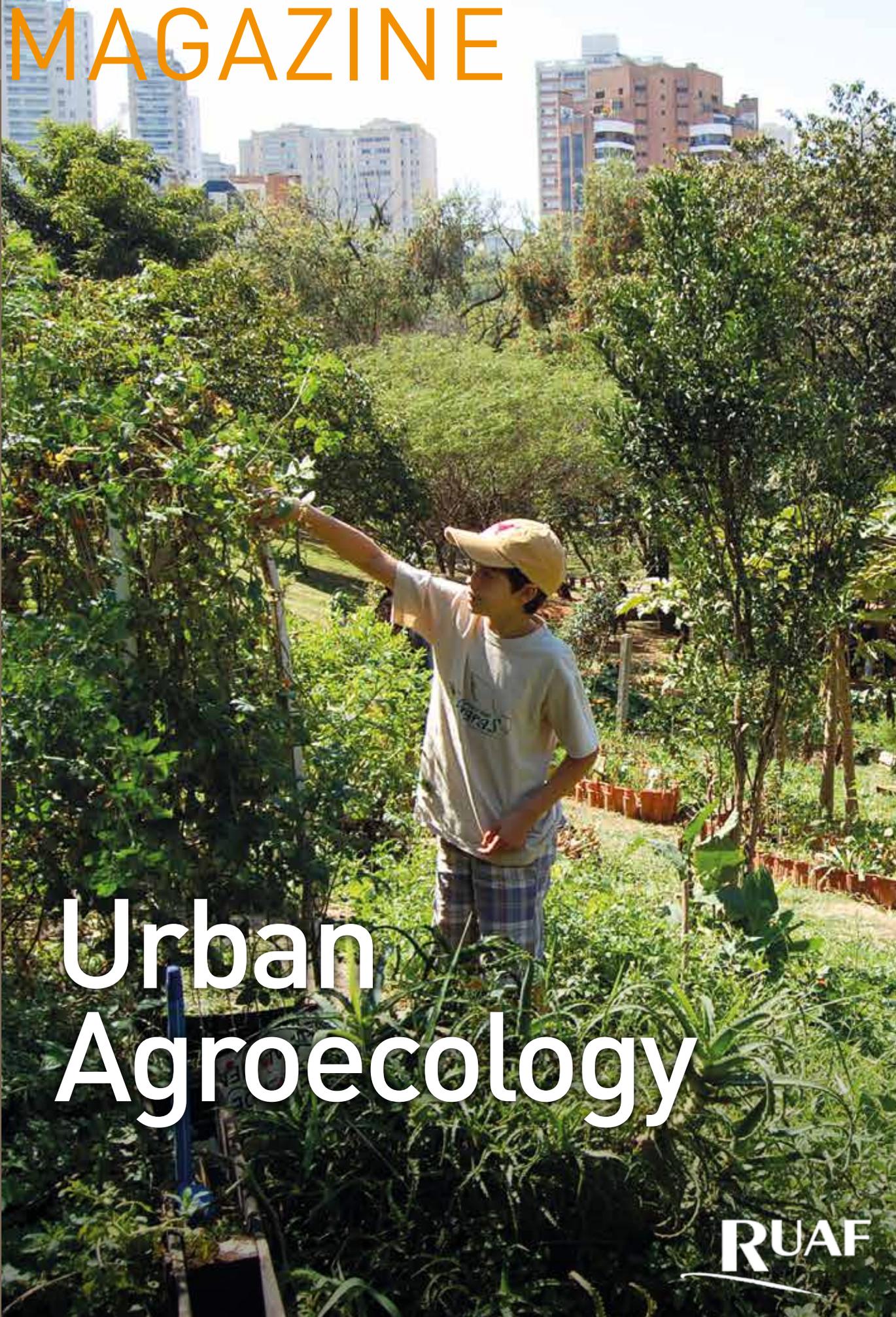


# URBAN AGRICULTURE

# UA MAGAZINE

33



# Urban Agroecology

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**RUAF**

### In this issue



05-17

#### Conceptualising Urban Agroecology

Photo by Madrid Agroecologico



18-40

#### Practices and City Initiatives

Photo by GEAG



41-64

#### Urban Policies Supporting Agroecology

Photo by AGRUPAR



65-75

#### Citizen Activism and Social Movements

Photo by Rohan Ayinde

Editorial	03
Why We Need Urban Agroecology	05
Urban Agriculture or Urban Agroecology?	07
From Agriculture in the City to an Agroecological Urbanism	08
Exploring Urban Agroecology as a Framework for Transitions to Sustainable and Equitable Regional Food Systems	11
Urban Agroecology: For the city, in the city and from the city!	13
Towards a Transformative Urban Agroecology	15
Urban Agroecology: Principles and potential	18
Redefining Value Using Urban Agroecology on Public Land in Canada	21
Reduction in Sale of Agricultural Land in Gorakhpur	24
Agroecology as a Driver for a New Sustainable Urban Settlement in Taiwan	27
New Forms of Urban Permaculture in Seville	29
Urban Agroecology in Rome	31
Food Forests in the Netherlands	34
Romanticising the Past: A case study of a tide mill in Suffolk	37
Pioneering Urban Agroecological Research with Citizen Science	38
Urban Agriculture in Cuba: 30 years of policy and practice	41
Systems of Control for Agroecological Food Production and Commercialisation in Quito	45
Nairobi's 21st Century Food Policy	48
Using Agroecological and Social Inclusion Principles in Rosario	51
Promoting Agroecological Food Production in Rosario	52
'Cities for Agroecology' Networks in Europe and Spain	55
Institutionalising Agroecology? Reflections on municipal pastoralism in Spain	58
Monitoring Agroecology Values in Peri-urban Landscapes in Beijing	61
Practices of Urban Agroecology in São Paulo	65
Urban Agroecology Movement Changes the Brazilian Metropolis	68
An Agroecological Approach to Waste in Food Production and Consumption in Spain	70
Politicising Urban Agriculture for Food Sovereignty	72
Struggles of Rooftop Farming in Porto Alegre	75
The Centre for Agroecology, Water and Resilience at Coventry University	76

#### Cover

São Paulo. Photo by Pops Lopes

# Editorial

Chiara Tornaghi  
Femke Hoekstra

*Urban Agroecology in Sao Paulo.* Photo by Pops Lopes

**This issue of the UA Magazine is a joint effort of the RUAF Foundation and the Centre for Agroecology Water and Resilience (CAWR). It aims to articulate and document the emerging field of urban agroecology. The Magazine will be launched at the occasion of the 8th AESOP conference on Sustainable Food Planning, titled “Re-imagining sustainable food planning, building resourcefulness: food movements, insurgent planning and heterodox economics” (14-15 November 2017), hosted at CAWR in Coventry, UK.**

The UA Magazine tries to provide insight into the questions: “What is ‘urban agroecology’, exactly? Is it a type of ecological or organic agriculture in the city or if not, what else or what more?”. As we will see from the contributions in this Magazine, definitions differ and tend to reflect the various ways the term agroecology is understood in different countries, by different organisations, or according to different political economic preferences. Often agroecology is perceived as more than a production technique or system: it is a movement, a science, a political vision and a practice

which alongside agricultural knowledge, endorses specific values and ethics, such as social relations of mutuality and respect, a commitment to bring forward more equitable change and land stewardship.

Under this perspective ‘urban agroecology’, is a practice which – while it could be similar to many ‘urban agricultural’ initiatives born out of the desire to re-build community ties and sustainable food systems, has gone a step further: it has clearly positioned itself in ecological, social and political terms.

In *ecological* terms, it is based on respecting all forms of life, it steers away from purely human-centred approaches, and is committed to protect the land from degradation, pollution and enclosure. In *social* terms, it strives for (and thrives upon) mutual support, learning and respect of cultural differences. In *political* terms, it is embedded in a network of movements for food sovereignty and justice, and equitable access to resources and benefits and in *economic* terms it ranges from social enterprises to commons. It also develops its own strategising, re-skilling and strengthening tools (see the emerging literature on urban political agroecology). In *geographical* terms, urban agroecology reflects more specifically on how the urban condition constrains (and the drivers of urbanisation), shapes and attributes particular

meanings to the urban cultivation of food, and it brings forward just and fair models of urbanisation.

However, urban agroecology is still an emerging concept, and its ecological, social, political, economic and geographical meanings are far from having a shared understanding and narrative.

This thematic issue of the UA Magazine seeks to offer an opportunity to share ideas among a diverse community of practitioners, scholars and activists, on what urban agroecology means to them, what affinity they see with related concepts (such as with the organic movement or urban agriculture, etc.) and how we can together advance in further development of the concept.

As usual, the Magazine shares a diversity of perspectives from an extraordinarily wide number of geographical contexts, and we are aware that some of them pull in different or opposite directions. Narratives of reforming versus re-founding the food system, independent versus institutionally framed experiences, quantifying versus qualifying the benefits of urban agroecology, and city-based versus urbanism-oriented changes are some of the areas where we see diverging or contentious views. A deeper engagement with the meaning of the 'urban', too often interpreted as opposed to the countryside – in a world where both cities and rural places are shaped by the resource extraction and food demands of planetary urbanisation – is also still to be fulfilled. Yet, we believe that from the diverse materials in this issue of the UA Magazine we have made a start on pinning down the emerging field of urban agroecology, and reflecting on its challenges.

The Magazine is organised in four blocks. In the first section, we explore *alternative ways of conceptualising* urban agroecology, especially in relation to urban agriculture. Are they different? Why are they different and how do these differences count and impact on our work and more generally? Here, we also discuss whether it is enough to consider urban agriculture and urban agroecology as forms of food growing that have moved from the countryside to the city. Does the 'urban' - the location in the city - make any difference? Does it change the social meaning, potential impact and day-to-day practices of agriculture and agroecology practitioners, and if so, how to take them into account to build a more sustainable world? On this matter C.M. Deh-Tor (p. 8) suggest that collectively we could consider, build and empower a 'resourceful reproductive and agroecological urbanism'.

The second group of articles explore *practices and city initiatives* related to urban agroecology. These articles contribute to the documentation and analysis of local experiences and initiatives with urban agroecology in different locations worldwide. They illustrate the specificity of applying agroecological approaches in (peri-) urban contexts, and begin to flesh out its potentials, bottlenecks and success factors. They also include intra-urban agriculture and peri-urban forms of agroecological production and the strengthening of rural-urban linkages and biodiversity in

urban areas. Articles touch on issues as diverse as the design of biodiverse and productive urban farms in North America; agroecological production as a peri-urban land use management strategy in India; agroecology as a driver for the development of a new sustainable urban settlement in Taiwan; new forms of urban permaculture in Seville; and food forests in the Netherlands.

The third group of articles focus on *urban policies supporting agroecology*. Here we focus on government-led initiatives and the role of urban policies supporting agroecology, and the ways and legal tools through which such policies ban or constrain the use of chemicals and encourage natural agriculture. Cuba has been a global leader in the policy, science and practice of agroecology in general and of urban agriculture based on agroecological principles in particular. But also in Quito and Rosario, production practices stimulated by the municipality are based on agroecology principles which lead to greater autonomy by reducing dependence on energy, knowledge, inputs and intermediaries. Agroecology provides a broad approach to sustainable urban food policies, going far beyond organic farming towards a perspective of food justice and ecosystem services provided by food systems. There are a growing number of city networks that recognise this and are oriented towards sustainable food systems.

The final section concludes with contributions focussed on *citizen and social movement-led initiatives*. The movements for agroecology are diverse – occurring in different places, amongst diverse peoples, different knowledge sets and worldviews and at different scales. Yet, what holds these in common are their commitment to social transformation. For example, the *Movimento Urbano de Agroecologia, MUDA-SP* (Urban Movement of Agroecology), is a collective of significant political presence in matters relating to urban agriculture and agroecology in São Paulo. *Madrid Agrocomposta* is creating new partnerships between food producers and consumers, rural and urban dwellers, and policy makers in and around Madrid based on the principles of agroecology and circular economy.

In addition, CAWR shares its tools to explore, research, and learn about urban agroecology in the context of broader food and ecological challenges and the specific challenges posed by the urban setting.

We hope this issue of the UA Magazine will contribute to scaling up and scaling out of urban agroecology in cities and city regions by providing inspiring practices, guidance, and understanding of its specific needs and tools for networking and political action.

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# Why We Need Urban Agroecology

Barbara Van Dyck  
 Noémie Maughan  
 Audrey Vankeerberghen  
 Marjolein Visser

*Fostering reflexivity for food system action research participants, Brussels, June 2017. Photo by Marie Maloux*

Since early 2016, the Brussels Agency for Research and Innovation finances 7 participatory action research projects for sustainable food systems. These projects bring together scientists and practitioners that closely cooperate to promote access to healthy food for all; to develop a logistical platform for alternative food systems; to explore and overcome barriers to urban farming; and to support transdisciplinary food system knowledge production in Brussels (see [www.cocreate.brussels](http://www.cocreate.brussels)). We are part of an action research project that aims to enrich urban agriculture with agroecology and of a cross-cutting project that seeks to encourage reflexivity and foster mutual learning among all project participants. From that position, we explore the role of urban agroecology in food system research.

In their proposal for an agroecological urbanism, Deh-Tor (p.8) suggests that building alternative food systems includes dealing with challenges as vast as urbanisation processes, land management, life rhythms, financial drivers and collective arrangements for food provision, education or austerity politics. We believe that urban (political) agroecology proposes clues to make such connections and see food systems as part of a bigger picture. Moreover, a complex and contextualised understanding, may help to set research priorities in a democratic and socially meaningful way and to adopt research methods that open up space for multiple voices and perspectives. Especially for those that often go unheard or get marginalised.

Food system research is in fact far from univocal in the definition of the challenges to address, the socio-technical trajectories to promote or the nature of the relations with industry, politicians, activists, farmers and food practitioners to cultivate. Research approaches not only depend on disciplinary backgrounds, but are equally inspired by different, often conflicting, narratives of progress. Food system researchers should thus position themselves. What are various accounts and pathways of food system

innovation? How do they diagnose problems to favour specific pathways? And, what narratives of progress does their research contribute to?

### Urban political ecology in food system research

With our research, we seek to contribute to food systems that are led by principles of social justice and autonomy from corporate capture. Such goals require unravelling the political conditions and consequences of knowledge production and use. For example, how do we reinforce or counter uneven spatial developments through knowledge production? Or, in what ways does food system research reproduce social and environmental injustices?

Hence, we believe food system knowledge production needs to be situated in its context, and needs to incorporate questions of 'who benefits' to the core of its analysis. Critical geographers can help here; urban political ecologists in particular. Urban political ecology provides a framework that links political debate with the science of ecology to urban settings. In addition, it offers an understanding of cities that challenges traditional distinctions between urban/rural and society/nature.

Adopting an urban political ecology lens keeps food system research away from the temptation of translating complex issues into seemingly straightforward technical questions, devoid of socio-political meaning. Instead it makes visible how social geometries of power shape access to food, its production and consumption. At the same time, urban political ecology has the potential to explore alternatives to urban development, food provisioning and feeding, as it invites us to question what organisational forms need to be developed and to identify the spaces of struggle.

### Agroecology for food sovereignty

However, with the strong focus on environmental justice and on the intertwined-ness of nature and society, urban political ecology risks losing track of the realities of ecology itself. The broad field of political ecology, in fact, has been criticised for reducing the study of agriculture and environment to questions of power. The challenge is to bring questions such as food as nourishing bodies, soils as living organisms, urban gardens as life-sustaining infrastructure into food system research, while taking issues as money, location, skin colour, gender and social status seriously. In other words, food issues cannot be treated as purely socio-political, neither as mere ecological or agronomic but are always inherently socio-technical. They are co-constructions of water, people (including their forms of knowledge, their labour), investment flows, soil organisms, and more.

Agroecology captures this co-construction. La Via Campesina, the world's largest peasant organisation, understands agroecology as a way of farming that is highly political and promotes food sovereignty; i.e. developing farming systems that challenge power structures by seeking to put the control of seeds, biodiversity, land and territories, water, knowledge, culture and the commons in the hands of the people who

feed the world. Hence, the political nature of knowledge production is a given for the social movement. Knowledge dialogue or the "collective construction of emergent meaning based on dialogue between people with different historically specific experiences, knowledges, and ways of knowing" is a basic principle of agroecology.

### Urban (political) agroecology

Drawing on the discussions in 'urban political ecology' and 'agroecology for food sovereignty', urban (political) agroecology could become a conceptual pillar to facilitate conversations between different knowledges, to build a common ground between disciplines and practices. This entails to move away from expert positions to research fora where scientists become practitioners practicing science. Consequently, and thinking with Isabelle Stengers, we do not need "neutral" scientists, instead we need scientific practitioners that develop the ability to add their "divergence to other diverging voices" and are aware of the need to "enter into alliance against those who will refer to their knowledge in order to conclude". In that regard, Line Louah et al. propose that agronomists put their scientific knowledge and methodologies at the service of the practitioner through collaborative research.

We propose urban agroecology as a stepping stone to collectively think and act upon food system knowledge production, access to healthy and culturally appropriate food, decent living conditions for food producers and the cultivation of living soils and biodiversity, all at once. Urban agroecology is not a goal, yet an entry point into, and part of, much wider discussions of desirable presents and futures.

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# Urban Agriculture or Urban Agroecology?

Ulrich Schmutz

7

**Urban Agriculture (UA) sounds similar to Urban Agroecology (UA+), but they may have little in common.**

Urban agriculture is like agriculture in general. It is a broad term including subsistence agriculture, organic agriculture, industrial agriculture and factory farming. Urban agriculture can also include subsistence farming in a city, urban allotments and urban organic horticulture. But it can also include high-intensity vertical farming and metropolitan food clusters or 'agroparks'. These could be termed 'factory farming in a city'.

The term 'factory farming' is not meant in a derogatory way, but rather as a realistic description of how plants and animals are produced in a factory following the same logic as cars or plastic bottle. In this form of urban agriculture feed for animals (in vertical pig or fish farms) or liquid nutrient media (hydroponics in vertical salad farms or aquaponics with fish in plastic cages) are made in another factory outside the city from ingredients 'efficiently' sourced around the world. This form of agriculture is often self-declared as sustainable. But the sustainability logic can be questioned. Sometimes only a few carefully selected indicators are used to claim sustainability. For example, this type of urban agriculture may just use a little less of a specific resource than a less-sustainable form of industrial agriculture.

**Organic urban agriculture (oUA) sits in between UA and UA+, depending how organic is understood**

There are different understandings of "organic". Legal definitions in the EU, USA and other places protect the words organic, ecological, agroecological and biological when commercially marketing produce. Products within these 'safety nets' require legal certification to use them, and this also stops them from being misused to sell something, which falls below the legal standard.

The historic, pre-legislative understanding of organic is very different. The International Federation of Organic Agricultural Movements (IFOAM) was driven by diverse movements in different countries – just as in today's agroecology movement (hence the plural of movement, as there are more than one).

However, IFOAM's recent new title '*Organics - International*' sounds very much like a corporate mission statement. If organic is only defined as a corporate brand it has lost its original meaning and power as movements for social change.

When the organic movements started nearly 100 year ago they were holistic and encompassed not only production but



also consumption, lifestyle, education and spirituality. Early on, organic-biological movements like Bioland focussed on empowering farmers, changing agricultural policies and direct marketing. This is not meant as a romantic notion of the 'good old days' of organic. It is not necessarily a bad thing when those once selling organic muesli from the back of a VW camper are now running medium-size companies employing hundreds of people. But some of these people may, during this success story, not have noticed that maybe they have conformed more than was necessary.

UA+ at its best can perhaps infuse a bit of its energy and meaning back into the naturally aging organic movement. Urban political agroecology, taking in urban governance as a transformative process, contains such meaning. It looks not only at how food, water and energy are produced and consumed in a city but also questions how these resources are shared and equally distributed in a just way for people and plants.

UA+ can also help the term organic to burst out of the tight limitations of the legal organic standards and start thinking outside the box and in 'open-access mode' again. Annual certification versus participatory guarantee schemes, self-certification and even using human manure and urine are examples where UA+ and a rejuvenated organic movement based on its roots have a bright future.

## **In conclusion:**

UA and UA+ have nearly nothing in common. But oUA and UA+ should have nearly everything in common if oUA can drop its recent 'intensification and techno-fixing adventure' and re-focus on its roots.

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# From Agriculture in the City to an Agroecological Urbanism:

The transformative pathway of urban (political) agroecology

C.M. Deh-Tor

Photo by Maria Caterina Feole ©

**In this article we capture three things at once: the reason for this special issue, the thinking behind the 8th Annual Conference of the AESOP Sustainable Food Planning (SFP) group (Coventry, 2017) and the core mission of the International Forum for an Agroecological Urbanism. The Forum and the Magazine will be launched at the AESOP SFP conference whose theme this year is “Reimagining food planning, building resourcefulness: Food movements, insurgent planning and heterodox economics”.**

## Background

In the past three years we have merged our research and activists interest for ecologically and socially just agricultural practices, appreciations for the emancipatory value of cities, and the search for modes of urbanisation which are led by principles of land stewardship, equity and solidarity.

## The problem with food within western urbanisation

As urban scholars working on the politics of urban land and processes of urban development, we have been too well aware that the possibility to control and localise food provision has not been considered throughout the history of western urbanisation. Think for example of the modernist manifesto of the Athens Charter (CIAM/Le Corbusier), which in classifying different spatial urban functions in the city plan, did not include agriculture or food production. Modernism has driven zoning and urban planning for

decades and has been extremely influential since the beginning of the 20th Century. But western urbanisation has also been dominated by organic, piecemeal, processes of densification of the city, such as the building up of kitchen gardens and vegetable plots, during periods of population growth. Apart from some remaining gardens and allotment sites, the once common food growing spaces have largely disappeared from the map. We are also aware that the scale at which urbanism operates constrains the possibilities to make any real radical change of the ‘food regime’ possible. For example, land value and land management, fundamental components in the attempt to re-develop productive urban landscape, are largely driven by market mechanisms which value high profit activities (real estate) and de-value agricultural and agroecological and solidarity-based community led food growing practices.

The omnipresence of cheap food provided by the mainstream retail sectors – whose price does not take into account the ecological impact of transport, resource depletion and storing of unseasonal products – make it also very difficult for alternative local producers to compete and thrive, while paying their workers fairly.

Money saving austerity politics are also impinging on the food allocation choices of both private individuals and organisations, who find themselves struggling to enact more responsible and just purchasing choices.

Urban landscapes and educational approaches also tend to reduce the possibilities to nurture and reproduce in the new generations those skills fundamental for making healthy and environmentally sound food choices or engaging in food practices more substantially.

Seen together, the points listed above make clear that cities and urbanisation processes, with their life rhythms, financial drivers and collective arrangements for food provision, are the ones that need to be tackled for any progressive change to be made. Building alternative food systems has therefore to deal with these ongoing challenges. What we imagine is nothing less than the re-urbanisation of food.

### Urban challenge and new value systems

Of course, there is a whole range of experiences – many of which extensively presented in the previous issues of the UA Magazine – that strive to build alternative realities and challenge the food system, from small community projects to broader city-wide food policies. They remain important. However, our aim here is to point out the full range of ways in which neoliberal urbanism shape and constraints opportunities for change, which are often overseen. Too many food initiatives tend to think of cities as a container, a place where to make change, disregarding broader ecological and social interconnections (issues of global justice, for example), as well as the valuing mechanism that shape decision making on a day-to-day basis. For example, if the main rationale for people's behaviour is time efficiency and financial convenience, then it will be very difficult to roll out a full range of coherent, equitable and environmentally sound choices, because a number of them will have financial implications (i.e. substitute chemical inputs with increased human labour, reallocate land ownership rights on the basis of land stewardship, etc.).

We contend that the “urban” – the high dependence from collective arrangements (i.e. housing, food, transport) and the impossibility of self-provision, and the way capitalism/finance work as its engine- poses specific challenges and conditions which are deeply structural and that to bring forward change we need to go beyond a ‘food in the city’ approach. As mirrored in the call for papers for the AESOP SFP 2017 conference, we are trying to enlarge a conversation that enables knowledge exchange between innovative practices, political strategies, alternative economic models, different forms of land management, and a new valuing system which together make up an alternative urbanism. In other words, an alternative way to organise our mutual interdependencies. We need to imagine logics of urbanisation that no longer systematically devalue food, displace farmers, destroy soils, turn nutrient, water and energy flows into waste streams, etc., and are based on a long working week with no time for food growing and cooking, but rather begin to imagine urbanisms that enables to incorporate food production and consumption in all its dimensions.

Our take is that urban food policies alone, or the food sovereignty of farmers, will not suffice in bringing forward a way of urban living which is environmentally and socially just, and that a more holistic view and spheres of change are needed.

The thought behind the theme of the conference was to recognise people's right to control the conditions of the knowledge, resources and ways in which food is prepared,

eaten and metabolised by humans, without undermining the ecosystem or ending in self-sufficiency discourses. At the core of this convergence we see a pivotal role for urban agroecology.

### Urban agroecology

Agroecology -in our view- is not just an agricultural method: it is a ‘package’ of value-based practices which are explicitly addressing social and environmental justice, are culturally sensitive, non-extractive, resource conserving, and rooted in non-hierarchical and inclusive pedagogical and educational models that shape the way food is produced and socialised across communities and generations. Agroecosystems, while specific to each geographical context, share a number of ecological and social features including “socio-cultural institutions regulated by strong values and collective forms of social organisation for resource access, benefits sharing, value systems”. The principles and practice of agroecology, centred around multi-species solidarities, biodiversity and environmental stewardship, have been extensively noted for their ability to conceive of and deliver *alternative ways of producing food*.

Agroecology is also being strongly mobilised as a *political tool*. Its strong links with the international food sovereignty movement, and its inclination to action-oriented, transdisciplinary and participatory processes has led to defining it simultaneously as a science, a movement and a practice. Political agroecology and urban political agroecology are taking shape at the crossroads between scholar activism and urban movements, although its full political potential is yet to be metabolised. The work of Barbara Van Dyck in this issue (see page 5) is very telling and an important step in this journey.

Striving for resource sovereignty in profit-driven urban environments, a number of politically-active food growing initiatives are effectively building the ground for a nascent urban political agroecology (see Just Space in London, for example, and a number of contributions here). So, while La Via Campesina and other coalitions striving for food sovereignty are framed predominantly within rural, agrarian and peasant imaginaries and communities, an urban political agroecology, which focusses on how the ‘urban’ differently questions and provides opportunities of food provision, is slowly taking shape.

We believe that agroecology as a praxis, and urban political agroecology as a politically aware way of enacting agroecological dynamics of food production and consumption in the city, can provide the social glue (the value system) and the political twist, upon which to build a new mode of urbanisation.

### International forum for an agroecological urbanism

What if solidarity, mutual learning, interspecies (more than human) exchanges, environmental stewardship, food sovereignty and people's resourcefulness were the principles of a new paradigm for urbanisation? How would urban



Photo by Félix Zucco / Image granted by Zero Hora

design, property regimes, food provision, collective services, and the whole ensemble of planning and socio-technical arrangements change, if they were informed by urban agroecology? How can we begin to radically transform the food disabling urban landscapes that have systematically displaced food production, recovering both historical food growing practices and imagining new urban arrangements?

We contend that agroecology contains the political, social and ecological foundations for a radically alternative model of urbanisation – what we call a resourceful, reproductive and agroecological urbanism.

We call for building a shared journey with social movements, food activists and scholars and to multiply the spheres of urban life in which the values and logics of agroecology are articulated and engendered. We wish for a collective journey, a generative encounter of practices and ways of knowing and doing through which it can be possible to substantiate what an agroecological urbanism might look like.

As a vehicle for such a collective endeavour we commit to nurture an International Forum for an Agroecological Urbanism (IFAU). The Forum is a statement against the isolation of disciplinary specialisation. A way to acknowledge the need to see the big picture. To think of transport, housing, food, the environment, private property rights, inequality and injustice all at once. From theory and practice. A space where social reproduction, agroecology, and resourcefulness are pillars of a new urbanism.

*Building an agroecological urbanism.* The Forum is a way to bring in conversation the knowledge that already exists into a coordinating and strategising platform where new planning practices and political trajectories can be imagined. There are thousands of individuals with solid knowledge relevant for this project, which we would like to reach out to. We mean individuals with practical knowledge (i.e., in agroforestry, organic indoor or rooftop horticulture, waste management, renewable energy, social economy, neighbourhood kitchens schemes, etc.). But also individuals working around conceptual models (transport systems, waterways, alternative land management), willing to

engage in the challenge of rethinking the pedagogies and paradigms of urban planning. We also mean to reach out to individuals or organisations and movements/communities with direct experience in policies and activism, to share how they have developed, deployed, tested, and learn from their main obstacles and successes in building new collective arrangements (i.e. community kitchens) and/or mobilising heterodox agroecological practices and ethics. In sum, we aim to gather, share and give visibility to knowledges and experiences that together will help visualising, imagining and conceptualising an agroecological urbanism.

*Empowering an agroecological urbanism.* The Forum is also a space for dialogue where to reflect on the political, social and ecological processes that are needed for building an agroecological urbanism. A place where to build an international movement, where to imagine political trajectories of empowerment with unusual combinations of actors (i.e. agrarian and urban movements), to build new solidarities, to share activist tactics. To map out what spheres of life need alternative arrangements (i.e. waste and metabolic cycles, land stewardship, private property rights, global justice of natural resource distribution) and build a post-capitalist urbanism.

#### C.M. Deh-Tor

C.M. Deh-Tor is a collective pen name for critical urban scholars Chiara Tornaghi (Coventry University, UK) and Michiel Dehaene (Ghent University, Belgium).

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# Exploring Urban Agroecology as a Framework for Transitions to Sustainable and Equitable Regional Food Systems

**Social and political context in which urban agroecology emerges. Urban agroecology has in the last year appeared as a topic in debates on the future of sustainable agriculture and food systems. Two parallel developments create the background to this newly emerging area. Firstly, there is growing attention on the urban dimensions of food system challenges and on the potential role of cities in promoting a transition towards more sustainable and equitable food systems. This is illustrated by over 150 cities joining the Milan Urban Food Policy Pact to both publically state and claim their role in strengthening urban and regional food systems. The New Urban Agenda, adopted at the Habitat3 conference in Quito, puts ample attention on urban food security challenges and the need to reinforce urban-rural linkages; and most of all, through bottom-up development of urban food strategies by local city governments and citizens across the globe.**

Secondly, in the last 5-10 years we have witnessed a growing recognition for agroecology as a promising approach for guiding a transition towards sustainable agriculture and food systems. Agroecology is still strongly based on grass-roots movements of small farmers and peasants, but has gained attention in international debates by institutions such as the UNCTAD and the FAO, who started a regional consultation process around the topic. The agroecology framework is especially promising, as it fully recognises the negative ecological effects of conventional food production systems but also gives central attention to the co-management of ecological resources in future agri-food development options. In addition it increasingly recognises the role that reinforced urban-rural linkages play in such models of co-management.

## Key elements of the current food system crisis

Urban agroecology therefore appears as a promising approach for debates about the future urban food system. It is important to recognise that the current food system crisis is characterised as:

- A multidimensional and systemic crisis, which developed in the last 3 to 4 decades and simultaneously affects a range of economic, ecological, social, health and cultural aspects.
- A confrontation between two different and opposing agri-food development models or paradigms, with different values and frames for looking at food systems.
- A crisis of food governance mechanisms, i.e. the ways in which we make decisions about food-related issues. Current decision making processes are now outdated; the now 40+ year old view that food production is all about efficiency and that food and farming can be institutionalised as a separate sector, is no longer fit for purpose. The search for new food governance mechanisms, sometimes by engaged policy makers but more often driven by civil society groups, is very much the basis for the new dynamic we see occurring.

## Why does food appear on the urban agenda?

Agroecology provides an interesting framework to better understand and design sustainable urban and regional food systems, but at the same time it needs to be further developed. Much of the current work strongly focuses on rural contexts with small scale and peasant farmers as key actors in the management of agroecosystems. Such approaches continue to be relevant but they insufficiently address the specific nature of food systems in urban and peri-urban contexts.

The strong, sometimes one-sided, focus on rural dimensions of food systems does not only apply to agroecology. There is a general need to better understand why food has emerged so strongly on urban agendas in recent years. Two decades ago agricultural and food policy were almost synonymous to rural policy. Nowadays, we see that issues such as food consumption practices, organic production in urban and peri-urban settings, reduction of food waste, and local and proximate food economies are key elements for an urban agroecological framework.

The (re-) appearance of food on urban agendas can be understood in the light of Carolyn Steel's ground-breaking work on the history of cities in relation to food. In her book "Hungry Cities" she convincingly shows that when looking at urban history through a food lens, it is clear that at some point we lost the awareness of the intrinsic relation between food and cities. *"We live in a world shaped by food. It determines our survival, our politics and economics. How, then, have we come to consider food as just another*



Photo by Madrid Agroecológico

*commodity? Our profound disconnection with food is the curious legacy of industrialisation. It is also the symptom of a way of life we can no longer afford. Food is not only a powerful shaper of our lives, but one that we can harness as a tool."*

### Food as a powerful transformative tool

From this perspective it is clear that food continues to be an important and powerful tool for social and economic transformation in cities. This is essential for understanding the many things that are happening in urban agroecology and why it is promising for future urban agendas. Food is appearing on different political agendas, ranging from economic development and employment generation to environment, climate change, health, social inclusion and waste management, and provides a starting point to address such issues in an integrated way. Relocalising food systems in and around cities for all these agendas, at least hypothetically, emerges as an important factor in seeking solutions to the multiple crises that current society faces.

It is especially by building interconnections and synergies between agendas that such solutions are shaped. Health and wellbeing on the one hand are important drivers for food system change, but at the same time provide a starting point for developing markets and demand for local and organic foods. Similarly, food production in urban and peri-urban areas provides opportunities to create synergies with urban waste and water management from a perspective of urban metabolism. Also, issues around social coherence and local identity are connected to food producing activities and provide an important entry point for rebuilding trust in local governance. In Spain, agroecology and food policy emerge strongly on local municipalist agendas, as a network of almost 20 cities have organised themselves around the topic of agroecology. This is a way to regain and reinforce local and democratic control over food systems, which in many respects is the essence of urban agroecology.

### Learning from the diversity of urban agroecological practices

A key element to further develop urban agroecology is to build on the many experiences and upcoming practices in cities. Many cases of urban and peri-urban agriculture around the world apply non-chemical production methods and in some cases explicitly identify themselves as agroecological. Examples include Quito, Rosario, Cape Town, Havana, and the Western Province of Sri Lanka. These and other cases show that there is a strong basis for urban agroecology, but also that what is specific to agroecology in an urban context needs to be better defined. Experiences show that common approaches in rural agroecology do not necessarily work in urban settings – for example restoring soil processes is not always possible in urban contexts where soils are often contaminated and ecosystem processes are disturbed. However the urban context provides specific knowledge, resources and capacities which are sometimes lacking in rural settings. This is for example the case with the development of short marketing channels and direct producer-consumer relations, participatory approaches in labour mobilisation and certification, and initiatives in the area of solidarity economy.

These experiences indicate a strong case for further dialogue and collaboration between urban agriculture, city region food policies and agroecology. The different contributions to this issue provide a rich source of practical experiences to feed this dialogue and indicate how, in different social, cultural and policy contexts, agroecology is becoming a key factor in urban food policies.

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# Urban Agroecology: For the city, in the city and from the city!

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*Urban citizens of São Paulo sowing for the creation of the Cultural Center Community Garden. Photo by Pops Lopes*

Over the last 20 years, several organisations and individuals researching and working with urban agriculture and agroecology in Brazil have accumulated experiences in different local territories. Several national networks and forums, such as the Brazilian Association of Agroecology - ABA ([aba-agroecologia.org.br/wordpress](http://aba-agroecologia.org.br/wordpress)), the National Articulation of Agroecology - ANA ([www.agroecologia.org.br](http://www.agroecologia.org.br)), and the National Urban Agriculture Collective ([www.facebook.com/cnagricurbana](http://www.facebook.com/cnagricurbana)), have supported and articulated experiences of agroecology and urban agriculture. Agroecology is conceptualised simultaneously as a science, a political movement and a social practice. The central concept is the reproduction of life and common interest, distancing these networks from the logic of commodification and industrialisation imposed by the agribusiness sector and the contemporary food system.

## Concepts of agroecology

The agroecological approach allows us to observe situations in which some of the “agricultures” present in cities and metropolitan areas differ from the pure market-oriented and industrial logic of production. Instead they connect the social function and the value of land, so as to configure new

metropolitan territories, and to reinvigorate livelihoods centred on socio-environmental reproduction.

However, some conceptual approaches reinforce urban-rural or urban-nature dichotomies, by associating “the urban” with the built environment, or with the legal demarcation of the urban perimeter. On the other hand, other approaches idealise the countryside as a space of tradition, nature, agricultural practices and the production of food and raw materials. This is in opposition to the notion of the city as a space of consumption, services, production of knowledge, innovation and creativity.

## Different experiences, different approaches

Three approaches identified in the Brazilian “agroecological field” articulate, in different ways, agroecology and urban agriculture, as well as different concepts of the city and urban versus rural areas. Two approaches, identified as agroecology **for the city** and agroecology **in the city**, somehow reinforce the usual approach to the urban and the rural as separate (though complementary) spaces. They attribute an essentially rural character to certain agricultural practices even if located in urban spaces or identify the rural “within” the urban. The agriculture carried out in the city is associated with rural memories, ancestral practices and peasant identities transformed by the urban way of life.

‘Agroecology **for the city**’ seems to affirm rural areas as territories in which market-oriented and urban supply agriculture must be located. Spaces such as “green belts” or peri-urban areas are usually considered as “non-cities”. The interference of the “urban” is however recognised, together with the benefits of proximity to urban infrastructure such as cultural facilities, transport networks, and other services. There are also corresponding forms of income generation.

Urban spaces are thought of in terms of consumption and access to markets, not as territories where agriculture can and is being developed. In this logic, the emphasis is on the importance of farmers' interaction with cities (especially through participation in farmers' markets), with a view to increase awareness of the urban population on the importance and benefits of family farming and preservation of rural production areas for cities. Initiatives of people who opted for job opportunities and "a country" lifestyle are also commonly incorporated into this type of narrative.

"Agroecology **in the city**" sees the "islands" of rurality in urban areas, as artificial and built-up spaces. They are valued in the perspective of seeking sustainability in cities. Urban agricultural spaces are seen as green areas that are idyllic rural areas within the urban fabric. In this perspective, the producers' rural knowledge is valued and urban agriculture is seen as the expression of this knowledge. From the point of view of agroecology, the prevailing perception is that knowledge migrates along with people, from rural territories to urban spaces, bringing with them the practices and ways of understanding the world based on work in the countryside. Such spaces are generally "invisible" due to their reduced participation in the urban capitalist economy. Or they are interpreted as remnants of a rural heritage that have not yet been transformed by modernity and urban expansion.

"Agroecology **from the city**" on the other hand leads to a shift in focus from rural-urban contradictions to the contradictions between industrialisation and commodification processes versus the reproduction of life. Two types of space correspond to this distinction, which is found in Lefebvrian's theoretical perspectives on the production of urban space and the right to the city. This approach also examines hybrid and transitional territories, where economic activities and lifestyles associated with so-called antagonistic universes coexist, such as urban and rural, or urban and nature.

Last but not least, the agroecology that typically emerges in more urbanised contexts involves a great diversity of subjects and actors, and dialogues with the specificities of these contexts. The concept brings the understanding that nature is or must be closely integrated with built-up spaces. Nature composes and consolidates the production of urban space in these territories. According to the concept of the right to the city, it is seen as a collective work, which can and should be transformed by the practices of those who live in it. In this sense, urban agroecology involves the creation and appropriation of the city by people who do not necessarily have a rural past or rural ties, but who come from diverse professional occupations. From this confluence other knowledges emerge and influence practices. Traditional knowledge aligns with technologies and knowledges specific to the urban, generating social innovation and developing other consumption-production arrangements.

### Towards urban agroecology!

The growing strength of the urban agriculture movement has provided recognition of different agricultural histories and practices in urban territories, and extended the



*Victory's Flavour Urban Farm located in the São Mateus neighbourhood in São Paulo. Photo by André Biazoti*

possibilities of relating the urban population with nature and agriculture. Urban agriculture and agroecology may help create the principles and dimensions of an agroecological approach to productive systems, social subjects and urban territories. We can term it "urban agroecology".

However, not all experiences of urban agriculture incorporate agroecological principles. This new field must also understand cities as territories of dispute between social movements engaged in the promotion of life, and the capitalist industrial food system. It is necessary to move forward by laying aside the false dichotomy between urban and rural, and to identify that there is a common interest in valuing land through the productive use of spaces essential to the reproduction of life.

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# Towards a Transformative Urban Agroecology

Michel Pimbert

Photo by Madrid Agroecologico

**From its initial emphasis on ecology for the design of sustainable agriculture, agroecology now emphasises the study of the ecology of food systems, including all the elements (environment, people, inputs, processes, infrastructures, institutions) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socio-economic and environmental outcomes. Agroecology's focus on whole food systems thus invites urban producers to think beyond their garden plots and consider broader issues such as citizens' access to food within urban municipalities and the governance of food systems.**

Urban agroecology is increasingly informed by a vision of food sovereignty which aims to regenerate a diversity of autonomous food systems in both rural and urban areas. Food sovereignty seeks to guarantee and protect people's space, ability and right to define their own models of production, food distribution and consumption. Three dimensions of urban agroecological transformation are highlighted here: *ecological* (re-organising the material basis of food production in the image of nature); *political* (expanding citizen participation and democracy in the co-production of knowledge, policies and urban spaces); and *economic* (inventing forms of economic organisation that re-territorialise food and wealth production whilst creating

free time for citizens to shape and re-govern urban spaces).

## Urban agroecology practices for food sovereignty

A transformative urban agroecology for food sovereignty seeks to reduce dependence on corporate suppliers of external inputs and distant global commodity markets. Agroecological approaches in urban areas thus tend to be based on:

- *Re-embedding gardening and agriculture in nature, relying on functional biodiversity and internal resources for production of food, fibre and other benefits.* Resilient agroecological systems mimic the structure and function of natural ecosystems: biodiversity-rich fruit orchards and agroforestry systems, intercropping, genetic mixtures, mixed farming, agro-sylvo-fish production systems;
- *Reducing dependence on commodity markets for inputs* (hybrid seeds, fertilisers, pesticides etc.) enhancing urban farmers' autonomy and control over the means of production;
- *Diversifying outputs and market outlets, often with the help of citizens.* A greater reliance on alternative food networks that reduce the distance between producers and consumers whilst ensuring that more wealth and jobs are created and retained within local economies: Community Supported Agriculture, short food chains and local food webs, local procurement schemes that link peri-urban organic producers with city schools and hospitals;
- *Rediscovering forgotten resources:* organic manure and the soil's capacity to improve the yields and nutritional quality of foods; renewable energies (solar, wind, biogas) and their decentralised and distributed micro-generation in towns and cities;

- *Trade rules protecting local economies and ecologies*: the spread of agroecological practices in urban areas depends on: (a) replacing proprietary technologies and patents on biodiversity with locally adapted legal frameworks that recognise farmers' rights and guarantee equitable access to urban seeds and livestock breeds; (b) replacing global, uniform standards for food and safety by a diversity of locally developed food standards that satisfy food and safety requirements; (c) introducing local food, energy, and water procurement schemes.

### From linear to circular food systems

Urban agroecology in the context of food sovereignty goes much further than a focus on *agricultural production* alone: it questions the structure of the entire food system. Indeed, much of conventional *urban agriculture* is dependent on external inputs (e.g. hybrid seeds, pesticides) and mirrors aspects of industrial food systems which are fundamentally unsustainable, along with their supporting energy, water and waste management systems. Their linear, and increasingly globalised, structure assumes that the Earth has an endless supply of natural resources at one end, and a limitless capacity to absorb waste and pollution at the other. An alternative is to shift from linear systems to circular ones that mimic natural cycles. This can be done by adopting a circular metabolism that reflects the natural world. There are two ecological design principles here which are shared by agroecology and related approaches such as bio-mimicry, eco-design, and permaculture. The first is that nature is based on nested and interacting cycles – for example, carbon, nitrogen, phosphorus, and water. The second is that 'waste' is converted into a useful form by natural processes and cycles, ensuring that waste from one species becomes food for other species in the ecosystem.

In circular urban and peri-urban production systems, specialised and centralised supply chains are replaced with resilient and decentralised webs of food and energy systems that are integrated with sustainable water and waste management systems. Circular systems that mimic natural ecosystems can be developed at different scales, from individual garden plots to entire cities, by using functional biodiversity, ecological clustering of industries, recycling, and re-localised production and consumption within a territorial based approach to sustainable living. These circular systems are often characterised by: agroecological design; a focus on 'doing more with less'; widespread recycling and reuse; the re-localisation of production and consumption; and a new agrarian-industrial mutualism between towns and countryside. Circular systems that combine food and energy production with water and waste management aim to reduce carbon and ecological footprints whilst maintaining a good quality of life through a controlled process of de-growth in consumption and production based on the '8 Rs': Re-evaluate, Re-conceptualise, Restructure, Redistribute, Re-localise, Reduce, Reuse and Recycle.

Village Homes in the suburbs of Davis in California (USA) pioneered this circular economy approach in the late 1970s ([www.villagehomesdavis.org](http://www.villagehomesdavis.org)). A 70-acre subdivision was designed to promote sustainable living, integrating within

the landscape solar-powered homes and low energy buildings, pest management, ecological land use, runoff management and consumption of locally grown food. Today, local residents obtain a significant share of fresh, seasonal food from the Village's 23 acres of greenbelts, orchards, vineyards and vegetable gardens based on urban agroecological principles.

On a larger scale in Spain, urban farmers and other citizens involved in the *Catalan Integral Cooperative (CIC)* in the city of Barcelona and nearby municipalities are weaving together a decentralised and distributed network of circular systems under democratic control and popular self-management. For example, CIC has successfully developed a functional logistics network for the transport and delivery of organic food of small producers in peri-urban and rural areas of Catalonia. CIC's *Network of Science, Technique and Technology* has developed technologies and machines adapted to the particular needs of small producers and urban gardeners. Peri-urban agroecological farms that feed local schools work with cooperatives for the digital manufacturing of farm tools and they are also part of a territorial network of peer-to-peer production, small scale industrial ecologies, as well as local exchange networks and social currencies. These socio-technical innovations not only foster a new agrarian-industrial mutualism between town and countryside; they also help restore a sense of selfhood, competency and active citizenship (<https://cooperativa.cat/en/>).

### Deepening democracy

One of the clearest demands of the agroecology and food sovereignty movement is for citizens to exercise their fundamental human right to decide their own food and farming policies. Democratising the governance of municipal food systems means enabling urban farmers, gardeners and other citizens, - both men and women -, to directly participate in the choice and design of policies and institutions, decide on strategic research priorities and investments, and assess the risks of new technologies. This can be best done through an expansion of direct democracy in decision making to complement, or replace, models of representative democracy. Institutional innovations such as popular assemblies and methods for inclusive deliberative processes such as citizens' juries help create safe spaces for decision making *by and for* citizens.

Deepening democracy assumes that every citizen is competent and reasonable enough to participate in democratic politics. However, this requires the development of a different kind of character from that of passive taxpayers and voters. Second, active citizenship and participation in decision-making are rights that are claimed through the agency and actions of people themselves – they are not granted by the state or the market. Third, empowering urban farmers and other citizens in food system governance requires social innovations that i) create inclusive and safe spaces for deliberation and action; ii) build local organisations and their federations to enhance peoples' capacity for voice and agency; iii) strengthen civil society and gender equity; iv) expand information democracy and citizen controlled media



Photo by Maria Caterina Feole ©

(community radio and video film making, among others); v) promote self-management structures at the workplace and democracy in households; vi) learn from the history of direct democracy; and, vii) nurture active citizenship. Fourth, only with some material security and time can urban farmers and other citizens be 'empowered' to think about what type of policies and institutions they would like to see and how they can develop them. This requires radical reforms in economic relations similar to those listed in Box 1.

Last, new political structures are needed to combine localism with interdependence for coordinated action across towns, cities, peri-urban landscapes and larger areas. One option is 'democratic confederalism', which involves a network of citizen-based (as opposed to government) bodies or councils with members or delegates elected from popular face-to-face democratic assemblies. These confederal bodies or councils enable the interlinking of a region-wide web of city neighbourhoods, villages, and municipalities into a confederation through which citizens can govern themselves.

### A transformative urban agroecology calls for alternative economic practices

- *The re-localisation of plural economies that combine both market oriented activities with non-monetary forms of economic exchange based on barter, reciprocity, gift relations, and solidarity;*
- *A guaranteed and unconditional minimum income for all;*
- *A significant drop in time spent in wage-work and a fairer sharing of jobs and free time between men and women;*
- *A tax on financial speculations, to fund the regeneration of local economies and ecologies;*
- *Cooperative, communal, and collective tenure over land, water, seeds, knowledge and other means of livelihood;*
- *Economic indicators that reflect and reinforce new definitions of well-being such as conviviality and frugal abundance.*

### Conclusion: toward a new modernity?

A growing number of youth in social movements claim that agroecology and food sovereignty can help invent a new modernity by regenerating autonomous food systems in rural and urban spaces. This vision of modernity looks to other definitions of 'the good life' - including Buen Vivir or Sumak Kausai in Latin America, De-growth in Europe, and Ecological Swaraj in India. By encouraging a shift from linear to circular systems, agroecological pathways to urban gardening and farming not only help reduce the carbon and ecological footprints of cities and produce nutritious food. A transformative urban agroecology for food sovereignty can also contribute to a wider emancipatory process in which citizens affirm their collective right to democratically control the production and use of urban space and urban processes. This 'right to the city' involves claiming '*some kind of shaping power over the processes of urbanisation. Over the ways in which our cities are made and remade, and to do so in a fundamental and radical way.*'

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# Urban Agroecology: Principles and potential

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*A large scale experiment assessing the productivity of various intercrops in Berkeley. Photo by Miguel Altieri*

**In light of climate change, failures in industrial agriculture, increased energy costs and demographic pressure, and as multinational corporations increase their control of the food system, a significant rise in food prices, if not food shortages can be expected. This situation is compounded by the fact that by 2030, 60% of the world's urban population will live in cities, including 56% of the world's poor and 20% of the undernourished. Today, for a city with 10 million people or more, over 6,000 tonnes of food has to be imported every day, traveling an average of 1,000 miles. Given these scenarios, urban agriculture (UA) is becoming a major sustainable alternative for food security on an urbanised planet. Urban production of fresh fruits, vegetables, and some animal products, near consumers, improves local food security, especially in underserved communities. By improving access to fresh, nutritious food, UA can help in combating childhood obesity, diabetes, and poor nutrition that are prevalent in many urban communities. This article looks at this world-wide issue, providing findings from crop research and illustrations taken mainly from North America.**

In response to food insecurity, UA has spread rapidly. From 1950-2005 UA increased in developing countries by 3.6% annually. In the United States, UA has expanded by >30% in the past 30 years. One reason for this is the fact that UA can be very productive, providing an estimated 15–20% of global food. However, an important question remains, what level of

food self-sufficiency can cities obtain through UA? A survey with the goal of providing 300g /day per capita of fresh vegetables, found that 51 countries have insufficient urban area to meet the recommended nutritional target. In addition, UA would require 30% of the total urban area to meet the global demand for vegetables. More optimistic estimates have calculated that, for example, Cleveland, Ohio, with its population of 400,000, has the potential to meet 100% of urban dwellers fresh vegetable needs, 50% of poultry and eggs, and 100% of consumed honey. These estimates suggest that self-sufficiency could be achieved, depending on how UA is designed and managed (i.e. crop arrangements, production practices used, size of plots). Urban farmers do not always optimise crop planting density or diversity, thus modifications of cultural practices to enhance yields are necessary. Agroecology can help realise the productive potential of UA by providing key principles for the design of diversified, productive, and resilient urban farms.

## Agroecological principles

Agroecology uses well-established ecological principles for the design and management of diversified urban farms where external inputs are replaced by natural processes such as increasing soil fertility and enhancing biological pest control. Agroecological principles (Table 1) are applied by way of various practices. These lead to optimal recycling of nutrients and organic matter turnover, closed energy flows, water and soil conservation and balanced populations of pests to their natural enemies, all key processes in maintaining UA productivity.

The integrity of an urban farm relies on synergies between plant diversity and a soil rich in organic matter and soil biota. Soils with high organic matter and active soil biological activity exhibit good soil fertility and beneficial organisms that prevent pathogen infection and pest incidence. Integration of soil, water, and pest management practices constitute a robust pathway for optimising soil quality, plant health, and crop production.

**Table 1.** Agroecological principles for the design of biodiverse and productive urban farms

1. Enhance the recycling of biomass, optimising organic matter decomposition and nutrient cycling
2. Enhance functional biodiversity – natural enemies, antagonists, soil biota, etc., by creating appropriate habitats.
3. Provide the most favourable soil conditions for plant growth, by managing organic matter and by enhancing soil biological activity
4. Minimise losses of energy, water, nutrients and genetic resources via conservation of soil and water resources and agrobiodiversity
5. Diversify species and genetic resources at the field and landscape level
6. Enhance beneficial biological interactions among agrobiodiversity components promoting key ecological processes

### Crop diversification

A key agroecological principle is the diversification of urban farms, which combines crops in temporal (rotations) and spatial arrangements (intercropping); at times combined with fruit trees and small animals.

#### *Intercropping*

Intercropping involves mixtures of annual crops in the same plot of land at the same time, resulting in increased crop diversity which improves soil organic matter (SOM), soil cover, water retention capacity and microclimatic conditions favouring production. Crop diversity also enhances resilience to climatic variability and favours arthropods and microorganisms involved in improved nutrient cycling, soil fertility, and pest regulation.

Synergistic crop combinations include tall and short plants, plants that use resources at different times, shallow- and deep-rooted plants that exploit different soil horizons such as legumes with cereals, tomatoes and basil or beans, lettuce or mescluns between rows of leek or garlic, arugula under kale. Good crop mixtures lead to increased productivity partly due to the process of facilitation, when one crop modifies the environment in a way that benefits a second crop, for example, by lowering the population of a pest, or by releasing nutrients that can be taken up by the second crop. A combination of two contrasting species leads to greater overall productivity because the mixture can use resources (nutrients, water, sunlight) more efficiently than separate monocultures. The overyielding of intercrops is measured using the Land Equivalent Ratio. When the value is higher than 1, polycultures overyield (i.e. a LER of 1.5 it means that a monoculture requires 50% more land to obtain the same yield of the polyculture). In our experiments at Berkeley, we have obtained LER values > 1.3 in combinations of lettuce and mizuna, tomatoes and beans, broccoli and fava beans, and kale and arugula.

#### *Crop rotations*

Crop rotation is the practice of growing a sequence of different groups of crop species (legumes, root crops, fruit crops, and leaf crops) in the same area for many seasons. By dividing the garden in 4 plots (each planted to each group of crops), every successive year each group moves to the next plot clockwise. Basic rules include alternating between legumes and non-legumes, never planting crops of the same family consecutively, and alternating crops of deep and shallow roots. Legumes increase available nitrogen in the soil, even after they are harvested, for future crops. Including legumes in crop rotations reduces the need for external nitrogen inputs. Rotating plant families reduces soil-borne diseases like verticillium wilt and soil-dwelling insects.

### Agroecological soil management

Agroecology promotes a series of soil-health-improving management practices such as complex crop rotations, intercropping, minimum tillage, cover cropping and use of a variety of organic amendments. These management practices, increase inputs of SOM, decrease losses of carbon, maintain soil coverage, decrease soil disturbance and encourage beneficial organisms. Improved soil properties resulting from such practices have added benefits such as more available water, less compaction, enhanced nutrient availability, and the production of growth-promoting substances, which promote growth of healthy and productive plants.

Most crops grown on compost-amended soils have positive yield response. In our studies, we have found that average yield (weight/plant) of tomatoes amended with one application of 12 t/ha (4.8 tonnes/acre) compost was 23 and 38% greater than plots amended with 6 t/ha (2.5 tonnes/acre) and un-amended controls. Moreover, organic soils exhibit high populations of antagonists that suppress many soil-borne diseases.

A main challenge for urban farmers is to access animal manure as a source of Nitrogen as shortage of available N may greatly reduce crop yields. Many cities do not allow animal-raising, which further limits N availability. As an alternative, many farmers grow green manures such as fava beans, vetch and peas, or a mixture (at times adding 20% rye or barley) in fall and winter. This constitutes an important strategy to increase N supply for crops. In California a vigorous green manure growing for four to six months before incorporation typically adds between 112 and 224 kg N/ha (100 and 200 lb/acre) N to the soil for the succeeding crop. Yields of most vegetable crops increase with increasing rates of N. Carbon to N ratio of incorporated materials should be equal to or less than 20:1 to assure net short-term mineralisation and avoid N “hunger”.

Many urban soils have been impacted by uses that may leave a legacy of contamination. Surveys in US cities have found soil lead concentrations above 400 mg/kg in many urban gardens. On-farm generated organic amendments like animal manure, compost and green manures have some utility for low-level remediation due to dilution and stabilisation of potential contaminants.

## Biological pest regulation

There are natural enemies of pests on urban farms and they constitute a form of biocontrol by regulating pest populations. These enemies include predators, parasitoids, and pathogens. Their effectiveness is typically constrained by low floral resource availability in and around urban farms, due to the higher percentage of impervious surfaces in the urban landscape. Our research shows that it helps to sow borders or strips of buckwheat, sweet alyssum, coriander, wild carrot, phacelia and fennel early in the season. The abundance of syrphid flies, lady bugs and many parasitic wasps increases as the strips provide them with pollen and nectar.

The literature suggests that diversification in urban farms achieves positive outcomes, including natural enemy enhancement, reduction of pest abundance, and reduction of crop damage. Many studies conducted on cabbage, broccoli and brussels sprouts have reported three results: aphids and flea beetles are more likely to locate and remain on host plants occurring in monocultures than in cole crops associated with other plant species; pests immigrate into polyculture systems at significantly lower rates than into monoculture systems; and, pests emigrate from polycultures at significantly higher rates than from monocultures. Moreover, generalist natural enemies tend to be more abundant because they can utilise a greater variety of hosts available in diverse garden systems, and their action usually results in lower herbivore population densities.

Mixed crop systems can also decrease pathogen incidence by slowing down the rate of disease development and by modifying environmental conditions so that they are less favourable to the spread of certain pathogens. Moreover, many intercrops are often superior to monocrops in weed suppression, as intercrop combinations can exploit more resources than sole crops. This suppresses the growth of weeds more effectively through greater pre-emptive use of resources.

## Water conservation and use efficiency

Farmers need water to irrigate their crops and provide drinking water to their animals or fish. In the event of water shortages or decreasing quality of the available water sources, urban producers can access sources such as wastewater, greywater, or harvested rainwater, and apply such water via irrigation more efficiently than can rural producers. In areas of water scarcity, productivity should be measured per unit of water (weight or volume), with the goal of irrigation systems reaching efficiency values > 60%.

In rainfed regions improvements of rainwater capture, selection of drought tolerant varieties, alternative tillage systems, and mulching are critical to secure good harvests. Addition of organic amendments to the soil is vital as many studies show that SOM enhances water retention. Depending on the soil type, it is estimated that for every 1% increase in SOM, the soil stores 1.5l of water per square meter. Organically rich soils usually contain arbuscular mycorrhizal (VAM) fungi, which are of particular significance under water stress conditions, as VAM colonisation increases water use efficiency.

## Conclusions

Examples from productive urban farms around the world suggest that self-sufficiency in terms of vegetables could potentially be achieved at the level of a community or city. Well-designed urban farms can be up to 15 times more productive than rural holdings. In Cuba, an area of just one square meter can provide 20kg of food a year (200 tomatoes (30kg) per year, 36 heads of lettuce every 60 days, 10 cabbages every 90 days and 100 onions every 120 days). But this requires the application of agroecological principles to guide the intensive cultivation of a diversity of vegetables, roots and tubers, and herbs in relatively small spaces.

It also requires that citizens have access to sources of green biomass and/or manure as nutrient sources. Some cities provide weekly residential collection for plant debris and food scraps. In 2010, the city of Berkeley, California collected 13,650 tonnes of residential food and green waste and 6,500 tonnes of food scraps from commercial customers. This material is processed by a private composting company, which at the end of each month from February to October makes freely available 80-120 cubic yards of compost to residents.

Agroecological designs feature well-planned crop diversity, complemented by organic soil management. Together these comprise an effective agroecological strategy to improve nutrient cycling and soil fertility. They also limit nutrient and water losses, reduce impacts of pests, diseases and weeds and enhance overall productivity and resilience of the cropping system. But diversifying urban farms *per se* does not necessarily mean that they are being managed agroecologically, unless the collection of crops chosen interact biologically. Many urban farms are diversified in response to food security or market demands. Such farms do not reach full potential as the crops do not interact with each other synergistically, necessitating external conventional or organic inputs of fertilisers or pesticides. The key is for researchers and practitioners to find the right combinations of crops that complement each other to achieve overyielding.

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# Just Food Farm: Redefining value using urban agroecology on public land

Phil Mount

All images courtesy of Just Food

**Public land is one of the primary battlegrounds on which ideology will contest power in the 21st century. As city regions face continued pressures to expand, control and disposition of public land will increasingly become a focal point of governance. At the crossroads of financialisation, privatisation, and devolution, the stewardship of public land will pit the preservation of landscape, ecologically sensitive zones, and agricultural land, against the forces of urban expansion, development, and speculation.**

In communities with significant populations of low-income and marginalised families, the ability to access public land for food production can not only provide a much-needed supplemental source of household food, it could also incubate new skills in knowledge sharing and collaborative decision making. This is an opportunity for a new, urban, agroecology to initiate a dialogue between different types of knowledge, including traditional knowledge, indigenous knowledge, farmers' knowledge, migrant knowledge, and scientific knowledge. More than this, agroecology embraces a commitment to political and social change, to address the needs of the community.

For urban agroecologists, these needs centre on community food security, the enhancement of ecological diversity, and the scarcity of land for food production. Proximity to distinctively urban issues and scarcities elevates the social dimension and responsibilities of agroecology. Proximity to marginalised urban communities affords unique

opportunities to address these issues and scarcities collectively through dialogue and actions rooted in food justice and food sovereignty shaped by urban experiences and realities. The employment of urban agroecological principles on public land will therefore be an important tool for systems transformation. This article looks at this issue from Canada, where low income and new migrant populations seek food resources.

## The Context

The Just Food Farm is situated on 150 acres in the heart of Ottawa, and borders Green's Creek natural area, an ecologically-sensitive corridor providing habitat for wildlife and valuable green space for nearby residents. Just Food is in the third year of a 25-year lease with the National Capital Commission (NCC), a crown corporation that manages over 200 km<sup>2</sup> of land – much of it farmland – expropriated over 50 years ago to create a Greenbelt around the city. The farm was used for over 30 years as the NCC's nursery, and in the past two decades has developed a legacy of untended tree cover across half of the site.

In 2017 the Just Food Farm is hosting 12 new farmer trainees, 10 experienced farmers, and education and demonstration projects offering apiary, permaculture, foraging and food forest workshops, as well as environmental programs for youth. The farm is a long-term host of the agrarian Karen refugee community farm, and Operation Come Home's FarmWorks project, with community-supported agriculture baskets for 30 households. This year the Just Food Farm has opened a Syrian Refugee garden. The plant-a-row, donate-a-row program has all produce going to a local food cupboard. Autumn will also bring a new sugar-maple grove, as well as thousands of trees and plants in the new Community Food Forest.



While the Start-up Farm program focuses on small-scale urban agriculture production of organic vegetables, there is space for new projects which prioritise the harmonisation of agriculture within the existing landscape, using thoughtful, low-input, conservation-agricultural production systems that demonstrate scale-appropriate agroecological vegetable production practices. These include rainwater irrigation systems, living mulch, passive solar greenhouses, mixed-stock compost production, composite cross-population breeding, and much more.

At the same time, in order to truly foster urban agroecology, these projects aim to integrate food justice for the community. Participation in and co-development of community farm projects is invited, and spaces are provided for the community to learn, grow and flourish. This involves re-imagining the commons for the 21st century, in a major urban centre. Canada is a society that both inculcates and minimises the gulf between prosperity and hardship. Here the proper use of the commons must focus on the stewardship of collective resources for the benefit of those marginalised and disadvantaged by our collective pursuits.

By demanding of the farmers and practitioners scale-appropriate practices that enhance the soil and biodiversity of the site, while integrating food production seamlessly into existing natural spaces, urban agroecology challenges conventional agroeconomic rationales. Accepted agronomic practices strip the region of bush-lots, tree-lines and hedgerows. New social spaces on public land – created specifically to prioritise sharing and caring – challenge accepted wisdom that increasingly demands the primacy of economic value in public projects and spaces.

The market exchange rate of the food and services produced does not begin to capture the value produced on the Just Food Farm. There are many more benefits that are hard to quantify arising from a community demonstration and education farm on ecologically sensitive public land bordered by strip malls and a residential area with the highest concentration of Syrian refugees in the country. Social enterprise models challenge the prioritisation of market return or profit in food justice programming. However, the discourse of social enterprise does little to de-commodify public spaces and conversations. Urban agroecology can step into this breach, demanding 'common' public spaces that value nourishment of body, spirit and mind for all, equally, across the community.

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# Promoting Agroecology in Gorakhpur: Reduction in sale of agricultural land

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*Dissemination of climate information to farmers. Photo by GEAG*

**Protection and preservation of agricultural land around cities, in their peri-urban areas and rural hinterlands, becomes more and more important in an era of rapid urban growth and increasing climate change impacts. A large percentage of agricultural production can be found in peri-urban and rural areas within reach of cities, with a recent study indicating that approximately 60% of all irrigated crop land and 35% of all rain-fed cropland is within 20 kilometres of city boundaries.**

Rapid urbanisation extends into peri-urban and rural areas where food production has to compete with building or other land uses. This challenges traditional approaches to food and nutrition security. It also challenges thinking on how cities are fed. Urban expansion goes hand-in-hand with an increase in the demand for natural resources, including land and water that provide vital food and ecosystem services to cities. There are also increased challenges in terms of economic efficiency, land use and land rights. Large scale conversions of agriculture land to non-agricultural uses may cause problems in cities and rural areas with regards to drainage systems and flood retention. They can cause temperature increases, environmental pollution and increased vulnerability to disruptions in imported food supply, especially in areas affected by climate change.

These reasons led the Gorakhpur Environmental Action Group (GEAG), as part of the Asian Cities Climate Change Resilience Network (ACCCRN) and with financial support

from the Rockefeller Foundation, to embark in 2012 on the project ‘Enhancing climate resilience of Gorakhpur city by buffering floods through climate resilient peri-urban agriculture’. The project aimed to:

- Develop models of climate-resilient integrated agriculture-horticulture-aquaculture-livestock systems in small, marginal landholdings in the peri-urban context, employing a diversity of water systems
- Enhance the income and food security of the poor and vulnerable populations
- Ensure the sustainability of peri-urban agricultural lands through different regulatory and incentive mechanisms
- Enhance the flood-buffering capacity of the city as it expands, through the institutionalisation and replication of sustainable management of agricultural ecosystems.

## Ensuring farming livelihoods

It was understood that these aims could only be realised by ensuring that agriculture remains the preferred land use option by both farmers and decision-makers. The hypothesis was that farmers would continue farming and not sell their land if they could make a good living out of agriculture.

Project interventions supporting improvement of agricultural production in peri-urban areas around Gorakhpur city consisted of four major components:

1. The project introduced a number of low-external-input, sustainable agriculture (LEISA) and climate-resilient production practices through farm models, with the underlying idea of “seeing is believing”. 30 farmers (12 women) were involved. The practices build on agroecological principles in terms of sustainable production, decreasing dependence on external inputs, reducing vulnerability and promoting food security and

### Practices included:

- *compost: introducing several different composting forms*
- *trichoderma: introducing this fungi strain which enhances plant and root growth*
- *bio-pesticides: mostly made from locally-available resources to deter pests*
- *oil cakes: mostly using locally-available mustard oil and neem as additional fertilisers*
- *plantation: establishing tree plantations of teak, but also other species such as guava*
- *mixed farming: growing more crops (mostly a variety of vegetables) on the same piece of land during a single growing season*
- *seed production: producing seeds on-farm or buying them*
- *IPM: promoting the lowest-possible use of pesticides and only using chemical pesticides if bio-pesticides did not have sufficient effect*
- *kitchen gardening: gardening for home consumption*
- *loft farming: farming on a loft or roof*
- *bag or thermocol farming: planting seeds in thermocol or jute bags, and hanging them on poles above waterlogged or inundated land*
- *low tunnel polyhouse: raising early nurseries and vegetables in tunnel greenhouses*
- *permanent raised beds: raising beds, so that they remain above waterlogged soil during the monsoon season*
- *relay cropping: starting a second crop amid the first crop before it has been harvested.*

income for both men and women farmers.

2. Formation of local institutions such as the Farmers' Clubs, Agro-Service Centres, Farmer Field School and the Laghu Seemant Krishak Morcha (LSKM) that can be considered as farmer unions and fall under the umbrella of the national LSKM
3. Provision of the weather forecasts and agro-services provided by SMS
4. Establishment of direct linkages from farmers to government line departments and GEAG agronomic experts.

Complementary project interventions such as research, documentation and advocacy furthermore enhanced the understanding of policy- and decision-makers about the importance of preserving peri-urban agricultural lands.

In case of floods, practices such as bag and loft farming help farmers to grow saplings during the flood season. These can be planted into the fields once the water recedes. In case of water shortage, farmers are now able to rent the needed equipment from the agro-service centres to irrigate their fields when needed.

The project has had a tangible and demonstrated impact on direct beneficiaries and "outreach" farmers. The average agricultural income of farmers has more than doubled due to uptake of agroecological practices, reduced input costs, crop diversification, crop intensification, expansion of agricultural land under cultivation, and reduced crop loss due to natural hazards such as floods. Income also increased because of better market linkages and better prices for products.

Evaluation data available estimate that 50-80% of the farmers in the intervention villages adopted one or more of the above practices, while the adoption rate in neighbouring villages was estimated at 10-30%.

The project's activities have also resulted in greater resilience of farmers based on:

- increased resourcefulness (due to better access to needed equipment through the agro-service centres), resources (such as capacity building and finances), and services (such as government programmes)
- increased access to information due to its provision, discussion, and dissemination through farmer clubs, farmer field schools, and LSKMs, and GEAG's provision of weather and agro-services data to help them make more informed decisions
- increased responsiveness, due to their increased abilities to respond and adapt to their situations.

By demonstrating improved practices and increased income, the project has renewed people's interest in farming in the peri-urban areas. As a result, according to a project sample study, the sale of agricultural land decreased substantially in the eight project intervention villages. According to the study, 1.83 acres of land were sold in the northern cluster of the city in 2010, while this was reduced to 0.66 acres of land in 2015. In the southern cluster the decrease was even more apparent: from 6.9 acres in 2010 to 0.2 acres in 2015 (according to a sample of 166 farmers in the northern cluster and 108 farmers in the southern cluster in the 8 project villages). This is despite many builders still coming to inquire if there is land for sale and land prices having gone up by 10 times over the last years.

### Reducing flood risks

The project's contribution to its overall goal of buffering floods in Gorakhpur has not been clearly established. The project implementation was only in eight villages of the 170 in the peri-urban agricultural area – a scale too small to have a tangible impact on buffering floods. Moreover, the production interventions and typology promoted by the project were oriented toward reducing climate change impacts on agricultural production and income. They were not oriented toward reducing climate change impacts on the city through preservation and improved management of agricultural land areas.

The project recognised that implementing peri-urban agriculture to buffer floods is only part of the solution. Other parts of the solution, such as attention to the city's poor drainage and introduction of holistic planning, would call for controlling city expansion and development, establishing

proper drainage systems, and ensuring conservation and proper management of open spaces, water bodies, and agricultural lands in peri-urban areas and beyond.

### Monitoring sale or preservation of agricultural land

Habitat III and the New Urban Agenda (NUA) recognise that urbanisation has increasingly linked cities with their peri-urban and rural hinterland, spatially as well as functionally. Given the large scale of urbanisation and the transformation of rural space, it is argued that sustainable urbanisation must promote integrated territorial development. Balanced urban-rural linkages are needed as part of a common system for the benefit of the urban and rural population alike.

Such balanced urban-rural linkages have to build on protection and preservation of agricultural lands in city regions. Such protection is also key to the building of more resilient City Region Food Systems. In terms of the Sustainable Development goals, the project addresses the following three:

- SDG 2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture)
- SDG 11 - Make cities and human settlements inclusive, safe, resilient and sustainable–
- SDG 12 - Ensure sustainable consumption and production patterns

Specifically, the project addresses target 11a: Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning. Under SDG 12 it addresses Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources; target 12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses; target 12.7: Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

Sustainable planning and management of peri-urban agriculture areas is also key to the implementation of the NUA in three key ways. First –and as illustrated by the Gorakhpur project- its benefits are multiple and stretch beyond the food system to key policy areas of concern. These include local economic development, spatial and economic planning, and ecosystem protection. Second, the development of sustainable city-region food systems can generate positive political support for wider urban-rural linkages through coalition building centred on food. And thirdly, protection of peri-urban agriculture production merits attention in its own right given the importance of addressing more sustainable urban food systems and climate-resilient urban growth.

The promotion of agroecology in connection to other support interventions has proven to be the key to increase economic viability of peri-urban farming systems in Gorakhpur. Beyond the more traditional monitoring of impacts on farmer livelihoods (food and nutrition security, income),



*Bag farming.* Photo by GEAG

there are others. Monitoring the sale, or conversely, preservation, of agricultural land, is an important indicator to monitor not just effectiveness of farming practices, but also of more sustainable urban growth.

### Replication potential

There is a huge scope for replication of the project in other villages in the peri-urban areas of Gorakhpur. This project's scope for replication, at city and district level and beyond, would require continued advocacy work to promote agroecological production as a peri-urban land use management strategy. Inclusion of such land use in disaster risk reduction and management plans would also be paramount.

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# Agroecology as a Driver for the Development of a New Sustainable Urban Settlement in Taiwan

Marina Chang

**This article reports an on-going research initiative involving Sa'owac village, an urban indigenous community in Taiwan. It concerns the Amis traditional agricultural practices on a peri-urban riverbank settlement as well as addressing political issues such as citizen participation, right to the city, food justice and food sovereignty. Our work adopts a collaborative, participatory and inclusive research approach involving universities, community colleges, NGOs and grassroots social movement organisations in Taiwan.**

## Sa'owac Village in Taiwan

50 years ago, due to rapid urbanisation and loss of land and livelihoods, groups of the Amis people, the biggest indigenous tribe in number in Taiwan, left their rural east coast homeland and moved to cities, either voluntarily or under coercion, for temporary and low-paid jobs. Gradually, they realised that city life was too difficult but there was no land to return to. A small group followed the Dahan river upstream, to the edge of the metropolitan Taoyuan County (changed to Taoyuan City since 2014). Here in north Taiwan they established their settlement on the riverbank. They built cottages and farmhouses using traditional techniques and recycled materials collected from the urban construction sites. They explored the local environment to gather wild foods, and transformed unused land into vegetable gardens. They also established rice farming, fishing and raised livestock to feed their families.

However, these newly built 'homes' were not safe. In late 2008, in response to land politics and development interests, the Taoyuan metropolitan government notified the Amis indigenous residents that, as illegal residents, their shelters would be dismantled and their fields paved to create a new riverside bicycle route to boost eco-tourism. The Amis, who had settled there with massive hardship and formed a deep attachment to the territory, launched a series of protests. Rather than rejecting the plan of this new bicycle route with its own social and economic merits, they demanded a just compromise accommodating middle class eco-tourism and the livelihood of marginalised peoples.

The violent demolition of their homes by the local government during the protests strengthened their

determination to fight for their basic human rights to stay and live. They publicly announced their tribal name in Amis language, *Sa'owac Niyaro* meaning 'Riverbank Village'. Through intensive networking and strategic alliances with many organisations and individuals, including academics, grassroots activists, NGOs, media reporters, other Amis groups and other indigenous tribes located elsewhere, Sa'owac villagers eventually achieved victory. They reclaimed their land, housing, and farming rights.

## Learning from Sa'owac Village

While indigenous food and farming knowledge has made great contributions to rural agroecology, the Sa'owac case study demonstrates its relevance in an urban/peri-urban setting in three ways.

1. Sa'owac villagers retain rich indigenous knowledge of wild food mapping, harvesting, preparation, cooking and other forms of processing. While many of these plants are widely regarded as weeds in non-indigenous eyes, they are common treasures from nature to indigenous people. This knowledge not only meets a large part of Sa'owac villagers' daily nutritional needs, but also plays a central role in maintaining cultural identity. It also supports exploration of the local environment around the settlement and acts as a guide to constructing of an agroecological farming system.
2. Despite its intimate scale, Sa'owac village presents a vivid example of sustainable urban metabolism – an organic circular economy: where indigenous practices attuned natural cycles; and 'waste' is converted into useful resources. This process serves to both heal alienation and close the waste-energy-water-food loops. Such a microcosm of traditional agriculture offers a promising model for other areas, promoting biodiversity and sustainable year-round yields.
3. Sa'owac village demonstrates the potential of indigenous knowledge to transform the peri-urban zone, providing a framework for restoring the livelihood of small-scale urban farmers using socially oriented schemes such as communal and solidarity economies. It also mediates a de-urbanisation phenomenon where people migrate to the countryside and experiment with new forms of smallholder farming practice.

Through long-term exploration and cultivation of the environment, Sa'owac villagers transformed the natural



During the protest period, boards with newspaper clips, "Where is justice? Why demolish the Amis tribe only for a new bicycle route?" were erected just outside their settlement. They are shown being demolished by the local government.



In the foreground, diverse vegetables and fruits, including banana, papaya, cassava, cabbage, aubergine, Chinese spinach, asparagus, and water bamboo shoots are grown in this small vegetable garden. In the middle, there are trellises growing legume plants such as beans, peas and corn, which can help nitrogen fixation. Applying an intercropping farming technique can largely reduce the damage of pests, which does not require any pesticide and chemical fertiliser. In the far distance at the back, one can see modern urban buildings, which are a one-hour drive from this farm site.

riverbank into a thriving ecosystem, which provides favourable ecological conditions for highly productive, diverse and sustainable agroecosystems. Not merely oriented to critiquing dominant society trends, they are redefining the basis of an alternative. Since the protests, the elderly Sa'owac villagers have strongly advocated development of a long-lasting vision for self-reliance and self-determination that can be appreciated not only within the Amis community, especially by the younger urban generation, but also by wider society.

### Conclusion

While agroecology has made great contributions to rural development, this paper considers its urban relevance. We argue that the village's identity is grounded, through agroecology as driver, in village development and response to socio-political adversity, utilising and perpetuating indigenous food and farming knowledge and establishing land rights. We hope this paper will stimulate new debate and future research. In particular research is needed on the transformative potential of agroecology and urban indigenous communities, to help us rethink the wisdom of the past in designing future solutions for urban development.



A farmhouse was built by using traditional techniques and recycled materials collected from the nearby urban construction sites.



A group of community college students on a field visit to Sa'owac village. In the lower area of the farmland ditches were dug to introduce streams of the river. Water spinach grows around these ditches, both in and by the water. The source of water also forms a natural fishing pond. One villager explained to students this integrated fish-plant symbiotic model. While initially most students thought these ditches were covered by weeds, they soon realised that they were edible plants.

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# Learning from Nature: New forms of urban permaculture in Seville

Christopher Yap  
Xavier Castroviejo

*La Boldina's perma-formance in barrio Macarena, Seville; using public performance to share their permaculture philosophy. Photo by Christopher Yap*

**La Boldina is a group dedicated to urban permaculture in Seville, Spain. Whilst the group's practice is rooted in classical permaculture principles – promoting biodiversity, sustainable resource management and self-maintaining green spaces – they are also experimenting with new ways of learning and engaging with the city through agroecology.**

La Boldina emerged from Huerto del Rey Moro, an occupied community garden in Macarena; one of the few green public spaces in Seville's *Casco Antiguo* (Old Town). There exist some differences of opinion regarding the management and development of the site. Some local residents emphasise organic food production and gardening. Others are driven by a more holistic vision for managing the land that draws on both permaculture and, implicitly, agroecological principles.

In response, at the start of 2017, a group of permaculture gardeners began to look for new growing spaces. La Boldina now cultivates sites across the city including school gardens, occupied spaces, allotments managed by the City Hall, and a small farm in Hinojos, 40 km outside of Seville.

Working with rather than against nature leads inevitably to the development of diverse and distinctive growing spaces. These spaces are characterised by companion planting, water recycling, and the protection of the long-term vitality of the soil. La Boldina focuses on cultivating spaces in a way that maximises their long-term resilience. Food growing is a secondary activity. In addition to urban agriculture, their

activities include performance art and storytelling, public lectures, and public permaculture training workshops.

La Boldina's commitment to permaculture is reflected both in the spaces they cultivate and in the group itself. This includes how it operates and how it engages with the wider city. The group is consciously diverse and non-hierarchical. It comprises gardeners, architects, teachers and performing artists, amongst others. Knowledge of permaculture varies significantly, from those that are entirely new to the practice, to those that have accumulated a vast knowledge over many years. However, by creating a space for knowledge sharing, discussion and experimentation, La Boldina has become a creative and adaptive organisation. From it, diverse projects emerge and take shape organically.



*Boldo, from which La Boldina takes its name, is central to the group's permaculture practice. Photo by Christopher Yap*



*Huerto del Rey Moro, Seville.* Photo by Christopher Yap

For this group, permaculture is a philosophy that extends beyond managing gardens. La Boldina uses permaculture as a lens for engaging with other urban processes. A permaculture-inspired community, for example, should be diverse, adaptive and self-managing. At the same time agroecological ideas, such as recognising interconnectivity and cycles, are being repurposed as social and political principles for engaging with broader urban issues. These include the speculative housing market and gentrification of working-class neighbourhoods. As one member explains, permaculture principles are increasingly “reflected in the private lives of the group”. This thinking is reflexive within their small community of 30-40 individuals, but it also shapes their wider engagement with groups of residents in the neighbourhood, and other self-organised networks across the city.

To date, La Boldina has transformed several new growing spaces and given new life to existing sites. However a number of challenges remain. The group, though growing, is still a small exception in a city of almost 700,000 people. In order to cultivate wider change, La Boldina will need new allies to share their vision for a greener, community-managed urban environment. Moreover, La Boldina’s commitment to participatory processes and the organic emergence of new initiatives has led to a conscious lack of clear strategic direction and clear group identity.

Yet these challenges are not necessarily critical. Whilst the group’s identity is still emerging, there is a strong, collective sense of identification *with* the group. Rather than trying to influence institutional political processes, La Boldina is collectively developing an urban permaculture philosophy that profoundly affects how they and other citizens might understand and transform the city, materially and socially. One member of the group described the process as “throwing seeds”, the aim being not to grow as one organisation, but to proliferate, multiply and connect.

In La Boldina, we can see an emergent form of urban permaculture; one that reconciles classical permaculture principles with the local social, cultural and ecological contexts. In learning from nature, the group is seeking new ways make their urban environment more sustainable, more interconnected, and more collective. It is precisely this form of organisational innovation that will better enable us to articulate and share the multidimensional benefits of urban agriculture, and better integrate permaculture and agroecological principles into European cities.

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# Urban Agroecology in Rome

Caroline Ledant

*An horticulturist is resting and recovering from the bright sun. Photo by Maria Caterina Feole ©*

**What would be the distinctive features of urban agroecology that make it different from urban agriculture? What does agroecology look like in an urban environment? Taking urban gardens in the city of Rome, Italy as an example, this article describes some of the key aspects of the combination between agroecology and urbanity. The rationale for urban agroecology goes well beyond the need for more green spaces and fresh food; this article highlights the important social and political aspects that differentiate urban agroecology from other types of urban agriculture.**

The concept of “agroecology” does not have a single and widely accepted definition. It is nevertheless historically rooted in social movements defending small-scale farmer’s rights to produce food following ecological processes and based on farmer’s knowledge and innovations. This is what is claimed in the Declaration of the International Forum for Agroecology (or Nyéléni Declaration). The Declaration was made by the International Planning Committee for Food Sovereignty, which represents more than 6000 small-scale food producer organisations worldwide. Control over the food system is at the heart of the issue. This means control over all aspects, ranging from land, water and seeds to end-products, production techniques and knowledge. This article illustrates how agroecology and its inherent challenge of people’s control over food and land can also be applied in an urban context.

## Gardening in Rome

Rome has an unusually large share of green areas (67% of the Municipality) of which a great part is under protection (67% of the overall unbuilt land). It also has amount of wastelands. The city of Rome and its surroundings are hosts to an increasing number of urban farms and vegetable gardens. Living up to their reputation, Romans are looking for fresh and quality products and are setting up diverse ways to bypass conventional food systems. Grassroots initiatives such as gardens and farms, as well as direct sales on-farm, farmers’ markets and purchasing groups are thus rapidly spreading.

### Urban gardens Tre Fontane

*The “Orti urbani Tre Fontane” gardens have been launched by a group of residents setting up a formal organisation. They submitted their project to the municipality, which rented them an abandoned plot for one year, renewable. For its members, the collective dynamic and the creation of a self-managed space are as important as food production itself.*

*The area is divided into individual plots and a collective space with fruit trees, a children’s playground, tables and chairs and an apiary. The collaboration with a school makes the educational garden very lively. In 2015 a campaign called “adopt a tree” was launched and promoted old varieties of trees or those threatened with extinction.*

### “New agriculture” farm

The peri-urban farm of Agricoltura Nuova was created in 1977 by a group of young people occupying land threatened by a construction project. Saving a natural area was the rationale for the community to develop the project, and to build an organic and multifunctional farm.

Today the agroecological initiative has a pizzeria, an equestrian centre, a picnic area, an impressive vegetable garden and a direct sales counter. This educational farm, with its apiary, cattle and poultry managed in synergy with the vegetable garden, enhances biodiversity (see also article in *Urban Agriculture Magazine 29* [www.ruaf.org/short-food-chains-rome-context-experiences-policy-implications](http://www.ruaf.org/short-food-chains-rome-context-experiences-policy-implications)).

A recent trend, asked for by social organisations, has led the city of Rome to take a role and set rules for urban gardening. In 2013, several organisations launched a petition asking for public recognition of “social and shared gardens”. In July 2015, City Hall approved a new regulation on urban gardens, stating that the public spaces can be rented for free, on a renewable basis, by organisations having legal personality. The regulation also provided for the development and maintenance of urban gardens in Rome. It states that the gardens should be 100% organic and exclusively grown for self-consumption. In other words, the products cannot be sold, while the recreational and education dimensions are fostered. This supportive provision of public land is one key step. Nevertheless, to date it is still the only incentive or support coming from either the Municipality of Rome or the Lazio Region to promote urban or peri-urban ecological farms and gardens.

Despite weak public-sector involvement, many informal groups and organisations restore and manage these numerous abandoned public spaces, creating collective dynamics and retaking control of their living environment. Growing one’s own food seems in many cases to be closely linked to the desire to create new and self-managed spaces. This also fosters new forms of democracy through collective control over public spaces and food production. Although



Urban farmers celebrate the “Archaic wheat festival”  
Photo by Maria Caterina Feole ©

involved gardeners usually do not claim to practice agroecology, several initiatives show strong links with agroecology as described in the Nyéléni Declaration. This will be discussed in the last section.

### Agroecology and urbanity

Taking control of space and food through gardening in an urban context gives a very specific shape to agriculture. The proximity to the city and its high concentration of people provides a wide range of potentialities for agroecological gardens. This section will highlight the features that can emerge from the combination between agroecology and urban areas, based on observations of different experiences in Rome.

*Taking control of both food and space:* The collective ownership of abandoned public spaces is frequent in Rome. Citizens organise themselves to manage a piece of land in their environment that allows them, to some extent, to rely less on the more conventional food systems. The creation of a self-managed area is as important as producing food. This was explained by one of the founders of “Orti urbani Tre Fontane”, according to whom such initiatives are driven by strong desires both to avoid a more conventional way of living individually and to avoid eating “food from nowhere”.

Nyéleni Declaration	Roman experiences (based on observations)
Agroecology goes hand in hand with the efforts for building local food systems	The food produced is consumed by the community (cannot be sold)
Agroecology is a matter of autonomy for farmers and consumers	Citizens share knowledge, seeds and experiences that reduce their dependency on the conventional food system
Biodiversity, ecological practices, old varieties	Use of old varieties, apiary, integrating crops, trees, compost, flowers and favourable conditions for insects and pollinators are among the activities that enhance biodiversity
Farmer’s knowledge sharing	Educational gardens and activities. Partnership with schools. Building and sharing of local knowledge
Access to the Commons	Collective ownership of land triggers social interactions, and collective management of resources such as water, energy and seeds.



*The horticulturists and neighbourhood residents have formed a musical band.* Photo by Maria Caterina Feole ©

**The social role of green spaces:** The need for green spaces where neighbours can meet and children can play is well justified in a highly urbanised and populated environment. Flowers, insects and trees undoubtedly improve the quality of life in urban areas, while the garden promotes social interactions. An increasing number of studies are demonstrating the positive effects on health of a daily contact with nature, and this is especially true in areas with high biodiversity.

**Biodiversity:** Agroecological urban gardens promote higher species richness and urban biodiversity amongst residential blocks and roads. In some cases, bees and other pollinators may even find more favourable conditions in cities, compared to some countryside areas with monocultures and chemically-treated fields. Moreover, the social compared to the productive role of urban gardens makes them quite suitable for experimenting with non-conventional crops such as low-production or ancient varieties.

**Education:** Many agroecological urban gardens in cities play an important educational role. The proximity of schools facilitates children's participation to gardening activities. While benefitting from the many positive effects of nature, it also brings them an opportunity to learn about plant and animal species, composting, plants interactions, insects, natural pest control, water management, traditional knowledge and so on. Being almost always directed to children, these educational activities also have the potential to be expanded to broader audiences.

### What can we learn from the Roman experiences?

The Roman experiences show that urban areas are already a place for agroecology as described in the Nyéléni Declaration. Distinctive features that characterise agroecology as understood by small-scale farmer's organisations worldwide are effectively present in Rome. These common features described below can be considered as guidelines to promote and enhance agroecology efforts in cities.

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# Food Forests: An upcoming phenomenon in the Netherlands

Eva de Groot  
Esther Veen

34

**Food forests are a relatively new phenomenon in the Netherlands, but there is increased interest. As there is yet limited knowledge of Dutch food forests, we conducted an exploratory study using a literature study, interviews with three initiators of food forests, and an online questionnaire amongst people interested in consuming from food forests. The last was distributed via Facebook and had 41 respondents. In this paper we share our most important results.**

## What are food forests?

Food forests imitate natural ecosystems by combining trees, crops and (sometimes) livestock. Where a monoculture uses only one layer for food production, a food forest is a polyculture with many layers (see figure 1). The top layer is the canopy or tall tree layer with trees around nine meters high, mostly nut and fruit trees or nitrogen-fixing trees. The second layer is the low tree layer, with trees between three and five meters in height, mostly fruit trees. Layer three contains shrubs, between the small trees. These are mainly berries, fruit, nut and currant shrubs, but can also be medicinal and flowering shrubs. In the herbaceous layer underneath, one finds perennial plants without woody stems, such as medicinal herbs and bee-forage plants. The fifth layer is the rhizosphere, consisting of root crops like potatoes or carrots. The soil surface, which fills the remaining space on the ground, protects the soil and prevents weeds from growing. The final layer is vertical, consisting of vines and plants that climb trees, such as grapes, berries or beans. It is possible to add layers, such as a wetland layer or fungal layer.

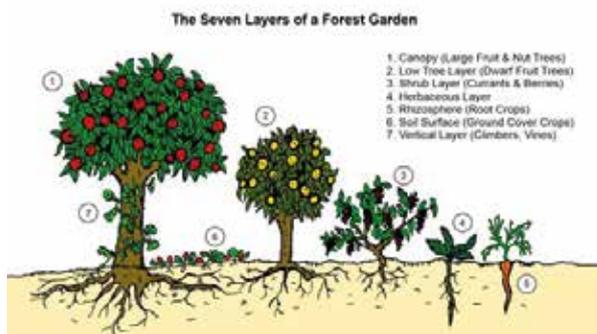


Figure 1: The seven layers of a forest garden (Eliades, 2011)

Food forests are a form of agroforestry, the umbrella term for land-use systems involving trees, crops and/or animals on the same unit of land. There are three main types of agroforestry: 1) agrisilviculture (crops + trees); 2) silvopastoral (grassland/ animals + trees), and 3) agrosilvopastoral (crops + grassland/ animals + trees). An agroforestry system can contain two or three plants, or more than forty different types. The more different species, the more the system is following a natural pattern. Food forestry takes this principle the furthest.

Permaculture, closely related to food forests and agroforestry, is a design philosophy that approaches agriculture from the viewpoint of self-sufficiency. It is an agricultural principle that uses the patterns and features observed in natural ecosystems and works with nature rather than against it. Permaculture looks at all the functions of plants and animals, not treating any as a single product. It has ethical principles like taking care of the earth and sharing the output of the land. Agroforestry is one of its many forms.

Similarly, food forests can also be seen as a form of agroecology, which concerns the application of ecological processes and principles to agriculture. It mimics structural and functional relationships of natural ecosystems, and beneficial interactions that preserve and restore ecosystem services.

## Food forests in the Netherlands

A map created by Van Akker naar Bos ('from Field to Forest': [akkermaarbos.nl/voedselbossenkaart/](http://akkermaarbos.nl/voedselbossenkaart/)) shows there are currently 54 food forests in the Netherlands, nearly 103 hectares, with another 13 planned. However, this number is likely overestimated since Van Akker naar Bos uses an unclear concept and includes initiatives that others would not consider food forests. Initiators can add their own projects so it is not always clear whether these are established or planned. Despite this shortcoming, figure 2 shows clearly that the interest in food forest is growing rapidly.

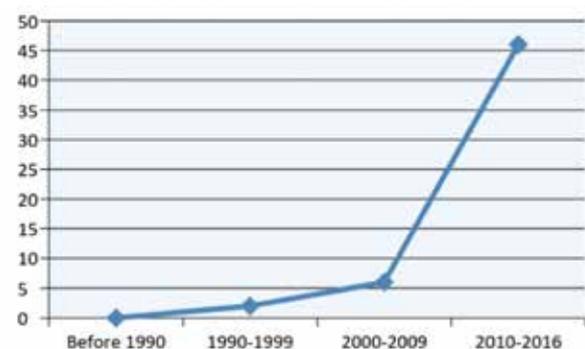


Figure 2: Growth of the number of food forests in the Netherlands

## Motivations to start food forests

We asked three food forest initiators for their motives: Xavier San Giorgi from Food Forestry Development - one of their established projects is food forest *Makeblijde* -, Jan Degenaar and Maarten Schrama - who are in the start-up phase with their *Voedselbos Lekkerlandgoed* - and Hans van der Velde from *Stichting BuitenZinnig*, whose food forest is in the planning phase. Interestingly, none of them has a farming background.

### Food Forest Eemvallei offers good economic perspectives

Marc Buijter, *Stichting Voedselbosbouw Nederland*

*On 5 July 2017 six parties were contracted for the realisation of Eemvallei Zuid, a public nature area of 50 hectares in Oosterwold, a suburb of Almere in the province of Flevoland. The occasion was also the kick-off of the biggest food forest in Europe thus far (30 hectares) that will be an integral part of the area. Stichting Voedselbosbouw Nederland is responsible for its design, development, management and economic operation.*

*The festive signing of the contract was the culmination of a complex and prolonged process of consultation and negotiations between the province of Flevoland, the municipality of Almere and the initiators: Staatsbosbeheer, Stichting Speelwildernis, Stadsboerderij Almere and Stichting Voedselbosbouw Nederland. Staatsbosbeheer is the former state forestry service. Now economically independent, it is the leading owner and manager of forest land and natural areas in the Netherlands. In the coming months, the provisional design will be elaborated into a detailed, definitive design for the whole natural area of Eemvallei Zuid. The planting of edible and otherwise functional trees and shrubs will start in 2018.*

*The Food Forest Eemvallei will be a recreational food forest open to the public. An exploratory analysis of costs and benefits indicates economic profitability starting 2026. A limited budget for planting and landscape management will be provided by the province of Flevoland, just enough for the basic management and harvesting for the first eight years.*

*Nevertheless, there is reason to be optimistic about the economic potential of Food Forest Eemvallei as it provides opportunities for additional sources of income. Besides the selling of fresh forest produce like nuts, fruits, herbs and vegetables, income can be derived from the manufacturing and sale of other processed forest products. Ciders, marmalades, smoothies and chutneys can complement recreational services like forest tours and leisure activities. Training and education in food forestry and forest ecology can complement ecosystem services like carbon sequestration and enhanced biodiversity.*



Photo by Voedselbos Vlaardingen

Rather, they were inspired by the food forest concept and wanted to bring it into practice. However, they have different aims, such as research, production, or enhancing social contacts. Food forest education moved all three interviewees.

### Motivations to consume from food forests

It usually takes five to ten years for a forest to be fully productive. Most food forests in the Netherlands are being planned or just beginning. There are hardly any 'consumers' yet to buy or pick food from them. The main interest of our respondents, prospective consumers, was the concept itself and its perceived environmental benefits. Seventy-one percent mentioned a more diverse ecosystem, and 23% no use of chemicals or fertilisers. While most people may not want to visit food forests only to buy products, 63% of our respondents would visit food forests for recreation purposes like forest hikes or picnics. Clearly, food forests can serve multiple functions.

### A future for food forests in the Netherlands?

We wondered if people's diets could consist of food forests products alone and whether producers could make a living from the forests' output. Most food forests produce nuts, fruit, vegetables, herbs and sometimes meat. A good design would enable much to be grown or raised in a food forest. But living completely off the harvest of food forests would require changing to a diet with little to no grains, meat and fish.

The food forest initiators we spoke to claim it is possible to make a living from food forests. They argue that forests can generate a large output per hectare due to the different layers. Moreover, food forests often cultivate special species that can be sold as niche products for higher prices. In practice, there are currently hardly any food forests with a viable business model. Perhaps this can be promoted through care or educational activities.

### Future steps

Managing a food forest is hard; it requires a lot of knowledge and takes a long time to generate outputs. Most food forest farmers will need financial support for the first few years. Some are transitioning to food forests gradually. Farmers are currently participating in various projects and research; a study is currently investigating integration of food forests in the metropolitan region of Rotterdam and The Hague (see box).

## Food forestry in the delta landscape: strategies for research and realisation

Paul de Graaf, Rotterdam Forest Garden Network

Forest gardening or food forestry is seen as a promising form of agroecology. But it is not ready for application in West European agriculture because of a lack of practical localised experience. The main function of the first generation of food forests from the viewpoint of sustainable agriculture is learning, gaining experience and gathering reliable data on investments in time, labour and capital.

However, food forests serve many other functions of more immediate value, such as recreation or increased biodiversity. Because of this diversity of policy goals, many food forests get public financial support or private investments of money and time. A challenge at this stage is finding permanent locations for food forests, especially near the city.

Rotterdam Forest Garden Network (RFGN) aims to realise a diversity of food forests, to learn from and inspire, in and around Rotterdam. For each location a unique model is developed that balances available social, spatial and financial resources. So far, they have established an inner-city park, a former educational garden and a collective garden of a school and a retirement home. Stichting Voedselbos Vlaardingen was realised in 2015 in a recreational area at the edge of the city of Vlaardingen. On this one hectare, RFGN will test the concept in the low-lying peat landscape common in the west of the Netherlands. They want to increase biodiversity, enhance recreational value and experiment with food forest business models.

The site is part of the regional recreational area administered by the Recreatieschap (which represents municipalities and the Province) and managed by Staatsbosbeheer. Stichting Voedselbos Vlaardingen (SVV) rents the land free of charge for 20 years, with the possibility of extension. Once the food forest becomes

profitable, SVV will start paying rent. The food forest is expected to become productive after four or five years reaching full production after 15 to 20 years, with some trees only reaching full production after 50 years. This timeframe and the reliance on volunteers and social entrepreneurs is a challenge. The food forest will consist of a publicly-accessible part and a semi-public part where products are harvested by SVV. The costs for realisation were covered by funding from the Province, the Innovation fund from the Recreatieschap and a local private fund. Running costs will mostly be the time and labour of four to eight hours a week for a coordinator and a group of five to ten volunteers. The intention is gradually to cover the professional hours; currently the coordinator, a member of the RFGN, works for free. A paid part-time job will help make the food forest less reliant on personal motivation. The site is too small for a full-time food forest farmer, but the knowledge gained will hopefully help future initiatives to set up professional food forests. For now, educational and recreational activities as well as the processing and sales of the first food forest products provide some income. RFGN considers itself part of a national group of frontrunners (including Stichting Voedselbosbouw NL, Rich Forests and Circle Ecology) that collaborate, exchange knowledge and initiate research on food forests. The research "Food forestry in the Deltalandscape" aims to identify and map physical, conceptual, legal, social and financial space for realisation of food forestry experiments in the Rotterdam region. It is an initiative of RFGN and Voord&Wij, supported by a grant from the Creative Industries Fund. It combines stakeholder dialogue with comprehensive mapping to identify real possibilities for interested farmers and others. It will develop a framework that embeds food forestry in public policy and private interest in the region. The intention is to start pilots that involve new coalitions of landowners, farmers, investors and citizens/consumers and take a next step towards a viable food forestry.

Food Forestry Netherlands used to function as a national umbrella organisation, this role is now taken up by *Stichting Voedselbosbouw Nederland*. However, until now most food forest initiatives remain unconnected. Some of the main players do exchange knowledge and experiences, but others are following their own course and form their own networks. More collaboration could improve awareness, knowledge and communication about food forests. Hence, better cooperation between food forest producers may be the start of a viable agroforestry community.

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# Romanticising the Past: A case study of a tide mill

**“Twice a day the mill takes a gulp of the incoming tide”, is a popular lyrical description of the ancient technology of the Woodbridge Tide Mill in Suffolk as it harnesses the physics of the natural world. The human exploitation of the rhythm of the tide cycle demonstrates to an energy-challenged modern world a sustainable method to power a food-processing machine. It encapsulates the fundamental dependence of humankind upon natural physics and demonstrates an example of how to decouple ourselves from contemporary dependence on fossil fuels and globalised food systems. It helps reduce our ecological footprint.**

The miller utilises the tide timetable as it ebbs and flows with the gravitational pull from the moon. The miller also has an intimate knowledge of the tidal river and the workings of mill machinery powered by centrifugal and gravitational forces. Twice a day the millpond fills with high tide water through a non-return pipe. This water is then saved until low tide. At low tide, sluice gates holding back the millpond water open. The force of the escaping water is sufficient to turn a five-metre diameter oak wheel at up to five revolutions per minute. This force then powers the millstones via a system of cogs to produce a regulated five tonnes per annum of locally grown high protein flour.

The thirty thousand year story of milling grain – that includes human and animal power, water, wind and electricity – is an impressive catalogue of resourcefulness, invention and the search for efficient and convenient energy to transform a hard indigestible grain into food. Milling cultivated grain began with female energy grinding the grain by hand using stone querns, a practice that continues in rural African, Asian and South American communities today, and perhaps represents the most authentic community mill.

The contrast of small scale, localised and predominately female milling communities with the 800-year long history of the Woodbridge Tide Mill made me consider the social and economic implications of such a case study for a more sustainable food future. As a machine once sited within a zero-carbon farming and transportation system – one that used horses and sailing barges to farm and deliver grain and flour – it has much to communicate about sustainable food infrastructure. Yet as a model for a more holistic view of sustainability it is perhaps questionable. While community resilience as vital, the aspects of social inclusion, gender equality

and equitable urban food provision are also important. The mill machinery is a powerful example of humankind working with nature, but the mill lists the church, monarchy and businessmen as past owners; these ran commercial models of production.

The Woodbridge Tide Mill is the only working tide mill remaining of the 200 British tide mills that were built in the stone, wood or clay brick of their locality. In 2011 a donation of nearly one million pounds sterling was awarded from the UK Heritage Lottery Fund to repair and reinvigorate the mill as a ‘Living Museum’. The practice of milling wheat grain using power derived from the tide was revived at the mill in 2012 to top up visitors’ admission entrance income. These provided the means to finance the repairs and maintenance of the volunteer-run mill. Many of the 2000 annual mill visitors declare the mill ‘so clever and yet so simple’.

Undoubtedly, it is a very clever machine that works in harmony with nature, yet as a case study or model of sustainable food processing it also reveals more about people who construct and manage food chains. If we are only “domesticating of the past... for present causes” without questioning the historical British milling model we forsake the principles of equality and social involvement which are just as necessary for sustainable and equitable urban food. The charming appeal of the old mill gently drinking to provide the energy to grind grain is an example of how the construction of ‘popular consciousness’ that “fit[s] in the framework of contemporary interests” can mythologise heritage food stories.

The mill offers many valuable energy-efficient and sustainable solutions to milling, yet with a more holistic analysis, it could also reveal some valuable insight into patterns of economic and social markers that regard food as trade and not development. Wholesome and natural versions of British milling must be seen in relation to their feudal history, to capitalism and gender inequality. Otherwise we overlook the potential of learning about how control and power challenge food security. Awareness-raising of such aspects could perhaps be key to greater understanding of the behavioural complexities of food production.

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# Pioneering Urban Agroecological Research with Citizen Science

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Margi Lennartsson  
Gareth Davies

**The Henry Doubleday Research Association (HDRA), now known as Garden Organic, was established as a UK charity in 1958 by Lawrence Hills. From the outset the aim was to conduct scientific research that could ‘improve and encourage horticulture and agriculture generally’ (stated as object 1 of Henry Doubleday Research Association). With very limited funds, the idea was that simple experiments would be conducted by the members in their own gardens and the results sent back to be collated and published in the quarterly Newsletter of the association.**

The organisation was very much conceived as an association of individuals that would explore, trial and share knowledge about ‘alternative’ farming or gardening techniques. Lawrence Hills was strongly motivated to challenge what he perceived as ‘orthodoxy’ or ‘authority’ by using experimentation to challenge the type of industrialised food production that was being developed after World War II. He was a key pioneer of the organic movement alongside Lady Eve Balfour and Sir Albert Howard.

In the early years, when there were only a few hundred members, there were regular participants working in one or more ‘teams’ that each tackled a particular issue: *Russian Comfrey* (differences in varieties, productivity and value as a stock feed, as a soil improver or in medicine), *Pest Control Without Poisons* (the benefits of various plants, particularly *Tagetes*, on pests and diseases), *Composting and Green Manures* (techniques of composting, effects of applications and the use of different green manure species), *Freak Plants* (looking for possibly useful abnormal plants that may have resulted from nuclear testing then being carried out). Over the years these themes became less clearly defined as the range of research undertaken increased but in broad terms they have been continued until the present day (Figure 1).

Since the beginning, between three and ten members’ experiments have been conducted each year (sometimes repeated in successive years) – more than 500 experiments in all. Some ran in collaboration with other organisations (such as universities or commercial companies) and some have been used as the foundation for more formal scientific studies. Experiments to investigate various aspects of pest control have been the most common, particularly so in the early years. In the last fifteen years there has been an increase

in the number of experiments concerned with novel crops, wildlife surveys and socio-economic aspects (e.g. surveys of garden productivity and vegetable buying habits). At present there are usually between 100 and 300 participants in each experiment – mainly private individuals but also schools and community groups. Clearly defined instructions are provided (together with seeds or other specialist materials) and there are either paper or on-line forms to complete to record the results.

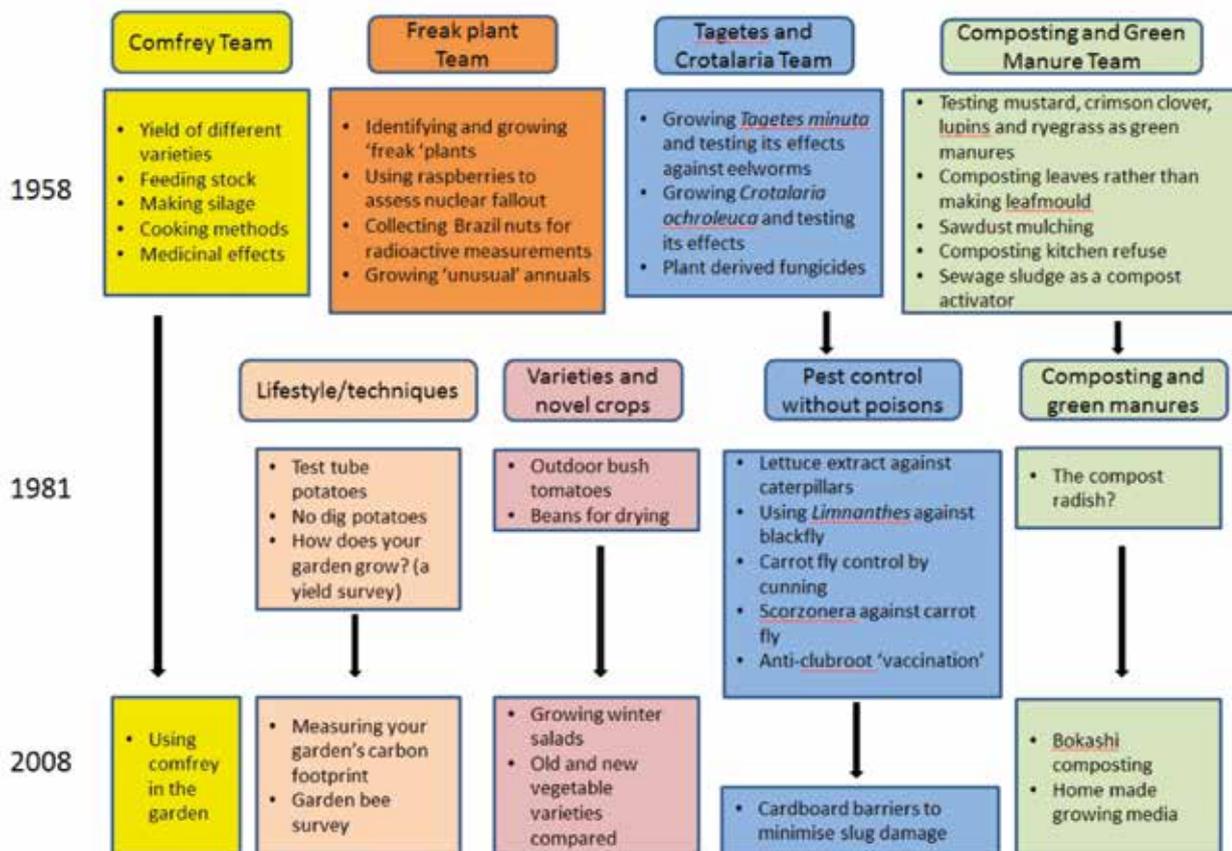
The results have always been published, primarily for the benefit of the members, in the organisation’s Newsletters (now known as *The Organic Way* magazine). Initially individual accounts were reported verbatim, with little statistical analysis or objective evaluation. This approach

## Garden Organic today

*After 60 years, Garden Organic is still supporting individuals and communities today across the UK in developing important horticultural skills based on the principles of organic growing. Garden Organic is home to the Heritage Seed Library, a unique living collection of over 800 endangered vegetable varieties, safeguarded from extinction and shared with growers nationwide. They also work to preserve exotic crops through the Sowing New Seeds project, bringing communities together through sharing and growing crops, which they have brought to the UK from around the world.*

*The Master Composter and Master Gardener programmes engage expert volunteers to mentor and support novice growers and help them to compost effectively. The Food Growing Schools: London project is a diverse project that engages children practically across the spectrum from food growing to cooking and turning the produce into higher value items. The project start coincided with the changes to the Government school food policy, and it became an important tool to enact the cooking in the curriculum requirements of the new policy. Garden Organic has also developed a number of project within vulnerable and food insecure communities (in Warwickshire and Southwark), where gardening and mentoring schemes have helped to identify food insecurity that goes below the radar, or tackled health and wellbeing through horticultural therapy.*

Figure 1. Examples of Member's Experiments in each of the key themes carried out at different times in the organisation's history.



was harder to maintain as the numbers of members and participants increased. Later, with the employment of dedicated research staff, the results were better summarised and the conclusions more clearly identified. One of the aims of the work was to establish firm foundations for advice concerning organic gardening techniques and to dispel unfounded 'myths'. Many of the findings were incorporated in popular books written by Lawrence Hills and then subsequently by other authors working for the association (e.g. Stickland and Pears). With Lawrence Hills background in journalism (gardening correspondent of *The Observer* 1958-66 and of *Punch* 1966-70), the findings were also very successfully disseminated to audiences outside the organisation, via regular columns in gardening magazines and broadsheet papers and also via Britain's first organic gardening television series *All Muck and Magic* broadcast by Channel 4 in the late 1980s and through practical demonstration in the organisation's gardens open to the public. As a result, the experiments really underpin many organic gardening and growing techniques commonly used today. The information provided an important source of guidance, not only for organic gardeners, but notably also for many of the first commercial growers who started to grow organic vegetables on a field scale.

The participatory approach of the research has clearly benefitted and influenced organic gardening in practice over the years, offering an active approach to knowledge transfer and often a very immediate uptake of research findings. In a

recent questionnaire, many of the experimenters participating in the scheme reported that their involvement had often had a direct impact on what they grow and how they manage their gardens. Example quotes from the respondents included:

*'Yes, the experiments influence the way I garden- the use of comfrey fertiliser, mulches, composting techniques and pest resistant varieties are some examples.'*

*'This year my leeks had leek moth. Having done the experiment, I knew to cut the leeks down. They have re-grown.'*

*'I now look more closely at bees, bumble bees and butterflies.'*

*'One year there was a slug count. I became more aware of the different kind of slugs and their habits and I now don't feel it is necessary to destroy every single slug in sight.'*

*'Taking part in the experiments have made me realise to what extent all gardening is in fact a series of in vivo experiments... I am now more likely to compare two things and see what works best.'*

From the 1990s onwards, increased external funding for research allowed the organisation to also conduct more 'formal' scientific research, often to develop agroecological ideas and techniques originally explored as Member's Experiments, for example, to examine the effect of winter green manures on soil nutrient dynamics. Whenever

### Examples of some recent experiments

**Shark's fin melon as a novel crop (2012).** *Cucurbita ficifolia* gets its name because the flesh of the large fruits can be made into a broth resembling the texture of shark's fin soup. Seeds were obtained as part of the Sowing New Seeds project (which was set up to encourage the growing of exotic crops in the UK). The experiment was run to find out how well the plants grew in different areas of the UK and how worthwhile the melons were as a cooked vegetable. Almost all the experimenters found it to be a very vigorous and productive plant, although many found it to be unpalatable.

**Ecological footprinting of gardening (2007 and 2008).** This experiment took the form of a survey to evaluate how much CO<sub>2</sub> was generated by the members' eating habits and their gardening activities, considering both the resources used and how much food was produced. Growing at home could reduce the carbon footprint associated with fruit and vegetable consumption by 13% although frozen storage could have a significant impact.

**Bumblebee survey (2013).** One of the aims of this project was to raise awareness of the importance of bumblebees in urban areas and to find out which food plants were important to them. Even plants that appear popular with a large number of bumblebee species may be avoided in preference for other plant species when these are available – emphasising the value of diverse planting schemes. This work led to the development of the Blooms for Bees project: [www.bloomsforbees.co.uk](http://www.bloomsforbees.co.uk)

**Blight resistant tomatoes (2011 and 2012).** *Phytophthora infestans* causes 'late blight' in both potatoes and tomatoes. This experiment was run in collaboration with the Savari Research Trust and ProVeg seeds to evaluate the performance of newly bred bush varieties of tomatoes. Participants were also encouraged to send in samples of diseased leaves for genetic analysis to help map the incidence of different blight strains across the UK.

**Biochar as an amendment to enhance soil fertility (2014).** The addition of biochar (charcoal) to soil can have beneficial effects on fertility and has been advocated as a way to mitigate climate change. However, its use is controversial and this experiment, run in collaboration with Oxford Biochar, was designed to evaluate its applicability in a gardening situation. Participants were supplied with biochar and seeds of suitable test crops.

**Compostable packaging (2015).** In recent years there has been an increase in packaging labelled as 'compostable'; the aim of this experiment was to find out how well a range of products decomposed in typical domestic compost heaps. Plates made from bagasse composted well but forks made from plant based materials did not and there were very variable results with caddy bags. The official 'home compostable' label was not found not give an obvious indication of how well materials actually broke down in practice.

possible the research still employed participatory approaches, but working primarily with commercial organic producers growing fruit and vegetables on a field scale. This resulted in close links with a number of universities and research institutes, particularly with Coventry University which went on to establish the Centre for Agroecology, Water and Resilience in 2014.

As a well-established citizen science programme, the Members Experiments has provided a structure for investigation by individuals and groups, particularly schools. In addition to generating new knowledge, this pioneering research programme has continued to have an important role for Garden Organic in terms of enabling active engagement with members and to promote interactive learning.

The combined results and achievements of the citizen scientists have provided a firm base for organic gardening practice as we see it today, and as a social movement with its values firmly embedded in the wider principles of organic agriculture - the principles of health, ecology, fairness and care - it is likely to continue to be important for urban agroecology practice also in the future.

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# Urban Agriculture in Cuba: 30 Years of policy and practice

Margarita Fernandez

*Mutistructured intercropping at Organopónico Alamar. Photo by Margarita Fernandez*

**It is estimated that by 2050, 80% of the global population will live in urban areas, a reality that is changing priorities for urban planning and policy. For many years, Cuba has already reflected what that future global reality will be, with close to 80% of its population living in cities across the island. This dynamic, along with a combination of conviction and necessity, is one of a handful of reasons the urban agriculture movement in Cuba took hold in the early 1990s.**

For more than two decades, Cuba has been a global leader in the policy, science and practice of agroecology in general and of urban agriculture based on agroecological principles in particular. While the term ‘urban agroecology’ is not commonly used in Cuba, instead ‘urban agriculture’ or ‘urban agriculture based on agroecology’, agroecological principles are fundamental to the movement.

In the 1990s, Cuba was plunged into an era of severe food and fuel shortages as a result of the fall of the Socialist Bloc, the source of more than 80% of their imports at the time. This forced a transition from a centrally-planned, large-scale, high external input, capital intensive monocultural system to a decentralised, small-scale, low external input, diversified, knowledge-intensive system. The transition required a restructuring and decentralisation of land tenure and management, food distribution, technical assistance and knowledge exchange.

Urban agriculture was one of the most important strategies responding to the food crisis initially and has over the years established a stable role in national food and agriculture policy and practice. Bringing the producer closer to the consumer was essential in a country that faces fuel shortages and whose population is 80% urban. This article describes the evolution of the multi-actor, multi-scale institutional and management structures that engage with and service urban agriculture. It outlines the policy environment that has enabled urban agriculture in Cuba to be successful, and summarises key social, economic and ecological benefits achieved to date.

## **Multi-scale, multi-sector, multi-actor management structure and programmes**

The urban agriculture movement, based on agroecological principles, has been and continues to be successful because of the diversity of actors deeply engaged across sectors and scales. Even in 1987, before the crisis, Raul Castro, as head of the Armed Forces, initiated the production of cafeteria food through intensive production in raised beds called *organopónicos*. When the food crisis hit, the *organopónicos* became a popular form of production that spread throughout cities in Cuba. Ministries, institutions and schools were encouraged to tear up their lawns and produce food for self-provisioning. Urban gardens sprouted up all over the city, mostly as home gardens, at community centres, and in vacant lots. Recognising its power to solve the food and fuel crisis, in 1994, the Ministry of Agriculture (MINAG) established a Department of Urban Agriculture, one of the first of its kind in the world. Today, it has evolved into the Urban and Periurban Integrated Agriculture Program (PIAUS by its acronym in Spanish), and remains one of the seven most important programmes of MINAG to this day.

PIAUS is managed by a diverse set of government and non-government actors, allowing for distinct needs from the national to the local level to be met (see Figure 1). The central axis of the programme, the National Urban and Suburban Agriculture Group (GNAUS) is housed under one of MINAG's key research institutes, the National Institute of Tropical Agriculture (INIFAT). This group has members from six Ministries and 16 institutions including the Ministries of Education, Public Health, Science, Technology and Environment, as well as the National Association of Small Farmers (ANAP), the Cuban Association of Agronomists and Foresters (ACTAF), the Cuban Association of Animal Production (ACPA) and the Fundación Antonio Núñez Jimenez (FANJ). GNAUS directs the strategic plan of the movement and the methodologies for implementing activities of the 31 subprogrammes.

The subprogrammes represent areas of work promoting agroecological principles, including land use, soil fertility and organic fertiliser, seeds, pest management, water use, animal health, marketing, capacity building and training, apiculture, and more. PIAUS has a group in each province with representation from the Vice President of the Provincial Governments as well as a Provincial Representative for the programme. There are 168 Municipal Groups, one for each municipality in the country, Municipal State Agricultural Enterprises, 168 Urban Farms and 1452 Popular Councils. The productive base is made up of all the farmers involved. This structure has allowed for systematic, efficient and diverse

support to be provided to the movement. Within INIFAT, the programme has also established the first urban agriculture Master's Program in the country.

### Enabling policy environment

The organisational structure serves as a legal guideline, (in Spanish *lineamientos*), providing a set of rules and principles prescribed by the government to implement the PIAUS. But there are other policies that support urban agriculture and agroecology at the national and municipal levels. The highest form of policy in Cuba is released every five years at the conclusion of the Communist Party Congress in the form of a document entitled *Guidelines for the Social and Economic Policy of the Party and the Revolution*. The 2011 and 2016 Guidelines there are two (#205 and #206) specific to urban agriculture:

205: *Effectively develop the municipal food self-sufficiency programme, relying on urban and suburban agriculture*

206: *Implement the suburban agriculture programme efficiently using the land that surrounds cities and towns, with the least possible expenditure of fuel and imported inputs by utilising local resources and use of animal power*

While the term agroecology is not explicitly used in the guidelines, there are several that outline principles associated with agroecology. Guideline #185 discusses the

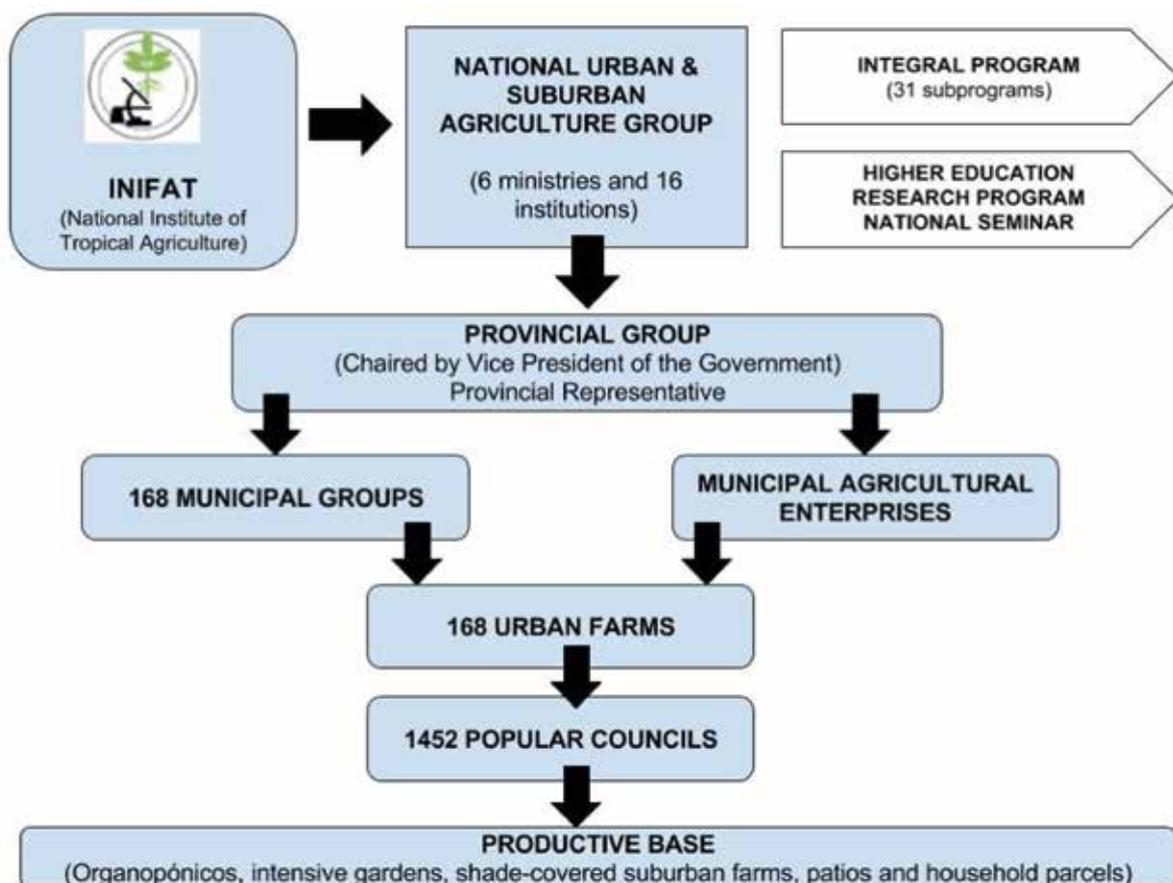


Figure 1. Organisational Structure of Urban Agriculture Program (GNAUS, 2015).



Farm participating in the Farmer to Farmer Movement lists the agroecological practices they implement. Photo by Margarita Fernandez

importance of import substitution by prioritising a territorial view of agriculture, incentivising local production for local consumption through the urban and suburban programme. Guideline #187 discusses the importance of using agroecology practices to increase yields through diversification, crop rotation and polycultures and to “develop a sustainable agriculture in harmony with the environment, that provides the efficient use of phyto and zoo genetic material, including seeds, technology, and the use of organic fertilisers, biofertilisers and biopesticides”.

Another important policy that supports urban agroecology is MINAG’s Policy for the Municipal Food Self-Provisioning Program from 2015. This states that food sovereignty is a top priority of the State and the Cuban government and that the key strategy for achieving this is by decentralising the agricultural sector by increasing communities and municipalities’ capacity to feed themselves. The policy states that a municipality’s capacity to guarantee food for the population should include the “participation of all actors in the territory (individual producers, cooperative members, state enterprises, municipal agriculture delegations) in order to succeed in developing a solid economy at the municipal level, based on agroecological principles, following local climatic and demographic contexts, integrating all facets of municipal livelihoods, including traditional agrarian culture and food of the population”.

Finally, a key land distribution law, one of the most progressive in the Americas, has contributed to the increase in land under urban and suburban production. Decree-Laws 259 and 300, passed in 2008 and 2012 respectively, allow landless citizens to gain usufruct rights to up to 13.42 hectares (1 caballería) of land, and allow existing farmers to gain usufruct rights that extend their farm sizes up to 67.1 hectares. This policy has granted land access of more than 1.7

million hectares of mostly idle rural and urban/suburban agricultural lands to more than 200,000 farmers, many of whom are new to farming.

### Key social, economic and ecological benefits

One of the main contributions of the urban agriculture movement has been Cuba’s increased access to a diversity of fresh fruits, vegetables, small livestock and medicinal plants. This has served to increase dietary diversity and improve nutrition. Across the country’s cities, more than 50% of the fresh produce consumed is produced by urban farmers, surpassing one million tons in 2014. The urban agriculture movement has generated more than 300,000 jobs and trained tens of thousands of farmers, technicians, and government officials in agroecological techniques through a diversity of formal and informal trainings and exchanges including strong influence from the ANAP’s Farmer to Farmer Movement. Urban farms run educational programmes with elementary schools and supply highly-subsidised foods to schools, hospitals, retirement homes and other social institutions.

The 31 subprogrammes of PIAUS that provide services and training in different aspects of the food system, prioritise local sovereignty through production of diverse agroecological inputs such as seeds, organic fertilisers, biological controls, innovative irrigation techniques, animal traction, and wind and solar energy. The use of these locally-produced items has avoided 50 million dollars-worth of imported inputs annually.

Finally, the management and tenure structures in urban agriculture, as in the rural sector, are dominated by cooperatives, although there are some private farmers as well. There are three types of cooperatives – the Credit and Service Cooperative (CCS) formed in the 1960s, the



*Shade cover netting to control solar intensity at Organopónico in Matanzas. Photo by Margarita Fernandez*

Agricultural Production Cooperative (CPA) formed in the 1970s and Basic Unit of Cooperative Production (UBPC) formed in the 1990s. The CCS farmers own or lease their land under usufruct rights, but share credit, infrastructure, and markets. The CPA farmers share and work the same piece of land. The UBPCs are state-owned farms that were broken up into smaller cooperatives during the food and economic crisis to decentralise management and production. Cooperatives are an important economic expression of agroecological principles of equity, participation, diversity, multifunctionality, and resilience. In terms of market, urban farms, whether in a cooperative or private, tend to sell most of their harvest directly to the community from an on-site farm-stand. Many urban farms also sell directly at farmers markets, and to restaurants and institutions.

## Conclusion

Since the beginning of the urban agriculture movement in Cuba, it was clear to movement leaders that, because urban food production is both intensive and in such close proximity to dense human populations, toxic agricultural inputs should not be used. An agricultural approach that follows principles of diversity, resource recycling, local production of inputs, etc. was thought most appropriate. More than two decades later, due to strategic alliances between farmers, scientists, and the government, Cuba has one of the most advanced urban agriculture systems based on agroecological principles in the world, with strong policies in place that support it. There are national, provincial and municipal policies that guide production, distribution, consumption, education, and services provided by the diversity of actors involved in the food system. The PIAUS engenders key principles of agroecology and food sovereignty that have nourished an urban agriculture system that is socially just, economically viable, and ecologically resilient. Robust participation from key ministries and institutions has

solidified urban agriculture's role in Cuba's agrifood system as not just a strategy to confront crises but as the best approach to sustainably feed the island's population in a nutritious, equitable, environmentally sound and resilient way. The Director of PIAUS, Nelso Companioni, recently stated "Urban agriculture is no longer an agriculture only for crisis situations but is an agriculture for a resilient and sustainable today and tomorrow".

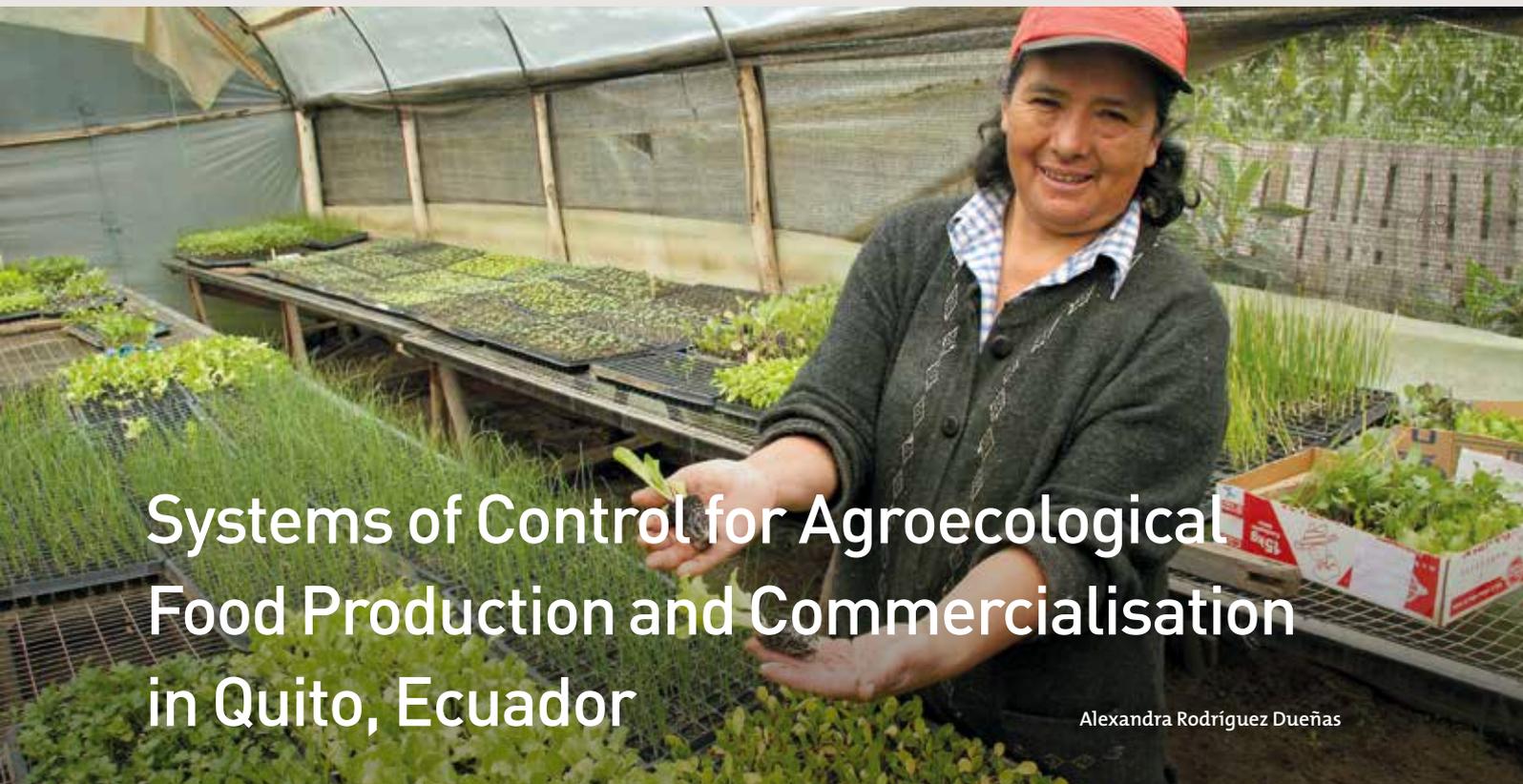
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# Systems of Control for Agroecological Food Production and Commercialisation in Quito, Ecuador

Alexandra Rodríguez Dueñas

Photo by CONQUITO

**Agriculture is a key element of Quito's history. Food production for self-provisioning was practised throughout the consolidation of the city by different groups historically inhabiting the territory. The Quito people were the first inhabitants of the territory (500 CE), then with the conquest of the Caras (980 CE) the Quito–Cara culture began. They developed important engineering works such as agricultural terraces on mountain slopes and irrigation channels on desiccated lagoon beds. The development of these agricultural systems sustained the population growth of that era.**

The Quito-Cara culture, together with its knowledge and traditions, lost ground after the arrival of the Incas (1487 CE). The Incas possessed key agricultural expertise, which allowed them to increase the productivity of the land. They were able to bring into production land that was until then considered ill-suited for agricultural use, as well as to overcome the inclement climate. The Incas developed innovative tools, fertilising and soil conservation techniques and water optimisation systems. In addition, they were able to domesticate a broad range of plant species and develop a harvest calendar. It is estimated that the Incas cultivated up to 70 plant species. Food was at the centre of rituals and spiritual life. For example: "Inti Raymi" is the festival of the sun and the harvest of the solstice of June. This symbolises the gratitude of the Andean peoples, who offer thanks to Paccha Mama (Mother Earth), for allowing a good production

and harvest of traditional products. This gratitude is celebrated with music and dance.

Ancestral knowledge and alternative technologies are the basis under which the 'chacra,' a small-cultivated plot, is managed. This approach – currently validated technically and scientifically – is part of the Andean worldview and considered to have a strong agroecological base.

Through Spanish colonisation, new crops such as fruit trees, vegetables, cereals and farm animals were introduced. Additionally, practices of food production in household yards and religious communities became generalised.

Across time, expressions of urban agriculture in Quito have been based on traditional and ancestral practices inherited from the pre-Columbian era. This mostly refers to potato, corn, field bean, black-seed squash, pumpkin, broad beans, quinoa, mashua and oca. However, these practices have not fully escaped the influence of the green revolution – which triggered indiscriminate agrochemical use, biodiversity loss, unreasonable resource use as well as the loss of cultural values like community work and connection with nature.

The most common element across urban agriculture definitions is localisation – mostly discussed in terms of proximity to cities (e.g., intra or peri-urban agriculture). However, urban agriculture is not solely distinguished from its rural counterpart based on geographical location but by its integration and interaction to, and with, the urban ecosystem. Therefore, urban agriculture must be based on agroecological principles to achieve sustainable production and support human health. Achieving a diverse and stable agricultural production in urban areas hinges on the

development of production systems that are well-adapted to the urban ecosystem, respond to the effects of climate change and mitigate it.

Meeting future demand for food under sustainable production schemes and through reasonable processes has become of vital importance for the future of humanity. The municipality of the metropolitan district of Quito has – since 2002 – addressed this challenge through the implementation of the Agricultura Urbana Participativa project (AGRUPAR, Participative Urban Agriculture). Through this project self-production of food on previously unproductive or underutilised spaces is encouraged. This strategy aims to reduce food insecurity by improving the availability, access and quality of food, as well as to generate a source of income and savings for the producers engaged in the scheme. Moreover, the strategy is framed as a vehicle for urban sustainability and resilience since its implementation can contribute to improving microclimates, nutrient cycling, water management and biodiversity preservation.

AGRUPAR as an intervention is based on *agroecological and organic practices*; it supports the direct marketing of surplus production, the economic and social inclusion of vulnerable sectors, and the promotion of responsible consumption – with an emphasis on local, fresh, diversified and nutritious diets.

Many urban families in vulnerable situations are actively involved in self-production of food and related activities. Eighty-four per cent of project participants are female heads of households. This practice not only improves access to safe food, but it also generates savings and even increases household income, becoming a means of livelihood. The average monthly income recorded is USD \$175. Through the AGRUPAR project, the municipality currently supports 1300 productive units on more than 30 hectares in Quito, carrying out horticulture, farm animal husbandry and food processing. The municipality provides training and technical support on topics such as cultivation, handling of small

animals and food processing. The project has 17 farmers' markets (locally known as bioferias), which allow the direct sale of surplus production. More than 105 types of food can be found at these markets.

In 2007, an internal control system (SIC, sistema interno de control) was developed as part of the AGRUPAR project to ensure transparency and traceability of activities. This control system has since supported food producers in the documentation of all relevant productive activities (i.e., soil preparation, fertiliser use, sowing, plant transplants, phytosanitary control, crop rotation plan, inputs, acquisitions and sales, production records and annual improvement plans amongst others). A key component of this system is the *analysis of pesticide residues* in soil, plants and unharvested products, which equips farmers with an additional point of control.

As part of the internal control system (SIC) several resources and processes have been put in place to ensure its effectiveness. These include: a quality control manual, a point person for quality issues, an approval committee as well as internal inspectors (project technicians). The latter carry out annual audits on the productive units, based on the Ecuadorian organic-ecological-biological production standard. Further, an external agency – nationally accredited and whose work is overseen by the national authority for sustainable food production (AGROCALIDAD) – audits and certifies productive units wishing to obtain a nationally-recognised organic certification. This can enable food producers to access differentiated food markets. Finally, at farmers markets, producers conduct additional inspections and interact with consumers as a form of community oversight.

The SIC provides an effective mechanism through which AGRUPAR can guarantee that the production from the units, *whether officially certified or not*, complies with national regulations. Production practices in AGRUPAR units *go beyond* organic production principles as these only



Photo by CONQUITO



Photo by CONQUITO

substitute inputs, fail to increase diversity and consider food as a commodity to be traded at the highest possible price as opposed to being a basic human need.

*Organic production based on agroecology principles*, leads to greater autonomy by reducing dependence on energy, knowledge, inputs and intermediaries. Additionally, it stimulates the use of local inputs, the recovery of ancestral practices, the recognition of flexibility and resilience of family labour as well as the reduction of dependence on a single product or market through the generation of highly-productive and diversified systems. Within the agroecological approach there is greater recognition of agricultural ecosystems, the health of both farmer and consumer, the sustainability of livelihoods, as well as the nutritional, therapeutic and safety values of food.

In Quito, other initiatives related to healthy food have been developed by civil society organisations. For example, agroecological market fairs. These fairs allow local farmers and those from nearby provinces to sell their products. Products found on these markets are guaranteed through the Participative Guaranty Systems (SPG, *Sistemas Participativos de Garantía*). SPG systems operate based on the participation of several actors that endorse the product and the agroecosystem through which it was produced. SPG systems will soon be regulated by the national framework for agroecological production.

In 2016, the Municipality of Quito opened the first organic and agroecological market – La Floresta – with the aim to improve access to healthy and local food. Both organic and agroecological food producers participate in the market. They share the space and complement each other's food offerings. However, the lack of a framework in which selection criteria for vendors as well as the equivalence of diverse control and certification schemes are clarified, emerged as the main operational challenge for the market. Control systems range from the AGRUPAR endorsement, to formal

organic certification, to certification validated through a participative guaranty system. Given the diversity of processes, degrees of traceability as well as the documentation validating each of these schemes, there is a need for additional controls. Such controls would entail verification visits to producers, harmonisation of supervision formats as well as of technical expertise across teams, the creation of an assessment committee and the possibility of carrying out pesticide analysis on residues.

While there are differences between the agroecology-based organic production in the urban setting and its more purely rural equivalent, it is their commonalities, which have brought both sets of producers to work together. Actors recognise both systems as sustainable and with food as their unifying theme they jointly lead the movement towards food sovereignty in Quito. Their efforts focus on developing regulation for the use of municipal markets; in fact, both branches of the movement were invited to collaborate in the development of a regulation for the law of seeds, biodiversity and promotion of sustainable agriculture in Ecuador – a law that was recently approved by the National Assembly.

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# Nairobi's 21<sup>st</sup> Century Food Policy

Diana Lee-Smith  
Davinder Lamba

*Kikuyu women conversing (Bazaar Street 1900). Photo History of Nairobi*

**Agroecology has been a characteristic of Nairobi urban farming historically, through the practices of small farmers. The new Nairobi City County government passed a progressive law on urban agriculture in 2015. It now promotes urban agriculture for food security, and will allocate land and water resources especially for vulnerable groups such as slum dwellers. Nairobi will be a good example to look at in coming years to observe how these innovative policies and administrative changes impact on people's lives. Incorporating agroecological processes is likely to be an institutional challenge as the new policy and governance arrangements are implemented.**

Nairobi, Kenya's capital, is only 118 years old and was a racially-divided colonial city for much of its history. Urban agriculture practices in the city are well-documented, including nutrient re-use on small farms and nutrient flows across the city. After being ignored throughout the 20<sup>th</sup> century, urban agriculture and the management of the urban food system have seen substantial policy changes since Kenya's new constitution in 2010 entrenched the right to food. New laws nationally and locally aim at food and nutrition security, especially for low-income urban residents. Civil society and urban farmers may now be able to influence urban governance affecting food security. The article sets out the history and the positive policy achievements, as well as some of the hurdles to be

cleared in attaining an ecologically-balanced and equitable outcome for city residents in the 21<sup>st</sup> century.

## Development of Nairobi's food system

When Nairobi was founded as a railway camp by British colonists in 1899, the local people were already feeding themselves – from agriculture in the hills above the city and pastoralism on the dry plains to the South East. There was trading along well-established routes. More agri-food businesses sprang up with the coming of the British settlers. Today's food system reflects history, despite political and social changes. Nairobi's early 20<sup>th</sup> century agri-food system was all about colonisation. There were biased rules and regulations and settlers dominated business and public life. Railway workers brought in from Asia were prevented from producing food and had to eat what was provided, many growing sick and even dying as a result, while baking and selling bread for example was reserved for a European-owned bakery. Generally, only African men, not women, were employed in town and they had to carry identity cards. Women were tolerated as they brought in food but were not accepted as urban residents. Up until independence in 1963, people of different races were restricted to specified areas and only Europeans owned urban land.

There were food businesses and urban demand stimulated vegetable farming in and around the city. Some vegetables came from small farms along the Nairobi River in the city centre, a site used for agriculture up until 2010, when a river clean-up got rid of urban agriculture. African women traders would also come into town by day to sell, hawking their vegetables door-to-door or by the roadside. This component of Nairobi's agri-food system has lasted until today, with itinerant women hawkers carrying heavy loads and still being harassed by the authorities.

Many things changed with independence in 1963, but many did not. Widespread throughout Nairobi's history, urban agriculture was not documented until 20% of Nairobi households were found growing crops in the city in the 1980s in a survey by Mazingira Institute. In 2017, this would represent well over 200,000 households. Likewise, 7% were keeping livestock. The 2009 census counted 55 thousand cattle in Nairobi, 47 thousand goats and 35 thousand sheep. Urban farms are more productive than rural farms, perhaps because of the availability of (mostly waste) water and other forms of organic waste which provide useful inputs to crop production and maintain backyard soil productivity. The 1980s survey found 35% of crop growers were using compost and 29% were using manure, 91 and 44% respectively producing these inputs on their own farms. This means agroecology was, and probably still is, prevalent on the city's small household farms.



*Woman vegetable seller.* Photo by Diana Lee-Smith

### Nutrients and livestock in Nairobi's food system

The backyard ("next to the house") is the most common form of household urban agriculture found throughout Africa, although high densities in low-income areas make such gardening difficult. Most people with backyards are middle or high income. Studies by Urban Harvest, part of the Consultative Group on International Agricultural Research (CGIAR), showed these farms are effective in cycling nutrients. Urban farmers in Nakuru, a town 150 km from Nairobi, recycled almost all their domestic organic waste, mostly as livestock fodder. Just under half the manure produced inside the town was re-used as fertiliser. But households with backyard crop-livestock farms re-used 88%, while poor farmers with less space only re-used 17%, resulting in dumping. Some intensive vegetable producers were, however, making good use of this manure on under-utilised land, and in 2009 the practice was expanded with municipal support, with plans to use dumped manure for co-composting, packaging and sale as bio-fertiliser.

Urban Harvest also found that 70% of Nairobi's solid waste is organic and biodegradable, typical of many African cities. Mapping its flows revealed that very little of this was used as fertiliser, and then in an uncoordinated way. Livestock manure was used to the extent that Maasai herders outside Nairobi were linked to urban and rural crop production through an organised market in the city, but this was disconnected from manure production within the city, where there was an almost total lack of market information on nutrients. Domestic solid waste was used as livestock feed in backyard farms. Although less than 1% of Nairobi's solid waste was processed, non-market systems worked better. An estimated 54,500 Nairobi farm households used compost they made themselves in the early 2000s, and 37,700 households used livestock manure to fertilise their crops, about half getting it from their own animals.

Because everyone thought urban dwellers were better off than rural people, it came as a shock in 2000 when the African Population and Health Research Council (APHRC) found that Nairobi slum residents had the worst health and nutritional status of any group in Kenya. This was attributed to the lack of basic services in these areas, which are overcrowded and lack water and sanitation.

Hunger is also widespread in these areas, many people only eating once a day or sometimes less. And Kenya is not alone in this. A survey in Southern Africa found 77% of low income urban dwellers were food insecure. While most urbanites who farm do so to feed their own families, they are not the poorest people. Urban farmers are better off than non-farmers. Slum dwellers cannot easily find space to farm whereas better-off urbanites have backyards where they can produce food. On the other hand, Urban Harvest showed that children who eat animal-source foods (milk, meat, eggs) are healthier, meaning urban livestock-keeping promotes child health. And, urban agriculture was linked statistically to better household food security. Thus, urban agriculture can alleviate malnutrition among urban dwellers if policies are targeted for slum dwellers, as Nairobi now plans to do.



*Kibera slum in Nairobi.* Photo by Diana Lee-Smith

### 21<sup>st</sup> Century policies

Kenya as a country is now implementing a Food and Nutrition Security Policy, with Food Security Committees at the level of counties – the new units of devolved government. The long-awaited Urban and Peri-urban Agriculture and Livestock Policy (UPAL) will be integrated into this institutional framework. A country-wide Urban and Peri-urban Agriculture, Livestock and Fisheries Strategy (UPALF) is in fact already in place.

Because of devolution of political power to county governments, Nairobi has its own executive and has taken over several administrative functions, including agriculture. The City County of Nairobi's Assembly passed the Urban Agriculture Promotion and Regulation Act in 2015. The first objective of this Act is to "contribute to food security through the development of agriculture in the county by empowering people and institutions through allowing and facilitating agricultural activities for subsistence and commercial purposes". The fourth objective is to "Regulate access to land and water for use in urban agriculture within the county, giving priority to residents of high density and informal settlements", while the sixth objective is to "institutionalise administrative procedures for access to agricultural resources including organic waste". The city also has its own policy in place and in 2016 provided Inter-Sectoral Training on Urban Food Systems and Agriculture for its staff. In fact, this was seen as a pilot and Nairobi hopes to roll out more such training. The 2015 Act makes no explicit provision for stakeholder involvement, although there is a constitutional requirement for public consultation, and FAO is assisting Nairobi in developing a multi-stakeholder platform.

Civil society was in fact ahead of government in addressing Nairobi's food system. A bottom-up process called the Nairobi and Environs Food Security, Agriculture and Livestock

Forum (NEFSALF) was convened by the NGO, Mazingira Institute, in the early 2000s. Stakeholders came from the public sector, the private sector and the community sector (farmers). There was good attendance from the public sector in the form of extension representatives from the Ministries of Agriculture and Livestock, although the City Council seldom attended. The farmers began their own network in 2004, also called NEFSALF, which requested government to provide them with training. The response was positive and courses at Mazingira have continued until today. Nairobi's farmers frequently out-perform others in the country in national competitions.

### What happens next?

The policy environment of urban agriculture has totally transformed in the 21<sup>st</sup> century, and the intentions of government are to support urban farmers, and promote urban agriculture by slum dwellers through making land and water available. There is a policy intention to improve the agroecology of the city by better nutrient cycling, through re-using organic wastes in urban and rural agriculture. This may be easier said than done, as agriculture and environment (responsible for waste in Nairobi) are separate sectors and so far, there has been no direct collaboration on this.

But neither have specific land and water arrangements yet been made to enable slum dwellers to farm. There are however active plans and efforts to institute this through project development by the city. In the longer term these will need to be monitored and evaluated in relation to levels of malnutrition and food security in Nairobi's slums. But key to the future governance of food security in the city will be the institutional relationship between Nairobi's farmers and the city government. NEFSALF has been a voice for the farmers prior to policy change, but will it, or other similar bodies of urban farmers continue to influence governance of urban agriculture? In the 20<sup>th</sup> century, urban farmers could not relate to the city government but only central government, through extension services they provided. Now those extension services are provided by Nairobi City County government. But will it be a top-down relationship, or will there be a political voice for the farmers and a say in governance?

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# Using Agroecological and Social Inclusion Principles in the Urban Agriculture Programme in Rosario, Argentina

Antonio Lattuca

Photo by Antonio Lattuca

**The Urban Agriculture Programme (PAU, Programa de Agricultura Urbana) in Rosario, Argentina is built on agroecological production principles, which support plant diversity, the improvement of soils and reduces dependence on external inputs. The programme also promotes social inclusion and public participation in all its activities.**

## Agroecological production

The programme trains farmers to produce organic fertilisers and plant-based phyto-stimulants to support plant growth. It collaborates with other municipal departments as well as private companies to recycle coffee and green waste from a waste bank. Waste and cow dung from a slaughterhouse, barley remnants from a company that makes craft beer, wood chips and green park waste are other items in the waste bank. All organic residues are used for the production of an organic fertiliser, through composting or vermiculture practices.

## Promoting equitable access to green spaces

The programme builds on collective efforts to claim citizen's right to green spaces and spaces for food production. Diverse new productive public spaces have been integrated into the urban fabric and low-income and slum settlements. These spaces include:

- Garden Parks (through an agreement with National Roads)
- Green Corridors alongside railroads (through agreement with the NCA Railroad Company)
- Gardens with aromatic and edible plants in public squares, hospitals and schools

- Organic Seed Production Centres
- Demonstration centres for the production of organic vegetables, applying intensive production techniques
- Agroecological Innovation Centre with a rainwater and grey water recycling system
- Agroecological nursery of Rosario engaging unemployed youth.

## Community and youth involvement

Local communities are engaged in the design and management of the various productive spaces. Through public workshops and garden events, the wider community is exposed to information and training on the agroecological cultivation of vegetables and medicinal plants and spices in small spaces. Events are organised both in the central district of Rosario as well as the different low-income neighbourhoods in the city where thousands of families participate. During the workshops, seeds – provided by the national Pro-Huerta INTA programme – and aromatic plant seedlings are distributed.

The programme specifically aims to reach young people. The 'Youth with More and Better Work' programme – which is managed by the Ministry of Labour, Employment and Social Security – engaged 140 young participants (aged between 18 and 24) in the PAU programme. They were assigned an individual plot and trained to farm it based on agroecological practices. Currently, youth between the ages of 16 and 35 are being trained in agroecological production in the city as part of the 'New Opportunity' programme supported by the Province of Santa Fé. In addition, young urban gardeners have begun to provide their own training and information services to others as a strategy to diversify their income. They provide guided visits to the garden parks, and develop and

coordinate workshops and training in cooperation with different institutes like the Cultural Center Parque España, the Rosario Medical Association and the Association of Municipal Workers of Rosario. In addition, they give courses in schools and institutes of secondary education in order for young people to learn about the advantages of agroecological production.

### Food security and resilience

The Urban Agriculture programme contributes directly to promoting more food-secure and resilient neighbourhoods, with a focus on the most vulnerable groups in the population. Programme design based on agroecological principles stimulates environmentally-friendly food production as well as the fulfilment of social, environmental and economic goals within the framework of a social and solidarity-based economy. The following principles and priorities were established:

- Address food insecurity of urban families living in poverty by bringing into production vacant land through secure land tenure agreements
- Establish a food production system of fast-growing produce (i.e. fruits and vegetables)
- Improve the neighbourhood scenery by transforming abandoned vacant lots into productive spaces
- Produce healthy foods of high nutritional value in order to meet the dietary requirements of families living in poverty
- Establish a direct marketing system through the implementation of market fairs in strategically located public spaces in the city.

The programme's long-term plan includes the consolidation of urban agriculture as a permanent activity; it is one that supports secure spaces for production and commercialisation. Rosario's municipal public policy supports urban agriculture, while the productive use of public spaces has been included in urban planning. The programme collaborates with Pro-Huerta INTA. This is an organisation which carries out food education and promotion activities related to family orchards, school and community gardens and the production of fruit, eggs, poultry meat and rabbits.

### Urban agriculture as a space of learning and innovation for peri-urban production

Experiences achieved in the PAU are currently being shared with the peri-urban agriculture programme developed by Rosario and Santa Fe Province where it is located. Long-time gardeners from the parks support training of conventional peri-urban producers in agroecological production techniques. Markets established for the urban agriculture farmers now also serve as an outlet for the peri-urban agroecological farmers. Without over 15 years of experience in the PAU, the Green Belt Project Rosario (see next article) could not have been set up as an additional step in the consolidation of agroecology as a public policy tool for the city.

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## Green Belt Project: Promoting agroecological food production in peri-urban Rosario

**The Green Belt Project Rosario (PCVR, Proyecto Cinturón Verde Rosario) seeks the conversion of productive peri-urban areas in Rosario to agroecological systems. The general aim is to achieve production of healthy food (meaning without contaminants) and improvement of the socio-economic conditions of producers, their families and farm workers. It also aims to contribute to the health of consumers and the environment, as well as revitalise short food supply chains that target differentiated markets.**

The city of Rosario is located in the Santa Fe province of Argentina. The city covers an area of 179km<sup>2</sup> and has an estimated population of almost 985,000 inhabitants. Together with other 24 localities it comprises the Metropolitan Area of Rosario (AMR, Área Metropolitana de Rosario).

In the past, horticulture production from Rosario's green belt used to supply most of the fruits and vegetables to the city, including potatoes, tomatoes, lettuce, onions, carrots, squash or pumpkin, and different varieties of fruit. However, the local agricultural production area and capacity have diminished over the past years. This is due to urbanisation of agricultural land as well as shifts from horticulture production to soy production for export.

Soybean producers as well as remaining horticulture farmers currently produce their crops by applying high levels of

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chemicals with corresponding risks for environmental contamination and human safety. Overall, the city has seen a reduction in its local production capacity to feed its population, becoming more dependent on longer-distance food imports, while horticulture farmers have lost their livelihoods. Human health concerns for food safety have also increased.

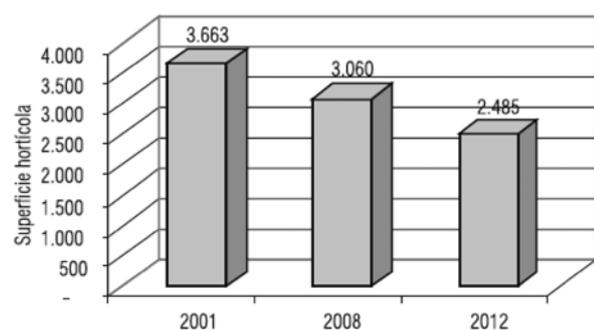
A production survey showed that current local production is mainly provided by small-scale family farmers who cultivate small areas of land and generally apply large amounts of agrochemicals. Most do not benefit from technical assistance and are advised only by vendors of agrochemicals. Research and laboratory analysis showed high levels of bacterial and chemical contamination of produce and lack of protection for agricultural workers, especially when applying pesticides. Producers also indicate increasing competition from imported products from other regions and low-quality production. At the same time, the Rosario population shows increasing consumer consciousness and demand for quality and healthy food products.

The Rosario Green Belt Project (PCVR) promotes new forms of sustainable and agroecological food production. This is understood as the stable production of goods and services that meet the nutritional, socio-economic and cultural needs of the population without compromising the health of people, natural resources, or the environment. The PCVR brings together government actors, technical institutions and civil society. It builds on work done through the Urban Agriculture Programme (as described in the previous article) and seeks to consolidate the city's agroecological public policy.

### The Rosario Green Belt (PCVR) project

The PCVR is implemented in the peri-urban area of Rosario. It seeks to promote conversion to agroecological production systems in the entire productive peri-urban region.

The PCVR is based on land use ordinance no. 9144/13, which establishes the protection of 800 ha of productive peri-urban land to be used for fruit and vegetable production and safeguarded from urban expansion. The urban plan includes a proposal for this area to be an agroecological production area. It is also built on ordinance no. 8871/11 which sets an area of 100 m from the urban boundary as an agrochemical-free zone where no application of agrochemical pesticides is



Loss of horticulture area (in hectares) in the Rosario green belt from 2001 (3663 ha) to 2012 (2485 ha)

allowed. The 800 ha green belt is also recognised in the 2018 Strategic Plan for the metropolitan Area of Rosario.

The project addresses growing concerns about food safety and quality. It also seeks to strengthen the linkages between the city and its hinterland, local food production and consumption, food quality and responsible consumption, as well as stimulating the local and regional economy. Moreover, the project seeks to advance and reward horticultural activities based on ethical production principles as much as the producers' identity in their relationship to healthy food.

The project strategy is based on participatory technical support at individual and group levels. The project offers incentives for agroecological conversion processes, quality monitoring, and marketing under a provincial collective brand – which recognises the product as agroecological.

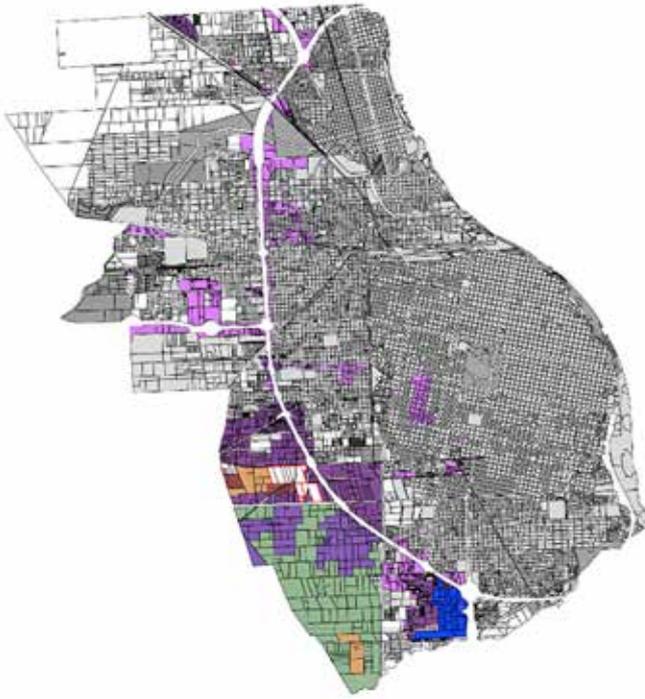
The project falls under the responsibility of the Municipal Secretaries of: Production and Local Development, Environment and Public Space, Health and Social Economy. It is implemented in conjunction with neighbouring municipalities, the Pro Huerta programme and the Ministry of National Family Agriculture.

### Project implementation

The project started with the development of eight demonstration production units in the Rosario peri-urban area and six additional ones in the neighbouring town of Soldini. This accounts for a total of 40 ha being converted to agroecological production. At this trial stage, producers are converting either their entire farm, or a smaller area of minimum one hectare.

The project has three main work streams: productive, social and commercial. In terms of *production*, technical support is provided through participatory methodologies at group and individual levels. The aim is to achieve an attitude change. Support also comes in the form of provision of infrastructure and incentives to advance the agroecological transition. At the *social* level, the project aims to strengthen the relationship between producers and to improve their quality of life, for example housing, health and road infrastructure. At the *commercial* level, the aim is to increase the sale of differentiated products of higher quality. In the initial project stage this is achieved through direct sales based on customer orders, participation in four weekly market fairs organised by the municipality, sale of bulk food packages and deliveries to stores that stock organic produce. The project also plans to reach an agreement with grocery stores so that the produce is presented on special produce displays. Producers will also be able to sell their produce in the new Patio Market that will bring local and regional producers together in a retail space designed for food products of differentiated quality.

Products are sold under a 'Product of My Area' (Producto de Mi Tierra) logo, a quality label provided by the Government of the Province of Santa Fe. The logo aims to characterise the products by their location of production, tradition and excellence, to support their distinctive place in the market and their recognition and trust by consumers.



*Green area: Protected area for the horticulture greenbelt. 800 ha of land that cannot be built upon. Municipality of Rosario*

At the municipal level, a cross-departmental, technical and political team has been formed to be in charge of project implementation. The team is made up by members of the Secretariat of Production and Local Development, Secretariat of Environment and Public Space, Secretariat of Social Economy and the Food Institute. It is also connected to the Sustainability Cabinet through which all municipal areas collaborate in the designing of public policies.

At the provincial level, the project enjoys the technical and financial assistance of the Ministry of Production of the Province of Santa Fe, which is provided through the Provincial Peri-urban and Sustainable Food Production Programme. The project collaborates with several educational and technological institutions, NGOs and the private sector (the latter to promote productive use of organic waste). It collaborates with the Chamber of Commerce to monitor product quality and levels of agro-chemical residues.

### Lessons learned

- It is important to have agroecological public policies that provide security to producers. When conditions such as secure land tenure and support at the productive and commercial levels – that ensure a stable income – exist, producers are quick to participate and allocate land to agroecological conversion.
- It is important to work with producers in coordination with civil society, educational and technological institutions to promote the behavioural change required for a transition towards sustainable systems. Through this project, agroecological production at large scale is being demonstrated. This builds up confidence for more

*In larger cities, opportunities for formal and informal employment creation are becoming scarce. Urban growth may also impact food security. In response, our city has developed an Urban Agriculture Programme for the past years. Amongst others, the programme supports fruit and horticulture producers in peri-urban and semi-rural areas. These are areas often characterised by family production units and applying traditional production techniques to sustain and improve their enterprises. Given the fact that these producers have the capacity to provide consumers with safe and nutritious food, they will be supported in the adoption of good production practices that guarantee sustainability in production, social inclusion, hygiene and safety and environmental management [www.rosario.gov.ar/web/sites/default/files/perm.pdf](http://www.rosario.gov.ar/web/sites/default/files/perm.pdf).*

producers to join and increases consumers' access to healthy foods.

- Support for (improved) localised or regional production systems needs to combine production and marketing support with consumer education and awareness. Once citizens are made aware of where their food comes from and the quality of the food they consume, more responsible consumption habits will increase demand for more healthy and local products.

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# 'Cities for Agroecology' Networks in Europe and Spain

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Photo by Madrid Agroecológico

In December 2016, the Zaragoza City Council organised an international seminar on **Cities for Agroecology**. This event marked the start of two parallel processes of city networking, at European and national level. The Milan Urban Food Policy Pact World Mayor's meeting in Valencia (October 2017) represents an important milestone in the consolidation of agroecological approaches in sustainable urban food policies as both networks are advancing fast.

## Introduction and background

Zaragoza City Council, in cooperation with local civic organisations, has been involved in restoring and protecting its traditional "huerta": thousands of hectares of historical and highly fertile orchards within the municipality. From 2013 to 2016 the city used a LIFE program grant for the project "Environmental recovery of peri-urban areas through intervention in the ecosystem and organic farming". The project adopted an agroecological approach, in which advancing towards a localised, sustainable food system would be the cornerstone for maximising ecosystem services delivered by peri-urban agricultural areas.

The LIFE project built upon municipal organic community gardens started in the 80s and the weekly organic farmers' market, with some key additions. Project funding was used for the following activities: a school for new peri-urban farmers; a public-private partnership land bank; an organic farmers cooperative; the provision of public infrastructure for local food logistics; sustainable public food procurement; promotion of organic food in municipal markets, 17 small retailers and 15 restaurants; and, public awareness campaign

on local and organic food. After three years, the Red Agroecológica de Zaragoza was created, linking 17 agricultural holdings on 57 ha of organic farming with 22 new farmers. Consequently, Zaragoza has become a leader in national and European agroecology-oriented food policy.

The 2016 international seminar on 'Cities for Agroecology' held in Zaragoza was part of the LIFE project. It was organised in cooperation with Fundación Entretantos – an NGO specialised in participatory processes and networking around territory and sustainability. More than 150 people attended the meeting, including representatives from more than 20 European cities. A special workshop was organised for city representatives to discuss the creation of a European network of cities. The high interest and attendance from Spanish cities, each with their local specificities, drove the organisation to launch an additional process at national scale that eventually led to the Spanish Network of 'Cities for Agroecology'.

## What does 'Cities for Agroecology' mean?

The discussion on agroecological food policies at Zaragoza's seminar addressed some of the following key topics in terms of network actions:

- **Promoting local production, processing and consumption of organic food**, either officially certified or included within Participatory Guarantee Systems
- Addressing **ecological features related to local food systems**, especially on upstream processes such as input provision, and **regulating ecosystem services** such as water quality, soil fertility, organic matter cycling, crop biodiversity
- **Supporting professional agriculture within local food system frameworks**, aiming to develop City-Region Food Systems (CRFS)
- **Activation and protection of urban and peri-urban agricultural lands** and landscapes, while granting access

to land for new entrants and professionals into organic farming

- **Strengthening the local food supply and logistic networks** for local stakeholders by providing: public infrastructure, logistics coordination, public procurement, and supporting Community Supported Agriculture (CSA) schemes
- **Promoting access of consumers to local, organic food** by raising awareness and engaging with communities on how they access appropriate local, high-quality food
- Focusing on the **practical implementation of policies** through participatory, good food governance mechanisms with local civil society and private actors, while avoiding getting lost in organisational and bureaucratic barriers that may harm operational capacity.

Internationally, there is a growing number of city networks oriented to sustainable food systems, especially after the Milan Urban Food Policy Pact (MUFPP). Emerging from this, we anticipate future strong engagement with organic farming, local production and beyond. The agroecological approach entails a deep commitment to sustainability as well as a major commitment to social justice regarding food systems. This approach therefore includes the concept of food sovereignty and environmental and food justice. It is an ambitious and transformative agenda for urban food policy.

### Some declarations from representatives of Spanish cities

- *For Teresa Artigas, Environmental counsellor of Zaragoza and promoter of both networks, joining means “an important step forwards in the efforts the city is already undertaking towards sustainable agri-food and territorial models”*
- *In a recent press release, the City Council of Manresa (Catalonia) stated that “We have been working for years on supporting public and private initiatives to promote local and sustainable agriculture, and it would be very positive to consolidate a model based on agroecology principles among producers, intermediaries and consumers. The aim of the Networks is to share strategies, information and action proposals”*
- *The City Council of Palma de Mallorca has developed a participatory assessment of the agri-food sector in the city, and implemented actions on city organic markets, consumer and school awareness, and is now working on an access-to-land tool for organic farmers. For the Ecology Counsellor, Neus Truylol, “strengthening an agroecological model of production and stopping the decrease in farming activity within Palma is a fundamental aim with a triple benefit: environmental, agricultural and social, regarding new job possibilities. Joining the Spanish network will help us to work in this direction”.*

### Two nested networks with one common process

In 2017, the cities involved in the [AgroEcoCities European Network](#) had several online meetings following up Zaragoza’s seminar. These were supported economically by Zaragoza City Council and technically by Fundación Entretantos. A Steering Committee was set up, including city officers from Brugge, Ghent, Freiburg, Zaragoza and València and city representative organisations like Liverpool Food People and the Bristol Food Council. In May we held two thematic group webinars on food waste and local food governance. These incorporated other cities and civic organisations to exchange and discuss practical experiences. The continuity of the network needs to be sustained by a shared interest in running activities; there will not be any formalised structure. The next physical meeting will be held in autumn, and probably linked to València’s MUFPP summit.

In early 2017, Zaragoza and València City Councils, in a consortium with Fundación Entretantos, received 12 months co-funding from Daniel & Nina Carasso Foundation for developing a Spanish network of “[Ciudades por la Agroecología](#)”. Six cities formed the Steering Committee: Zaragoza, València, Las Palmas de Gran Canaria, Madrid, Lleida and Pamplona-Iruña. In early May, the network held a first physical meeting in Zaragoza, with the attendance of ten cities and meetings around three thematic work groups: 1) participatory processes and food governance, 2) promotion of agroecological entrepreneurship and access to land, and 3) promotion of local food delivery networks and infrastructures. The second physical meeting of the national Network was held in September 2017 in the city of València, at a seminar on Civil Society, Food and Sustainable Cities, which brought together delegations of 18 cities, including city officers and policymakers, but also private actors, civic organisations and scholars already working with member cities. The foundation document of the ‘Ciudades por la Agroecología’ Spanish network was signed a few weeks later.

### What do Cities for Agroecology need?

From the two networks it has become clear that cities, and especially city officers involved in sustainable food policies, need space for peer-to-peer exchange of knowledge and experience. As urban food policies are a relatively new issue for city governments, there is a lack of practical tools, such as rules, public support mechanisms or practical actions to be implemented. As many cities do not have a department for food policy, there is also a strong need to address how to introduce food affairs in current administrative structures. Finally, participants have recognised a need to learn from the pioneer experiences of others, and to develop innovative knowledge and lines of action in cooperation with locally-involved scholars and civic organisations.

The most valued topics for knowledge exchange have been the following:

- Creating and coordinating food logistics, supply networks and public infrastructure to improve local food systems sustainability, including sustainable public procurement

- Improving land planning and protecting agricultural land use
- Implementing participatory, strategic food plans
- Developing local food councils and enhancing relationships between local governments and economic and civic organisations
- Reducing food waste and promoting the circular economy

Political moments at the local administration level in Spain have opened new opportunities for innovative and sustainable policies on many topics, including food. The Spanish network has taken advantage of this momentum to formalise a resilient structure, capable of overcoming possible political changes in advance. Therefore, cities are making a strong effort to create a formal Association of Cities before the end of 2018. Fourteen city governments have already supported this step, and it is expected to be up to 20 by the end of 2017. Besides the need for practical tools and knowledge exchange there are other reasons to build a strong network. The need for a political window for sustainable food policies, supported by local, civic and private actors is probably the most urgent of them.

Each city involved in the networks is currently developing its own agenda, boosted by local action based on their specific background. Cities as Bristol, Liverpool, Barcelona, Valladolid and Vitoria-Gasteiz have been working on the participatory construction of Local Food Strategies. Alternatively, Bristol, Brugge or València have created Local Food Councils, whilst other cities such as Madrid and Córdoba have formalised civic engagement through MUFPP follow-up committees. Ghent, Zaragoza, Barcelona and València are involved in peri-urban farming social processes of revitalisation, focusing on organic farming. Some cities are trying to protect their agricultural lands through participatory land planning (Ghent, Barcelona). Some (Ghent, Zaragoza, València, Grenoble and Freiburg) are providing public infrastructure for local logistics and delivery. Finally, some others (Liverpool, Las Palmas de Gran Canaria, Madrid, Barcelona and Grenoble) are tackling food access inequality through public procurement coordinated with local agroecological food delivery chains.

### Challenges for agroecology-oriented urban food policies

The big picture shows a very active network, but there is still a lot to do. We rely on vast ongoing expertise from different cities but we also need to spread and disseminate this knowledge across Europe. Nevertheless, the European cities also share some common challenges that need to be addressed in the near future:

- Lack of specific departments (and therefore budget) for food policies within city governments; there is also a lack of competences on agriculture
- Austerity and externalisation policies within local administrations; this allows flexible alliances with civic organisations through consultation, but makes food policies politically weak and unstable
- Lack of agricultural land and decrease of agricultural holdings within urban areas

- Increasing food poverty, food deserts and disaffection, especially among low income social groups.
- Lack of metropolitan authorities in many urban areas, constraining the need for a shift from metropolitan-scale to City-Region Food Systems. Both food supply chains and administrative coordination need to be adapted to better scaling
- Special vulnerability to global change in urban areas
- Lack of awareness of cities' dependence on physical flows, both among policymakers and general citizenship; this affects food policy development
- The need for a deep cultural and value change that can support better food policies in more sustainable, equitable and fair urban societies.

### Conclusions

Agroecology provides a broad approach to sustainable urban food policies, going far beyond organic farming towards a perspective of food justice and ecosystem services provided by food systems. It points to City Region Food System as its optimal scale. Moreover, the political perspective of agroecology focuses on participatory, bottom-up governance processes which give a star role in the leadership of such policies to local civic and economic organisations, together with local authorities. Such an approach is taken by a number of European cities as a framework for developing ambitious and transformative agendas, with the aim to stabilise those policies within a context of political instability, austerity and global change.

Despite the great number of common challenges to be addressed, an increasing number of innovative urban policies and strategic tools are emerging. They adopt both the concept and the aims of transformative agroecology. Cities stress the need to come together to share their experiences. This gathering should provide the basis for creating, storing and disseminating new useful knowledge, leading the way for understanding and improving localised food systems. Furthermore, they need to gather more and more cities, in order to stabilise those networks and develop stronger tools for providing mutual support among them.

The agroecological approach needs to find its place among the growing number of networking processes on urban, sustainable food policies around the world. These networks present themselves as a complement for other, previous initiatives, especially those oriented to lobbying. Articulating the different city networks related to MUFPP, signatory cities, at different territorial scales, can also be a useful tool to strengthen such movement.

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# Institutionalising Agroecology? Reflections on municipal pastoralism in Spain

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*Municipal goats' barn. Photo by Flora Sonkin*

The municipality of El Boalo, 60 km north of Spain's largest city, Madrid, is developing policies and projects that aim to support environmental sustainability and attract young people to work with the land. Using the concept of agroecology, one such project is El Boalo's municipal goatherd, which is being promoted by the local government as a means to revitalise pastoralist traditions, offer environmental education, promote tourism and foster entrepreneurship. The goal is to boost the local food system and turn the municipality into an example of innovation in environmental sustainability. The initiative is part of the municipality's local development strategy and new waste management plan. This type of municipal initiative provides valuable insight into the role municipal policy and projects can have in shaping local food systems. But the implementation of this project by a public institution raises several questions, such as: Who is actively involved? Whose interests and needs is the project responding to? And what are the opportunities and challenges of institutionalising agroecology? Through this article, we evaluate this case of institution-led agroecology.

The municipal goatherd project started in October 2016, turning the 7,200 inhabitants of El Boalo into official owners of 75 "public" goats. The herd was presented to the community on the main square of the town, with the ceremony becoming especially memorable when one of the goats gave birth unexpectedly. This event marked the start of a new role for the municipality. It is promoting innovative natural resource management through initiatives especially attractive to people moving out of Madrid looking to be more engaged with their natural environment and local food system.

## The changing role of municipal politics

The roots of El Boalo's goatherd project can be linked to a broader global trend, occurring over the past decade, of municipalities becoming a space for new forms of social and political change. Conceptually defined as *municipalism*, this movement identifies decentralisation of political power and direct democracy as two core elements. Increasingly, municipally-led initiatives aimed at developing more sustainable food systems are also seen as part of this emerging political current. This is evidenced by inter-municipal commitments at different levels. At the global level, there is the Milan Urban Food Policy Pact. At national level examples from Spain are the Red de Ciudades por la Agroecología and Red Terrae. At local level there are initiatives to integrate food and agriculture into municipal agendas of large cities as Barcelona, Zaragoza, Valencia, and Madrid, as well as smaller Spanish municipalities such as El Boalo (see also previous article). In emphasising the importance of food and agriculture on the municipal agenda, these initiatives offer important perspectives on the future of agroecology in urban and peri-urban areas.

In the case of Spain, municipalist practices gained strength and political support during the *indignados* movement (also known as the 15-M movement or #spanishrevolution), which gained widespread recognition in 2011. In attempting to resist austerity measures taken by the national government, Spanish social movements proposed new governance arrangements. These focused initially on the local level, and ran counter to Spain's two establishment political parties. The success of the 15-M and related social movements contributed to citizen-led platforms being elected and forming municipal governments in 2015. This brought issues of participatory governance and sustainable food systems to the forefront of political agendas in municipalities across the country. Now, two years later, it is possible to see some of the first signs of municipal policy change, at least on paper. The municipal coalition governing El Boalo was also formed by similar citizen-led platforms, and has recently started integrating agroecology into some of its municipal projects, such as the goatherd.

### Linking to agroecology

Agroecology is increasingly being recognised at high-level policy forums, in academia, and by farmer movements, as a transformative process for improving the sustainability and resilience of agricultural systems. Gaining strength in the 1980s as a holistic framework, today agroecology is commonly referred to as a science, a set of practices, and a movement. It promotes low-input and small-scale agriculture that resembles natural ecological systems. More recently, international peasant movements like La Via Campesina, as well as global policy makers like the former Special Rapporteur for the Right to Food, have emphasised the links between the more technical practices of agroecology and the socio-political environment in which this food production occurs. That is to say there is now widespread agreement that the sustainability of the field cannot be dissociated from the livelihood of the farmer, both in rural and urban contexts. Agroecological practices have been broadly defined around five key principles:

- Conservation of agrobiodiversity
- Nutrient cycling
- Energy efficiency
- Water efficiency
- Conservation of local and traditionally-used genetic resources

In addition to these ecologically-based principles, a number of socio-political goals related to the context in which agroecology is practiced are identified as critical for transforming agriculture systems in a socially just way. These goals therefore emphasise that agroecology should be practised supporting:

- Equitable land access
- Territorially-based food systems
- Peasant and indigenous knowledge
- Food sovereignty

These were some of these principles and concepts that inspired the El Boalo municipal goatherd project.

The goats first emerged in El Boalo's municipality as part of the town's municipal waste management plan, which aims to repurpose the organic waste from tree- and shrub-pruning in public green spaces. Previously-discarded bio-waste therefore became fibrous feed for the goats. They receive weekly prunings as part of their diet, and the rest of the wood is chopped and used as mulch for the community's chicken compost and community gardens.

These projects in El Boalo do not stand alone, but are part of a broader trend of using municipal level politics as platforms for spreading practices of sustainable food production and consumption, while using the concepts of agroecology and/or food sovereignty. One of the key facilitators of this trend in Spain is *Red Terrae* (Network of Agroecological Reserve Territories). It is a network of municipalities working towards an agroecological transition through rural municipalism, of which El Boalo is a member.

### Institutionalising agroecology

For the municipalities in the Red Terrae network, institutionalising agroecology through public policies is part of a process of re-municipalisation, aimed toward increasing local autonomy of public services. In the case of El Boalo, after finishing a contract with a private waste management company, the municipal council decided to take back providing the service itself. Benefiting from partial funding from the European Union, the municipal goatherd is one of several components of the new municipal zero-waste plan. The plan also includes a community composting system with door-to-door organic waste collection and use of chicken compost at local schools. Due to these efforts, El Boalo was recently named the 'first zero waste municipality' in the Madrid region by Zero Waste Europe in recognition of the town's innovative waste strategy.

El Boalo's municipal activism offers some important insights into the advantages of an institutional approach to supporting agroecology. Public institutions can be pillars of stability in communities, and in some cases institutions have the capacity (and also sometimes the mandate) to extend services and opportunities to marginalised populations that may otherwise be ignored.

For the municipal goatherd case, two institutional advantages are clear. First, the project is formulated as part of an institutional service. None of the activities related to the goatherd are therefore profit-oriented, unlike most farming activities in the region. Through this socio-environmental project, the municipality is able to promote agroecology practices that otherwise may not be economically feasible for farmers, and in turn build new local markets, social networks, and education opportunities. For example, local schools have been eager to integrate the project into a number of curricula, allowing school children to go on herding excursions for physical education class and learning about nutrition by testing goat milk in chemistry class. Secondly, the municipality was able to access non-local resources and political platforms, such as European funds, that otherwise would be out-of-reach for individual farmers and traditional producer organisations.



*Municipal goatherd being presented in the town square.* Photo by Ayuntamiento de El Boalo-Cerceda-Mataelpino

In this way the institution's administrative capacity and political status enabled the promotion of agroecology practices in innovative ways.

Despite the municipality's political enthusiasm for leading this project, its institutional nature also raises challenges for its long-term sustainability and for the integrity of the agroecology principles it strives to follow. For example, so far, the project has been implemented in a fairly top-down manner. The mayor and his staff take on many of the animal husbandry responsibilities such as feeding, herding and birthing, as well as promotional initiatives in the media and regional events. This has meant that local farmers have had little involvement in the project, both in terms of the project's formulation and the care of the animals themselves. Farmer-to-farmer exchange of local and indigenous agricultural knowledge is a key component of an agroecological approach, but given the institutional management of the goatherd, this component of farmer-to-farmer engagement is lacking. Furthermore this limited local farmer participation has negatively impacted their feelings of community 'ownership' of the initiative.

A second drawback to institutionalising agroecology is that these initiatives become dependent on the political agenda of elected politicians. As mentioned, the goatherd is currently mainly managed by local councillors, and it is not clear how, or if, the project will be continued beyond the next municipal elections. Furthermore, there is the concern that by politicising the concept of agroecology its principles will be appropriated and diluted for political gain, and in turn lose their legitimacy.

### Food for thought

As new urban and peri-urban spaces become fertile ground for emerging agroecological food systems, it is clear that public institutions - from local municipalities to national ministries - can play an important role in facilitating innovative projects to foster ecological sustainability and social justice. But these openings also bring to light struggles over how agroecology is used and practised, adhering to all of its social, ecological, and political dimensions. Agroecology

as a concept and set of agricultural practices is now a "territory in dispute" between public institutions and social movements.

While it is important for research and advocacy to highlight innovative initiatives and public policies that push forward agroecology as a concrete pathway for more sustainable food systems and resilient communities, it is necessary to maintain a critical perspective. The co-option of the concept for political and economic interests is a risk. Therefore agroecology as a movement must actively engage in reclaiming participatory spaces in public administrations as a means for upholding its principles and co-producing real food system change.

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For more examples on institutionalising agroecology in Spain, see: [www.ecologistasenaccion.org/tienda/editorial/1809-libro-arraigar-las-instituciones.html](http://www.ecologistasenaccion.org/tienda/editorial/1809-libro-arraigar-las-instituciones.html)

For more information on Spanish municipalism, see: [www.tni.org/en/publication/the-open-source-city-as-the-transnational-democratic-future](http://www.tni.org/en/publication/the-open-source-city-as-the-transnational-democratic-future)

# Monitoring Agroecology Values in Peri-urban Landscapes in Beijing

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*Apple Agro-Park Park in Changping District, North Beijing*

**China's many initiatives promoting urban-rural development, such as "The new countryside construction" and "New urbanisation" programme, are grounded in five development concepts: innovation, coordination, green development, opening up and sharing, and eco-civilisation. The concept of eco-civilisation refers to a comprehensive and harmonious system which builds on multi-stakeholder participation in the creation of a high-amenity environment and landscape with natural biodiversity and cultural richness. In other words, the question for Beijing is how its peri-urban landscapes can be maintained, while providing natural ecosystem services and cultural context.**

This evokes the question of how to measure ecological values or ecosystem services in a quantitative way to help raise public awareness and support. Beijing municipal government, jointly with academia, has been exploring new methodologies to quantify the value of agroecology in peri-urban landscapes in Beijing during the past decade. This article presents some achievements to date and poses some critical questions to be considered in future use.

## **Assessment of agroecology values, Version 1.0 (2006-2009)**

Given the complexity of the ecosystem, there is no ready-to-use methodology to assess the value of agroecology.

However, this value can be roughly divided into three parts: the direct agro-output value, the indirect agroecology economic value, and the agroecology service value. The first refers to the traditional production value of agriculture, including farming, forestry, animal husbandry, secondary production and fisheries. The second refers to the extra economic benefits generated by utilising the agro-resources. The third, agroecology service value, refers to the invisible ecological benefits brought by the natural agroecological system, including farmland, forest, and grassland.

Following this logic, an assessment and monitoring index system for evaluating the value of agroecology was initially established jointly by Beijing Bureau of Statistics, Beijing Municipal Bureau of Landscape and Forestry, and National Bureau of Statistics in 2007 (See Table 1 below).

## **Assessment of agroecology values, Version 2.0 (2010-2015)**

Based on application of Version 1.0 of the index, a special research project on further improvements of the monitoring system was conducted jointly by Beijing municipal government departments and various research institutes such as the Chinese Academy of Sciences, Chinese Academy of Forestry, Beijing Normal University and others. A new consensus on the concept of agroecology value was reached, in which the multiple functions of (peri)urban agriculture with their respective values were clearly identified. The direct agro-output value was mainly related to its production function, the indirect agroecology economic value was mainly related to its social service function, while the agroecology service value was linked to all, but mainly the eco-environmental functions.

The improved monitoring system further stressed the importance of agroecology values in landscape improvement, climate adjustment, water conservation and disaster mitigation, as well as agro-cultural service functions. In addition, a new sub-system of wetland was included in the system, along with additional indicators for the other three sub-systems as shown in Table 3.

Based on this index, the economic value of agroecology in Beijing was calculated as value in current year (VCY) and present discounted value (PDV). Specifically, VCY refers to the economic value per category in the measured year, while PDV refers to the value of accumulated value-added products, minus an annual discounted value of 5% assumed lost. Table 2 presents the PDV of agroecology using the new index system in Beijing from 2010 to 2016. It should be noted that the total PDV of agroecology in 2009 was much higher than originally calculated based on the initial index system. The main differences were induced by the indirect agroecology economic value (9.5 vs 93.5) and the agroecology service value (608.6 vs 732.7).

It can be seen from Table 2 that the total PDV of agroecology experienced a rapid increase during this period with an annual growth rate of 3.5%, compared to that of 2.7% during the period 2007 to 2009. Of all the categories, the indirect agroecology economic value gained the highest annual growth rate of 5.2%, resulting from the fast development of urban agriculture in its social service function, including the boom of agrotourism, rural heritage and cultural experiences. The value increase in agro-ecological value came from farmers' preferences for trees and agroecology practices and municipal government support.

### Assessment of agroecology values, Version 3.0 (2016-present)

Based on five years' application of the updated index system, again some minor adjustments were applied in 2016. The adjustments mainly focused on changes of some parameters and monitoring methodologies in calculating the index values, particularly the landscape improvement, environmental cleaning and purification. Following the

Table 1. The improved index system for evaluating the value of agroecology in Beijing (2010). Additions are indicated in bold. The other categories correspond to the original 2007 index.

Index	Indicators	
The direct agro-output value	Farming	Value-added products from traditional agriculture production
	Forestry	
	Animal husbandry	
	Fishery	
	Secondary production	
	<b>Water supply</b>	<b>Value-added conservation of water resources</b>
The indirect agroecology economic value	Sightseeing and leisure	Tourism revenue
		Sightseeing parks revenue
		Revenue from eco-parks, resorts, nursing homes, education and training centres/bases, etc.
		Revenue from forest park, natural reserve, etc.
	Crafts and souvenirs	Revenue from various kinds of self-processed crafts and souvenirs by local materials
	<b>Cultural tourism service</b>	<b>Revenue from agro-cultural tourism</b>
<b>Hydroelectric storage</b>	<b>Potential value from enhancing capacity of hydro-power</b>	
<b>Landscape improvement</b>	<b>Revenue from improvement of land use, transportation, and green environment</b>	
The agroecology service value	<b>Climate adjustment</b>	<b>Oxygen/CO<sub>2</sub> balance, mitigate greenhouse effect, wind prevention, humidity, temperature improvements</b>
	Water conservation	Rain-water harvesting
		Water purification
		Flood prevention
	Soil conservation	Reduction of land loss
		Prevention of decrease in soil fertility
		Mitigation of sediment accumulation
	Environment cleaning and purification	Absorption of SO <sub>2</sub>
		Absorption of fluoride
		Absorption of oxynitride
		Dust fall prevention
		Noise reduction
		Recycling of solid waste
Carbon sink and oxygen supply	Absorption of CH <sub>4</sub>	
	CO <sub>2</sub> fixation	
	Oxygen supply	
Bio-diversity	Diversity of animals and plants	
<b>Disaster mitigation</b>	<b>Flood water storage</b>	
	<b>Farmland protection</b>	
	<b>Wind break and sand fixation</b>	

Source: Beijing Bureau of Statistics

**Table 2.** The PDV of agroecology by categories in Beijing (2010-2015)

Categories	2009 original	2009 new index	2010	2011	2012	2013	2014	2015
Direct agro-output value	31.5	33.5	34.9	38.9	41.9	44.3	46.1	38.5
Indirect agroecology economic value	9.5	93.5	100.3	107.3	114.9	119.7	123.8	129.1
Agroecology service value	608.6	732.7	740.2	750.6	761.4	779.1	815.1	873.9
Total value of agroecology	649.6	859.7	875.4	896.8	918.2	943.1	985.0	1041.4

Unit: billion yuan. Source: [www.bjstb.gov.cn/taiban/\\_719/\\_727/stgb/index.html](http://www.bjstb.gov.cn/taiban/_719/_727/stgb/index.html)



*Chestnut Agro-Park in Huairou District, North Beijing*

adjustment, the value of agroecology by categories in Beijing in 2016 was calculated as shown in Table 3.

The comparison of VCY and PDV in Table 3 indicates that the yearly agroecology service value is huge, while the PDV is even more significant. The agro-economic value results from accumulated yearly inputs and performance, while the agroecology service function mainly depends on a well-maintained plant stock. Thus, maintenance is needed

over an extended period.

### Discussion

Application of the methodology shows that the index system could serve as a powerful tool in convincing policy-makers to allocate more resources to agroecological services through improving peri-urban agriculture. Based on this new way of presenting data on agriculture value, Beijing has enlarged its budget for management of its peri-urban mountainous

**Table 3.** The value of agroecology by categories in Beijing (2016)

Categories	Value in current year (VCY)	Present discounted value (PDV)
Direct agro-output value	39.6	39.6
Indirect agroecology economic value	115.0	115.0
Agroecology service value	198.5	901.9
Total value of agroecology	353.1	1056.5

Unit: billion yuan. Source: [www.bjstb.gov.cn/taiban/\\_719/\\_727/stgb/index.html](http://www.bjstb.gov.cn/taiban/_719/_727/stgb/index.html)



*Mulberry Agro-Park in Daxing District, South Beijing*



*Eco-landscape in Peri-urban North part of Beijing*

areas to enhance their agroecological service function in soil and water conservation as well as acting as a carbon sink. In 2016 a large new programme was launched to increase the city's forestry land area percentage to one third of its region by 2020.

#### Editors notes

In China, agroecology is understood as sustainable and multifunctional land use and (agro)ecosystem services. This concept of ecosystem services is criticised by several groups for being anthropocentric (promoting an exploitative human-nature relationship). However, others argue that the concept may also be used to reconnect society to ecosystems, emphasising and reconceptualising humanity's relationship with nature. In the latter case, nature and ecosystems are appreciated because of their simple existence, and looked upon with awe and respect. Economic evaluation of agroecological values is also critiqued for being too narrowly economic in which value is mostly understood as gains/economic profit, whereas agroecological values also include values such as land stewardship, equality, justice, mutual learning, etc. Counterarguments claim that valuation of ecosystem services leads to more informed decision-making where "monetary valuation thus provides additional arguments for decision-making processes and does not replace ethical, ecological, or other nonmonetary arguments". Other forms of non-monetary evaluation, such as stakeholder perceptions, biophysical and human welfare assessment are complementary methods that can be used (Taken from: Schroter M, et al. 2014, Ecosystem Services as a Contested Concept: A Synthesis of Critique and Counter-Arguments. [onlinelibrary.wiley.com/doi/10.1111/conl.12091/full](http://onlinelibrary.wiley.com/doi/10.1111/conl.12091/full))

However, the current index system proposed by Beijing may not be readily applied by other cities due to the high cost of investigation, identification of detailed agricultural typologies, maintenance of databases, and costs of the participation of local agencies. There is a need to adapt and apply the method for wider practical use.

The system helps convince the larger society to recognise the importance of agroecology in enhancing the quality of life and city welfare as the whole. However, the extensive indicators are hard to communicate clearly to Chinese consumers. They may be more motivated by seeking zero risk to food safety, than showing concern for environmental protection or farmer livelihoods. Once consumer trust in the food system is improved, this may change over time.

Finally, the index system is based on quantitative—economic measurement. It needs to be complemented with recognition of non-monetary values. Such social values would include education of children, enjoying traditional food flavours or living in harmony with the planet for example. Care should also be taken that the index does not create a ground for justifying the economic exploitation of nature.

These challenges are relevant in discussing agroecology worldwide. This article serves therefore as a starting point to kick off this debate.

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# Practices of Urban Agroecology in the Municipality of São Paulo: Income generation and community activism

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Photo by Pops Lopes

**This article considers two practices of urban agriculture related to agroecology in São Paulo: the first is related to income generation and the second derives from community activism. The first practice is present in the far southern region of the municipality of São Paulo, which is made up of the districts of Parelheiros and Marsilac, where many family farmers live. While income-generating urban agriculture is not new to the *paulistano* urban space as such, its productive and political dimensions are. The second practice, the community garden, is to be found in different areas of the municipality. ‘Hortelões Urbanos’ (Urban Gardeners) is the founding network and voice of the activist movement in public spaces in São Paulo.**

## The Producers from Parelheiros

The family-based agricultural production to be found in Parelheiros characterises the green belt of the metropolis, supplying its fruit, vegetable and poultry supply. It has undergone transformations, adapting itself to organic production and agroecology. Most of the family farmers in this region are still producing in a conventional way. However, due to policies that have begun especially in the last decade, there is an increasing number of family farmers starting to produce agroecologically. Furthermore, these producers have been calling for municipal public policies to recognise them to a greater extent. The São Paulo Masterplan, which

was approved in June 2014, recognised the region as a rural zone. With this recognition, agricultural practices developed there become visible and are empowered to aim for projects which would have previously been unreachable due to their lack of recognition.

There are many rural producers in the district of Parelheiros due to how this region was established. In 1829, a group of immigrants made up of 94 German families settled in the region to establish a colony. Then, in 1940, Japanese immigrants began to arrive and focused on agriculture. The producers’ properties range from 5 to 20 hectares and include both conventional and organic producers. These producers are based in the most preserved areas of the municipality of São Paulo with Atlantic rainforest and many natural springs. There are two environmentally-protected areas in the region: Capivari-Monos and Bororé-Colônia.

The authors followed a group of organic producers living and producing on family farms of two to eight hectares. Despite the small area, their produce is diverse. Root vegetables are the main produce during the hotter months and leafy vegetables during the colder months. They mostly sell their produce at organic markets around São Paulo, normally in higher-income neighbourhoods in the western and southern parts of the city, where customers have greater purchasing power. One of these producers claimed that his earnings from sales per market could go up to 3000 reais (the equivalent of 791 US Dollars in November 2015). Demand for organic vegetables has only gone up in recent years and a lack of produce is therefore their main problem. Production capacity is limited by the small area on which they plant and by family being the main workforce. Nowadays, it is hard for producers to get temporary helpers, ‘no one wants to work

the land anymore' as it is hard work and usually does not offer fixed working hours. One of the producers complained at a meeting of the difficulty in contracting someone to work on a tractor; she had been in contact with someone who demanded an hourly pay of 100 reais (the equivalent of 26 US Dollars in November 2015).

The producers also face other problems. Being a long way from the central zones where trade and services are concentrated, Parelheiros is often overlooked by the public authorities. Dirt tracks in poor conditions, poor cell-phone signal, lack of public transport and electricity are just some of the difficulties that farmers face in their day-to-day life. Despite this, the producers of the region receive support from the technicians of the *Casa de Agricultura Ecológica Umberto Macedo Siqueira*, better known as the *Casa de Agricultura de Parelheiros, CAE* (House of Ecological Agriculture), founded in 2006. They keep track of producers in the southern region of São Paulo, carry out farm inspections, and give advice. Technical support is directed towards the agroecological model of production, due to the environmental characteristics of the region. Therefore, their aim is to persuade conventional family farmers to become agroecological ones.

To defend their interests, the producers act as councillors in the managing councils of the environmentally-protected areas, and the *Conselho Municipal de Segurança Alimentar e Nutricional de São Paulo, Comusan* (Municipal Council on Food and Nutrition Safety). Furthermore, they frequently come together to participate in events in which organic farming, family farming, sustainability and other fields of interest are discussed; an example to supply to a school feeding programme in São Paulo city. They search for modes of organisation and coordination to strengthen their production, organic certification and marketing, through participating in the *Cooperativa Agroecológica dos Produtores Rurais e de Água Limpa, Cooperapas* (Agroecology Cooperative of Rural Producers and Clean Water) and the *Organização de Controle Social, OCS* (Social Control Organisation) of São Paulo.



*Cooperative members meet to discuss and learn about the standardisation packaging.* Photo by the author

### Learning from Sao Paulo

- *The city is bolstering agriculture on its urban fringes in hopes of stopping the outward sprawl of development and raising the living standards of rural people*
- *A Master Plan changed the designation of more than a quarter of the city's land from 'urban' to 'rural', which for farmers opened access to low-interest loans to buy machinery and seeds*
- *The city is also boosting demand for local organic agriculture – for example, by increasing purchases for use in school meals.*

*Read the blog: [How São Paulo is tackling poverty and urban sprawl by bolstering farming](#) by Ignacio Amigo, Citiscope. Citiscope is a nonprofit news outlet that covers innovations in cities around the world. More at [citiscope.org](#).*

*Cooperapas* was founded on 9 June 2011 with 30 members. Today, it has about 25 cooperatives and is looking to strengthen integration so that they can sell in more locations (organic markets, grocery stores, supermarkets and restaurants) in the municipality of São Paulo. The *OCS* is a group created by some producers who are part of *Cooperapas* to create a certification that recognises their products as organic. This enables them to get access to organic markets in the city. Every month, producers, consumers and *CAE* technicians visit one of the farms and carry out an inspection. Together they assess the situation and share ideas of what can be done to improve. This type of survey is called social certification and is recognised by the Ministry of Agriculture of Brazil.

In this way, producers are looking for ways to continue to farm and defend their interests, despite the difficulties they face. This farming continuity is of utmost importance to avoid the occupation of the farms by informal settlements, as this has very serious consequences for the environment, endangering water sources and atlantic rainforest vegetation.

### Urban agriculture as an expression of activism

In São Paulo, urban agriculture is not new. In the mid-20<sup>th</sup> century, the working class population, who in search of cheaper land had already occupied the most peripheral areas of the city, would build their houses on unoccupied land surrounded by a vegetable patch or garden. The horticulture 'backyard' tradition persisted following the arrival of large numbers of people from the 1950s onwards due to the rural exodus. This residential agricultural model served to complement the basic family diet, to save income and to maintain a tie to their rural background.

It is only from the start of the 21st century that urban agriculture also spread as a form of activism. The emergence of a network called '*Hortelões Urbanos*' in 2011 was a key step in bringing together a group of urban agriculture



*Cyclist Community Garden on Paulista Avenue; one of the busiest central tourist spots. Photo by the author*

enthusiasts. Their initial interest was to discuss food production in the city, but they were also committed to taking practical initiatives in public spaces. *Hortelões Urbanos* was developed by two journalists, Claudia Visoni and Tatiana Achcar. They created a public group on Facebook in 2011 to share experiences and information related to urban agriculture at household or community level. Immediately, some of its members organised themselves on-line and suggested having face-to-face meetings to discuss possibilities and strategies for the occupation of public space to create a community garden. In 2012, after a few such meetings, which usually took place in restaurants in the Vila Madalena neighborhood in the western region of São Paulo, some *Hortelões* members decided to take action. This form of green guerrilla-inspired activism came to life in Plaza Dolores Ibarruri in the neighborhood of Vila Beatriz (close to Vila Madalena), in the western region of expanded downtown São Paulo. Better known as *Praça das Corujas* in reference to the stream of the same name on its eastern limit, the community garden established there became known as the 'Corujas Community Garden'. Currently, *Hortelões Urbanos* has more than 70,000 members on its [Facebook page](#).

The *Movimento Urbano de Agroecologia, MUDA-SP* (Urban Movement of Agroecology, see article page 63), is a collective of significant political presence in matters relating to urban agriculture and agroecology in São Paulo. As an actor in a number of branches of activism and practical support, it has produced a basic map with the location of community gardens in São Paulo. On this map, Corujas Community Garden is recognised as the first garden of its kind in São Paulo and has been authorised informally by public authorities. The Cyclist Community Garden, in the middle of Paulista Avenue, was set up soon after (also in 2012) without prior authorisation of the public authorities, confirming the practice of green guerrilla activism inspired by the pioneering project of Corujas Community Garden.

Corujas Community Garden presents itself as a space which questions the contemporary urban order. It does not promote the food self-sufficiency of its volunteers nor does it intend to do so. It does, however, aim to increase collective reflection

regarding the possibility of urban space also being a genuine space of permanent food production, through cooperation and social integration.

### Conclusion

Urban agriculture related to agroecology is a very significant activity in the social, political, economic and spatial relations of the metropolis of São Paulo. Its dynamics and function, though sometimes converging and sometimes conflicting with pressures of the public authorities, are not isolated.

Even while tending to be historically characterised as a structural part of the urban landscape crucial to the food supply of São Paulo's population, agricultural production in São Paulo stands out as a revitalising agent of metropolitan space and even as a creator of new patterns of cultural and consumer consumption.

Urban agriculture for generating income, like that developed in Parelheiros, has received government incentives to move towards agroecological principles and techniques, show-casing itself as an alternative with great potential to expand alongside the diverse consumer market of São Paulo. The agroecological agriculture they develop helps to preserve areas of great importance in São Paulo, which are home to springs and the remains of atlantic rainforest.

At the same time, urban agriculture originating from activism is an important mechanism for questioning and modifying the model of a city that prioritises individualism and socio-spatial segregation. The community gardens therefore support the transformation and upgrading of public space to promote solidarity and social integration.

### Acknowledgement

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# Urban Agroecology Movement (MUDA) Changes the Brazilian Metropolis

Susana Prizendt

Photo by Pops Lopes

**MUDA means change / plant seedlings. It is the Portuguese acronym for Urban Agroecology Movement, a network promoting agroecology in Sao Paulo. With 21 million people, Sao Paulo is the largest city of the global South and the most crowded metropolitan region of the Western hemisphere. MUDA supports many local projects and brings together farmers, volunteers and communities.**

Throughout the world, for centuries, we have seen an increasing flow of migration from agricultural areas to cities. As a result, we can now see a gradual distancing of urban dwellers from the rural space and its cycles governed by nature. In Brazil, a country of immense biodiversity, this distancing has social and environmental consequences, unbalancing the relationship between people and natural resources, threatening the preservation of our biomes and bringing the loss of peoples' culture. It is accompanied by increasing economic inequality.

Four fifths of Brazil's population has congregated in its cities, mostly following the logic of capital. This logic focuses on technologies that disregard human relationships, and weakens the power of its inhabitants to meet their basic needs without the omnipresent and mandatory use of money.

Cities are subjected to the interests of the real estate market, which, with its strong relations with public power through the financing political campaigns, influences government

policies and reproduces the logic of the segregation of social classes. Even with many vacant buildings and lots in central areas, poorer dwellers are pushed to the periphery, finding clandestine occupations and making their homes in slums without adequate infrastructure. Areas with natural water springs and preserved vegetation, important for the regional environmental balance, end up being invaded and degraded in the process.

In São Paulo, this scenario generates social and environmental conflicts that hinder conviviality among its inhabitants as they search for a reasonable quality of life. The population, largely estranged from its agricultural background, relies on a food industry that provides low nutritional items. Traditional healing practices have been replaced by the logic of large pharmaceutical companies. The same logic of economic dependence applies to housing, clothing, and cleaning products.

## Urban agriculture or urban agroecology?

Producing food in urban and peri-urban spaces offers possibilities to break with this dependence, exclusion and lack of social interaction. Using vacant or under-occupied city spaces for cultivation allows for reconnecting the rural, natural universe with the typical life of urban environments. Urban agriculture in São Paulo generates survival options for the poorest population. But it also meets the desire of a growing number of people in search of more solidarity and a healthier, sustainable lifestyle.

There are many forms of cultivation in the city with multiple purposes. A private garden, tended by salaried labour is very different from a small public space cultivated by a group. The former commercialises its crop and mostly cultivates

## Agroecology in São Paulo

- The municipality of São Paulo has a network of about 400 farms (see [interactive map](#)) dedicated to the production of local food. Not all of them cultivate agroecologically, but an increasing number is in the process of conversion and a network of organisations (MUDA-SP partners) assists in this process. Many of these farms are located in APAs (Environmental Protection Areas) and help to preserve water springs and forests. COOPERAPAS is a cooperative located in APAs BORORÉ- COLONIA and CAPIVARI-MONOS, at the southern end of the municipality. This cooperative is organically certified through a Participatory Guarantee System. It therefore incorporates two more agroecological practices: trust between farmers and consumers; and the autonomy of producers in relation to the commercial market where certification is acquired through a certification company.
- The Sister Albert settlement is an example of agroecological farming in the northern part of the municipality of São Paulo. It resulted from the struggle of rural workers for access to land and reveals that agrarian reform is feasible even in regions close to large cities. The settlement

commercialises agroecologically-produced food by direct sales to solidarity consumption groups.

- Indigenous villages still exist within the perimeter of São Paulo, producing agroecologically, mainly for subsistence, but also as a way of recovering and maintaining their culture.
- A set of “activist” gardens are maintained by groups with more pedagogical and militant goals for social transformations than for large scale cultivation of food. They cultivate public places, some quite symbolic, such as the Horta do Ciclista, in Av. Paulista, the city’s main avenue, attracting attention to the agrifood cause and sensitising Paulistanos to reflect on their food and way of life. It is the seed of agroecology being cultivated in people’s hearts at the centre of the megalopolis.

MUDA-SP’s mission is to support these initiatives and promote links between them and the population, strengthening the existence of agroecology in the municipality. One way to do so is on the internet, where the network maintains a website that offers a map showing where the agroecological gardens are.



Photo by Pops Lopes

non-native species while the latter may be rescuing ancestral knowledge, recovering native species long neglected by the market, and fostering relationships with each other. The latter also fosters a relationship with nature, transcending the productive logic based on the financial sector.

The percentage of Paulistanos involved in agricultural cultivation is still very limited but urban agroecology emerges as a radical proposal of social transformation. It distances itself from the simple practices of cultivation in urban spaces that define urban agriculture, and moves towards the development of deeper relations with the earth and more human solidarity. The cultivation of food in urban spaces becomes a tool for a broader ideal: to awaken the population of cities in relation to what they eat and how they live.

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A photograph showing a man with a beard and glasses on the right side, looking towards a large, white, cylindrical composting bin. The bin is situated outdoors in a rural or agricultural setting with trees and a wooden structure in the background. The text 'Revaluing the Marginal: An agroecological approach to waste in food production and consumption in Spain' is overlaid on the image in white font.

# Revaluing the Marginal: An agroecological approach to waste in food production and consumption in Spain

Flora Sonkin

Photo by Flora Sonkin

**Waste management and agricultural production are not often dealt with under the same policy umbrella, yet recent social innovations implemented by actors from the agroecology movement in Madrid have shown it is possible to make this connection. *Madrid Agrocomposta* is the name of the pilot project repurposing organic waste and creating new partnerships between food producers and consumers, rural and urban dwellers, and policy makers in and around the city. Bringing together principles of agroecology and circular economy, the concept is already seeing success in municipalities beyond the Spanish capital.**

The project emerged as an initiative of the citizen platform Madrid Agroecológico, and the pilot programme was included in the General Plan of Urban Waste Management 2016 of the City of Madrid. In a few words, Madrid Agrocomposta consists of the repurposing of organic waste generated in the city of Madrid, by donating it to agroecological farmers in the area for composting and utilisation as on-farm fertiliser.

### **Reworking the socio-ecological metabolism**

A system of organic waste collection, short-distance transport, composting in local agriculture (replacing synthetic fertilisers) and sale of local food, characterises the cyclical and agroecological approach of the project. The organic waste is collected by urban consumers, especially

school canteens, who donate their waste to peri-urban farmers, these farmers then transform the waste into valuable compost to be used as fertiliser on their farms. In the case of Madrid, the collection, sorting and transporting of waste is performed by an association working towards the socio-economic inclusion of young people, El Olivar. Meanwhile, the food producers sell their products in agroecological markets in Madrid city centre, where people who donated their organic matter can buy and taste the results of their collaboration. This full circle helps strengthen the connections between the urban consumers and peri-urban producers in many ways: through revaluing and giving a different meaning to organic waste, and through food, knowledge and economic exchanges.

The first cycle was implemented from March to July 2016 in four peri-urban farms in Madrid. At the end of that year, almost 40 tonnes of bio-waste had been processed by the participating farmers, and in several schools that composted on site. The organic matter was donated by more than 200 families, seven schools and two municipal markets. The simplicity of the model and its environmental advantages, paired with drive from the community, led to high-quality compost, in addition to the learning generated between the participating actors. More so, it has proven to be a small but very effective alternative to large waste disposal facilities. Sending waste to landfills or incinerators is more expensive to the municipal government in economic terms, but more importantly, it generates significant negative environmental impacts that are hard to quantify. Meanwhile, research has shown that on-farm composting and utilisation of organic fertiliser can contribute to carbon sequestration, and in the case of *Madrid Agrocomposta*, it is also beneficial to the city's budget.

## Agroecology & citizenship

The initiative was designed by the *Bioresiduos* (bio-waste) commission of Madrid Agroecológico (a social movement and advocacy platform), together with the food producers of the AUPA (Association of United Agroecological Producers). The project aimed to change how organic waste is managed in the city while supporting local farmers both in cash and in kind.

The idea was put into practice with the support of the Madrid City Council, who provided a new source of income to the peri-urban food producers involved. That is, the municipality paid farmers per ton of waste composted *in situ*, while they accessed high-quality and low-cost organic fertiliser. Promoting both agroecological practices and innovative waste management, the project was fuelled by citizen engagement which enhanced the support for local small-scale food producers. The next step is to implement an alternative currency. Called MOLA (*materia organica liberada*, in English, liberated organic matter), it would be given in exchange per kg of organic waste donated. The currency could then be used to purchase the agroecological products sold at weekly farmers' markets organised by AUPA in several squares around Madrid. The campaign started under the banner "Tua Verdura Vale Basura", translating, "Your Food is Worth Waste". Franco Llobera, active member of Madrid Agroecológico and co-founder of Red Terrae (Inter-municipal Network for Agroecological Territories), is one of the many people behind this idea. During an interview, he explained the concept of the project; he recognises how hard it is to make such a currency work, since it depends on a largely conscious citizenry to get it off the ground.

## Public policies for agroecology

This initiative can be seen as part of a global turn towards thinking about food policy at the municipal level. The Milan Urban Food Policy Pact and the AgroEco Cities European Network are supranational examples of these new spaces of commitment and collaboration. In Spain, initiatives which reclaim autonomy through more sustainable natural resource management and often include local support for agroecological practices at the municipal level are a part of a rapidly expanding movement (e.g. Madrid Agroecológico, Red Terrae, Red de Ciudades por la Agroecología, Llaurent Barcelona).

Madrid Agroecológico evolved from the Iniciativa por la Soberanía Alimentaria de Madrid (ISAm), as a group of social movements and associations working toward food sovereignty. The platform consists of six different commissions: Agrocomposting and Organic Waste, School Feeding, Food Producers, Training, Milan Urban Food Policy Pact and Social Mobilisation. In 2015, the citizen organisation presented food policy recommendations for municipal and regional governments to inform an agroecological transition. Since then it has become an advisory group to Madrid's municipal council on participatory processes for the creation of a Local and Sustainable Food Strategy for the city.

The experience of Madrid Agrocomposta represents a light of hope and encouragement to continue working along this

path. Following the first year of operation, the Madrid Agrocomposta model was extended, and different agro-composting experiences have been implemented in other municipalities of the region. One example is the Henares Agrocomposta or Alcalá Agrocomposta project - which Ecologistas en Acción is developing in collaboration with the Alcalá City Council. Another is the collaboration between Zarzalejo city council, *Zarzalejo in Transition* and the *Germinando* Collective, to provide agro-composting courses and implement another pilot project in the city.

The case of Madrid Agrocomposta offers a grounded example of how agroecological principles, such as enhancing recycling of biomass and closing nutrient cycles, can be practised while bridging the rural-urban and producer-consumer divides. This is done by bringing together diverse actors, including: food producers, waste managers, fertiliser and agricultural input enterprises, local food markets, consumers, and those concerned with health and nutrition as well as climate change. This project also highlights how working together with local governments can be an opportunity to push forward ideas and strategies from social movements and local communities. In conclusion, agro-composting can be seen here as an innovative strategy for constructing a holistic local food policy - one that integrates urban and peri-urban spaces, different sectors and their diverse actors.

## Acknowledgements

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# Policy from Below: Politicising urban agriculture for food sovereignty

Colin Anderson

*Youth delegation meets at International Forum on Agroecology. Photo by Colin Anderson*

**Urban agroecology goes beyond urban agriculture, which is often primarily technical or social in focus and has no fundamental political character per se. Agroecology is explicitly political and rooted in radical political thought and action. The case studies presented in this article can contribute to the development of political urban agroecology. They demonstrate mechanisms and platforms that social movements are co-creating as they argue for a transformative vision of agroecology.**

Agroecology is being defined and re-defined by different actors, including food producers, policy-makers, social movements and researchers. Some mainstream institutions such as the FAO and the French government are now also engaging with agroecology. While in some ways the adoption of agroecology in the mainstream is welcome, it is also problematic. These institutions often treat agroecology as a technical fix to the existing system and ignore the calls for transformative political and economic change. This puts agroecology at risk of being co-opted, like has been witnessed with sustainable agriculture and organic agriculture. Some social movements, including La Via Campesina, contest the co-optation of agroecology in order to claim a radical political agroecology.

The movements for agroecology are diverse – occurring in different places, amongst diverse peoples, knowledges and worldviews and at different scales. Yet, what holds these in common are their commitment to social transformation, through the combination of material practices that build

alternative food systems and discursive processes that argue for political agroecology. The political work of social movements often occurs in the margins, from the bottom up. It is thus decentralised, heterogeneous, place-based and emergent. Yet in the context of a globalised struggle for food sovereignty, it is necessary to engage in processes that bring dispersed actors together to make and re-make meaning together and advance a common political project across places and at different scales, from the local, national to the international.

In this article, I will share two such recent processes, one at national and another at an international level and I will discuss their relevance for urban agroecology, and for social transformation more generally.

## **A case study from England**

A People's Food Policy (PFP) is both a document and a process undertaken in England and created with the intention to advance the food sovereignty movement in the UK. The intention was to build networks, increase capacity and to generate a document that could provide the basis for strategic campaigns and actions in the coming years.

The process involved 18 months of nation-wide discussion amongst grassroots organisations, NGOs, trade unions, community projects, small businesses and individuals. The resulting document, *A People's Food Policy*, was launched in June 2017 – a manifesto outlining a people's vision of food and farming in England that is supported by over 90 food and farming organisations. It includes a set of policy proposals and a vision for change that is rooted in the lived experiences and needs of people most affected by the failures in the current food system.

In the UK, the publication is an important contribution to the debates on post-Brexit food and farming. Since Brexit, there has been almost twenty other reports marking recommendations for agricultural and food policy change in a volatile political moment. However, many of these reports focus on a narrow selection of issues and none link to the frameworks of rights, food sovereignty or agroecology. *A People's Food Policy* emphasises the interconnectedness between problems such as labour rights, environmental destruction and health, and the need for holistic integrated approaches to achieve food sovereignty. It articulates how these problems arise from a neoliberal and narrow market-led paradigm and it emphasises a shift to a paradigm where the well-being of people, community and the natural world, here and afar, are at the centre of governance.

Now that *A People's Food Policy* has been published, the steering group is bringing people together from different grassroots organisations in the UK to strategise on further mobilisation around it. In the end the document is only a part, albeit an important one, of a longer-term process of building food sovereignty in the UK.

### In the global arena

The International Forum on Agroecology, held in February 2015, was the largest international gathering of social movements on agroecology. It was organised by an alliance of small-scale food producers and consumers and held at the Nyeleni Centre, in Selingue, Mali. The forum served to create a space for dialogue and to collectively interpret the meaning of agroecology from the perspective of multiple grassroots constituencies (e.g. fisherfolk, peasants, indigenous peoples, pastoralists, etc.). Agroecology was treated as an emergent and evolving idea, with different meanings for different people coming from different contexts. There is much richness and diversity in the movements working on agroecology and this exchange in the space of the forum was a pivotal step forward to develop a common platform. It advanced the process of linking up and developing common principles of what agroecology means, for example, to a peasant in Indonesia or to fisherfolk from South Africa.

Social movements are very aware of the dangers of mainstreaming agroecology. A key rationale for organising the international meeting was to build collective consciousness and capacity to resist co-option: *"They have tried to redefine it as a narrow set of technologies, to offer some tools that appear to ease the sustainability crisis of industrial food production, while the existing structures of power remain unchallenged. This co-option of agroecology to fine-tune the industrial food system, while paying lip service to the environmental discourse, has various names, including "climate smart agriculture", "sustainable-" or "ecological intensification"- Declaration from the International Forum on Agroecology*

Thus, at the heart of the declaration, was the demand that agroecology must be linked to a process of social transformation. Ibrahim Coulibaly from CNOP in Mali, the host organisation of the international forum, explained (watch video: [youtu.be/-KmgKv5UyIU](https://youtu.be/-KmgKv5UyIU)).

*"There is no food sovereignty without agroecology. And certainly, agroecology will not last without a food sovereignty policy that backs it up."*

### Making the links: urban agroecology and food sovereignty

The call for urban agroecology must also be a demand for social transformation and requires engagement in work that is simultaneously practical and political. Agroecology demands not only changes in specific policies and practices, but more fundamentally, the transformation of the very structures, languages and cultures that underpin the injustices of the dominant paradigm. This is why intentional processes and statements that directly link the practical with the political in a broad vision of societal transformation, like the two examples here, are critically important. The links between urban agriculture and the wider agroecology-food sovereignty movement appear nascent, and there is work to do to connect and develop the political dimensions in urban agriculture.

While there are many local-level initiatives that are engaged in urban agriculture, including for example allotment and community gardens, the connection to transformative political thinking and explicit political action is often weak. Without an explicit political narrative, the transformative potential of urban agriculture is marginal. While I have focused here on food sovereignty and agroecology as important political frameworks, it is also important to note that this connection to radical political thinking may not necessarily be under the auspices of food sovereignty or agroecology. Radical politics in urban food growing spaces draw for example from anarchist thinking, the right to the city, food justice, amongst others. Yet still, many of these spaces are devoid of any of these emancipatory ways of locating urban agriculture.

My point is not to write off the diverse initiatives that do not have an explicitly political dimension but rather to say these are the frontiers of social transformation. We need to imagine how to cultivate radical political commitments in context-appropriate ways with people who are drawn to these spaces, many of who come to achieve personal satisfaction and reconnect with nature. The attainment of personal benefit is of course critically important. The satisfaction of growing one's own food, the joy of working together and interacting with people and nature and of course the enjoyment of eating food that you have had a hand in growing yourself are all core to the urban agroecology project. Yet these sites can be much more, and in some cases, are, as they are intentionally constructed as spaces to culture resistance, political dialogues and actions. My argument is that the processes and methodologies of politicisation need more attention.

In this regard, the declarations produced through grassroots processes, such as the UK *A People's Food Policy* and the *Declaration of the International Forum on Agroecology*, are examples of processes and tools that are helpful in locating the practical work in a critical political context and providing



UK Food Sovereignty Gathering at Organiclea in London. Photo by Joanna Bojczewska

ideas for how to take forward actions for change. Even more important are opportunities to bring people in and across communities into dialogue to build critical consciousness around the political and cultural problems that undermine social justice and ecological regeneration. The two examples here facilitated some of these dialogues, and the products of these dialogues will be used to provoke debate going forward. There are many methodologies in the vein of popular education that can be used in any context to make the links between the practical and the political in urban agriculture. The key is to start where people are, with what is important in their lives and together to deepen our political analysis as the basis for collective action.

Urban agroecology and food sovereignty are not only material but also are political and cultural projects – they will require a shift in how we think. This requires us to consider carefully processes of learning and pedagogy and to avoid imposing a pre-defined vision of agroecology onto projects and places but rather to engage in processes of dialogues amongst food producers and citizens to create critical understanding, mutual learning and collective consciousness. The tradition of popular education, rooted in the work and thinking of Paulo Freire, bell hooks, Orlando Falá Borda amongst others, can provide direction, tools and exemplify the commitments required to grow and evolve social movements.

The examples shared in this article unfolded at a national and an international scale respectively. Thus, neither was focused directly on the urban scale. There is a range of processes such as food policy councils that do focus on an urban scale, yet in many cases, these are not (yet) explicitly connected to food sovereignty. Regardless, what is clear is that there are important connections to be made across scales. To what extent are urban initiatives drawing from, connecting with and contributing to the wider food sovereignty movement? Conversely, is “the urban” and urban people being given enough consideration in a movement that is often largely rural in nature? These will be important questions to ask as we work to build movements across the rural-urban, and other, boundaries.

In closing, I want to reiterate that an urban agroecology must affirm the conviction articulated in the food

sovereignty, and other related, movements that social transformation, particularly in the food system, will not be reached through technical innovation alone (e.g. innovations in production practices). We must organise for shifts in power relations through cultural, institutional and political-economic change. This is a long game – one that does not often involve quick wins. Yet, momentum is building as the contradictions of industrial-corporate food reveal themselves and as the ingenuity of people is amplified through their coming together in social movements.

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Working with the European Coordination of Via Campesina, we are currently developing resources on popular education methodologies for agroecology available at [www.eurovia.org](http://www.eurovia.org)

# Struggles of Rooftop Farming in Porto Alegre, Brazil

Jessica Moreira Maia Souto

75

**On a 60m<sup>2</sup> terrace on the ninth floor of a building in Borges de Medeiros Avenue, one of the landmarks of Porto Alegre, members of the “Solidarity Mixed Cooperative of Utopia and Luta Movement” grow over a thousand lettuces and arugula heads per month. Cultivation is done hydroponically. Seedlings are grown in greenhouses to protect the plants from urban pests and dirt. Produce goes to building residents and is sold by “word of mouth”. Recently, the production is being marketed to two restaurants.**

*Utopia e Luta* (Utopia and Struggle) claims to operate the only rooftop farm in Porto Alegre. The movement was born during the World Social Forum in 2005 when attention was drawn to the issue of homelessness and the many empty buildings in the centre of Porto Alegre. One building, which had been empty for 17 years, had received many complaints from neighbouring residents. It was occupied during this manifestation. Soon after, a cooperative was created, the Utopia and Struggle Cooperative (CoopSul), so as to have a legal entity supporting the planting activities. Planting was already ongoing on the rooftop, with seedlings donated by other movements. Second-hand bathtubs filled with soil were used for production.

In 2009, the cooperative received public funding from Petrobras, and this allowed them to set up separate cooperative economic activities in the building. These included a bakery, a hydroponic vegetable garden, a laundry, a T-shirt printing activity and more recently a sewing workshop. The funding was also used for adapting the building for these activities and installing an elevator. The cooperative has not been very successful in generating other revenue however, and still struggles.

In 2016, a German NGO supported the cooperative to engage in training and learning. Each economic activity had a designated person who received a Brazilian minimum wage for a year and a half. This allowed the coop members to dedicate themselves to getting organised. Thanks to this support, Utopia was able to raise its rooftop production levels and partner with two major restaurants. This collaboration allows them to maintain the rooftop farming business even though no revenue comes from it yet. Also, several workshops were held for people who have long been unemployed. They want to learn to make a living from making bread or vegetable gardening and come to the cooperative in search of knowledge.

Envisioned to be a free political environment for its residents, Utopia was supposed to have selected members with no or minimal financial means who could live in the small apartments and work for the cooperative. The building would be a community space open to the public, so everyone could use it and learn, with no required membership.

Unfortunately, this turned out to be challenging for several reasons. Out of the 103 residents, only six participate in the activities and another nine sporadically come and go. The small number of participants is related to internal disputes regarding individual versus collective needs. And even though the movement was set up as a cooperative, there is no organisational structure. Each activity has a designated person who is responsible for checking supplies and running essential errands, but it is merely a designated person instead of a coordinator.

In addition, Utopia, politically neutral, was co-opted by different political parties prior to the elections of 2014, causing a rupture between some of the residents who then decided to leave the building. As a result, many apartments ended up vacant. It proved hard to attract new residents with a cooperative spirit and knowledge of its procedures and activities. Moreover, once residents decide they no longer need to stay in the building, they sometimes give the keys to acquaintances who have no idea of Utopia's history or procedures. As a result, out of the initial economic activities, only two are still running, the bakery and the vegetable garden.

The hydroponic vegetable garden produces arugula, lettuce, cherry tomatoes and herbs like basil, marjoram, and oregano. This year there was a big harvest of kale, parsley and chives. During the spring-summer season, it produces up to 1,400 heads of arugula per month in the 60m<sup>2</sup> greenhouse. In the winter, because of the many cloudy days, production is only half that amount. The hydroponic means of production attracted the restaurant owners. Arugula is sold the most, being responsible alone for the maintenance of the garden. Robson Reinoso, the designated person for the vegetable garden, was trained by Hydroponic Consultancy and since 2016 has been responsible for training and assistance to other members of the cooperative.

The strength of the cooperative is being a space where the potential to generate and exchange knowledge, income, and forms of food production come together. The cooperative uses urban public spaces to promote itself. It does this through the participation in organic and neighbourhood fairs, associations and events. The challenge remains to structure the economic activities and get people to participate and make Utopia a point of reference again for other social movements.

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**UA Magazine**

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*UA Magazine* facilitates the sharing of information on the impacts of urban agriculture, promotes analysis and debate on critical issues for development of the sector, and publishes "good practices" in urban agriculture.

*UA Magazine* welcomes contributions on new initiatives at individual, neighbourhood, city and national levels. Attention is given to technical, socioeconomic, institutional and policy aspects of sustainable urban food production, marketing, processing and distribution systems. Although articles on any related issue are welcome and considered for publication, each *UA Magazine* focuses on a selected theme (for previous issues, visit: [www.ruaf.org](http://www.ruaf.org)).

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# The Centre for Agroecology, Water and Resilience (CAWR)

Michel Pimbert

CAWR was created in 2014 with the aim to contribute to the new knowledge and policies needed to develop food and water systems that are resilient and socially just. The 90 people currently working at the centre are a diverse international community, a mix of natural and social scientists making extensive use of co-inquiry and blurring of boundaries between scientific, professional, citizen, and indigenous knowledge systems. CAWR's research focusses on five interlinked research themes:

- 1. Community self-organisation for resilience.** In this strand our research seeks to identify processes that enhance community strengths and build equity and resilience through people's agency and self-organisation in the face of adversity, natural and human induced disasters, instability and change. Within this overall framework, our research projects focus on the social, cultural, economic and political dimensions of the relationship between people and the production and consumption of food and water. Particular emphasis is put on the linked nature of social, ecological and environmental systems and the role of communities in mediating resilience to change and transformations for social justice and sustainable living.
- 2. Resilient food and water systems in practice.** The Centre aims to understand and enhance the resilience of the technologies and systems we depend on for our food and water security. For example, new knowledge allows us to develop systems that combine food and energy production with water and waste management to create circular economies that have low carbon and ecological footprints in rural and urban contexts. Our transdisciplinary research on agroecological models of production in rural and urban areas also focuses on how to reintroduce biodiversity in farming (intercropping, agroforestry, polycultures...) to reduce farmers' vulnerability to market volatility and climate change as well as re-localise food and water systems in rural and urban territories.
- 3. Understanding fundamental underlying processes that confer resilience or lack of it.** This research analyses key environmental drivers of change, such as climate change and its impact on the frequency of droughts and floods in contrasting situations. By doing fundamental research in an applied way, CAWR hopes to use this new knowledge on resilience dynamics to help enhance the capacities of communities, societies, and environments to anticipate and deal with sudden shocks, stresses, uncertainty, and unpredictable changes at different scales.
- 4. Enabling policies and institutions for resilient food and water systems.** Our research identifies the policies and institutions needed to scale up and mainstream equitable and resilient systems for food and water security. CAWR's work focuses in particular on exploring the policies and institutional frameworks needed to enhance community self-organisation for social justice and socio-ecological resilience at different scales. Power and the politics of knowledge are central to our thinking, and our research aims to better understand how, - and under what conditions -, can citizens to be more centrally involved in policy-making and the governance of resilient food and water systems in rural and urban settings.
- 5. People's knowledge and transdisciplinarity.** Underpinning this cross cutting research theme is the belief that everyone is able to contribute to the production of new knowledge. Some people have formal training as experts. Some people's expertise comes through their life experience. CAWR's work on people's knowledge and transdisciplinarity breaks down the barriers that exist between these two groups using participatory, transdisciplinary and transformative approaches with the aim to change society and create a more just world.

As part of its vision of influencing policy and practice, CAWR is committed to bringing together the science, transformative practices, and social movements working for agroecology, food sovereignty, water justice, and environmental sustainability in rural and urban contexts.