A concept note on scaling up agroecologically based Urban Agriculture in the Bay Area

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In the Bay Area hundreds of urban agriculture (UA) initiatives exist, many aimed at improving access of the poor to fresh produce and thus enhance their family nutritional intake. Over the last decade, urban agriculture has improved access to fresh, affordable and nutritious food in the greater Bay Area – where in many neighborhoods one in three residents are food insecure. As we continue to grow, the San Francisco 9-county Bay Area will need effective urban food production to meet the demand for fresh, healthy, affordable food in low-income communities.

Although urban agriculture programs are flourishing to improve family food security and nutrition, most city farmers have limited training or skills on agroecological horticultural methods and thus their yields are low due to deficient productivity and also pest, soil and other constraints. So far there has been no assessment of the production potential of urban agriculture settings or the effectiveness of organic production methods used in UA. The only assessment that has been done in the Bay Area of UA explores the amount of vacant lots (1201 acres or 406.4 hectares) that exist in the Oakland flatlands and their potential to grow food crops if such land would be put into production ("Cultivating the Commons" - http://web.pdx.edu/~ncm3/files/Cultivating_the_Commons2010.pdf.

In this report authors' calculations were based on average yields under three different management practices: conventional at 10 tons/ac (22.4 Mg/ha); low-biointensive at 15 tons/ac (33.6 Mg/ha); and medium-biointensive at 25 tons/ac (56.0 Mg/ha). Four different land use scenarios were considered: (1) all identified sites (<30% slope); (2) optimal land (<30% slope excluding north-facing slopes); (3) a high land use scenario of 500 ac (202.3 ha); and (4) a low land use scenario of 100 ac (40.5 ha). Authors estimated that the most conservative scenario would contribute between 2.9 and 7.3% of Oakland's current consumption, depending on production methods, or 0.6–1.5% of recommended consumption.

According to our analysis this calculations underestimate the production potential of urban agriculture. If agroecological design and management plans are well implemented and scaled up, UA yields could reach 10 kg of fresh biomass per sq.meter/year (that is 50% of what Cuban urban farmers-best in the world-reach under optimal management). Assuming that well defined agroecological management systems are scaled up in Oakland in 1000 acres (400 hectares), reaching a yield of 10 kg per sqm/year (1 ha= 2.47 acres, 1 ha=10000 sq m) we estimate that UA yields in Oakland would reach 100000 kg /ha/yr or 40 million kgs in the whole 400 hectares (or 1000 acres). If each person consumes 45 Kg per year of fresh vegetables, the total UA production in 400 hectares could feed 800 thousand people/year. Let's assume that the levels of production would only reach 5kg/sq.m/year, still fresh vegetable needs of 400,000 people would be easily met. Clearly improving the productive capacity of urban agriculture through the wide adoption of agroecological practices can improve food security of the urban poor while providing many environmental and social services for larger society.

What can we do to realize this agroecological potential? How to scale up the use of agroecological practices among urban agriculture practitioners? The strategy is to establish an alliance of researchers, NGOs and non-profits promoting UA and a well organized network of urban farmers engaged in a participatory research, capacity building and outreach initiative.

Types of UA research, education and outreach actions needed and envisioned

- Build a coalition of organizations involved in UA that under Food First leadership arrives at a concrete action plan to create capacity and scale up agroecology in UA. A partial list of potential organizations include: Ecology Center, City Slicker Farms, HOPE Collaborative, Urban Roots, People's Grocery, OBUGs, PUEBLO, Berkeley Community Gardening Collaborative and many others.
- These organizations may be interested in re-organizing BACUA or a similar initiative (http://nature.berkeley.edu/srr/BACUA/bacua_proposal.htm) which was originally interested in entering with UC Berkeley into a university/community partnership in order to create the world's first university center on sustainable urban agriculture and food systems. Fifteen years ago the University was not interested in this proposal. With the creation of the Berkeley Sustainable Food Institute there may be grounds to renew a civil society-University dialogue that would lead to a major UA initiative at Gill Tract and also in various neighborhoods.
- Provide sufficient support (human and financial capital) to expand the course Urban Agriculture (ESPM 117, currently taught by Professor Miguel A Altieri) so that at least 100 urban gardens are established by participating students and GSIs (at least 6) in various low income neighborhoods of Berkeley and Oakland next Fall 2013. An example of a crop plan developed by UCB students in a low income school last year is enclosed as a PDF. See also http://nature.berkeley.edu/blogs/news/2012/10/urban_ag_students_turn_neglect.php
- Initiate an urban agriculture participatory research and outreach program aimed at training a key number of UA farmers on agroecological methods so that they serve as trainers of others farmers via a farmer to farmer horizontal exchange of innovations and information. A first step would be to offer a short summer course to a selected group of UA farmers and NGO technicians. Unlike rural villages, where agricultural knowledge is continually shared and reinforced through extended family networks, informal knowledge sharing between urban farmers in the East Bay is difficult because farms are located in different neighborhoods and communities. The establishment of a system of Urban Farmer Field Schools that will build the capacity of urban farmers—and the communities they serve—to address the production, distribution and inter-organizational issues facing local food systems in the East Bay can help resolve some of these issues. The field schools will provide an opportunity to generate useful agroecological knowledge and build farmer-to-farmer and community relationships for community-driven food security.(see Appendix I, concept note on Urban Farmer Field Schools developed by Food First).

Some components of the participatory agroecological research program

Although there are hundreds of urban farms and gardens in the Bay Area, there is rigorous data on the production levels of UA and therefore its contribution to local food security. Nor there is an assessment if the horticultural methods used by urban agriculturalists are effective, or the yield losses experienced in UA farms and gardens due to insect pests, diseases , weeds and soil constraints. Such assessment is crucial to realize the full food security potential of UA and thus benefit thousands of food insecure people.

1. To assess the production potential of urban farms and gardens, what are the main factors limiting productivity (pests, soil constraints, etc-) and analyze the efficiency of the methods urban farmers are using to overcome such factors.
2. To conduct an inventory of the genetic diversity of crop varieties grown by urban farmers in at least 50 UA farms. We will estimate yield potential, adaptation to microclimatic and soil conditions (mainly water stress) , resistance to pests and diseases and the agronomic performance under organic management of the main varieties of such crops and varieties used by farmers. A main outcome will be the identification of best adapted and resistant varieties and a set of

organic practices (i.e. composting, green manuring, compost tea, mulching, intercropping, etc) to manage them for optimal horticultural performance.

3. After a diagnosis of the main agronomic problems affecting UA, a series of on farm-research trials and research plots will be established to evaluate agroecological methods that effectively can overcome limiting factors, and thus determine best practices that farmers should promote and widely share. To achive this, a series of experiments will be carried out in selected urban food gardens and also at UC Berkeley Agricultural Experiment Station (Gill Tract and Oxford Tract) to test the performance (yield, incidence of pests and diseases, response to organic amendments, tolerance to water stress, etc) of selected varieties of target crops under various regimes of organic management (i.e. intercropped, variety mixtures, various types and dosages of compost, differing levels of water stress, mulching regimes, etc). A main outcome will be the identification of best management agroecological practices for specific varieties in order to attain optimal productivity and health .By reducing yield losses with ecological horticulture techniques then the yield potential of UA can be more fully realized.