 doi:10.1017/S1742170514000052

Gearing up to support urban farming in California: Preliminary results of a needs assessment

Rachel Surls[1]*, Gail Feenstra[2], Sheila Golden[2], Ryan Galt[3], Shermain Hardesty[4], Claire Napawan[5] and Cheryl Wilen[6]

[1]UC Cooperative Extension, Los Angeles County, Alhambra, CA 91801, USA.
[2]Agricultural Sustainability Institute, UC Davis, Davis, CA, USA.
[3]Department of Human Ecology, UC Davis, Davis, CA, USA.
[4]UC Small Farm Program, Department of Agricultural and Resource Economics, UC Davis, Davis, CA, USA.
[5]Department of Environmental Design, UC Davis, Davis, CA, USA.
[6]UC Statewide IPM Program and UC Cooperative Extension, San Diego County, CA, USA.
*Corresponding author: ramabie@ucanr.edu

Accepted 22 January 2014 **Preliminary Report for Themed Content: Urban Agriculture**

Abstract

According to the United States Census, California is the most urban state in the nation. Although there are many outstanding examples of urban farms in California, in general, urban agriculture (UA) has been slower to gain momentum here than in some other states with large urban populations. Over the past several years, urban agriculture's popularity in California has begun to escalate, with strong emerging interest in San Francisco, San Jose, Oakland, San Diego, Los Angeles and other metropolitan communities. One challenge for urban farmers and municipal decision makers engaged with UA in California has been limited availability of relevant information and technical assistance. A new project team at the University of California Cooperative Extension, part of the Division of Agriculture and Natural Resources (UC ANR) is working to develop web-based educational resources that will be grounded in a needs assessment that is currently underway. The needs assessment includes a literature review, an internal survey of UC ANR personnel, and community clientele interviews. This paper will report on preliminary findings and analyses of the needs assessment, particularly how UC ANR personnel are engaged with UA, and what tools they think would best serve urban farmers. We suggest implications for those involved with UA, such as personnel of land-grant universities, local governments and non-profits seeking to address the needs of urban farmers in an environment of constrained resources.

Key words: urban agriculture, community food systems, urban farming, community gardens, community supported agriculture programs, farmers, markets, food policy councils, urban planning

Introduction

Across the country, metropolitan areas and adjoining peri-urban communities are experiencing a growing interest in urban agriculture (UA). For the purposes of this paper, the definition of UA was adapted from the American Planning Association's 2011 Report 'Urban Agriculture: Growing Healthy, Sustainable Places'[1]:

> Urban and peri-UA refers to the production, distribution and marketing of food and other products within the cores of metropolitan areas (comprising community and school gardens; backyard and rooftop horticulture; and innovative food-production methods that maximize production in a small area) and at their edges (including farms supplying urban farmers markets, community supported agriculture and family farms located in metropolitan green belts).

There are many examples of how these UA practices and policies are coming to fruition. Land inventories, such as the ones conducted in Portland and Detroit, are being employed by municipal governments to support UA projects[2,3]. Just in the past 2 years, large cities, including Chicago, Atlanta, Boston, Minneapolis and Portland, revised policies and zoning ordinances to accommodate changing land-use patterns[4,5]. Non-profits and municipal governments in cities across the country have also begun creating food policy councils, which often include

elements directed toward strengthening UA[3,6,7,8]. A report from the American Planning Association indicated that UA continues to grow as a planning priority, with several cities and counties including UA in their comprehensive plans[1,9]. In addition, a growing number of state land grant universities and their cooperative extension systems are allocating resources toward research in UA[2,3,10].

California leads the country in agricultural production; meanwhile, it has seven of the ten most densely populated urban centers in the USA[4,5,11]. This juxtaposition creates a unique set of challenges and motivations for UA in California as compared to other parts of the country. Over the past several years, the momentum in California has begun to escalate, with strong interest emerging in San Francisco, Oakland, San Diego, Los Angeles and other metropolitan communities. Backyard chickens[12], community gardens[13,14], farmers' markets[15] and community supported agriculture programs (CSAs)[16] are gaining popularity, as local food continues to find its place on the tables of urban residents.

One challenge for urban farmers and municipal decision makers engaged with UA in California has been limited access to information and technical assistance. University of California Cooperative Extension (UCCE), part of UC's Division of Agriculture and Natural Resources (UC ANR), is a logical partner to provide research-based training and information. However, a study conducted at UC Davis found that UA tends to fall between the cracks in the UCCE system. It is beyond the scope of the Master Gardener Program, which focuses on non-commercial gardening such as backyard and demonstration gardens, and is often considered too marginally commercial to be a focus for UCCE personnel who work with farmers[17]. Given the growing importance of UA among Californian residents and decision makers alike, it is an area that a public institution focused on agriculture might consider prioritizing.

UC ANR and UCCE personnel will need to be creative in developing resources for UA clientele, who may have different needs from their traditional audiences. Since many staff members work in fields such as youth development and nutrition education, which can intersect with urban farming, there are opportunities to cut across traditional program areas in addressing UA.

In the fall of 2012, a new 15-member multidisciplinary project team at UC ANR began the process of developing a web-based information portal that will make it easier to serve urban farmers and policy advocates. The development of web-based educational resources will be grounded in a needs assessment that is currently underway. The needs assessment includes a literature review, a survey of UC ANR personnel and community clientele interviews. This paper focuses on the preliminary research results from the needs assessment.

Methods

The needs assessment includes three steps. In order to better understand national trends in UA and build a case for its importance, the first step was a literature review that focused on the economic, social and health impacts of UA, primarily in the USA[18]. Using more than 78 sources, including 53 peer-reviewed articles, 22 program or agency reports, and three books, it is a snapshot of the state of UA.

The second step of the needs assessment was a survey developed to gather data on current ANR personnel engagement with UA. UC ANR is geographically dispersed, with staff at three campuses, nine research and extension centers and 57 county offices. In addition to being spread out around the state, UC ANR includes varied programs beyond those geared toward production agriculture, but which can be related to UA, such as youth and community development, nutrition and consumer sciences, natural resources and the Master Gardener Program, which trains volunteers to help backyard (non-commercial) gardeners. The project team was aware of various efforts being undertaken related to UA, but it was unclear how widespread these activities were, and what they looked like on the ground.

In addition to investigating the type and scope of current activities, the team wanted to learn more about barriers to working with UA clientele, identify resources that would be helpful in expanding UA work, and assess the willingness of UC ANR personnel to serve as subject matter experts on UA topics. There have been no prior efforts in the organization to define and comprehensively gather data on UA activities throughout the state, although an earlier study which surveyed farmers in one California county and interviewed a subset of extension staff was foundational to this effort[17].

The 19-item online questionnaire was geared to both academic and non-academic personnel, who may be involved with UA, including Cooperative Extension advisors/agents/educators, extension specialists, campus faculty working on topics related to UA and others, as appropriate. Because no comprehensive list of such individuals was available, and to avoid excluding any potential respondents, the survey was sent to all UC ANR personnel, via several employee listservs, reaching a total of 1639 employees, with two reminders to each listserv, beginning in February 2013 and closing after 2 months. The survey was also publicized in UC ANR's employee newsletter. As part of the survey, ANR personnel were provided with the team's adapted American Planning Association definition of UA (see the Introduction) to help frame their responses.

The survey garnered 156 responses, which represented a 10% response rate from all personnel contacted. A high response rate was not necessarily expected, since many personnel are in positions that are unrelated to the topic. Fortunately, the response rate was higher (38%)

among UCCE advisors in counties, who work closely with local communities and thus may be more likely to have contact with UA clientele. Most respondents indicated that the geographic areas within which they work have significant population centers. Eighty-one percent interact with a geographic area that includes an urban or metropolitan area with a population of 50,000 or more.

The third step was to conduct interviews with urban farmers and local policy makers engaged with UA, to learn more about challenges and barriers they have encountered, as well as their needs for educational materials, support and technical assistance. Recommendations for potential interviewees were gathered from the project team, and evaluated with a matrix to ensure a diverse mix of interviewees geographically, demographically, and from various sizes and types of urban farms. Farms under consideration had to meet ANR's definition of UA, which eliminated sites where production was strictly for individual home consumption or projects that were solely for educational purposes. Community gardens, school gardens and 'urban homesteads', for example, did not meet the team's criteria unless they had sales or other community distribution built into their activities. The pool of local policy makers sought for interviews included city and municipal employees working on UA issues, as well as advocates from food policy councils and similar organizations formulating and promoting UA policy changes in their community.

Once a list of appropriate interviewees was gathered, invitations were sent by email, and a $10 gift certificate was offered as a small incentive. A semi-structured interview format, which included both open-ended and closed-ended questions, conducted by phone or in person, was used to gather detailed information. Each interview took approximately 45–60 min to complete. Interviews began in July 2013 and were ongoing at the time this paper was completed in August 2013. Both the online questionnaire and the clientele interview guide were developed by the project team, pilot tested and approved by the UC Davis Institutional Review Board.

Review of the UA Literature: Impacts

The majority of the literature reviewed can be classified into two major typologies that fit within UC ANR's definition of UA. The first group consists of literature related to food cultivation within cities, including community gardens and urban farms. These are often community-driven projects that rely on non-profits or agencies. The other group of literature is devoted to peri-UA with producers that market directly to urban centers. Farmers' markets and CSAs are the most researched topics within this category. Because UC ANR's UA definition encompassed both production in cities and distribution of farm products from the urban fringe into city centers, the literature review was not disaggregated into urban and peri-urban results. Urban and peri-urban farming were viewed as a continuum, rather than two separate categories.

In assessing the types of impacts identified in the literature, social impacts were the most frequently documented, with health impacts second. Economic impacts were the most difficult to find, and often modeled projections rather than using primary data. The following is a brief summary of the social, health and economic impacts from the literature reviewed.

Social impacts

For the purpose of this review, social impacts incorporated impacts on human interactions with the built environment. There were five major impacts found in this category: (1) creating safe places and reducing blight, (2) enhancing community development and building social capital in communities, (3) creating education and youth development opportunities, (4) fostering cross-generational and cultural integration, and (5) providing access to land. These impacts are summarized below.

The presence of community gardens and urban farms contributes to beautifying neighborhoods, creating safe spaces and employing residents, and that, in turn, creates a sense of pride in place[19–21]. Most recognized, however, is the community development potential of UA. The interactions in urban gardens and farms often involve decision-making and planning processes that require consensus, making community gardens important places for encouraging democratic values and citizen engagement[2,21–25]. For urban farms and businesses, the development of self-determination, self-reliance and activism are major impacts[3,19,26–28]. Studies found that participants expressed improved self-esteem and pride[19,29].

CSAs and farmers' markets were directly connected to social capital and building communities. Studies with farmers and members of CSAs mentioned that relationships are developed through frequent interactions at farm events and weekly pick-ups[30,31]. Farmers' markets are also places for gathering and fostering community. However, barriers, such as lack of culturally appropriate food and affordability, may exclude low-income and minority residents in some markets[6,32,33].

A related impact of UA is the way it functions as a medium for learning experiences, educational programs and youth development opportunities[1,19,20,25,34,35]. Learning outcomes included awareness of environmental issues and ethics, sustainability and food systems[2,3,25,30,34]. Much of this learning and knowledge sharing spurred awareness of environmental and social justice in order to empower residents, and increased activism[4,5,19,26,36]. UA is also a way to promote cultural and cross-generational integration. Several urban farm and community garden projects allow immigrants to cultivate food to sell and consume[3,5,7,8,29,37]. In others,

cross-generation sharing and integration between youth and seniors occurred[9,21,23,38,39].

For both gardeners and farmers, UA projects allow them to access land, a scarce resource in many urban and peri-urban landscapes. In some of the literature reviewed, participants felt that one of the most important benefits of community gardening was 'providing a piece of land for people to call their own for a season'[10,23], where they could develop a sense of pride and ownership[11,38]. Peri-urban farms found direct marketing through CSAs and farmers' markets to be a critical tool for generating public buy-in and political awareness to advocate for farmland preservation, which can in return lead to land access[12,15,40,41].

Health impacts

Improving the health of inner city residents is a primary objective of many UA projects. Major health impacts attributed to UA included: (1) food access and security, (2) increased fruit and vegetable consumption, (3) food and health literacy, and (4) general improvements to health and well-being (mental health and physical activity).

UA has been a successful strategy in improving food access and making communities more food secure[5,13,14,38,42,43]. UA food projects evaluated by the Community Food Security Coalition, for example, produced 18.7 million pounds of food with over 726,000 lb donated for community food consumption[15,44]. Three prior literature reviews found an array of sources suggesting that UA can increase fruit and vegetable consumption among participants[45–47]. People who participate, or have family members who participate, in community gardens 'were 3.5 times more likely to consume fruits and vegetables at least five times per day than people without a gardening household member'[17,48]. Farmers' markets are also associated with more healthful food consumption. For example, neighborhoods with farmers' markets had higher fruit and vegetable consumption rates among people of color[49].

Some reports suggest that UA is an important strategy to increase food and health literacy[7,20,21]. Several community and urban farm programs included nutrition information that discussed healthful food choices at the request of communities[2,21–26]. These programs, as well as CSAs and farmers' markets, raised nutrition awareness and increased healthy cooking and eating practices[3,19,26–28,30,35,36,48].

Economic impacts

Five major economic impacts found in the literature included: (1) job creation, training and business incubation, (2) market expansion for farmers, (3) decreased food expenditures, (4) savings for municipal agencies, and (5) increased home values. Economic impact studies were not as prevalent as studies about social and health impacts of urban agriculture. The majority of the studies in this review focused on farmers' markets and CSAs; much of the rest focused on the economic benefits to consumers and gardeners.

Many UA projects provide skills training and provide jobs. These programs often employ youth to run gardens and farms, or provide paid stipends in addition to skills training[29,50]. Other UA projects, particularly farmers' markets and CSAs, successfully incubated new businesses[15,30,31]. Additionally, research on famers' markets and CSAs found that these direct marketing strategies created reliable markets for small famers to expand their operations[51]. Economic modeling was used in two studies that showed UA as having a potentially positive impact on job creation and revenue generation[52,53].

There was substantial research indicating that UA can reduce the money spent on food. Some reports quantified the savings, which ranged from $475 a season for individual gardeners[23] to $915,000 worth of food a year for an entire community garden program[47]. Famers' markets and CSAs can also provide consumer benefits through cost savings[54]. Farmers' markets in low-income communities in studies reviewed had more affordable and quality produce[32,49] than corner stores, and in some cases, provided enough competition to lower supermarket prices on produce[43].

The idea that UA can save municipal agencies money by maintaining vacant lots was often listed in agency reports as a positive impact[5,7–9]. A few studies correlated the presence of UA with increased home values and household income[55,56]. In one study, the presence of shared gardens raised property values by as much as 9.4% within 5 years of establishment[55]. Tax revenues from these property increases were estimated at half a million dollars per garden over 20 years, making initial investments from government agencies for community garden and farm projects cost-effective[55]. However, rising property values can have negative impacts for the substantial part of the population that does not own real estate, since it can lead to higher rents for low-income residents, which can cause large-scale exclusion of long-time, poorer residents.

Challenges and barriers

Many reports, books and articles discussed the challenges and barriers for UA projects, which include zoning, city ordinances, contaminated soil, access to water, securing capital/funding and distribution[4,5–7,10,57–60]. The two most frequently discussed in the literature are maintaining social equity and accessing land.

Most of the UA projects include a social component meant to benefit the public or specific clientele. Many are non-profits and/or are located in low-income areas that have historically been impacted by structural inequality[61]. Despite their positioning in underserved communities, staff managing these projects may come from a highly educated, affluent background[19,27].

Table 1. Involvement of UC ANR staff in urban agriculture (UA) during the past 12 months by activity.

'Select the UA activities that you have been involved in within the past year. Select all that apply'	Frequency ($N = 156$)	Percent (%)
Training Master Gardeners, 4-H Leaders, or other ANR volunteers to work with UA projects	54	34.6
Guidance, support for community gardens	47	30.1
Production advice for small urban farmers	44	28.2
Guidance, support for school gardens	35	22.4
Applied research related to UA	35	22.4
Guidance around food safety as it relates to UA production/distribution	34	21.8
Production or marketing advice for farmers on the urban fringe	31	19.9
Healthy food access as it relates to UA	29	18.6
Guidance, support for 'farm to school' or other 'farm to institution' efforts	27	17.3
Design of UA projects	22	14.1
Marketing advice for small urban farmers	21	13.5
Other	20	12.8
Providing nutrition education in conjunction with UA	19	12.2
Guidance, support for youth involved in UA activity	16	10.3
Participation in UA policy development	16	10.3
Guidance, support in developing or marketing value-added projects	15	9.6
Guidance, support for urban poultry raising	15	9.6
Guidance, support for raising other livestock, e.g. goats	12	7.7
None of the above	12	7.7
Guidance, support for urban beekeeping	11	7.1
Record keeping and business management for urban farmers	10	6.4

Coming from outside the community they serve, these staff members may not fully consider limitations such as the cost of farm products relative to what community members can afford, or lack of accessibility of UA sites due to inadequate public transportation options or limited operating hours[50,62].

In terms of land access, many US cities have a substantial amount of acreage in vacant lots according to land inventories and public records[2,5,63,64]. There are several efforts, such as in Portland, OR[5], Vancouver, BC[2] and Detroit, MI[3], to identify these spaces and utilize them for agriculture. However, many vacant lots are Superfund sites, or have contaminated soil, requiring costly remediation[3,59,65]. Overcoming these barriers can require massive amounts of capital, and remediation can often only be achieved with major support.

These impacts and challenges provide a broad and helpful context for understanding the specific experiences, challenges and needs of California's residents who participate in, or benefit from, UA. Cooperative Extension personnel who work directly in UA settings must consider impacts and recognize challenges in order to serve best this community.

Findings of the UCANR Staff Survey

The results of the survey, the second component of the needs assessment, provided an important look at current involvement in UA among UC ANR personnel.

UA involvement and types of projects

UA involvement was common among the survey respondents, with 65% noting that they had provided support, advice, technical assistance or served as a partner for UA activities within the past year. The most common type of involvement cited was training Master Gardener, 4-H or other UCCE volunteers to serve UA clientele (35% of respondents). However, UC ANR policy currently prohibits UCCE volunteers from giving advice on commercial projects, so their involvement is limited to helping with UA projects whose products are made available through donations or other non-commercial distribution. The second most common activity was providing guidance and support for community gardens (30% of respondents). The third was giving production advice to small urban farmers (28%). Less common were providing guidance and support related to raising urban poultry (10%), urban livestock (8%) and bees (7%). Table 1 provides additional examples.

Perceived relevance to UC ANR's mission and challenges

Most of the respondents considered UA relevant to UC ANR's mission, with 63% identifying UA as 'highly relevant to ANR's mission' and another 33% viewing it as 'somewhat relevant.' Some respondents commented that UA deserves more attention. For example, one respondent stated that ANR should 'recognize and value the contributions of small-scale farmers operating on

Table 2. Educational materials helpful to UC ANR staff if developed or adapted for California.

'Would research-based educational materials on the following topics, if developed or adapted for California, be valuable to your urban agriculture (UA) clientele? Select up to five topics you think would be most helpful'	**Frequency (*N* = 156)**	**Percent (%)**
Pest management in UA	63	40.4
Water management in UA	55	35.3
Design of community UA projects	48	30.8
Soil testing and remediation for UA	46	29.5
Tips for UA projects at schools	46	29.5
Benefits of UA projects to local communities	42	26.9
Strategies for improving healthy food access through UA	41	26.3
Safe handling of urban farm products	41	26.3
CSAs, farmers markets and other marketing opportunities for urban farmers	37	23.7
Best practices for UA policy	36	23.1
Urban farm business planning	34	21.8
Value-added products in UA (using farm products to create something more valuable or appealing)	30	19.2
Urban poultry raising	26	16.7
Keeping goats and other livestock in urban areas	19	12.2
Urban beekeeping	19	12.2
Record keeping and business management for urban farmers	16	10.3
None of the above	9	5.8

the ag–urban interface and get serious about supporting them. It is time for our organization to move past the big farm bias/approach for everything.'

Only 4% of the respondents considered UA to be 'not relevant' to UC ANR's mission. One respondent wrote, 'In this time of diminishing UCCE staffing, I feel we should put our resources where they will do the most good in safe guarding our food supply and natural resources. UA impacts relatively a few people. I see very few operations that are professional or economically viable; so I am loath to take resources away from the farmers who are feeding LOTS of people and redirect them toward these who are impacting relatively few.'

Respondents also noted various challenges in addressing the needs of clientele related to UA. Almost half stated that because this was not their core clientele group, they had difficulty making time (53%) to provide support. Funding was another common barrier to addressing this audience (37%), as was a lack of current research-based educational materials (23%).

Open-ended responses hinted at special challenges addressing this audience, such as their lack of knowledge and the subsequent need to invest more time with them. Time is limited among UCCE personnel, who often cover large geographic areas and serve many farmers. One commented, 'Commercial producers need help on a specific item. Urban people do not know where to start so you need to explain the process of raising an animal from start to finish.'

Educational resources needed and likelihood of more involvement

Respondents to the UC ANR survey would like to see educational materials developed on a number of topics, especially pest management (40%) and water management (35%) in UA, design of community UA projects (31%), soil testing and remediation for UA (30%) and tips for UA projects at schools (30%). More examples are listed in Table 2.

If print and web educational resources were developed on priority UA topics, 36% of respondents indicated that they would be likely or very likely to expand their work in UA. Another 32% said it was a possibility, whereas 32% said it was very unlikely or somewhat unlikely that they would expand their work in this area.

Respondents were asked if they would be willing to serve as subject matter experts to help develop, review or adapt educational materials on specific UA topics, and 30% said that they would be likely or somewhat likely to do so. Another 27% said that they might possibly become involved in such an effort, while 44% said that they would be very or somewhat unlikely to do so.

Clientele Interviews: Needs among Urban Farmers and Policy Makers

Although very preliminary, the results from the interviews of urban farmers and policy makers suggest some potential areas of agreement between the UC ANR survey and the stated needs of clientele. Of the five interviews completed (15–20 additional interviews are scheduled), two interviewees are involved exclusively on the policy side of UA (they are not farmers), and three are urban farmers who have also become involved in policy work. Two are in the San Francisco Bay Area and three are in Southern California.

Urban farmers: Situation, challenges and needs

The three farms represented include a for-profit urban farm, a farm operated by the staff of a public agency and a farm managed by a non-profit organization. In terms of size, two of the farms were 1700 sq. ft. and 4 acres, and the third totals 3 acres, but consists of 50 small sites, located in private backyards, at schools and in public parks. This multi-site project aggregates its harvest to distribute through a CSA. All three operate in the urban core of their respective cities, rather than in peri-urban settings. The two farms that operate in the non-profit/public sphere both have a strong social justice focus. They distribute low-cost produce in their communities, which are underserved and low-income, through CSAs and farmers' markets that offer fresh produce at an affordable price.

All three farms produce vegetable crops, fruit and herbs. One site includes a small aquaponics component that produces tilapia. Two sites include chickens, and one has additional poultry (turkeys, ducks and quail), as well as rabbits and bees. Two of the farms produce value-added products, including jams, dried fruit and dehydrated herbs. Two sites have paid employees and all three use volunteers.

All three farmers had gardening experience before becoming urban farmers, and it has proved challenging at times to move from backyard gardening into small-scale commercial farming. Challenges included land access, long-term availability of land, business planning, production issues, regulations, marketing and access to information. When asked what help would have been most valuable to them in their start-up phase, they indicated that nuts and bolts information on production would have been most helpful; for example, one farmer noted the importance of 'a handbook on how to start an urban farm from a trusted source.' As their farms developed, they needed more information about regulations, marketing, labor and business management, as well as in-depth production advice.

Two of the farmers discussed the challenges of searching online to find reliable information and one commented that 'trying to do piecemeal research on line is difficult. It's hard to authenticate the information, and we are never sure if it's correct.' Their most important sources of information while starting their urban farms were non-profit or advocacy organizations focused on UA and related topics.

UA policy makers: Situation, challenges and needs

All five interviewees had some level of involvement with the UA policy, and four had policy work as a focus in their employment. (Three were also farmers, as noted above, involved in both farming and policy activities.)

In terms of the barriers and challenges they faced in developing and implementing UA policy, most often mentioned was the complex process of changing local zoning codes to be more flexible in allowing UA. Three interviewees mentioned difficulties in getting diverse stakeholders to agree and move forward. 'The challenge has been taking everyone's energy and channeling it into action,' said one interviewee.

In their efforts to change local policy, interviewees found that not everyone in their communities is pro-UA, and one person mentioned animal rights activists specifically as having organized against zoning code changes that involve animals. Another interviewee noted that animal agriculture sparked some community resistance in regards to smell, noise, the ambiguity of raising animals as pets or for food, and home slaughtering. Other challenges and barriers included competing demands for vacant land, regulatory barriers, local concerns about public health issues and funding to support UA policy work.

Asked what training and technical support would have been most helpful in their work on policy, one person felt that having basic materials on allowable uses of land, and basic definitions of UA with clear examples and models would have been helpful in educating decision makers and stakeholders during the early phases of her work. Two mentioned that some types of certification training on UA would have been helpful.

Regarding their most used sources of information, this group made use of resources from food policy councils, the American Planning Association, city planning departments, local government and regulatory agencies, such as county environmental health departments and non-profit organizations focused on health-related policy change.

Training and educational materials for urban farmers and policy makers

Both groups were asked about topics where training and educational materials would be especially valuable, if developed, via a series of closed-ended questions. Three topics selected by all interviewees as having potential to be 'very helpful' were information on: (1) CSAs, farmers' markets and other marketing opportunities for urban farmers; (2) water management for urban farmers; and (3) pest management for urban farmers. Four of five interviewees thought that resources on best practices for UA policy, as well as strategies for improving healthy food access through UA, would be valuable. All participants said that online, downloadable resources would be very helpful.

Implications and Next Steps

Implications of these preliminary findings may be helpful for those involved with training, technical assistance and education for UA, such as personnel of land-grant

universities, local governments and non-profits seeking to address the needs of urban farmers in an environment of constrained resources. The project's goals were to develop UC ANR's capacity to support UA in California by conducting research and providing objective UA information to urban residents and policy makers. Results of the needs assessment will be used over the coming year to guide development of an online portal offering research-based UA educational materials. The data gathered tentatively confirm that this will be a useful strategy, since both UC ANR staff and UA clientele have articulated a need for reliable sources of information on UA topics. A consistent and reliable source of science-based information will likely be useful to both urban farmers and policy makers. It will also help UC ANR/UCCE personnel to serve the needs of beginning urban farmers, who need very basic information as they are getting started.

However, online resources will need to be supplemented with other approaches, such as farm visits and small workshops, since not all UA practitioners have reliable internet access. Training and educational materials in Spanish and other languages will also be important. The Cooperative Extension personnel who work most closely with farmers have historically focused most attention on the economic aspects of farming, such as how to use inputs efficiently, and have been less likely to view farming through a social justice lens. Since many of the documented impacts of UA are social, the future work with UA clientele will require a collaborative approach that takes social inequities and injustices into account[17,61].

Areas of focus for developing or adapting educational materials will be prioritized based on needs assessment results. Pest and water management for UA are two examples of high-priority topics that emerged among both UC ANR staff and clientele. Although the farmers interviewed were not specifically asked if their operations were certified organic, it is likely that they will be most interested in non-chemical strategies for pest management, given their locations in residential and community settings.

Despite challenges with allocating time to become more involved in UA, UC ANR personnel who responded to the survey overwhelmingly considered these activities as relevant to the organization's mission, and almost a third said they were likely to help develop, review or adapt resources. This level of support was welcome, given that Reynolds[17] had previously found that UC ANR/UCCE's research and extension support for UA was limited. Two-thirds of the respondents said they had provided support, advice, technical assistance or had served as a partner on a UA project within the past year. Most often, these efforts involved training volunteers who offer assistance for some non-commercial forms of UA, providing guidance for community gardens and offering production advice for urban farmers. Additionally, over 20% of UC ANR respondents were involved in some form of applied research related to UA, and this is another area where UC ANR has the potential to contribute significantly toward the development of successful UA systems. Some of the areas for further inquiry that emerged from the needs assessment are outlined below.

UA as a viable economic development tool should be studied further. More comprehensive and longitudinal studies need to be done within California and in the rest of the USA, that look at how these projects are financed and their economic contributions to the region (beyond how they function as other industrial land uses and/or are financially viable for individual farmers) and their sustainability. Comprehensive monitoring, evaluation and impact assessment are needed to provide objective advice to project designers and policy makers.

The most successful UA projects described in the literature were products of fruitful partnerships[2,10,13,21,35,66]. There have been attempts to document a few partnerships in case studies, particularly regarding land access, with government agencies or land trusts[5,66]. A more comprehensive examination of partnerships and best practices that reflect diverse and unique circumstances among programs and cities would be a useful resource for municipalities.

Participatory action research in which researchers and community organizations together develop research protocols, gather data, analyze it and draw out implications is rare; yet sorely needed for strengthening the theory, practices and policies about UA. In particular, comparative case studies that involve both researchers and community practitioners in design, data gathering and analysis, can begin to address some of the social justice challenges faced in UA settings[67]. Beyond providing a source of accessible, science-based information for urban farmers and policy makers, UC ANR and similar institutions can play an important role in contributing to the growing body of knowledge on UA and its impacts on communities.

References

1 Hodgson, K., Campbell, M.C., and Bailkey, M. 2011. Urban Agriculture: Growing Healthy, Sustainable Places. APA American Planning Advisory Service, Washington DC. p. 1–148.
2 Mendes, W., Balmer, K., Kaethler, T., and Rhoads, A. 2008. Using land inventories to plan for urban agriculture: Experiences from Portland and Vancouver. Journal of the American Planning Association 74:435–449.
3 Colasanti, K., Litjens, C., and Hamm, M.W. 2010. Growing Food in the City—The Production Potential of Detroit's Vacant Land. The CS Mott Group for Sustainable Food Systems at Michigan State University, East Lansing, MI. p. 1–13.
4 Goldstein, M., Bellis, J., Morse, S., Myers, A., and Ura, E. 2011. Urban Agriculture: A Sixteen City Survey of Urban Agriculture Practices Across the Country. Survey written

and compiled by Turner Environmental Law Clinic at Emory University Law School, Atlanta, GA. p. 1–94.
5 Balmer, K., Gill, J.K., Miller, J., Peterson, M., Rhoads, A., and Rosenbloom, P. 2005. The Diggable City: Making Urban Agriculture a Planning Priority. Nohad A. Toulan School of Urban Studies and Planning at Portland State University, Portland, OR. p. 1–102.
6 Dufour, R. 2009. Start a Farm in the City. ATTRA – National Sustainable Agriculture Information Service Publication, Butte, MT. p. 1–20.
7 SPUR. 2012. Public Harvest. SPUR Report. SPUR, San Francisco. p. 1–36.
8 Cohen, N., Reynolds, K., and Sanghvi, R. 2012. Five Borough Farm. Report by Design Trust for Public Space, New York. p. 1–178.
9 Hodgson, K. 2012. Planning for Food Access and Community-based Food Systems: A National Scan and Evaluation of Local Comprehensive and Sustainability Plans. Report by American Planning Association. p. 1–175.
10 Hendrickson, M.K. and Porth, M. 2012. Urban Agriculture – Best Practices and Possibilities. University of Missouri. p. 1–52.
11 United States Census Bureau. 2012. Growth in urban populations outpaces rest of nation [Internet]. Census Bureau Report; Available at Web site http://www.census.gov/newsroom/releases/archives/2010_census/cb12-50.html (accessed February 22, 2014).
12 Stinson, S. and Mete, A. 2013. Popular backyard flock program reduces biosecurity risks of amateur production. California Agriculture 67:203–209.
13 MacNair, E. 2002. Seeds of Success. POLIS Project on Ecological Governance, University of Victoria, Canada. p. 1–34.
14 Twiss, J., Dickinson, J., Duman, S., Kleinman, T., Paulsen, H., and Rilveria, L. 2003. Community gardens: Lessons learned from California Healthy Cities and Communities. American Journal of Public Health 93:1435–1439.
15 Feenstra, G. and Lewis, C. 1999. Farmers' markets offer new business opportunities for farmers. California Agriculture 53(6):25–29.
16 Galt, R.E., O'Sullivan, L., Beckett, J., and Hiner, C.C. 2012. Community supported agriculture is thriving in the Central Valley. California Agriculture 66:8–14.
17 Reynolds, K. Expanding technical assistance for urban agriculture: Best practices for extension service in California and beyond. Journal of Agriculture, Food Systems, and Community Development 1(3):197–216.
18 Golden, S. 2013. Urban Agriculture Impacts: Social, Economic, and Health Literature Review. Compiled for UC Division of Agricultural and Natural Resources. Available at Web site http://www.sarep.ucdavis.edu/sfs/UA%20Lit%20Review-%20Golden%20Reduced%2011-15.pdf (accessed February 22, 2014).
19 Bradley, K. and Galt, R.E. 2013. Practicing food justice at Dig Deep Farms & Produce, East Bay Area, California: Self-determination as a guiding value and intersections with foodie logics. Local Environment 19(2): 172–186.
20 Ober Allen, J., Alaimo, K., Elam, D., and Perry, E. 2008. Growing vegetables and values: Benefits of neighborhood-based community gardens for youth development and nutrition. Journal of Hunger and Environmental Nutrition 3(4):418–439.
21 Teig, E., Amulya, J., Bardwell, L., Buchenau, M., Marshall, J.A., and Litt, J.S. 2009. Collective efficacy in Denver, Colorado: Strengthening neighborhoods and health through community gardens. Health and Place 15(4):1115–1122.
22 Holland, L. 2004. Diversity and connections in community gardens: A contribution to local sustainability. Local Environment 9(3):285–305.
23 Patel, I.C. 1991. Gardening's socioeconomic impacts. Journal of Extension 29(4):1–3.
24 Glover, T., Shinew, K., and Parry, D. 2005. Association, sociability, and civic culture: The democratic effect of community gardening. Leisure Sciences 27(1):75–92.
25 Travaline, K. and Hunold, C. 2010. Urban agriculture and ecological citizenship in Philadelphia. Local Environment 15(6):581–590.
26 White, M.M. 2010. Shouldering responsibility for the delivery of human rights: A case study of the D-Town farmers of detroit. Race/Ethnicity: Multidisciplinary Global Contexts 3(2):189–211.
27 McClintock, N. 2013. Radical, reformist, and garden-variety neoliberal: Coming to terms with urban agriculture's contradictions. Local Environment 19(2):147–171.
28 Bonacich, E. and Alimahomed-Wilson, J. 2011. Confronting racism, capitalism, and ecological degradation: Urban farming and the struggle for social justice in black Los Angeles. Souls 13(2):213–226.
29 Feenstra, G., McGrew, S., and Campbell, D. 1999. Entrepreneurial Community Gardens: Growing Food, Skills, Jobs, and Communities. Agricultural and Natural Resources publication Report No. 21587. University of California, Oakland, CA.
30 Bregendahl, C. and Flora, C.B. 2006. The Role of Collaborative Community Supported Agriculture: Lessons from Iowa. North Central Regional Center for Rural Development, Ames, IA. p. 1–84.
31 Sumner, J., Mair, H., and Nelson, E. 2010. Putting the culture back into agriculture: Civic engagement, community and the celebration of local food. International Journal of Agricultural Sustainability 8(1):54–61.
32 Suarez-Balcazar, Y. 2006. African Americans views on access to healthy foods: What a farmers market provides. Journal of Extension 44(2):1–7.
33 Fisher, A. 1999. Hot Peppers and Parking Lot Peaches: Evaluating Farmers' Markets in Low Income Communities. Report by the Community Food Security Coalition, Venice, CA. p. 1–66.
34 Kerton, S. and Sinclair, A.J. 2009. Buying local organic food: A pathway to transformative learning. Agriculture and Human Values 27(4):401–413.
35 Krasny, M.E. and Doyle, R. 2002. Participatory approaches to program development and engaging youth in research: The case of an intergenerational urban community gardening program. Journal of Extension 40(5):1–16.
36 Levkoe, C.Z. 2006. Learning democracy through food justice movements. Agriculture and Human Values 23(1):89–98.
37 Beckie, M. and Bogdan, E. 2010. Planting roots: Urban agriculture for senior immigrants. Journal of Agriculture, Food Systems, and Community Development 1(2):77–89.

38 Armstrong, D. 2000. A survey of community gardens in upstate New York: Implications for health promotion and community development. Health and Place 6(4):319–327.
39 Schukoske, J.E. 2000. Community development through gardening: State and local policies transforming urban open space. Legislation and Public Policy 3(2):351–392.
40 Gale, F. 1997. Direct farm marketing as a rural development tool. Rural Development Perspectives 2(2):19–25.
41 Jarosz, L. 2008. The city in the country: Growing alternative food networks in Metropolitan areas. Journal of Rural Studies 24(3):231–244.
42 Corrigan, M.P. 2011. Growing what you eat: Developing community gardens in Baltimore, Maryland. Applied Geography 31(4):1232–1241.
43 Larsen, K. and Gilliland, J. 2009. A farmers market in a food desert evaluating impacts on the price and availability of healthy food. Health and Place 15(4):1158–1162.
44 Kobayashi, M., Tyson, L., and Abi-Nader, J. 2010. The activities and impacts of community food projects 2005–2009. Report from The Community Food Project Competitive Grants Program. p. 1–28.
45 Brown, K.H. and Jameton, A.L. 2000. Public health Implications of urban agriculture. Journal of Public Health Policy 21(1):20–39.
46 McCormack, L.A., Laska, M.N., Larson, N., and Story, M. 2010. Review of the nutritional implications of farmers' markets and community gardens: A call for evaluation and research efforts. Journal of the American Dietetic Association 110(3):399–408.
47 Bellows, A., Brown, K., and Smit, J. 2005. Health benefits of urban agriculture. A paper from the members of the Community Food Security Coalition's North American Initiative on Urban Agriculture [Internet] 1–27. Available at Web site http://foodsecurity.org/pubs.html (accessed February 22, 2014).
48 Alaimo, K., Packnett, E., Miles, R.A., and Kruger, D.J. 2008. Fruit and vegetable intake among urban community gardeners. Journal of Nutrition Education and Behavior 40(2):94–101.
49 Park, Y., Quinn, J., Florez, K., Jacobson, J., Neckerman, K., and Rundle, A. 2011. Hispanic immigrant women's perspective on healthy foods and the New York city retail food environment: A mixed-method study. Social Science and Medicine 73(1):13–21.
50 Metcalf, S.S. and Widener, M.J. 2011. Growing Buffalo's capacity for local food: A systems framework for sustainable agriculture. Applied Geography 31(4):1242–1251.
51 Feenstra, G. 2007. The roles of farmers markets in fueling local economies. Gastronomic Sciences 1(7):56–67.
52 Moreau, T. and Hodgson, K. 2012. Delta community-based farm district. Prepared for Corporation of Delta and Century Group. Delta, BC, Canada. p. 1–68.
53 Conner, D.S., Knudson, W.A., Hamm, M.W., and Peterson, H.C. 2008. The food system as an economic driver: Strategies and applications for Michigan. Journal of Hunger and Environmental Nutrition. 3(4):371–383.
54 Cooley, J.P. and Lass, D.A. 1998. Consumer benefits from community supported agriculture membership. Review of Agricultural Economics 20:227–237.
55 Voicu, I. and Been, V. 2008. The effect of community gardens on neighboring property values. Real Estate Economics 36(2):2414–2263.
56 Liu, J. 2008. The Whitmire Report. Published by Gateway Greening. [cited 2013 Aug 2]. p. 1–11. Available at Web site http://actrees.org/files/Research/gateway_greening_whitmire.pdf (accessed February 22, 2014).
57 Brown, K., Carter, A., Bailkey, M., Buchanan, T., Meares-Cohen, A., Mann, P., Nasr, J. and Smit, J. 2003. Urban Agriculture and Community Food Security in the United States: Farming from the City Center to the Urban Fringe. Community Food Security Coalition, Venice, CA. p. 1–29.
58 Pearson, L.J., Pearson, L., and Pearson, C.J. 2010. Sustainable urban agriculture: Stocktake and opportunities. International Journal of Agricultural Sustainability 8(1):7–19.
59 Hagey, A., Rice, S., and Flournoy, R. 2012. Growing Urban Agriculture: Equitable Strategies and Policies for Improving Access to Healthy Food and Revitalizing Communities. Report by PolicyLink, Oakland, CA. p. 1–52.
60 Viljoen, A., Bohn, K., and Howe, J. 2005. New Cities with more Life: Benefits and Obstacles. Continuous Productive Urban Landscapes. Architecture Press, Burlington, MA. p. 56–65.
61 Herrera, H., Khanna, N., and Davis, L. 2009. Food systems and public health: The community perspective. Journal of Hunger and Environmental Nutrition 4:430–445.
62 Macias, T. 2008. Working toward a just, equitable, and local food system: The social impact of community-based agriculture. Social Science Quarterly 89(5):1086–1101.
63 Broadway, M. and Broadway, J. 2011. Green dreams: Promoting urban agriculture and the availability of locally produced food in the Vancouver Metropolitan Area. FOCUS on Geography. 54(1):33–41.
64 Kremer, P. and DeLiberty, T.L. 2011. Local food practices and growing potential: Mapping the case of Philadelphia. Applied Geography 31(4):1252–1261.
65 Kaufman, J. and Bailkey, M. 2000. Farming Inside Cities: Entrepreneurial Urban Agriculture in the United States. Lincoln Institute of Land Policy, Cambridge, MA. p. 1–124.
66 Campbell, M.C. and Salus, D.A. 2003. Community and conservation land trusts as unlikely partners? The case of Troy Gardens, Madison, Wisconsin. Land Use Policy 20(2):169–180.
67 Campbell, D., Carlisle-Cummins, I., and Feenstra, G. 2013. Community food systems: Strengthening the research-to-practice continuum. Journal of Agriculture, Food Systems, and Community Development. Advance online publication. 121–138. Available at Web site http://dx.doi.org/10.5304/jafscd.2013.033.008