

Community Based Project: Group 3

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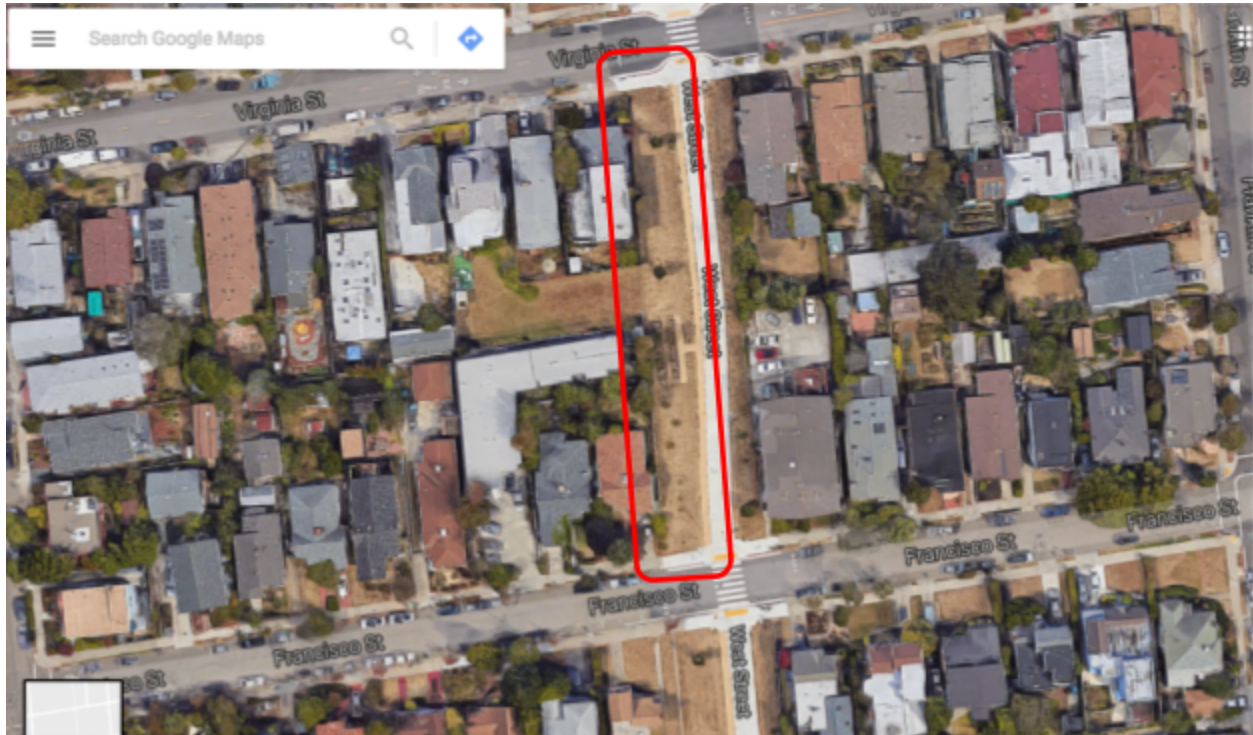
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Community Garden Proposal

Introduction

One of the five principles of agroecology is to increase beneficial biological interactions. Most might interpret this as just bugs, plants, and soils, but I would like to think it extends to the human interactions. Human to human interactions are interfered by technological inputs, by divides in the community that are out of the individual's control. Learning how to work with nature, instead of against it, can bring inner peace, and in turn, working cooperatively with others can bring peace and unity to the community. This is the kind of beneficial biological interaction we hope to achieve with our proposed project.

Our project is a proposed demonstration community garden installation going into neighborhood in North Berkeley, near North Berkeley Bart. It would be at an unmanaged lot, 80 by 8 meters, at West street between Francisco and Virginia. This garden would provide a unique collaboration between UC Berkeley, the City, and the Community, where volunteers from UC Berkeley would manage the garden until there are enough trained community members to manage it.



The majority of the neighborhood is well off, making over \$110,000 each year and owning their own home. However, there's also a large minority making less than \$30,000 each year, and an even smaller minority of incomes in between this divide. Socially, there is a large divide between these income brackets, and there is some tension between the Section 8 housing and homeowners in the area. The garden could provide a communal space where high and low income brackets could interact while providing workable lands for those without private land.

There is another equally important divide that the garden can bridge between students and the surrounding community. Although many community gardens have some sort of classes and volunteer work, these classes would be unique, providing UC Berkeley students an opportunity to teach while also learning from community members. The garden could provide a space for students and community members alike to research new gardening techniques and compare results.

In addition to the goals to provide a space for unifying and empowering the community, the garden would be a platform for other demonstration gardens throughout the bay. This would be an especially important push in low income areas and food deserts, such as West Oakland.

Our research focused on figuring out the need and the want of the community for a demonstration urban garden in the area. We tried to assess the need of the garden by comparing grocery store locations within a 2 mile radius and their prices of regular and organic produce. We also assessed need and want by surveying and interviewing the community. Finally, we tried to assess the need and want for the garden based on interviews with surrounding community gardens and looking at their management practices.

Community Surveys and Interviews - Challenges and Responses

Because of the income division within the community, we decided to make two separate analysis of data: using all responses, then comparing responses from those making \$110,000 or more, the “higher income bracket”, and those making \$69,000 or less, the “lower income bracket”. About 42% of our respondents fell into the \$69,000 or less category. The majority of those making \$69,000 or less were actually making less than \$30,000 or had fluctuating incomes. There is also an unexpected amount of Sect 8 government project housing in the area, causing reported tension between neighbors with income differences.

Unfortunately, we only got 12 people to take our survey, in which we tried to have a random sample from the neighborhood; however, we did get some extra interviews providing us some useful information for the state of the community and possible future management of the garden.

In order to assess their need for the garden, we asked them:

- 1) *If they have gardening experience.* In total, 63.6% had experience, with insignificant difference between the two income groups.
- 2) *if they garden with another community garden.* None of the respondents volunteered with another community garden, probably due to the busy schedules of all income groups and the distance of the non-allotment community gardens.
- 3) *if they garden at home.* 86% of those within the higher income bracket gardened at home. However, none of those in the lower income bracket gardened at home. 80% of those in the lower income bracket were renters, meaning they either couldn't garden the land they lived at or there wasn't even land available for gardening. Only 14% of the higher income

rented. This shows a great need for a communal gardening space for lower income brackets.

- 4) *how much they typically spend on groceries per month.* 80% total spent over \$200 on groceries, with no significant difference between the two income groups.

To assess their want for the garden, we asked them:

- 1) *If they wanted the garden and why.* About 29% of the higher income group didn't want the garden, whereas none of the lower income group responded no. Each income group mentioned issues with the land, such as contamination of soils, no water access, and how the majority of the neighborhood are wealthy, educated professionals who don't need a community garden. However, higher income groups clearly felt that these issues weighed stronger than any benefits that the garden could give. In fact, 20% of the lower income group said "not sure" about the garden instead of "no", even though these respondents mentioned all the same issues as the higher income group.
- 2) *How beneficial they think the garden would be to the community, scale 0 to 5.* The average benefit for the high income group was 3.3, with 0 being no benefit and 5 being extremely beneficial. For the low income group, the average was 4.5 (with one non-response because of their "not sure" to the previous question). This clearly shows that the low income group weighs the benefits more highly than the issues.

We conclude that the large majority of community members would want the garden and believe it to be beneficial. Overall, the lower income respondents reported it as more beneficial and more desired than higher income respondents.

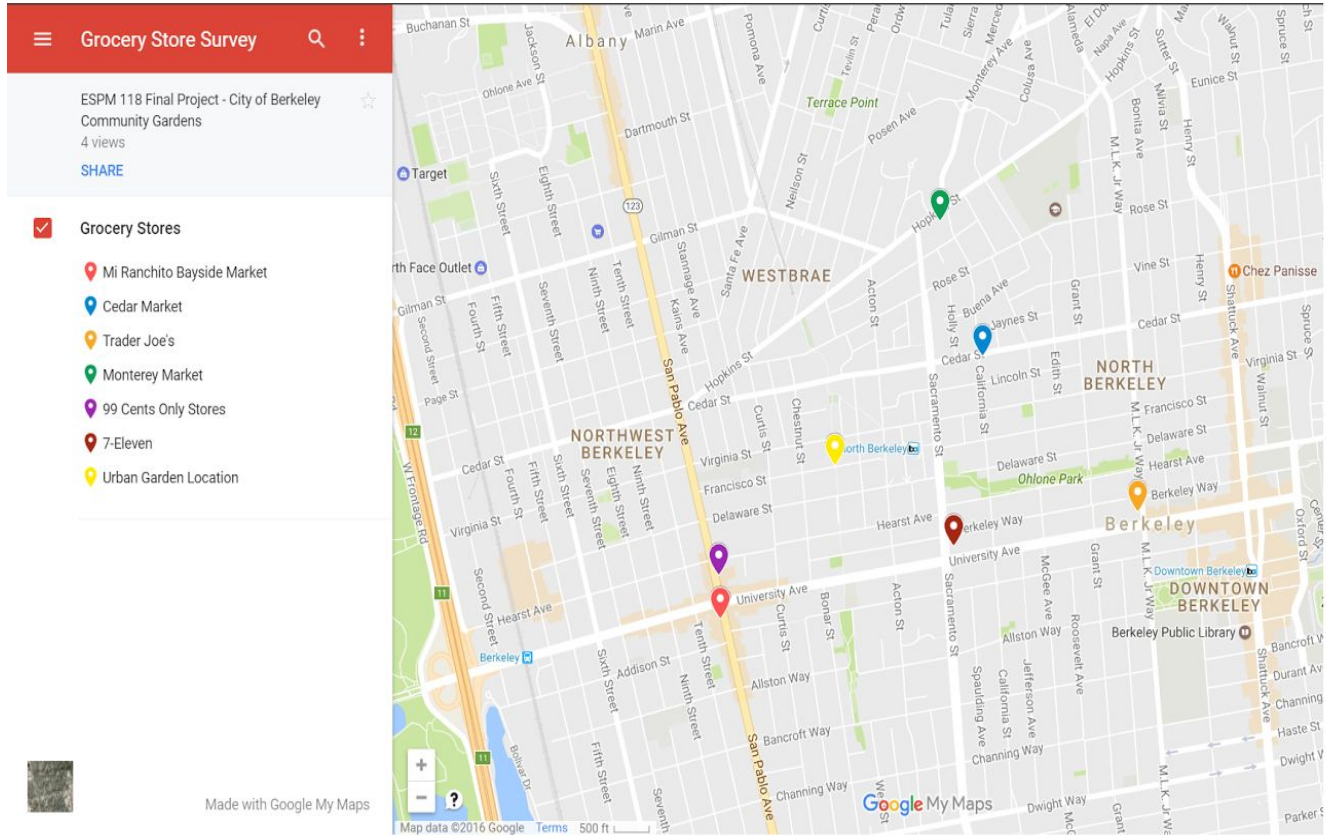
Other questions on the survey were to help assess future management of the garden.

Grocery Store Survey

The grocery store survey of our project is important to be able to assess the current produce choices and food choices that residents in the area surrounding the proposed garden have access to (walking distance, 1-mile radius). This portion of our project was done by going to seven different grocery stores in the area to record the diversity and pricing of their produce selection. We looked primarily for whether or not stores had non-organic and organic

produce, as well as a mix of various standard produce items (bananas, carrots, apples, spinach, lettuce) so that we could compare pricing between stores.

Map of Grocery Stores Surveyed



Data from Grocery Stores - Prices and Products

Produce Variety	Price Per Pound						
	Trader Joes [1 mile]	Monterey Market [0.7 miles]	Mi Ranchito Market [0.6 miles]	Cedar Market [0.6 Miles]	Dollar Store [0.6 miles]	Mi Tierra Foods [0.6 miles]	7-11 [0.5 miles]
Conventional							
Carrots	\$0.99	\$1.79	\$0.50	-	\$0.99	\$0.59	\$2.00
Apples	\$1.00	\$0.98	\$0.99	-	\$0.99	\$0.89	\$0.99
Spinach	\$1.99	\$0.98	\$2.59	-	-	\$1.59	-
Lettuce	\$0.66	\$1.49	\$1.19	Yes but no price	\$0.99	\$0.99	\$1.25
Bananas	\$1.14	\$0.69	\$3.00	Yes but no price	-	\$1.73	\$3.00
Organic							
Carrots	\$1.29	\$1.98	-	-	-	-	\$3.00
Apples	\$2.99	\$1.49	-	-	-	-	-
Spinach	\$2.49	\$3.98	-	-	-	-	-
Lettuce	\$0.63	\$1.98	-	-	-	-	-
Bananas	\$1.74	\$0.98	-	-	-	-	-

Results from Grocery Store Survey:

In carrying out the 1-mile radius grocery store inventory, we initially noticed large socioeconomic differences between the clientele of the surveyed stores. For example, the majority of customers in Bay Ranchito Bayside Market and the Dollar Store appeared to be of minority descent compared to the predominantly white demographics frequenting Trader Joe's and Monterey Market. Overall, ethnic diversity seemed much more varied among the stores along San Pablo Avenue in comparison to Trader Joe's and Monterey Market. This is most likely a result of higher public transit accessibility. Trader Joe's and Monterey Market were the only stores that had large organic produce selections; however, it is important to note that these stores also offered some of the cheapest produce per unit.

We also administered a community survey within the vicinity of the potential community garden site and found that nearly 100% of respondents spent over \$200 each month on groceries. Currently, the government's supplemental nutrition assistance program (SNAP), previously known as EBT, only provides a maximum of \$194 in food per month¹. Thus, the majority of individuals living in close proximity to the proposed community garden site are unable to rely on SNAP funding for their complete dietary needs. Further, respondents to our survey indicated significant interest in purchasing organic produce. However, upon reflection of our produce pricing data, we found that organic fruits and vegetables cost about 40% more than non-organic. While Trader Joe's boasts the least disparity in organic v. non-organic prices, the store forces customers to purchase pre-sized bundled fruits and vegetables in heavy plastic packaging. This bundling tactic could facilitate a lower cost in produce because it is likely that they sell more units of any given item, enabling saving for both the store and the consumer.

According to Bay Area Census data the population of Berkeley is diversified with over 40% of people being identified as "non-white"². Within our grocery survey, although our samples focused on only a subset of the produce within markets, we carried out a qualitative survey of "ethnic" produce available. According to the U.S. Department of Agriculture, ethnic crops are "fruits and vegetables that are commonly valued by persons with common racial,

¹ <http://www.fns.usda.gov/snap/how-much-could-i-receive>

² <http://www.bayareacensus.ca.gov/cities/Berkeley.htm>

national, tribal, religious, linguistic or cultural origin or background”³. We found that there were only two store options, Mi Ranchito Bayside Market and Monterey Market, that carried a wide range of produce, some of which included what could be considered ethnic crops. In the store that was the closest to the proposed garden plot, we observed little to no produce options available; the venues that did offer select varieties of produce were often poor quality – wilting or appearing less than fresh. We conclude from our survey of grocery stores that, within the area, there is not enough (a) affordable organic produce options, and (b) ethnic crop selections. What’s more, there is financial pressure on low-income individuals relying on food subsidy programs within the vicinity of the community garden site, as government funds per person falls below the average food spending of these households. We recommend that agroecological methods be employed to farm the proposed plot as this would produce products that are safer for consumption than with conventional methods. We also propose that another survey be conducted to understand the community’s desired varieties of produce -- allowing room for the cultivation of ethnic crops. To address the lack of available and affordable fruit options within proximal grocery stores, we recommend growing a selection of fruit trees in the proposed community garden.

Community Garden Practices

In order to inform our approach to creating the model for our proposed garden, we identified two primary models for community garden operation: (1) open community-based education with food production shared amongst the local community (2) private community garden. Examples of each model were chosen and interviews were sought by representatives of each organization.

The first model is best represented by the UC Gill Tract Community Farm, which is a collaborative project between the community and University of California Berkeley. Because of its open-sourced model for labor and education, it has the ability to provide multiple functions to the community including: sustainable urban agriculture instruction, free produce in exchange for light gardening work like weeding and watering, and a safe inclusive space for anyone who

³ <https://www.nal.usda.gov/afsic/ethnic-crops>

needs it. These functions address issues of food and social justice as well as urban sustainability. Funding is provided by the UC.

In addition to the Gill Tract, Urban Adamah provides some of the same functions but uses a hybrid private/open model to address the same issues. Urban Adamah was created to serve as a place to provide sustainable agricultural education as well as Jewish cultural exploration to Jewish youth and does so with its core fellowship. Kat Morgan, Special Programs Manager, was interviewed to shed insight on their operations. She states that there are multiple programs including a young adult fellowship (ages 21-31), which lasts for 3 months and available 3 times a year, which is a residential leadership development & urban agriculture program (Morgan, 2016). During harvests, volunteers from the community are allowed to take part in the work, and the produce is made available to the community for free. Funding is provided from private donations as well as fellowship fees. This model allows for the building of communities through cultural activities, shared responsibility through agricultural production, and food justice through its offerings during harvest time.

The second model is more of a traditional private community garden, in which members of the community apply for and granted space based on vacancy. If a lack of vacancy exists, applicants are then placed on a waitlist until a space opens. The University Village Community Garden was identified as a good example of this model and an email interview with Andrew Weitz, Community Relations Manager, was conducted. He states the garden provides the following:

“The primary services the UC Village Garden provides is a cost effective means of growing food in a hyperdiverse environment of gardeners from the local community that come from all around the world. The Garden provides tools, water, and a supportive environment for all gardeners to learn how to grow healthy plants and healthy food. Events are held throughout the year to stay in touch with and unite the community with local organizations that advocate for the importance of local and organic food. “ (Weitz, 2016)

The UC Village Community Garden’s model is similar to a majority of community gardens in that they provide space on a limited basis and once awarded, gardeners are allowed to manage their space within the guidelines set by the management team. Yields are then harvested by the individual and are not typically shared with the community. It serves as a great space to practice

urban gardening techniques, and possibly expose others to the benefits of doing so, but it does not address food security on a large scale. However, it's a model that works well for gardens of limited space and should not be seen as a negative because of its limited scope.

Upon reflection of the models described above, taking some of the open-sourced education that the Gill Tract provides and applying it to a smaller scale would work for the proposed project as it would generate interest and participation from the community, promote responsibility through the labor and management of the garden, and increase the dissemination of information related to the importance of urban gardening.

How to Address Land, Management, and Social Issues:

The lot currently there is reportedly lacking management by the community. Nobody knows who is managing it if anyone. It used to have more management, but by only a select group of individuals that did not make their presence known or advertise their garden for community use. The garden was originally implemented for community use, but the local government implemented it without consulting the community in a public meeting. Many community members were quite upset about the raised beds and would like to see improved usage of the land. There are multiple methods to maximize productivity of this land, ecologically improve it, and foster community synergy while also addressing contamination, water access, and management issues.

Issue 1: Potential Arsenic Contamination

Firstly, the soil needs to be tested to see the extent of contamination. In order to proceed, we'd need to see how deeply the contamination goes into the soil, how much of the area it covers on the lot, and the overall levels of arsenic compared to other particles. Many community members have commented on the high levels of arsenic contamination reported by the local government, so they may already have this data available. Our solution will be adjusted depending on results from testing.

There are multiple funding solutions available, including Federal and State-based EPA Brownfield Funding. The main objective of these funds is two-fold: (1) to remediate contaminated plots of domestic land so that toxicity does not pose an issue for the health of local citizens, and (2) to facilitate economic improvement through the conversion of underutilized land

to revenue-generating land uses. There exist three types of Federal EPA subsidy opportunities: grants for the assessment/testing of potential brownfields (up to \$200,000), revolving loan funds (subsidies as needed for anything related to the technical improvement of an identified brownfield – up to \$1 million), and grants for the cleanup of brownfield sites (up to \$200,000)⁴. At the California EPA level, there are two primary funding opportunities: a revolving loan fund (between \$200,000 and up to \$900,000)⁵ as well as an assessment program created and maintained by the California Recycle Underutilized Sites Program (which provides up to \$300,000 for general plots of land and \$500,000 for housing projects)⁶. Through a well-organized application, community engagement, and sufficient academic support, these funding opportunities could be tactically utilized to assess, clean, and convert the currently contaminated proposed site to its final community garden form.

A few other options focus on local efforts to reuse the soil. These include inputting raised beds with potting soils, similarly to what is already implemented in the lot but on a larger scale (Raised Beds, Ecology Center). The cost of this depends on the types of materials used and the cost of the labor, but overall should be relatively cheap compared to completely remediating the soils. However, raised beds also limit what one can plant because of varying root depths needing to match the depth of the raised bed. This can be avoided by not putting a lining over the contaminated soil, but that would be counterproductive to the purpose of the raised beds.

Another method is phytoremediation, which would avoid the costs of the raised beds and the limitations produced from it. Chinese brake ferns used to phytoremediate soils doesn't require a lot of moisture and is good with sunny conditions, growing even on rocky environments. However, this plant is invasive and can spread quickly and easily all year through spores and roots. Complications also arise with disposal of the ferns after they've remediated enough arsenic since they would contaminate compost. Lastly, it would take many years for this fern to remediate the soils to a safe level, so it would only present as a good option if the soils

⁴ http://www.epa.gov/sites/production/files/2015-10/documents/assessment_15-04_oblr.pdf

⁵ https://www.dtsc.ca.gov/SiteCleanup/Brownfields/upload/RLF_Facts1.pdf

⁶ <http://www.treasurer.ca.gov/cpcf/calreuse/faq.pdf>

were heavily contaminated and the garden was voted against by the council. Some other more simple remediation options outlined by the City of Berkeley suggest fish bone meal added to soils can stabilize heavy metals into indigestible forms, but there is not enough research to 100% back this claim (*Pteris Vittata*).

Many of the issues respondents reported were the inability to grow fruit trees in the land. This is what was reported by the local government when the previous lot's raised beds were inputted. However, the city of Berkeley has also reported some interesting findings on urban gardening in contaminated soils (Best Practices for Urban Gardening). In 2012, the City of Berkeley claimed that exposure to chemicals from the ingestion of homegrown plants on contaminated soils is less than the ingestion of soil and inhalation of dust. Berkeley soils are naturally high in arsenic, but plants tend to hold absorbed arsenic in roots and not tops or fruits. The City of Berkeley recommends building raised beds, thoroughly washing or peeling fruits and vegetables to get soils off of them, and avoiding soil exposure when gardening. There are also studies indicating that some plants absorb less arsenic than others. Fruits and seeds, especially from trees, will have the least amount of contamination, while leafs and especially roots will have more (Peryea, 1999).

The last topic is to teach members of the community on how to avoid exposure to arsenic when working in the garden and harvesting produce. The best practices include wearing face masks and gloves, avoiding touching the eyes and mouth after touching dirt, leaving soil-ridden shoes outside and washing them before using them indoors, and cleaning clothes immediately after gardening in contaminated soils. It is also extremely important to thoroughly wash and scrub, or peel produce to guarantee no contaminated soils are left on it. Due to human error, these practices will most likely not be followed exactly, but teaching community members these methods will be important to maintain the safest practices in the garden.

Issue 2: Lack of Water Access

This topic was addressed by a few of the community members, one estimating that it may take over \$15k to actually put in water access. To avoid high costs and to encourage farming in the dry climate of California, the management of the garden would implement agroecological methods that avoid heavy water use. These include dry farming, composting, growing seedlings

in pot holes, increasing coverage of the soil, no till, and other agroecological methods for conserving water, increasing humidity, and providing appropriate microclimates.

Issue 3: The Fence

This issue is quite debated because of the romanticism of a fence-free garden open to community members and respected by passer-bys. A couple of community members have mentioned some problems with this romantic ideal, including rebellious youth who smoke and “hang out” in the area, and the homeless population that occasionally camp out in the lot, with more emphasis on the latter.

The original hypothesis was that the fence would be perceived as blocking off community members, especially less-privileged members, from free access to the garden. I was shocked, however, when the survey results showed that 80% of those who make \$50,000 or less wanted the fence. Only 29% of those making \$110,000 or more wanted the fence. Overall, 60% of people wanted the fence, so it would take more community meetings with city officials and UC Berkeley volunteers to mediate differences and work out a conclusion for the fence.

Issue 4: “Vagrancy”

Many respondents of the survey reported “vagrancy” and homelessness in the area. Although a mostly wealthy area, locations near public transportation like North Berkeley Bart tend to attract homeless populations because of shelter, cheap transportation, and potential money opportunities. It’s a sensitive topic for most people to address, and figuring out how to fairly and ethically deal with a situation out of your control is more difficult.

If the garden were implemented, it would eliminate potential campsites and sleeping areas for the homeless population. This would be considered a good thing to many residents concerned about “vagrants” in the same neighborhood their kids play in. On the positive note, the garden is an opportunity to develop a program for feeding homeless populations in the area if the future garden management so chooses. On the survey, 63.6% said give to community members in need, and 54.5% said give to volunteers.

Conclusion

The garden should be implemented. This is supported much more highly and seen as more beneficial by those making \$50,000 or less and who are renting. Also, within the area of

the proposed garden, there is a significant amount of public housing and people who are food insecure and/or rely on public assistance in which the project could significantly help with.

It should be an open community garden in order to maximize benefits to the community, especially lower income members. This is difficult on smaller plots of land, seen with the garden beds already placed there. However, the proposed garden would take up the whole 80x8m lot, implement agroecological practices to maximize the productivity of the space, and generate heavy community involvement via UC Berkeley volunteer management and training.

The garden should grow fruits since these are the most expensive produce and their organic prices increase more dramatically than other produce. Amazingly enough, fruits, especially fruit trees, are the least likely to carry arsenic contamination compared to leafy greens and roots (cite). There is also a lack of ethnic produce available in nearby markets, so having a space for community members to grow this would be valuable. Fostering community dialogue is something community members have expressed as a value and something they want to see as a result of the garden which will require coordination and planning to achieve.

There needs to be more open community discussions with City and UC Berkeley officials about the management and implementation of the garden, especially with concerns of contamination and the fence. There are a multitude of ways to grow produce while avoiding contamination and heavy water usage that should be discussed with community members. In addition, the fence is an extremely important issue that determines how open the community garden will be, e.g. who will get full access to the garden, who will only be able to attend open hours and free classes, etc. It will require much discussion, community involvement, and careful planning to maximize the community benefits of the garden, but our research team believes that, with the right training and flexible management, this can be achieved.

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Survey Results:

Neighborhood

<https://docs.google.com/a/berkeley.edu/forms/d/1PKcqwV9BmcHa5SFHxixRRZpgZvLdsaBK57avZwUvhx8/edit#responses> (all data)

<https://docs.google.com/spreadsheets/d/18GBytP8v7c1pWV4aOsuTtPr7xgDzHc2wSagn5Bnx2XA/edit#gid=753650805> (split by income)

Full spreadsheet of grocery store pricing data can be viewed here:

https://docs.google.com/spreadsheets/d/1ADf_o4pk77raSI-YCU-451yB57VnKtKx9i0EIJg8a0w/edit