, having the campus garden be student-run will provide Brown students with a sense of ownership that creates greater dedication and commitment¹⁹.

The stipend for these student farm managers could come from a number of sources. Currently at the UEL Garden, the Center for Environmental Studies has an endowment that was created solely for the purpose of maintaining the UEL Garden. This endowment system has worked well; every year, the endowment earns income to pay for the workers' salaries and for the supplies (seeds, repair work) needed for each season. Another department or a number of departments could take responsibility (see Implementation Chapter for more detail).

While it is the student's responsibility to keep the garden in working condition, it would be Brown University's responsibility to protect the site and ensure that it was secure. Like other facilities on campus, there are guards on watch providing security and there are workers from Facilities Management²⁰ who keep an eye on certain zones on campus. There does not necessarily have to be police positioned at the garden site, nor would a facilities management worker have to tend to the garden; however, the school should protect and watch over the site in similar ways that it does with its other facilities. While fences are used to keep many community gardens in cities secure, a fence would not be appropriate for the majority of the candidate garden sites because of their small size and because a number of them are located in highly visible areas on campus adjacent to highly trafficked streets. "Living fences", which are widely spaced woody plants in single rows that are pruned regularly and are used instead of posts to create a barrier between a potential harm and the protected space [19], could be used in some of the garden sites such as the herb gardens. However, no fence would be appropriate for the green roof or the edible walkways.

Destination of Produce

¹⁹ According to my research, the commitment factor is one of the most important to be aware of and to deal with when implementing and maintaining a campus farm system. Through interviews with students involved with their farms, I learned that the greater involvement that students have and the more time they spend on site, the more dedicated they will be to ensuring the farm's maintenance and well-being.

²⁰ The Facilities Management does not have the staff to maintain a campus garden and it is not in their mission to do so; therefore, the University would not grant someone like Patrick Vetere, the Brown's Grounds Superintendent, the "Farm Manager" position, however Facilities Management could certainly be involved.

There are a number of possibilities for where the produce can go²¹:

1. Dining Services
2. Co-ops
3. For sale at farmers markets
4. Starting a CSA at Brown
5. Donation to food bank
6. Workers/volunteers' reward
7. The Faculty Club (flowers)
8. Commencement (flowers)

The campus garden could grow a variety of different kinds of produce, from vegetables and fruits, to herbs and edible flowers. The garden could grow herbs that could be sold to Brown's Dining Services to be used in preparation for the daily menus for students on meal plan. Gretchen Willis, Director of Brown Dining, has expressed interest in providing funding for such an arrangement. In addition to herbs, some of the produce grown in a campus garden could also be sold to Brown Dining. Although the garden will not be able to provide enough to feed every student on meal plan, the food from the garden could be used for novelty dishes as part of the "Roots and Shoots" initiative at the Ratty.

The produce could also go to Brown's established student co-ops. There are three "official" co-ops- West House, Waterman, and Finlandia. These co-ops currently buy food from a range of sources- anywhere from Stop & Shop, Eastside Marketplace, to bulk wholesalers. Particularly considering that one of the potential garden sites is located behind the West House co-op, having the produce raised in the backyard of where it is destined promotes the idea of local food. Similar to Brown Dining, the co-ops would purchase the produce from the gardens.

In the fall of 2004, Brown University had its first year of hosting a farmers market on Wriston Quad. Local farmers would sell their fresh produce to students, faculty, staff and local residents on Providence's East Side. This farmers market not only provided local produce, but also, it emphasized the high quality and friendly connection with small, local farmers. Although it is unclear the level of productiveness that this farm could provide, depending on the types of produce grown and the site chosen, the produce from Brown's campus farm could be sold at the farmers market. Selling the produce to anyone who passes by would provide an opportunity to promote the garden facility to people on campus, which could attract a wide variety of people to get involved with urban agriculture and gardening. Even if these people were to participate in garden work only one time, this promotion would be worthwhile. The

²¹ And, one or more of these destinations can be chosen.

major potential drawback of selling the campus garden produce at the farmers market is Brown's produce would be in direct competition with local farmers' produce, as opposed to complimenting the effort to promote local food.

To avoid the direct competition with local farmers at the Farmers Market, a CSA could be built around the campus garden. Other schools have earned a significant portion of their income by establishing a CSA with anywhere between 20 to 50 members, at a cost of \$100 or more per membership. Establishing a CSA would require a strong focus on the amount of produce grown at the campus garden in order for the CSA members to be able to rely on the garden for a source of food and make it worth their while.

Donating the produce to a local food bank would be a way for Brown to give back to the local community and extend its facilities beyond Brown. This destination would provide no economic payback for the food produced; but, other universities donate food from their farms as well.

Another option for the destination of produce that does not provide financial income is having a complimentary reward system for volunteers who work in the garden. In order to avoid a major barrier of campus farming, which is a lack of commitment, offering volunteers the produce they help to grow would provide an incentive for volunteers to work the land for a certain number of hours each week. This arrangement could also reinforce the idea of self-sufficiency and the great potential that local and urban agriculture has to feed parts of the world's population.

Liability Issues

There are many benefits of urban agriculture and of establishing a campus garden on campus; however, there are also liability issues. Providence is a city that has a history of lead problems, and lead levels remain high in the soil surrounding most houses. Therefore, there will be some concern in regards to growing produce for consumption in an environment that has high lead levels²². Similarly, although local food picked the day of consumption implies freshness, a campus garden will not have the same liability coverage as the larger food companies such as Sysco.

Another concern with urban gardening is any injury that may happen to a worker (volunteer or paid) in the field. Gardening is a physical activity and therefore, there is inherent risk involved. Fortunately, given Brown's urban environment, there is easy access to help

²² The creation of a campus garden would include replacing the soil and building raised beds to form a barrier against the lead.

and other services such as EMT service, hospitals, and emergency phones. The Southside Community Land Trust deals with potential liability issues by having insurance. Brown University is covered by its own insurance, and like Brown's other facilities, perhaps a campus garden could be incorporated under the same plan.

Finances

Establishing and maintaining an urban garden requires funding. Running a garden is like owning a house. Financial obligations include paying the rent or buying the land, paying for utilities and maintenance, and buying products to make the house beautiful and to provide nourishment and a sense of community. Similarly with gardens, general financial concerns include the cost of land, the costs of maintenance and labor, the cost of water, and other materials (e.g. soil, seeds, and tools). A rough budget was created for this thesis to get a sense of what some of the financial requirements would be (Appendix U: Budget). It includes a low end-budget, estimated at about \$4,500, and a high-end budget, estimated at less than \$600,000 for the necessary items. Reasonably, the costs of running a campus garden will lie somewhere in between this range.

The proposed campus garden is unique in that there is potential for some of the financial requirements to be "waived". For example, all of the candidate garden sites are located on Brown-owned property that is currently not being used for a separate purpose. Therefore, similar to the agreement with other universities, Brown could allow students to use a site for a garden without having to pay for rent or ownership of the land. In exchange, the sites could be beautified and the land put to use and incorporated into a student's educational experience. If the real estate costs were not covered by Brown, the sum of the candidate garden sites would total about \$560,000. These costs are included in the Budget in Appendix U. With most of the sites chosen having an approximate average value of \$75 per square foot, the total costs for land alone would make this vision for a campus garden unfeasible.

Similarly, facilities management has offered to provide soil and some tools to help promote the garden effort (Vetere, 3/28/05); Fred Jackson from the greenhouse has offered to provide seeds and space in the greenhouse to start some of the plants (Jackson, 2/23/05); and, Brown could provide the costs involved with the water use in the gardens. If the University provided some of these services and materials for free, then the budget would not have to be as large as if the University were not involved and did not support the effort. The majority of the budget would then be concentrated in the allotment of payment towards the stipend for paid student labor and the unpredicted costs that could require funding.

Although there are costs involved with running a campus farm, there can be income earned as well as other economic paybacks. The farm could earn money through sales of the produce, as discussed earlier in this chapter. In addition, while one may not recognize that there is a high economic return, a farm offers, among other merits, positive externalities to Brown both in terms of aesthetic value and educational enrichment. According to Professor of Environmental Studies and Economics, Talbot Page, “There is value added by the garden sites and there is potential for the gardens to enhance Brown University’s educational product” (Page, 3/25/05). Other possible benefits are improved community relations through donating some portion of the produce to soup kitchens, if some of the food was destined for this cause. Also, there are some savings for facilities management because student volunteers and farm managers would be responsible for caring for the land (Vetere, 3/28/05). (See Appendix V: Economic Valuation.)

Although a campus garden might not appear to have economic value, it provides a package of “intangible and elusive values” that do not have a market value; and, “anything that people like or dislike is an economic value” (Page, 3/25/05). A campus garden could give students a good experience intellectually for which, as alumni, these students might donate later on; it has the effect to make people feel healthier and more productive; it provides a calm and peaceful setting, a sanctuary, in the middle of a hectic university and urban setting; it provides a site for recreation and physical activity; it provides a site for research; and, it provides a place for education in the form of demonstration and outside learning, which adds variety to the classroom experience. Therefore, while the market would evaluate the garden with a certain price, often times this assessment underestimates the true value.

V. IMPLEMENTATION:

SUMMARY OF MAJOR FINDINGS:

THESIS QUESTION: *What is the feasibility of establishing an organic, student-run farm at Brown University?*

My major findings are as follows:

1. There is currently a national trend toward establishing campus farms at universities
2. A campus *farm* is not appropriate for Brown University; however, a collection or “archipelago” of small, urban *gardens* is fitting
3. There are a number of sites on Brown’s campus that could support gardens and certain related research activities
4. There is interest amongst students and faculty for garden facilities at Brown, expressing the social feasibility²³ of establishing campus gardens
5. Collaborating with Brown University and avoiding the costs for land would suggest that the gardens were economically feasible
6. Commitment to the campus gardens is necessary to ensure its sustainability
7. The timing to create a garden system at Brown is now

An Archipelago of Urban, Organic Campus Gardens

Initially, this thesis looked to research the establishment of a campus farm, one in size of at least ½ acre near to Brown University, not necessarily owned by the Institution. This size and general ownership proved difficult given the urban, high land price and other physical constraints on Brown’s campus in Providence. As a result, the feasibility of establishing an organic, student-run farm at Brown University is unlikely; however, a smaller site demonstrating urban agriculture is feasible. Hence, the idea of an archipelago of small urban gardens on Brown’s campus was born.

Identifying the Need at Brown

Interest in sustainable agriculture is not only growing nationwide, but also amongst college students. My thesis research and involvement in the Brown community has demonstrated that there is a strong interest in sustainable agriculture and there is a need for the next generation to become better stewards of the land through our consumptive behavior. This interest has been confirmed through the enrollment in Peter Heywood’s Plants, Food and People, attendance at SuFI meetings, and the establishment of the new staff position of a “Food System Coordinator” that has helped to bring local food to the dining halls.

Other ways in which the interest in sustainable food systems has manifested is in the classroom, with students in various classes working on food issues and how food fits into overall design strategies; in the campaigns that already-existing student groups are working on

²³ Social feasibility addresses the influences that a proposed project may have on the social system in the project environment.

such as BEAN (Brown's Environmental Action Network), Oxfam, SHAAC (Student Housing and Hunger Action Coalition), the most recent GISP on sustainable agriculture in the Spring of 2005, in addition to the past GISPs and ISPs on the subject. The need for campus gardens have been expressed in other forms, such as in some discussions and potlucks sponsored by BEAN, and in the continued interest in the internship at the Southside Community Land Trust.

Lastly, the student survey suggests that there are a number of students interested in the creation of campus gardens and a number of members of the faculty expressed their support for the project as well; even if it is not something in which they saw themselves involved, they still thought it was a good idea and useful to others at Brown. "Even without a role as a teaching tool, it is a desirable project", wrote one survey respondent. Once the idea of campus gardens was planted in the minds of survey respondents, many fantasized of great possibilities for such facilities. Some thought of campus gardens as having a sanctuary appeal, and other visualized a demonstration garden of wild native plant species that provided a diversity of plant family representation.

Generally, the comments from both of the student and faculty surveys emphasized that campus gardens could enhance the Brown Community. The amount of support for the garden project has been promising and suggests that the gardens could fill a need in one's educational and college experience that is currently not necessarily being fulfilled through other facilities or practices.

Applying Lessons Learned and Differentiating from Other Universities and the UEL

The responses from the questionnaire sent to universities with campus farms, the site visits, and the interviews that I had with various farm managers from other schools have offered a number of lessons that should be applied to the establishment of campus farms at other schools, such as at Brown University. As students at other universities used selling points to convince their institution, these same selling points could and should be used at Brown. Convincing arguments for establishing a collection of urban gardens at Brown include:

1. The educational and research potential in organic agriculture
 - a. An area of agriculture that is growing rapidly
2. The use of the sites for relaxation and recreation
3. The production of local food that could be used for various purposes
4. The widespread support from students, student groups, faculty and staff from various departments and agencies at Brown.
5. The community-building potential

One of the most common pieces of advice from other schools was to take the time to choose an appropriate location- one that is close to campus in order for a more diverse group of

students visit the farm site and have access to the benefits of the facility. Proximity to campus generally meant no longer than a 10-15 minute walk from central campus. Although there were schools that did not have their farms so close, these schools generally provided convenient transportation options for those interested in traveling to the site.

Another common lesson learned by other schools regarding their campus farms was to have a farm manager or one or two paid people who were in charge and responsible for maintaining and running the farm site. Some schools hired a farm manager as a hired position outside of the university and others paid a current staff member or highly dedicated students for this important position. This lesson could not have been stressed enough because the issue of maintenance and sustainability is a serious one to consider; however, some schools found that while it was important to have a manager to care for the overall organization of the site, the more involvement and participation from volunteers, the greater the interest level in the facility and the greater ongoing commitment from the students.

Good advertisement and publicity of the space was a valuable lesson learned. The more events and programs that can focus on and/or use the facility, the more it became an integral part of the school. One way that some schools have encouraged visitors is to advertise the diversity and uniqueness of the plants and crops at the farm. Pictures and images speak for hundreds of words; and, tastes can go even farther. Samples of the food produced have been given as samples at public events to encourage visitors. And, when the visitors do go to the farm site, many schools have found that the more colorful, interesting looking and nice smelling, the more attracted people are to stay and work at the farm, to return again and to spread the word.

Furthermore, many coordinators and proponents of campus farms found that their universities were supportive. They built a partnership between the university and the farm facility, which has allowed the farm operational budget to be more manageable and sustainable over time. The university's involvement ranged from the university providing the land and some tools, to helping fund the site and the labor involved in maintaining it.

The examples set by other campus farms help to provide advice and a basic framework for such a facility at Brown. However, given the uniqueness of urban agriculture and the basic principle of this agricultural form- that it must fit in well with the surrounding habitat- combining a number of small sites throughout the campus to form an archipelago of student-run, organic gardens would be most appropriate for Brown University. Having various different gardens could allow each satellite site to have a different focus, to ensure that the majority of

Brown students will be aware of at least one of the sites, and to allow for the different forms of urban agriculture to be showcased at Brown. Furthermore, the fact that the chosen candidate garden sites are well distributed across campus and not centralized in one area could ensure that a large majority of the Brown population would at least be aware of the garden system's existence (Appendix W: Map of Proposed Gardens).

The UEL Garden demonstrates what a community garden in an urban community looks like with private plots. It offers beauty to the campus and those who are aware of its presence; however, the number of people who are aware of its existence is a major limiting factor to the benefits that the Garden can provide to Brown's community members. The "archipelago system" of gardens would not have private plots owned by one or two people, but it would provide a space that everyone could work on, whether it was only for a one-time use of 45 minutes or a couple of hours every week. A big effort on the part of the student coordinators would be to publicize the sites well, in addition to have it be incorporated into a number of different classes, student groups, projects and departments. The UEL Garden is a well-functioning demonstration of urban agriculture; but, the archipelago system would take the work done at one site and spread it around campus to a different and new audience.

Therefore, although Brown University already hosts one urban garden and although other universities have their own student-run farms, no other college currently has such an archipelago system modeling various forms of urban agriculture. Adopting a number of the potential sites described could provide Brown University the opportunity to take a leading role in urban land use and redevelopment as it enriches the academic and physical structure at the school.

RECOMMENDATIONS REGARDING IMPLEMENTATION:

Purpose of the Archipelago Garden System

The purpose of establishing an archipelago of urban gardens on Brown's campus is manifold. Currently, there is a need for a more sustainable and secure food system- not only in Providence, RI, but also throughout the country and the world. A sound food system should have safer production, processing, and distribution mechanisms. Urban gardens, though on a small-scale, are an effective way to confront challenges such as pollution, land degradation and poor nutrition. Urban gardens also strengthen community.

Brown University is an academic institution that encourages research, experimentation, and exploration. The purpose of establishing an urban garden system at Brown would be to promote research, education, and exploration of different social, environmental, and ecological dimensions of urban farming and sustainable food systems. This garden collection, to be

called The BEAR'S (gar)Den Archipelago, which stands for Brown's Environmental Agricultural Research Station Demonstration, could provide faculty and their undergraduate and graduate classes an opportunity for demonstration projects/research, which could add a hands-on and experiential learning component to the traditional model of classroom education. Similar to Yale's farm, the Archipelago could provide students in an urban environment access to agricultural connection that is not part of a city dweller's daily life.

The BEAR'S Den Archipelago could be used to develop and demonstrate farming systems and strategies that are ecologically, economically and socially sustainable, and that have the potential to strengthen local food systems. It could offer programs- such as community-based programs through the Swearer Center for Public Service- with a site for an educational purpose. It could serve as a haven from and within the city, both the physical space and the activity of farming, to the local community and Brown. And, the BEAR'S Den Archipelago could grow food for consumption for a range of constituents, from the garden volunteers, brown dining service, the student coops, the CSA-subscription members, and/or recipients at a local food bank. The farm could be student-run, but could benefit the university community and its associated constituents.

There are currently nine proposed urban gardens involved in the BEAR'S Den Archipelago. Urban agriculture takes on various forms that are adapted to the specific site and environmental conditions. Hence, each of the proposed BEAR'S Den gardens could demonstrate a different form of urban agriculture. As proposed, the gardens will be spread out throughout the campus, which could provide the opportunity for all members of the community to acknowledge the existence of the site and get involved. Given that the sites are proposed in an arrangement that is well distributed in familiar areas of the Brown's campus, students, faculty, staff and community members could have the opportunity to take an active or passive role in the garden's existence. They could have the opportunity to enter the garden and admire it, work on the land, or pass by in between classes. In addition to each site demonstrating a different form of urban agriculture, each garden could also have its own theme or character and serve a particular need.

The Archipelago should be tied into an academic course from the beginning. The 2005 GISP on sustainable agriculture should continue in the Fall of 2006 (see Appendix O: Past Agriculture-Related Work for the syllabus from Spring 2005). In addition, one or more section projects in the introductory Environmental Studies class, ES11, should integrate the urban garden system (See Appendix J: A Sampling of Related Classes for types of projects).

Where to Find the Money

If one were to include the intangible values and evaluate the gardens as a public good, then the benefits outweigh the costs for such a project. However, there are still costs involved with the creation of the archipelago and in order to see the project through to fruition, these need to be covered. Funding for this project can be seen as one of the major barriers to the feasibility of establishing an archipelago of urban gardens on campus. There are initial, start-up costs in addition to maintenance costs over time.

There are a number of options when looking for funding. In addition to examining how other universities and colleges collected the necessary finances to create and run their farms, looking at the options at Brown specifically was necessary.

Support from Student Groups

Some universities and colleges have used student fees for maintaining their farms, they have built an alliance with student groups who help with backing support, or they have created a garden club that receives its own student funds. There are a number of student groups on campus that are encouraging establishing campus gardens at Brown for use in the classroom and for social and relaxation time; and they could be looked towards for financial and other support. These groups provide financial support when they co-sponsor events and bring speakers to Brown and therefore could allot a portion of their budget to the garden project. Category III organizations change their budget and reapply for funding each semester. BEAN and SuFI are two groups that have already talked about investing time and running campaigns to work on local food issues and many of the organization members have expressed interest in doing agriculture work and seeing a farm established at Brown.

There are other potential student groups from all divisions of the student groups on campus. For examples, student groups listed under the “cultural/identity/spiritual” category may also be interested in providing some funding as well such as the Zen Community or the Women’s Studies at Brown. Groups listed under the “Political/Social Action/Public Service” category feel a connection with this project and would support it financially and otherwise. Examples of groups willing to provide funding include Circle K, Oxfam at Brown, and the Brown Greens. In addition, student groups from the “Student and Campus Services” section such as the Bruin Club, BOLT- Brown Outdoor Leadership Training program, and Mental Wellbeing. The Brown Outdoors Club, from the “Recreational/Athletic” section would have an invested interested as well. Lastly, residential student groups, such as Art House and Brown’s Association for Cooperative Housing could provide additional funding.

The support and funding from these groups would vary. For groups like BEAN and SuFI, where there is a strong interest amongst the members of the organization for such a facility and it aligns with their mission, financial support could be reliable, more substantial and a permanent component of the groups' budgets. For other organizations, the funding may vary year to year depending on the interest amongst the members and what the organization is focusing on and what projects they are doing which would require the use of such funds.

Brown Dining Services Funding

The Brown Dining Services is currently working hard on increasing the amount of local food available in the cafeterias. While the purpose of the archipelago is not solely to produce large quantities of food, but to provide a site for independent research, demonstration of concepts learned in the classroom, and as a location for different people, departments, and interests to come together on common ground, Brown Dining has been supportive of the vision for this project. Willis has expressed interest in helping to get the archipelago up and running.

Given that the two herb gardens located close to the two major dining halls will be used primarily to supply Brown Dining with herbs, Willis has welcomed the opportunity to support a part of the project financially. Not only has Brown Dining stated that it would purchase the herbs and provide the up-front costs in case the growing season is not too favorable, but also Willis expressed the desire to be helpful in other ways that they can, both financially and otherwise. The estimated sum that the Brown Dining Services would provide has yet to be determined because the amount of herbs used is driven by the recipes; however Brown Dining has guaranteed that they would have something to do with the project (Willis, 11/30/04).

Work-Study Funding

Although starting with the class of 2006, freshman receiving financial aid will not have to fulfill work-study requirements because of a provision in the "Initiatives for Academic Enrichment" [20], there are three more years in which students on financial aid will need to earn on average of \$2,000. There are a number of opportunities, both on and off campus, to work for as part of the work-study program. By having the gardens act as an on campus work study opportunity, funding from these grants would support student workers.

Swearer Center for Public Service

The Swearer Center for Public Service offers a number of fellowships and supports a number of student workers. Moreover, every summer it financially supports an intern to work with Southside Community Land Trust on their City Farm. The summer stipend for that position is \$3,000 for the summer. The BEAR'S Den Archipelago does not want to compete

with the efforts that the SCLT is doing to promote urban agriculture in Providence; it wants to complement it. By having a stipend from the Swearer Center for students to work on the small gardens at Brown in a similar capacity as at Southside, the Swearer Center would be encouraging more students to get involved in the urban agriculture movement. Through a student's work on urban agriculture at Brown and gaining an increased interest in the movement, there will be more awareness and interest in the efforts made in the greater Providence community.

However, a meeting with Peter Hocking, Director of the Swearer Center, resulted in the question of the Center's engagement in providing funding for the archipelago effort because of how integrated into the Brown educational experience the campus gardens would be, as opposed to a public engagement (Hocking, 3/7/05). Given this fact, Hocking pointed to various academic departments as the base of support. Nevertheless, Hocking added that emphasis on a broader and bigger the vision for the campus gardens could make it easier for the Swearer Center to be involved.

This broader vision for the gardens would be possible; the focus would be on the local, sustainable agricultural connection with the rest of Providence as a way to work on food security issues in the current structure of our current food system, which is flawed. The gardens would represent the interest and effort for a more sustainable and secure food system, which would include a different way of production, processing, distribution and consumption.²⁴

Lastly, because one of the candidate sites for the BEAR'S Den Archipelago is located in the backyard of the Swearer Center, there could be more of an incentive for the Center to provide funding because they would be receiving an additional facility that could be used for their programs, staff, and volunteers. Also, a number of community-based programs affiliated with the Swearer Center for Public Service such as OLEEP (Outdoor Leadership Environmental Education Program), Fast Food Facts, EHAP (Environmental Health Project), City Girls, the Boys and Girls Club of Providence, among others could use the site to develop curriculum and/or one-day classes to talk about agriculture, environmental issues, biology, art and poetry. If the Swearer Center ended up providing some funding, as with their other

²⁴ Upon researching the feasibility of a green roof at Brown with Brown professor and engineer, Chris Bull, he came up with another idea to add to urban gardening, a traveling garden or a "grow-box on wheels" (Bull, 2/14/05). The grow-box project would be of more interest to the Swearer Center because of its potential use in local school classrooms. Bull envisions a venter cart that has an educational component. Because it would be able to move easily, the grow box could grow herbs for the dining halls and/or could be used for demonstration projects for elementary, middle and high schools.

fellowships offered, students would have to apply for this position and the funding would be used for paying student labor.

Applying to Grants

Other universities and colleges have stated that applying for grants from outside sources for maintaining campus farms are hard to come by and not reliable. Nevertheless, it is worth looking into applying for some grant funding to get the project initiated. There are a number of angles from which this project could apply for funding, ranging from, but not limited to, issues concerning community improvement, finding ways of solving food security issues, exploring different forms of urban agriculture, and working on campus sustainability issues through daily consumption. These grants could be found through government grants such as the Environmental Protection Agency or the United States Department of Agriculture or through foundation grants that focus on issues related to the environment, to education, to urban development, etc.

Alumni Donations

In addition to applying for established grants, looking towards alumni who would be willing to support such an endeavor will be an important component not only to the funding itself, but also in advertising the new facility. As with the components of the *Academic Enrichment Plan* where the school has found and attracted interested alumni, the Archipelago could attract a sector of the alumni community that has yet to be tapped for resources. The Archipelago could be promoted as a symbol for the larger notion of sustainability. At Dartmouth, an alumni who had never given to the college before got involved through the campus garden (Stokoe, 2/7/05).

After a meeting with Frances Halsband, she suggested that I go with her to an upcoming alumni reunion and fundraiser to present the idea of creating urban, campus gardens to possibly be integrated in the master plan (Halsband, 3/28/05). This interaction with alumni would allow for a discussion of such a project and the potential for donors to gain an interest in the idea and put economic and political pressure on the school to discuss the merits and deficiencies that the archipelago could have for Brown's future.

Community Supported Agriculture (CSA)

Establishing a Community Supported Agriculture "club" using produce from the farm was a common form of funding that many universities used to make a profit. Individual students, faculty members, staff and local residents could buy into a share of the CSA in return for some produce grown on and in the gardens. While this funding strategy has been very

successful for other institutions, because the focus of the archipelago of gardens is not as much to grow lots of food but to act as a demonstration farm, relying solely on CSA membership dues for the funding to maintain the gardens would be difficult.

LOGISTICS: The Ingredients Necessary

There are nine candidate sites that have been chosen to demonstrate urban agriculture as part of the archipelago. Each garden could serve a slightly different need and demonstrate a different form of agriculture with a distinct need; however, there are a number of supplies that will be necessary at all sites. The costs for most of these supplies are included in the start-up budget. In addition, the supplies can be shared across the proposed gardens, reducing the cost.

Farm manager

A farm manager is a necessary aspect to the success of the archipelago project. As mentioned in the “barriers section”, commitment and long-term organization is one of the major barriers to the success of campus farms. Most schools found that establishing a permanent Farm Manager position helped keep the farm in order and allowed more groups and individuals to access the farm. This phenomenon would prove true for Brown as well. For example, Brown’s greenhouse is open to the public, to student groups, and to classes and it is kept in order because of Fred Jackson, the Greenhouse Manager. Jackson was hired by Brown to fix up the greenhouse and make it more available (Jackson, 2/23/05).

The Farm Manager could be a couple of paid student workers, especially needed over the summer, which could guarantee the same commitment and dedication to the success of the garden. The finances required to pay one farm manager for a full year are about \$4,000. The paid student farm managers could ensure that Garrett Hardin’s coined “tragedy of commons” [21] would not take place. Similar to Hardin’s parable of a pasture, a garden could pose a dangerous situation created not by malicious outside forces but by the innocent behaviors of individuals acting alone.

“Each man is locked into a system that compels him to increase his herd without limit - in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own interest in a society that believes in the freedom of the commons” [21].

The farm managers would ensure that all of the volunteers and visitors to the gardens were working together for the benefit of the communal space as opposed to acting alone. To deal with the issue of an open access commons, paid student workers would be in charge of making the garden sites community-based. They would organize communal events open to everyone, such as potlucks, garden tours, or class visits; they would order seeds; and they would maintain the compost heap to ensure sustainability and beautification of the gardens.

Volunteer Student Workers

In addition to a farm manager, volunteer student workers would be an important component of the archipelago project. Volunteers, like the Farm Managers, are needed to work the land, spread the word about the gardens, and help keep the garden programs running. Organic agriculture and community gardening, even on a small scale, requires attention and many hands. Further, the volunteers would create a community environment.

Supplies for the Raised Beds

Lumber, post hole diggers, a transparent plastic tarp, a power drill and non-chemical treatment are all supplies required to build the raised beds on sites that are contaminated with lead or other toxic materials. The lumber should be at least two-feet high; post-hole diggers (which are already owned by the UEL and can be shared) will be used to arrange the structures and establish them into the ground; the transparent plastic tarp will be used as another barrier between the leaded-soil and the new soil to be brought into the sight. The power drill will be used to construct the frame for the beds and the non-chemical treatment will be used to protect the lumber from rotting. These materials can be purchased among other places, at Home Depot, or the local lumber yard “La Sweet” located in Olneyville, in Providence, among other places.

Soil

Given the urban environment of these gardens and the lead contamination found in much of the soil as a result, additional soil will be needed for most of the candidate garden sites.²⁵ Facilities Management has offered to provide soil for this endeavor (Vetere, 3/7/05).

Kristen Lewis owner and farmer of Rabbits Dance Farm and CSA in Cumberland, RI suggests that if Facilities Management cannot supply enough potting soil for all of the gardens, then the Mackenrow Farm in New York would be a good company from which to buy organic soil. Lewis buys this soil through the Northeast Organic Farmer’s Association’s (NOFA) bulk order, of which there is a Rhode Island chapter. If the timing does not work out to order with NOFA, Lewis suggested buying soil from a company called Vermont Compost or from Ideal, a company in New Hampshire. However, potting soil can be made on one’s own by mixing vermiculite, peat moss and sterilized compost (Giancola, 3/25/05).

²⁵ There is an organization that does lead remediation called The Worcester Roots Project that could help remediate the soil if there is a decision to do so instead of/in addition to building raised beds. For more information or to contact them, visit: <http://www.recworchester.org/roots.htm>. Although they focus on lead remediation in Worcester, they have come recommended.

In addition to the **organic potting soil** needed to recreate the growing medium for the gardens, there are two other types of soil that should be added to promote healthy growth. These soils include **organic fertilizer** and **compost**. While potting soil mix is used to start seeds and as a basis of a soil mixture to fill beds, organic fertilizer is needed at the beginning and end of the growing season to feed nutrients into the soil²⁶. Compost is also needed to supplement nutrients by adding it throughout the growing season. David Krakow, The Community Garden Coordinator, stated that chances are likely that the archipelago gardens could get a truckload or two or three of compost from City of Warwick for free (Krakow, 3/18/05). This system is what SCLT does for their community gardens. In order to cement this potential relationship, one would have to call up the Highway Department in the City of Warwick. If the donations do not work out, a good company to buy compost from is The Smithfield Peet Company, which sells compost at \$25/yard.

In addition to providing a lead-free growing medium for the garden sites, soil will also be needed to supply the Grad Center green roof with its base. All of the soil and growing medium will need to be brought to this site, as it is currently a concrete base, which does not promote plant growth. The rooftop garden soil may need to be purchased from a specialized green roof company or contractor, unless the green roof is implemented using a containerized system.

Seeds

A variety of seeds will be needed to grow produce in all of the gardens. Each of the sites has slightly different environmental conditions from the other. These site-specific characteristics, such as shade, will require a different type of plant. Fred Jackson has offered to raise some of the seeds in the greenhouse to prepare them for transplanting to the gardens (Jackson, 2/23/05). He has also offered to provide some seeds and plant material. In addition to the seeds and plants provided by Jackson, other sources of seeds include large seed distributors (such as “Farmtopia”, “Agway”, “Fedco”, and the “Eastern Native Seed Conservancy”). Once the BEAR’S Den gardens have seeds, there will be less of a need and cost to buy more. The archipelago project could promote the practice of seed saving.

Other Agricultural Tools

When gardening, there are a number of tools that are necessary and useful to ensure that the plants are growing well (See Appendix U: Budget, for an in-depth list of tools and

²⁶ One of the key components of organic/sustainable agriculture is to focus on the health and the “soul” of the soil. If the soil is healthy, the crops will also be healthy.

prices). Facilities management suggested that they have many of these tools. Nevertheless, it would be good to have a separate set of supplies specifically for the urban gardens.

TIMING: WHEN IS THE TIME TO GET THE GARDENS GOING?

The time to get the gardens going is now. The Archipelago could complement the work currently underway with Brown's new Sustainable Food Initiative. Also, urban agriculture is expanding worldwide and there is great student and faculty interest in the establishment of an urban farm at Brown. The movement for university farms is growing and Brown should not fall behind, as its Ivy colleagues such as Yale, Cornell, and Dartmouth and other liberal arts colleges around the country provide such a facility to their students' enriched academic experience. Such a farm's presence has the potential to greatly influence the behavior of Brown-affiliated individuals and community members. As Mark Cladis, Professor of Religious Studies, states "a farm has a place in the liberal arts education" (Cladis, presentation, 10/21/04). Furthermore, plans for and movement towards physically restructuring Brown's campus are currently taking place.

As mentioned earlier in this chapter, the ideas for establishing an archipelago of urban gardens on Brown's campus have been expressed to the architect, Frances Halsband, who is enthusiastic of the general idea, particularly the edible walkways. To continue to build this momentum and further integrate the BEAR'S Den Archipelago plans into the Master Plan for Brown, presentations about the idea should be given and meetings established with members of the administration, donors and alumni who are interested in Brown's redevelopment. Most importantly, it is the students and faculty that will be living and working on the campus and who should have a say in what the physical arrangement will be. Therefore, this energy and desire will need to be organized.

As previously mentioned, the current GISP on "Exploring Sustainability in Agriculture and Modern Food Systems" should be continued or taken the form of another GISP on sustainable agriculture. It should work along side a student group that is formed around this project or one that already exists that could choose to work on this project as one of its initiatives²⁷. This group and the GISP should not only organize the physical creation of the gardens, but also determine the classes that will use the facility and the first projects that will be performed on the sites. In addition, a strong advertising campaign should be built to ensure

²⁷ The SuFI student group that already exists is currently mobilizing on bringing more local foods to the cafeteria and many of the group members have expressed interest in working on a campaign to have small farms on campus.

that the Brown community and neighbors are aware of the BEAR'S den archipelago and that it is a site that is open to all. Finally, all of the necessary supplies should be purchased in preparation for the harvest season.

CURRENT RECOMMENDATIONS FOR EACH SITE AND PRIORITIES

The BEAR'S Den Archipelago garden system could be comprised of relatively small, individual forms of urban agriculture. The Archipelago could educate students, faculty and staff about the environment, it could engage the community in an interdisciplinary way, and it could demonstrate how to effect change. Therefore, the Archipelago will fit in well with Brown's Academic Enrichment Plan.

Each garden will meet a distinct need and have its own character and purpose. These needs and characteristics need to be advertised and a campaign to gather support from faculty and students will be needed to make sure the project is implemented. From the survey results, it can be concluded that there are a number of interested students who are ready, willing and able to take on this campaign. Once the support has been demonstrated further to facilities management and the administration, the construction of the gardens may begin. Furthermore, because each garden serves a different need, these gardens could be initiated simultaneously, instead of one after the other. Different departments and groups of students could be involved in constructing the different gardens, depending on their interest and departmental affiliations. Below is a summary of the characteristics for each site. (See Appendix X: Discussion of Proposed Sites for a more detailed explanation.)

Combining the Brown-Owned Backyards and the West House Garden along Brown Street

Combining the three backyards of the Brown-owned properties located on Brown Street just north of Meeting Street will provide a garden site that is approximately 2044 square feet, or 0.05 acres. Although sunlight is somewhat limiting and the site's soil is laced in lead, the West House Garden location fits many of the criteria of an urban garden site. There is fertile soil, access to water, and the neighbors are Brown-affiliated, including a house with students dedicated to environmental issues. It is less than ten minute walk from Faunce Arch, in between Pembroke and Main Campus. Also, there is currently a fence around all three backyards. What makes this site even more appropriate is that there is potential to connect it up with the brick walking path along the Pembroke Campus, where a past GISP designed and planted an edible landscape. This edible landscape could be enhanced and lead into the garden.

The West House Garden should probably be one of the first gardens in the archipelago to be implemented because not only has there historically been a garden located there, but also

because the current members of the co-op, located in the adjacent house, are interested in working in the garden and revitalizing it from its current unkempt state. Also, Patrick Vetere, Brown Facilities Management Grounds Attendant, states that the West House backyard is currently an overgrown eyesore and that any work on it could benefit the community (Vetere, 3/28/05). Although the renovation of Pembroke Hall, adjacent to West House, may interfere with setting up the garden, given the overall support from students, faculty and staff, there is an opportunity to have the West House Garden organized this spring as a pilot²⁸.

The Dining Hall Herb Gardens

The momentum, interest and passion for local food from Brown Dining Services should be encouraged and taken full advantage of by this garden initiative. Therefore, the second priority sites for the Archipelago effort should be the herb gardens at the dining halls. The herb gardens would be within a 10-15 minute walk of Faunce Arch and without the concerns of neighbors. The garden proposed near to the V-Dub is located directly behind the V-Dub building on small semi-circular raised bed of soil that is currently in disuse. This site is near to Alumni Hall and some of the dorms on Pembroke campus. This area is particularly appropriate because it has automatic irrigation, so it will require minimal maintenance by students. The V-Dub site is not highly trafficked by students; however, the garden could encourage students to visit this area in back of the V-Dub more than it is being used currently, which would transform a site that is not as used on campus into one with greater use.

The herb gardens located near the Ratty Dining Hall would be located on the corner of George and Brown, near to the Ratty loading dock and the entrance to the Brown Dining Services Main Office. While there are some rocks, trees and shrubs at the smaller the proposed site directly in front of Brown Dining office, which could make the area less ideal for growing, this area has irrigation and will require minimal monthly student maintenance (Vetere, email, 3/25/05). The other proposed herb site located near to the Ratty is located across the street in the northern direction on Thayer Street. It would be situated on the raised area on the sidewalk parallel to the Caswell dorm where there is currently pacasandra vegetation. The pacasandra replaced a simple small patch of lawn as a result of a grant that was associated with the Brown is Green initiative (Vetere, 3/28/05). While the pacasandra is superior to grass, the site could be improved once again for herbs, edible flowers, medicinal plants and other produce. Both of

²⁸ In fact, in the Sustainable Food Systems GISP, redevelopment of the West House Garden has already begun. Students built a second raised bed and partnered with Facilities Management in order to obtain soil and tools to work in the garden. Members of the West House Co-op have also joined in beautifying the backyard garden. (See Appendix _ for pictures of West Houses' redevelopment.)

these sites near to the Ratty are highly visible and would create a great connection between the food grown and food consumed for students on their way to dine.

The Edible Landscapes/Walkways

In addition to herb gardens and raised beds, edible landscapes are another form of urban agriculture. There are currently two sites proposed: a path that could go from Pembroke Campus to the West House Garden and a path that could go from Pembroke to the UEL Garden via Angell Street. Both edible walkways could present a collection of nut and fruit trees and bushes such as apples, black currants, strawberries, blueberries, and raspberries. There are already pear trees along the site proposed for the West House Garden Pathway. Robert Hart, gardener and author of Forest Gardening: Cultivating an Edible Landscape, Hart describes edible pathways as a “miniature imitation of a natural forest” [22] as there is a fruit and nut tree "canopy" and a lower level of bushes and perennial vegetables and herbs.

Given that the Master Plan for “The Walk” [23] prepared by the architecture firm, R.M. Kliment & Frances Halsband Architects, will link Pembroke Green and Lincoln Field is not going to be constructed within the next year or so, this aspect of the archipelago can be delayed as one of the last satellite sites to be implemented²⁹. However, the West House Walkway could be done simultaneously with the West House Garden implementation. Like the West House Garden site, the proposed edible walkway has once been used for edible plants and therefore it would be a good site to revitalize and do as one of the first projects. This site is small, and it does not have easy access to water; however, this site has proven to be a hospitable site for edible plants³⁰. There is some available light, fertile soil, and it is on campus in an area that is heavily trafficked to, from, and in between classes. It has a year-round use and the neighbors are generally the Brown community and Brown-owned property.

The Science Library Courtyard Quadrants

The Science Library courtyard quadrants, currently covered with lawn grass, offer a strategic location to start to build momentum for the BEAR’S Den Archipelago because Brown has already committed to do something about the site. This location has already presented itself as one in need of a makeover by the University. This site has good sunlight and it is centrally located on campus.

The Grad Center Green “Roof”

²⁹ The greenway will be implemented in phases with the first associated with the new Sidney Frank Building, which will be under construction in 2 years.

³⁰ About ten years ago, there was a GISP on edible walkways where a path of blueberry bushes and pear trees were planted on the Pembroke campus (Ward, 1/25/05).

Rooftops pose an interesting aspect to urban agriculture. Although it is difficult to grow produce on “green roofs”- which are living, vegetative roofing alternatives designed to provide continuous, uninterrupted layers of protection and drainage- it has been done before³¹. Establishing a rooftop garden would put unused space into use. Although there are many issues with rooftop gardens, it is an alternative site worth looking into and there is now an effort at Brown to get such a project off the ground.

The Grad Center tower terrace between towers C and D, adjacent to Thayer Street, would be a suitable location to establish a green roof. The building receives adequate sunlight; it is protected by two tall towers that block the wind, which is often a limiting factor for many rooftops; and the amount of space that the green roof garden could use is reasonably sized. According to Wilbur Yoder, an architect, engineer, and professor at RISD, the building is structurally sound (Yoder, 2/28/05). It can sustain 100 pounds per square foot. There is water access in the adjacent towers (though not direct access to the proposed green roof site). There is drainage into scuppers buried in the walls. The green roof on top of grad center would be 1062 square feet or 0.024 acres.

Hillel Entrance (Front Area Planters)

The newly constructed Hillel building on George and Angell Streets has planters in front of the entrance to the building. Currently, these planters are filled with ornamental plants; however, they are well positioned to grow produce as well, both from a physical perspective and a religious one. The area receives adequate sunlight, it has good access to water, and soil for healthy plant growth already exists. In addition to Hillel providing physical characteristics that are favorable to the promotion of urban agriculture on a small scale, the social factors are also advantageous.

Swearer Center Backyard

The Swearer Center is located on George Street between Benefit and Prospect Street. The site has adequate sunlight and good access to water. While it is not located in the middle of campus or on route to other locations, in it is conveniently positioned next to the Rockefeller Library and near to the Keeney Quad Dorm. It is also located on a common street used to walk

³¹ Santropol Roulant is an organization in Montreal Canada that is working with a number of other organizations, including the University of Quebec, which will utilize rooftops for food production and urban green space development. Through the green roof, they are also trying to create an environment that brings health and well-being to the community (Rabinowicz, 2004).

downtown from Brown's campus; therefore, many people pass by the Center on the way down College Hill.

The organization and the logistics for the Swearer Center garden could take time, which could delay the implementation of the garden design and construction. Therefore, this satellite garden may not be the first to get initiated, but it is certainly a hospitable, promising site.

EVALUATING THE BENEFITS

The proposed urban gardens for Brown University are not focused solely on food production and marketing; in fact, the primary goals of gardens are to act as demonstration sites, showcasing urban agriculture and providing experiential learning opportunities for Brown's academic classes, while providing a space for socializing, relaxing and working the land. Given this vision for the project, evaluating the benefits, particularly calculating an economic value for the benefits that these urban gardens could provide is difficult to quantify.

It has been found that community gardens enhance nutrition, physical activity and improve quality of life. In addition, community gardens provide opportunities to organize around other issues and build social capital [24]. In order to evaluate whether or not the BEAR'S Den Archipelago achieves these benefits as well as provides an environment for social development, environmental improvement and food production, all of which are hard to quantify, interviews with members of the community, focus groups, surveys, site observations and document reviews could be performed. These evaluations could be integrated into a section project with ES11, as discussed earlier, or into another class project.

Interviews could be performed with volunteers, the garden managers, professors who use the sites for class and students and faculty who may be actively involved in the archipelago. Questions for the interviews could include asking what the BEAR'S Den site and activities mean to them, what the individual saw as the gardens' strengths and weaknesses, and to relay some of their experiences and feelings about the gardens.

In order to evaluate the benefits of the BEAR'S Den Archipelago, another survey should be drafted and distributed to both faculty and students. It could be similar to the surveys handed out initially to understand the interest in establishing such gardens and whether or not individuals or classes use similar existing facilities. These surveys could ask comparison questions, such as: "How much do you use local facilities/sites as a class resource or for other purposes? Has this use changed as a result of the establishment of the BEAR'S den?" The survey could also ask questions related to one's personal use, such as the reasons why one works and/or values the garden sites. The purpose of the surveys would be to get a

sense as to if and how the implemented gardens have changed the experience at Brown. Similarly, focus groups could be used for this same end.

In order to evaluate if/how the gardens have had common health benefits could explore if there was a change in dietary choices, mood or in physical activity after the gardens were introduced on campus. A document review [25] could also be used to evaluate the BEAR'S Den Archipelago. The document review would provide a qualitative analysis of the written work produced as a result of the gardens. This work could include annual reports, promotional materials, collaborator reports, newspaper articles on each of the gardens, and research papers written from work done on the gardens.

Furthermore, indicators of benefits should be identified and evaluated before the gardens are implemented. Indicators that could be considered include: whether or not people have met a new acquaintance because of the garden facilities; if there is a (noticeable) increase in local herbs used in the cafeterias; and if one feels in greater contact with nature. Observation and informal discussion with garden users and volunteers could be performed to obtain this information.

FINAL CONCLUSIONS

It will be important to evaluate the archipelago gardens and the benefits that they have for Brown University, not only to get a sense of how the gardens are used, but also to identify future challenges that may arise and to find ways to improve the gardens as a better resource facility. The evaluation process could allow for insight in ways to connect with and compliment different movements towards sustainability, academic work, and various other interests on Brown's campus and in the greater Providence community.

The BEAR'S Den Archipelago of gardens could offer many benefits for Brown University. Public opinion surveys from students and faculty show that many people from diverse academic backgrounds are interested in the possibility that such a facility could exist at Brown. Therefore, the creation of a campus farm at Brown is socially feasible. Not only could it be used by classes, individuals, and Brown Dining Services, but also there are student campus groups and public service projects that could benefit from them. Economically, while there are costs involved, many of these could be waived and the finances required for the gardens' maintenance could be minimal- paid labor and a few supplies. Moreover, the benefits of the garden sites could outweigh these costs. Finally, the time is now for urban gardens and urban agriculture to be implemented on campus. Politically, the climate is right for this to be done at Brown.

Not only is the sustainable agriculture movement building among students and other institutions across the country, but also the University is currently restructuring the campus and sites are presenting themselves for revitalization. As Ruth Simmons and Brown University move forward with the *Academic Enrichment Plan*, change is in the air and there are many opportunities to fit in urban gardens into the goals of the plan.

Finally, implementation of the BEAR'S Den Archipelago has already begun. Students in the Spring 2005 Sustainable Agriculture GISP broke new ground at West House on May 4, 2005 (Appendix Y: The Work Begins), integrating farm work with the academic components of sustainable agriculture that were discussed earlier in the semester. Moreover, for this upcoming summer, residents at West House have agreed to care for the renovated garden and a student summer farm manager has recently been hired to start the herb gardens and begin to document the birth of the Archipelago project. Plans for the Archipelago are underway and seeds embedded in the West House Garden are beginning to sprout.

Epilogue:

After researching the history and current movement towards urban agriculture and campus farms, I have grown more passionate about its power to foster sustainable development in addition to providing economic and social benefits to individuals and communities. I believe that the establishment of an archipelago of urban, student-run organic gardens at Brown University is a tremendous opportunity to attract students from all different departments, backgrounds, and interests to meet together on common ground. This diversity will be drawn to the various garden sites for academic research, physical activity, a distraction and a spiritual oasis from both the busy urban environment and the reality of papers and exams.

An urban garden system at Brown could offer a resource for professors and students to do lab work within a “real world”, functional setting. This archipelago could provide an enriched academic opportunity to test/demonstrate theories learned in the book. A range of departments from Biology and Environmental Studies to Psychology, Engineering, Visual Arts, Education and Economics could use the gardens for research. It could complement already existing classes and encourage new courses, activities, and internships; perhaps the archipelago project could attract new donors and greater involvement from Brown alumni³². Also, the farm could host activities that could directly involve the Brown community and surrounding neighbors and could increase awareness in the importance of local and organic food, environmental protection, and urban landscaping.

With the vision and basic plan for the BEAR’S Den Archipelago set forth in this thesis, I am hoping that many of the people that I have spoken with, that have approached me with their ideas, and others who are working on like-minded sustainability projects will work together to mobilize and gain support from the general student body and faculty³³. Building a coalition and expressing the desire to see this project through to fruition is necessary to make the decision-makers aware of the interests amongst the “customers” of the University. Without an articulation of this “need”, there will not be as much of an incentive to implement the vision. I am thrilled with the current momentum behind this effort from students from various classes and from all different backgrounds; and, I am confident that this vision will be implemented.

This thesis, with all of the contacts made and information collected- basic site choices, drafted budgets, potential funding sources, a selection of classes that could use the facility, and interested and supportive faculty members- has begun to help lay the groundwork for a campaign to help with the organization and implementation of urban garden facilities for Brown. After support from members of the Brown community has been collected, the sources of funding should be finalized, including a commitment from student groups who will put money aside for the gardens in their budget for next year. Lastly, the application process for two paid student farm managers should be initiated for the fall.

The notion that Brown could establish farms on campus has been exciting many students since at least the fall of 2004. After a presentation of the findings of campus farming at universities across the country and the feasibility of a garden archipelago at Brown University on Thursday, April 7, 2005, (Appendix Z: Soup Seminar Slides) it was my hope that the BEAR’S Den Archipelago would become a campaign spearheaded by interested individuals and students groups. And in fact, students have begun to mobilize! It was a pleasure to be a member of the Spring 2005 Sustainable Agriculture GISP and to work with members of West House to rebuild the current garden in the West House backyard (Appendix Y: The Work Begins). I have been honored to work with Brown Dining and members of SuFI to establish a paid summer internship for a garden manager who would be responsible for closely reading through this thesis, working on the herb gardens and documenting the progress of the Archipelago. Thank you for this opportunity. I look forward to tasting the fruits of this labor.

³² Through researching the feasibility of creating urban gardens at Brown, I found myself in contact with a number of Brown alumni who were doing work on greening cities, urban agriculture, and farm education in the classroom. They were excited about the prospect and examination of the feasibility of creating urban gardens to enhance Brown’s offerings to its students.

³³ By doing research and sharing my thesis topic to other students, there has been a great amount of support and energy to get this project implemented. Many people are looking forward to getting a sense of a plan for the school and then want to take the project from there to make it happen.

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Bull, Chris, Brown Senior Research Engineer, 2/14/05
Cannon, Charlie, RISD Professor Industrial Design and Landscape Architecture, 2/22/05
Caton, Patricia Anne, Administrative Manager of the Center for Environmental Studies, 3/17/05
Cavanaugh, Chad, Brown CAD Technician, Facilities Management, 2/17/05
Cheney, Collin, Green roof Director at EarthPledge, Brown Alum, 1/12/05
Cladis, Mark, Professor of Religious Studies, 2/14/05
Dunbar, Nancy, Brown Associate Provost, 9/16/04
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Giancola, Elizabeth, UEL Garden Coordinator, Brown Alum, 1/25/05, 2/25/05
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Teichert, Kurt, Brown Resource Efficiency Manager, 3/7/05, 12/7/04, 3/7/05
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Conferences/Events

1. Examining the Link between Environmental Sustainability and Community Food Autonomy, Brown University, Providence, RI, 11/17/05
2. Verdopolis, Earth Pledge, New York, NY, 2/8/05-2/11/05
 - True to Our Roots: Michel Nischan- Chef, cookbook Author, Sustainable Advocate, Sources and Resources (2/9/05)
 - Local, the New Organic Panel: Greg Loosvelt- COO, Earth Pledge, Moderator; Bruce-Sean Reshen- change office to officer; Beth Collins- Executive Chef, Ross School; Sadhu Johnston- Assistant to the Mayor for Green Initiatives, City of Chicago (2/10/05)