



City Regions as Landscapes for People, Food and Nature

*Thomas Forster
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Thomas Forster and Arthur Getz Escudero

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Setembro 2012. Downtown Belo Horizonte.

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Opposite: Composite photo of Europe, North Africa and Western Asia at night, from NASA.

Foreword

“City Regions as Landscapes for People, Food and Nature is a timely response to the demand [...] to incorporate food security, nutrition, sustainable agriculture and related ecosystem services in urban and regional planning for human communities.”



Gino Van Begin
Secretary General
ICLEI, Local Governments for
Sustainability

The revolution in thinking about urban sustainability that is now beginning to take root around the world has begun to embrace the key role that rural linkages play in the current and future lives of cities. Powerful shifts away from false dichotomies between urban and rural are instead leading us to see and act upon the potential of a dynamic “continuum” and the spatial unit of the “landscape” that includes urban and rural communities as a manageable context for sustainable development in the future.

ICLEI-Local Governments for Sustainability began more than two decades ago on bringing a local focus and initiative to global environment and development challenges, and is proud to have recognized the importance of city regions as integrated landscapes. Resilient urban food systems were fully incorporated into ICLEI’s annual Resilient Cities Congress in 2013, when our Mayor’s Declaration emerged with the following emphasis:

“We invite local governments to develop and implement a holistic ecosystems-based approach for developing city-region food systems that ensure food security, contribute to urban poverty eradication, protect and enhance local level biodiversity and that are integrated in development plans that strengthen urban resilience and adaptation...”

The CITYFOOD network, launched at the Resilient Cities Congress in collaboration with the Resource Centres for Urban Agriculture and Food Security (RUAF Foundation) further culminates ICLEI’s work for information, training, technical and policy advice, and financial assistance on resilient city-region food systems and urban agriculture. We continue with this agenda as we press for broad and cross-cutting sustainable urbanization goals and targets in the post 2015 international development debates.

“City Regions as Landscapes for People, Food and Nature” is a timely response to the demand for a guided tour of the professional and policy entry points to incorporate food security, nutrition, sustainable agriculture and related ecosystem services in urban and regional planning for human communities.

As presented in the Resilient Cities Congress and here in this report, there are promising initiatives and new directions being explored in all regions of the world. The incorporation of these examples of best practice and policy in a comprehensive overview for professional planners and policy makers will help stakeholders in both urban and rural settings better understand the field and take action as appropriate.

February, 2014

Gino Van Begin

Preface

Over the past few decades, more and more land managers seeking to address the challenges of food production, ecosystem management and rural development have reached across traditional sectoral boundaries to seek partnerships to solve what are clearly inter-connected problems. Their work reflects an 'integrated landscape management' approach to meet the full range of needs from the land and resource base. They have created coalitions of stakeholders to negotiate more acceptable trade-offs and pursue newly discovered synergies. Their work draws on agricultural production systems that enhance, rather than undermine, ecosystem values; on cutting-edge science that illuminates inter-connections among land uses and land users; and on new methods to facilitate multi-stakeholder communication, negotiation and action. Some governments and major institutions are making commitments to pursue whole landscape strategies as a central sustainable development strategy. In 2011, to support the broader and more effective use of integrated landscape approaches, a coalition of leading agriculture, environment and development organizations came together to form the Landscapes for People, Food and Nature Initiative.

Most of the 50-plus partners now in the Initiative work primarily in rural landscapes, and with public, private and civil society organizations who engage directly with rural farmers and ecosystem managers. But it is increasingly evident that cities and human settlements, and global trajectories of rapid urbanization, will have a profound impact on rural landscapes. City regions themselves are grappling with challenges to achieve food security, sustainable urban agriculture, ecosystem management, biodiversity conservation, climate change adaptation and mitigation. New relationships are being forged between cities and their surrounding rural areas that involve new patterns of food supply, and recognize inter-dependence for ecosystem health and livelihoods.

City leaders have stimulated enormous innovation in urban food systems, ecosystem management, climate change, health and livelihoods. But it is still unusual for all these elements to be explicitly inter-related and collaboratively managed in the way we describe as 'integrated landscape management'. As the Landscapes for People, Food and Nature Initiative geared up, we wondered what we could learn—for action in both urban and rural areas—from integrated action already happening in urban development.

Thus, several partners in the Initiative who are deeply involved in various sustainable cities movements came together in 2012 to begin an assessment of city regions through an integrated landscape lens. Thomas Forster of the New School and Arthur Getz Escudero of Cardiff University tapped new research on sustainable urbanization and ecosystem resources and food systems, international networks such as FAO's Food and Cities Initiative and Local Governments for Sustainability or ICLEI, and Non-governmental organizations such as RUAF, to find examples and challenges of sectoral inter-linkages. This report, the results of that effort, provides an inspiring—if challenging—picture of the opportunities that integration presents for cities, and for re-shaping the relationships between urban and rural populations, economies and ecosystems.

“New relationships are being forged between cities and their surrounding rural areas that involve new patterns of food supply, and recognize inter-dependence for ecosystem health and livelihoods.”



Sara J. Scherr
President, EcoAgriculture Partners
and Secretariat Coordinator of the
Landscapes for People, Food and
Nature Initiative

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Landscapes for People, Food and Nature

The Landscapes for People, Food and Nature Initiative is a collaborative initiative to foster cross-sectoral dialogue, learning and action. The partners aim to understand and support integrated agricultural landscape approaches to simultaneously meet goals for food production, ecosystem health and human wellbeing.

Find out more at:

www.landscapes.ecoagriculture.org

This paper could not have been produced without the input and prior work of many in the research community, from associations of local governments and nongovernmental organizations, and those in national and international agencies concerned with the intersection of food and cities. Many of these experts are cited in references in the report. Most importantly, this project would not have been possible without the generous support and careful editing of Sara Scherr, Seth Shames, Heather O'Neill, Louis Wertz and the rest of the team at EcoAgriculture Partners in Washington, DC.

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About the Authors

Thomas Forster has worked with food and agriculture systems change at the farm and local level, in policy change at national and international levels, and through teaching and writing. In recent years he has worked on public procurement change in institutional food systems and UN policy support for city region food systems. He and his family live in New York City.

Arthur Getz Escudero has explored the urban rural continuum as apprentice to a traditional urban farming family in Japan, facilitator of international farmer and pastoralist network learning exchanges in policy to practice, and researcher/activist at the science-policy interface in planning, biodiversity, sustainable agriculture and food systems, and community-based natural resource management. He currently works between Kenya, the European Union and the United States.

Acronyms

| | |
|---------------|---|
| CBD | Convention on Biodiversity |
| CEPA | Community, education and public awareness approach |
| CGIAR | Consultative Group on International Agricultural Research |
| CSO | Civil society organization |
| DESA | United Nations Department of Economic and Social Affairs |
| DRR | Disaster risk reduction |
| EPWS | Equitable Payments for Watershed Services |
| FAO | Food and Agriculture Organization of the United Nations |
| GIS | Geographic information system |
| ICLEI | Local Governments for Sustainability |
| IFAD | International Fund for Agricultural Development |
| LAB | ICLEI's Local Action for Biodiversity |
| NCDs | Non-communicable diseases |
| NGO | Nongovernmental organization |
| ODA | Official development assistance |
| OWG | Open Working Group |
| PES | Payment for environmental services |
| RBA s | Rome-based agencies |
| RPE | Remuneration for positive externalities |
| RUAF | Resource Centers on Urban Agriculture and Food Security Foundation |
| RUF | Rural urban fringe |
| RUFS | ICLEI's Resilient Urban Food Systems Forum |
| SDG | Sustainable Development Goal |
| SMASAN | Belo Horizonte's Municipal Secretariat for Food and Nutrition Security |
| TEEB | The Economics of Ecosystems and Biodiversity |
| TST | Technical Support Team |
| UN | United Nations |
| UNDP | United Nations Development Program |
| UNEP | United Nations Environment Program |
| UNFCCC | United Nations Framework Convention on Climate Change |
| WUF | UN Habitat World Urban Forum |
| WWF | World Wildlife Fund |

Glossary

Agrobiodiversity – Agricultural biodiversity (or agrobiodiversity) is a broad term that includes all components of biological diversity of relevance to food and agriculture, and all components of biological diversity that constitute agricultural ecosystems, also named agro-ecosystems: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of the agro-ecosystem, its structure and processes.¹

Agroecosystem – An ecological and socioeconomic system, comprising domesticated plants and/or animals and the people who husband them, intended for the purpose of producing food, fiber, and other agricultural products.

Biological diversity – Sometimes shortened to biodiversity. The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (Convention on Biological Diversity or CBD, article 2). More generally, the totality of genes, species and ecosystems in a particular region or the world.

Ecohealth – An approach to human health that identifies the web of ecologically-based factors affecting human health—as well as the links between them. Equipped with this knowledge, local communities can better manage ecosystems to improve people’s well-being and the health of the ecosystem.²

Ecosystem – A dynamic complex of plant, animal and microorganism communities and their nonliving environment interacting as a functional unit in a specific place. Applied by some to cover only major ecosystem types or biomes, such as tropical rainforests.

Ecosystem services – Also called Environmental Services. Beneficial functions that are performed by natural ecosystems, including hydrological services (water supply, filtration, flood control), protection of the soil, breakdown of pollutants, recycling of wastes, habitat for economically important wild species (such as fisheries), regulation of climate, and services that are cultural, provisioning, regulating and otherwise contributing to human well-being.

Food environment – Food environment factors—such as store/restaurant proximity, food prices, food and nutrition assistance programs, and community characteristics—interact to influence food choices and diet quality.³

1. Convention on Biological Diversity, COP V. appendix at <http://www.cbd.int/decision/cop/default.shtml?id=7147>

2. ICLEI: <http://resilient-cities.iclei.org/resilient-cities-hub-site/resilience-resource-point/glossary-of-key-terms/>

3. USDA Food and Environment Atlas. <http://ers.usda.gov/data-products/food-environment-atlas/go-to-the-atlas.aspx#Ui9Ai-7Igd5Y> [accessed 11 November 2013].

Food and nutrition security – The World Food Summit of 1996 defined food security as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”. Commonly, the concept of food security is defined as including both physical and economic access to food that meets people’s dietary needs as well as their food preferences. In many countries, health problems related to dietary excess are an ever-increasing threat, In fact, communicable and non-communicable disease from nutrition are becoming a double burden.⁴

Food systems – All biological processes (or agrobiodiversity) as well as the physical infrastructure involved in feeding a population: growing, harvesting, processing, packaging, transporting, marketing, consumption, and disposal of food waste and related items. It also includes the inputs needed and outputs generated at each of these steps.⁵

Green infrastructure – Green Infrastructure is addressing the spatial structure of natural and semi-natural areas but also other environmental features which enable citizens to benefit from its multiple services. The underlying principle of Green Infrastructure is that the same area of land can frequently offer multiple benefits if its ecosystems are in a healthy state.⁶

Integrated Landscape Management (ILM) – Sometimes referred to as a landscape approach, commonly includes the following features: 1) agreed landscape objectives among stakeholders;; 2) land use practices that contribute to multiple objectives; 2) spatial interactions among land uses are managed to enhance synergies and reduce tradeoffs 4) collaborative, community-engaged processes are in place for planning, implementation and monitoring ; and 5) markets and policies are in place to support the diverse set of landscape objectives.⁷

Landscape – A socio-ecological system that consists of a mosaic of natural and/or human-modified ecosystems, with a characteristic configuration of topography, vegetation, land use, and settlements that is influenced by the ecological, historical, economic and cultural processes and activities of the area. The term is similar to other terms used for spatial or place-based approaches to natural resource and agricultural management, such as “territorial”, “foodshed”, “local food system” and others.⁸

Millennium Development Goals – Time-bound targets, by which progress in reducing income poverty, hunger, disease, lack of adequate shelter and exclusion—while promoting gender equality, health, education and environmental sustainability—can be measured. They also embody basic human rights—the rights of each person on the planet to health, education, shelter and security. The Goals are ambitious but feasible and, together with the comprehensive United Nations development agenda, set the course for the world’s efforts to alleviate extreme poverty by 2015.⁹

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4. World Health Organization: <http://www.who.int/trade/glossary/story028/en/>
 5. FAO, 2011, Food, Agriculture and Cities: http://www.fao.org/fileadmin/templates/FCIT/PDF/FoodAgriCities_Oct2011.pdf
 6. European Commission, 2014: <http://ec.europa.eu/environment/nature/ecosystems/>
 7. Scherr, S., S. Shames, and R. Friedman. 2013. Defining Integrated Landscape Management for Policy Makers, Ecoagriculture Policy Focus 10. Washington, DC: Ecoagriculture Partners. http://www.ecoagriculture.org/publication_details.php?publicationID=547
 8. Ibid.
 9. UN Millennium Development Goals: <http://www.un.org/millenniumgoals/bkgd.shtml>

Policy pathways – Any policy to encourage multi-agency collaboration, for example retention of land for food production in or near cities, promotion of biodiversity protection through ecological agriculture practices, or procurement of more foods produced locally, will open doors that lead to processes that in turn need leadership and management on an ongoing basis.

Resilience – The ability of a social or ecological system to cope with disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.¹⁰

Sustainable agriculture – The management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such development... conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable.¹¹

Sustainable Development Goals – The agreement by member States to launch a process to develop a set of Sustainable Development Goals (SDGs), which will build upon the Millennium Development Goals and converge with the post 2015 development agenda. It was decided to establish an “inclusive and transparent intergovernmental process open to all stakeholders, with a view to developing global sustainable development goals to be agreed by the General Assembly”.¹²

Sustainable diets – Diets with low environmental impacts that contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.¹³

Urbanization – The conversion of land from a natural state or managed natural state (such as agriculture) to cities; a process driven by net rural-to-urban migration through which an increasing percentage of the population in any nation or region come to live in settlements that are defined as “urban centers”.¹⁴

Vulnerability – The degree to which a people and a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.¹⁵ Vulnerability also extends to social, economic and ecological aspects when applied to the food system.

10. ICLEI: <http://resilient-cities.iclei.org/resilient-cities-hub-site/resilience-resource-point/glossary-of-key-terms/>

11. FAO, 1991: <http://www.fao.org/docrep/u8480e/u8480e01.htm>

12. UN Sustainable Development Knowledge Platform: <http://sustainabledevelopment.un.org/index.php?menu=1300>

13. FAO, 2012, Sustainable Diets and Biodiversity: Directions and solutions for policy, research and action: <http://www.fao.org/docrep/016/i3004e/i3004e00.htm>

14. ICLEI: <http://resilient-cities.iclei.org/resilient-cities-hub-site/resilience-resource-point/glossary-of-key-terms/>

15. Ibid.

1. Introduction

Bringing a landscape approach to food, agriculture and the management of natural resources to promote more equitable, resilient and sustainable cities

Objectives and organization

This paper is focused on how agriculture – including the natural and cultural resources that sustain people in and around cities, and even in remote rural areas – provides important and reciprocal benefits to the sustainable development of both rural and urban communities (see definition of sustainable agriculture in glossary).

The intended audiences are sustainable development actors at multiple local, national and international levels. Practitioners and policymakers active in the relatively new fields of urban and regional or territorial planning for sustainability and resilience are beginning to engage issues of food security, nutrition and sustainable agriculture.

Historically, there has been very little systematic food related planning or policy by subnational or local authorities. Landscape or place based approaches to food system planning, such as the newly termed “city region food system,”¹ are signs that this is changing. Rethinking the urban rural continuum² comprising urban, peri-urban and rural landscapes can help integrate food and nutrition security with climate action planning, disaster risk reduction, economic and community development, water, biodiversity and other aspects of natural resource management. This is a multifaceted and evolving process for many practitioners located in both urban and rural landscapes in both high-income and low-income countries.

There are three cross-boundary areas of dynamism that run through the sections of the paper:

1. The **most important challenges for cities and their surrounding peri-urban and rural areas are shared spatially and are strongly connected** (for example through flows of people, products and services, water and other natural resources across administrative boundaries). Yet perspectives, priorities, cultural and political concerns often differ across the urban rural continuum.
2. Given variations across the urban rural continuum, **stakeholders have different entry points** to advance sustainably and equitably managed ecosystem services and forms of governance concerning land use and tenure and flows of food, capital and services. A second key challenge will be balancing competing priorities and finding common ground amongst urban, peri-urban and rural stakeholders and across institutional boundaries.
3. Indeed **there are new bridges of common understanding and shared risks** among these stakeholders, particularly around defining and building

-
1. “City region food systems” emerged over 2012-3 in discourse across UN Agencies (UN Habitat, UNEP), Associations of local authorities (ICLEI), and the research community and is proposed as a spatial representation of food and agriculture for policy consideration at local, national and international levels. The term was defined in a 2013 Food and Agriculture Organization consultation as “the complex relation of actors, relations and processes related to food production, processing, marketing, and consumption in a given geographical region that includes one main or smaller urban centres and surrounding peri-urban and rural areas that exchange people, goods and services across the urban rural continuum.”
 2. The term “urban rural linkages” has been conjoined to food security in recent international policy (Commission on Sustainable Development in 2009 and the UN Conference on Sustainable Development outcome document, the Future We Want in 2012): “urban rural continuum” was added in the FAO’s Food, Agriculture and Cities in 2011: http://www.fao.org/fileadmin/templates/FCIT/PDF/FoodAgriCities_Oct2011.pdf

resilience. These bridges are being constructed in innovative city regions around the world and are supported by recent research and policy. These pioneering city regions provide **entry pathways into integrative solutions that link urban and rural interests and policies** in a landscape approach to common challenges and opportunities.

Thematic issue areas

This paper seeks therefore to identify pathways and areas of dynamism whereby inclusive participation and shared learning and values increase both equity and resilience throughout city regions. Overcoming mistrust and other barriers must begin where particular urban and rural communities find themselves, and where they may also find common ground with their rural or urban counterparts across key thematic issue areas.

Before discussing these thematic issue areas there is a need to deepen our understanding of particular challenges to bringing rural and urban together in order to develop more resilient city region food systems across the urban rural continuum. The urban planner and policymaker need to think outside the urban box and think about their rural colleagues in terms other than just as a supply of goods and services including labor for urban markets. The rural planner may or may not be aware that their communities' welfare is going to be increasingly interrelated to urbanization and the rural world has much more to gain and more to offer than merely the flows of people, goods and services. We will treat this issue in section two.

The following three sections will then go into detail describing issue areas where the integration of food, nutrition, agriculture and natural resources are already occurring in positive ways, and need to be understood, scaled up and supported by leaders at all levels. These sections are where the rubber meets the road in terms of practical and operational planning and action:

- Equity, poverty reduction and economic development (section three)
- Planning for an urban rural continuum that links biodiversity and agriculture (section four)
- Health, food and nutrition security in an ecosystem context (section five)

Throughout the paper, short examples of cities, initiatives and projects from around the world are provided that contain key lessons and good practices. These city region cases illustrate one or more of the entry pathways and dynamic areas that provide the common ground for linkages along the urban rural continuum. For example, one city region addressed the food insecurity of its urban poor and rural smallholder farmers' need for markets through solutions linking these urban and rural needs directly. Another approached its food supply in new ways as a result of a disaster that showed the fragility of the food supply and the need to protect productive resources for agriculture and biodi-

versity, while safeguarding additional environmental services. And yet another looked anew at its food system as a result of disease epidemics and other food safety vulnerabilities.

Integrated governance and policy

The three issue areas treated in sections three to five are dynamic unto themselves. Yet the highly multifaceted character of food systems at the city region level arises when they become integrated into city region sustainability and resilience strategies and planning processes. Here the economic development, biodiversity, health, food and nutrition security and climate change perspectives can and should be integrated and operationalized through governance processes supported by policy.

Section six, “Local governance and food systems,” summarizes the character of institutional linkages emerging between urban and rural governing authorities together with their private sector and civil society stakeholders. Such multilevel, multi-stakeholder governance frameworks should in turn deepen understanding and commitment towards collective action.

The final section is titled “Policy pathways for resilient city region food systems.” To operationalize and spread the innovations that link city region food systems to ecosystem planning, integrative policy is needed at multiple levels

“A landscape approach for city regions requires multi-level governance, new forms of collaboration, integration across disciplines and sectors, and adaptive innovation.”

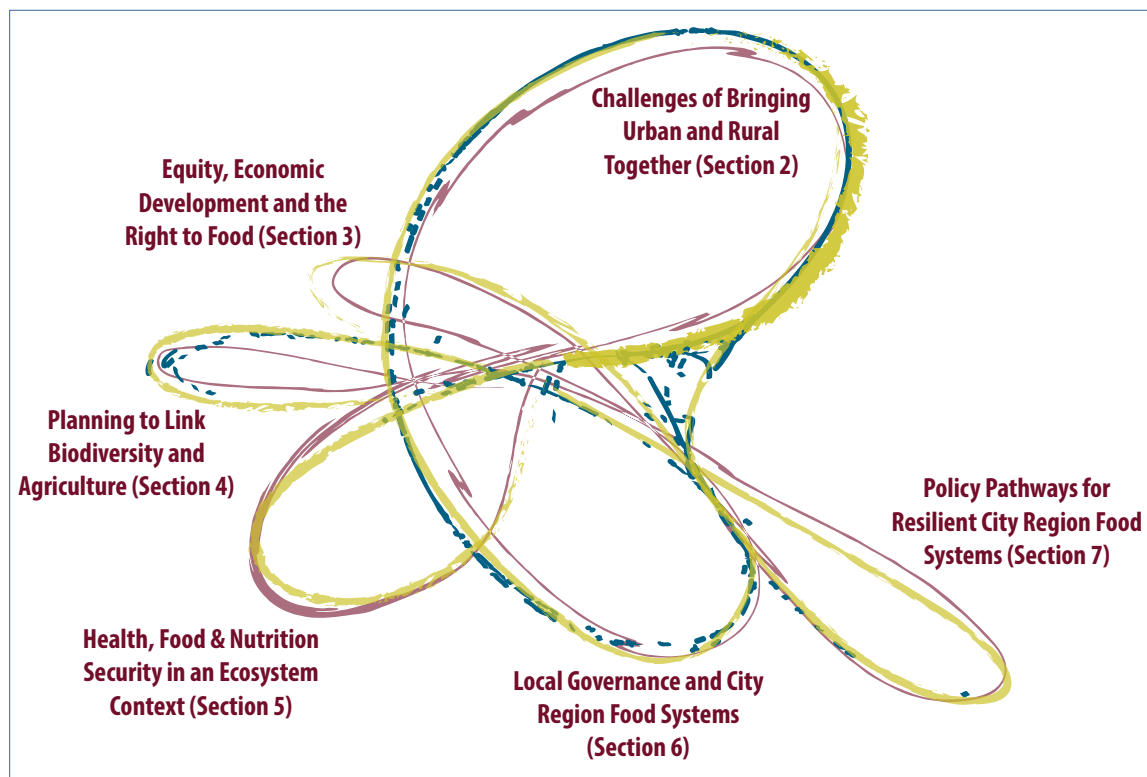


Figure 1. Structure of report - entry points for city region approaches to food, agriculture and natural resources

3. International Panel on Climate Change, 2013. *Fifth Assessment Report*. Geneva: IPCC.

4. See for example: Organization for Economic Co-operation and Development-Food and Agriculture Organization. 2008. *Agricultural Outlook 2008-2017*. Paris/Rome: OECD/FAO; United Nations System High Level Task Force on the Global Food Security Crisis. 2010. *Updated Comprehensive Framework for Action*, September 2010. New York: United Nations; Lang, T., D. Barling and M. Caraher. 2009. *Food Policy*. Oxford: Oxford University Press; Van Der Ploeg, J. W. 2010. The Food Crisis, Industrialized Farming, and the Imperial Regime. *Journal of Agrarian Change* 10(1): 98-106; UNCTAD [United Nations Conference on Trade and Development]. 2013. *Trade and Environment Review 2013*. Geneva: UNCTAD.

5. See for example: International Chamber of Commerce. Business ABC. Prepared for: *UN Conference on Sustainable Development (Rio+20)*, 20-22 June 2012, Rio de Janeiro; Unilever. *Our Approach to Sustainability*. <http://www.unilever.com/sustainable-living/ourapproach/index.aspx> [accessed 8 October 2013].

from municipal to rural, local and subnational to national, and national to international.

As we will see, this is not an idle or academic issue. Challenges like severe weather events, emigration and immigration, urbanization and economic volatility are all projected to intensify. Without integrating urban and rural approaches to food and nutrition at the landscape or city region level, there will be far greater disparity in food access, unbalanced diets, resource pressures and increased human suffering in the future. The good news is that work has begun to link urban and rural interests through integrative planning to boost resilience against these threats. This paper highlights that work.

Food and nutrition security are at risk in a rapidly urbanizing world

The on-going food crisis that began in 2008 is seen as the result of a set of interlinked factors – climate change, food and fuel price hikes, commodity speculation and financial collapse, population growth, land conflicts, and an excessive dependency on highly concentrated global supply chains in some countries. While levels of hunger have approached a billion people over the last several decades, the recent shock and continuing spikes have brought new global attention to the persistence of hunger and malnutrition in the world. In this context, researchers, policy-makers and practitioners are increasingly examining just how resilient, or shock prone, food systems have become. The specific relationships of climate change to global food supply are a subject of increasing concern.³ This debate has in turn led to questions about how dependent markets, cities and countries should be upon food sources of distant origin. Recent studies have explored how vulnerabilities that are economic, social and environmental, can mount under complex market signals and product flows. Supply interruptions, price spikes and export restrictions all interact to complicate the predictability and stability of food supplies.⁴

Recent policy responses, mostly at national levels, have begun to re-examine the structural and market forces governing food supplies at both global and regional levels. Some policies are shifting from a narrow reliance upon globalized food flows to a balance between regional, national and local and global food supply. The unpredictability of markets, prices and weather, so critical in agriculture, has led the private sector to realign strategies as well, including examples of decentralizing the production, processing and distribution of commodities to allow for greater resilience.⁵

Strengthening local food systems as a risk reduction strategy

At the same time, these responses have also served to stimulate interest in more localized production in the near and longer term. Research and policy advisors concerned with food and nutrition security describe the setting of a

stage for a potentially “perfect storm” by 2030, combining mass migration, civil conflict, resource conflicts and hunger.⁶ One result is a new interest in understanding and mapping the patterns of food flows from the source of production to consumption. From first understanding the current flows of global, regional and national origins of production, policy can then be informed to balance market forces with support for diversification of food sources, while protecting resources needed for food and nutrition security as strategies to mitigate risks of food insecurity and increased hunger.⁷

As just one example, modern industrial production systems for animal agriculture are a sector of the food system that is a microcosm of many of the issues discussed in this paper. Today, 4 out of 5 mammals on the earth are domesticated food animals for human consumption. This is a complex area of the food system that represents a large part of the overall flow of products and resources in between rural and urban areas (in both directions) and merits further investigation and understanding as trends for meat consumption continue to rise alongside urbanization.⁸ For example, surrounding many cities are intensive livestock feedlot operations, often causing problems for water quality, disease and land use planning. Furthermore, feed grains fed to animals for human consumption in changing urban diets are a large part of the urban food resource footprint and livestock value chains cut across countries at regional and global levels.

Prompted in part by concerns about the structure of the global food system, the “re-localization” of the food system has begun to be analysed and implemented as a long-term strategy toward reducing potential gaps in supplies⁹ and redressing a history of development planning that has disconnected the rural and urban world economically, socially and environmentally.¹⁰ For example land use planning policy has often separated housing from farming and this can impede development of diversified smallholder agriculture in and around dense settlements. It is important to note that most concentrations of population will continue to rely on local, regional and global food supply, in differing proportions. This by itself is not new. What is new is that there are many more actors, including subnational and local governments, civil society and non-agricultural sectors engaging in the discussion about the future of food and the many impacts – structural, political, cultural – that the design and policy formation around food systems entails.

Supporting local authorities to plan and manage their food systems

In discussions of sustainable and resilient community agendas, there is an assumption that local governments and local partners will make core decisions on how to balance the investments in planning and development for such sustainability. This assumption is upheld in international normative policy supporting the “subsidiarity principle”.¹¹ When practiced and where governance has the capacity, subsidiarity prescribes that decisions that can be more effi-

6. Beddington, J. 2009. Speech at the Sustainable Development UK Conference, May 2009, available at: <http://www.govnet.co.uk/news/govnet/professor-sir-john-beddingtons-speech-at-sduk-09>
7. Asian Development Bank (ADB). 2011. *Global Food Price Inflation and Developing Asia, March 2011*. Manila: ADB.
8. A good source on the use of resources (land, water, nitrogen, etc.) in livestock production and trade can be found in Galloway, J.N., et al., 2007. International trade in meat: The tip of the pork chop. *AMBIO* 36: 622–629. Cited in Setzinger, S., et al., 2012.
9. See for example: Kneafsey, M. 2010. The region in food – important or irrelevant? *Cambridge Journal of Regions, Economy and Society* 3: 177-190; Winter, M. 2006. Rescaling rurality: multilevel governance of the agro-food sector. *Political Geography* 25: 735-751; Field, S., O. Masakure, and H. Henson. 2010. Rethinking localization—a low-income country perspective: the case of Asian vegetables in Ghana. *Cambridge Journal of Regions, Economy and Society* 3: 261–277.
10. See for example: McMichael, P. 2005. Global Development and the corporate food regime. In: F.H. Buttel and P. McMichael, eds. *New Directions in the Sociology of Global Development. Research in Rural Sociology and Development* 11: 269-303; Friedman, H. 2000. What On Earth is the Modern World-System? Foodgetting and Territory in the Modern Era and Beyond. *Journal of World-Systems Research* VI (2): 480-515.
11. United Nations Conference on Environment and Development. 1992. *Agenda 21*. Rio de Janeiro: United Nations; *Official Journal of the European Union*. C 310/207. 2. Protocol on the application of the principles of subsidiarity and proportionality.

ciently taken at local level are indeed taken at that level, while national and international decisions are taken where local decisions are too difficult, or have inadequate reach, such as in trans-boundary issues of global interest.

For many reasons there is much interest in “place-based” development agendas today. This can extend to the landscape level, linking urban and rural areas. The focus upon city region food systems is not inherently about a preference for local, but as much about who decides when to rely on different sources of food as conditions change, in addition to how local production coheres with other regional priorities. Dialogue is often polarized between the “ideology of the local” and the “ideology of the global”, when in fact there should be articulation of a more integrated and multi-level approach in areas of good practice, governance and policy.

There are many synergistic reasons to reconnect urban and rural worlds at the landscape level. The city region food systems can form the basis of a strategy for reducing inequality and mitigating against severe weather, economic volatility, and civil conflict. The benefits of strengthening city region food systems can, if well implemented, impact the lives of the most vulnerable, enhance biodiversity, foster more resilience in natural ecosystems and improve nutritional security from agricultural systems.¹²

12. For more information see: FAO 2013. State of Food and Agriculture: Food Systems for Better Nutrition. Rome: FAO.



Skyline of Chongqing, China. One of China's largest municipalities, with more than 28 million residents, Chongqing represents the challenge and the necessity of bringing urban and rural together. Photo by Oliver Ren, <http://commons.wikimedia.org/wiki/File:SkylineOfChongqing.jpg>

2. Challenges of Bringing Urban and Rural Together

Before taking up thematic issues that link urban and rural landscapes in considering food systems, it is useful to examine the challenges at different levels. There is a lack of shared understanding based on solid research and analysis. There are inadequate levels of trained specialists who can operationally link the complex issues across both rural and urban landscapes. Not least, there are practical implementation barriers in specific locations with unique historical, customary and cultural differences. By understanding the character of these challenges, selection of strategies and tools to link solutions across the urban rural continuum will be far more effective.

Reimagining cities and their hinterlands

Urban and rural do not have to be opposing forces

While urban and rural areas are very connected, policies and institutions tend to oppose them, often creating a de facto urban-rural divide. For example it could be said no one is more interested in urban expansion than farmers whose land prices will multiply manifold if converted from agricultural land to land for housing or commercial development. However, urban expansion also implies a threat to farmers' livelihoods as producers. Urban dwellers, meanwhile, are eager to benefit from rural areas to obtain more fresh local food and to have recreational areas, or "country homes". However, they may oppose farmers because they find working farms too smelly, noisy and products too expensive.

As anyone coming from rural farming communities, rural development or resource management agencies, or even national or international agriculture agencies knows well, it is difficult and often threatening to consider urban perspectives and interests in relation to agriculture that go beyond cities as markets for rural goods and services. For example conflict over urban and rural uses of land and water resources can be extreme. For rural families and community leaders, recent trends and implications from rapid global urbanization are sometimes not considered or valued, and may even be discounted by the rural sector.

Conversely, urban planners and developers, along with national ministries of commerce or social development until recently have had mostly an urban bias. The international urban research community typically ignores the rural sector and agriculture, especially when urbanization has been framed solely around urban issues rather than incorporating the relationship with rural, urban and peri-urban areas. What has changed in some cities is a new interest in urban and peri-urban agriculture, in both high and low-income countries. Alongside that interest is new growth in markets provisioned with local and regional products. Nonetheless, it is still very difficult for urban people, planners

***“The dichotomy between urban and rural has been used to support a model of development that is no longer as relevant. It serves present purposes better to think of an urban rural continuum in all regions, with mutually reinforcing and reciprocal relationships, and flows of resources, people, and information.*”**

and decision makers to think outside the “urban box”. This false dichotomy between urban and rural thinking extends well into the policy world at all levels and to agencies whose activities are concentrating variously on rural or urban but rarely integrating both together.

The disconnection between urban and rural communities is exacerbated by the fact that many producers of food, fiber and fuel are selling to intermediaries such as distributors, processors and manufacturers. In high-income countries most consumer food dollars go to these intermediaries who often have little interest in the urban rural relationship. Nonetheless, these mostly private sector actors are important to bring to the table because of their power and capacity to either support or hinder progress in finding solutions to interconnected urban and rural challenges.

Impacts of global urbanization on rural areas will increase

While urban and rural thinking remain divided, the need for cooperation across the urban-rural continuum becomes ever more urgent. Urbanization of the planet has passed a critical threshold – with more than half of world population now considered “urban”, and projections suggesting that nearly 70 percent of humanity will be urban by 2050.¹ While it is estimated that urban land area currently constitutes only about 2.7 percent of the world’s land surface, the “urban estate” in the coming wave of urbanization is expected to double – concentrating mostly in Asia and Sub-Saharan Africa.² According to a 2013 UN briefing on sustainable cities, 60 percent of urban buildout expected by 2030 is yet to be built, underscoring the need to be proactive.³ A “whole new world” is being built, primarily in countries with severe resource constraints (natural, fiscal, administrative, and technical). This is occurring in an increasingly globalized context with many new, constantly fluctuating, interlinked, and uncontrollable variables.⁴

Despite the fact that the direct physical urban area is projected to double to just four percent of the global surface area by mid-century, more than 90 percent of global GDP is attributed to urban regions.⁵ In fact, urban demand for natural resources (food, land, water, energy, wood, etc.) and labor from rural areas creates an urban resource footprint far larger than the physical size of bounded human settlement. Especially taking the food supply of cities into account, the global footprint is much broader than just the built-up areas. For example the area needed to supply food to the Netherlands requires four countries the same size and the ecological footprint for large cities has yet to be analyzed.⁶ There are very few studies of the specific food system resource footprints of cities large or small. It is presumed that the larger resource footprints are found in the cities of high income countries. The aggregate impact of the urban footprint across the planet will vary relative to the collective behavior of urban dwellers and their consumption patterns in both high and low income countries.⁷

1. United Nations. 2013. Technical Support Team Brief for the Open Working Group: Sustainable Cities and Human Settlements, available at http://sustainabledevelopment.un.org/content/documents/2306TST_percent20Issues_percent20Brief_percent20Cities_FINAL.pdf [accessed 11 November 2013]
2. Shlomo, A., S. Sheppard and C. Civco. 2005. *The Dynamics of Global Urban Expansion*. Washington, D.C.: The World Bank.
3. See note 1 above.
4. Suzuki, H., et al. 2010. *Eco2 Cities: Ecological Cities as Economic Cities*. Washington, DC: World Bank.
5. Gutman, P., 2007. Ecosystem services: Foundations for a new rural-urban compact. *Ecological Economics* 62: 383–387.
6. Setzinger, S., et al., 2012. Planetary Stewardship in an Urbanizing World: Beyond City Limits. *AMBIO* 41: 787–794.
7. Global Footprint Network. *Footprint Calculator*. <http://www.footprintnetwork.org/en/index.php/gfn/page/calculators/> [accessed 8 October 2013].

As dense settlements, often located in coastal areas and on floodplains, cities also concentrate vulnerability – to the impacts of hazards such as flooding, landslides, heat waves, fires and other natural disasters.⁸ Climate change projections with associated sea level rise make for scenarios of large coastal populations needing to invest scarce resources in infrastructure defenses. Other strategies include relocating vulnerable and poor populations from lower lying areas into currently peri-urban and rural areas less prone to sea level rise or surge impact from severe storms. Food and nutrition security is jeopardized by the same forces of volatility in weather, and is compounded by the relative lack of access that the increasingly global urban population has to secure safe food and nutrition. Cities are now and will continue to be frontline parties responsible to manage crises that include a food dimension, and this and other dimensions of crisis can benefit from forms of urban rural partnership that will be discussed throughout this paper.

A sustainable future without improved urban rural linkages?

The term “sustainable urbanization” may seem like an oxymoron. While cities generate the vast majority of the world’s wealth, they are also (and perhaps because) known for generating pollution, wasteful overconsumption and greenhouse gas emissions. Nevertheless, cities have been and will continue to be centers of environmental and social innovation. Smaller cities, towns and rural areas also have a historic and continuing claim on innovation and good practice to scale up to larger population areas. All this begs the question: how can urban populations make transitions to more equitable, economically viable and resource-efficient patterns of production and consumption? The fact is, they cannot achieve such transitions without supporting and supportive rural communities and rural resources.

Increasingly, experience shows that single sector efforts fail to fully address the sustainability of food, energy, water, transport systems. Thus, more multi-sector and integrated approaches are being promoted, though still experimental and in need of testing in a variety of approaches and combinations of tools and strategies. The sustainable and reliable flows of food, ecosystem services, finance, labor and governance related to food systems, linking rural and urban areas, is a recent configuration around the resilience and sustainability agenda (for more detail on the current debate, see the end of section seven). The role of the private sector in the flows of goods and services from rural to urban and back is critical. Businesses engaged in agriculture, food, forestry, energy, and water are often powerful developers, and thus shapers of programs and policy. Today more and more companies are finding there is a business case for interdisciplinary and integrated approaches and often are willing to take a lead.

This convergence of issues and sectors is being treated more systemically across transport, energy, food, health, shelter, management of natural resources and critical urban infrastructure of all kinds, in what is being coined the

8. International Federation of the Red Cross and Red Crescent Foundations [IFRC]. 2010. World Disasters Report: Focus on urban risk. Geneva: IFRC.

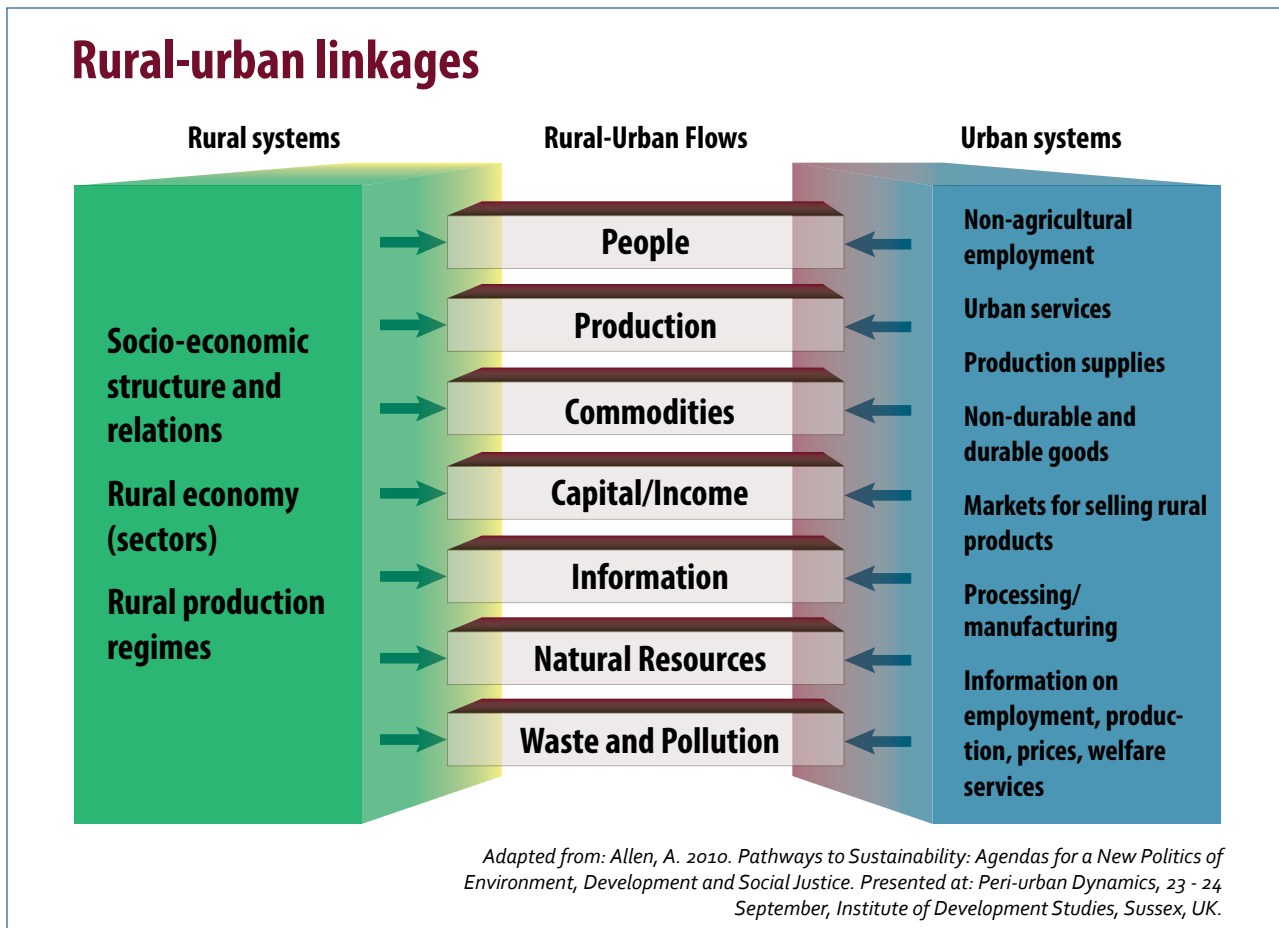


Figure 2. Flows across the rural urban continuum

“nexus approach”, for example with the Food, Energy, Water, Climate Nexus.⁹ Planning for urban resilience has moved from a disaster planning approach to a disaster prevention approach incorporating long-term resilience with development goals.¹⁰ Figure 2, above, displays some of the flows between rural and urban landscapes.

Professional and institutional challenges

There are multiple challenges to developing resilient city region food systems in an integrated ecosystem approach across the urban rural continuum. These challenges appear differently (or not at all) to different practitioners, planners and managers of discrete sectors in sustainable development and resilience planning.

- The urban planner concerned with housing and commercial development utilizes tools of zoning, permitting and taxation. He or she may not have

9. The Water, Energy and Food Security Nexus Resource Platform. See <http://www.water-energy-food.org/>

10. For more information, especially on operationalizing urban resilience, see in particular the conference “Resilience in Urban Regional Development, From Concept to Implementation” (27-28 March, 2014): <http://www.dlgs-dresden.de/konferenz-2014/>

even thought about the food issues of his or her city or region as a relevant concern.

- The environment planner concerned with maintaining natural habitats for health, recreation, biodiversity, and mitigation of severe weather hazards may think of agriculture as fundamentally adverse to environmental protection.
- The water planner, concerned with water supply and watershed management, may think of agriculture only as a water user and not as a contributor to water supply and watershed management.
- The climate action planner may limit their focus to hardening infrastructure and creating redundancy in energy, transport and communication systems, while ignoring food and nutrition security in relation to disaster risk reduction (DRR) management.
- The economic development professional may think only of commercial development in terms of manufacturing, wholesale and retail business development and not in terms of food and fiber production (farms and market gardens, or food aggregation and distribution businesses – and their economic potential as magnets for “liveable cities” investments).
- The public health professional may only be concerned about food-borne and dietary disease, sanitation and nutrition deficiencies with little thought or understanding of the food system that generates these problems.

These areas of professional “disconnect” with food systems are amplified by the disconnect between planners, systems managers and policymakers across the artifice of an urban rural boundary. At institutional levels, these interdisciplinary and inter-sectoral disconnections persist as well. In smaller cities and towns, there may be less of what is described here, but the general fact that disciplines and professional are not well equipped to manage the necessary integration often holds true at all scales of public, private and nonprofit agencies.

Making the food system visible where it was invisible

The food system has been largely “invisible” to non-agricultural, and non-rural agency professionals and stakeholders. The reasons for food system invisibility in local and subnational governments vary but as pioneering food system planners in the United States stated in an article in the *Journal of the American Planning Association* in 2000, “despite its low visibility, the urban food system nonetheless contributes significantly to community health and welfare; to metropolitan economies; connects to other urban systems such as housing, transportation, land use, and economic development; and impacts the urban environment.”¹¹ The idea that food systems can be designed holistically and intentionally modified with local or subnational actors in the driver’s seat is revolutionary.

11. Pothukuchi, K., and J. Kaufman, 2000. The Food System: A Stranger to the Planning Field. *Journal of the American Planning Association* 66 (2): 113–24.

“While challenges regarding natural resources are important in the face of increasing population density, the mechanisms that regulate access to, and management of, such resources may be more significant. Such mechanisms include land use and zoning policy, tenure policy, pollution controls, water management bodies or policies, procurement practices and others.

Even with all these institutional, professional and disciplinary challenges, there has been progress in the last decade in recognizing that food and agriculture is a sector of increasing interest to all the different sectors listed above. Stakeholders share a concern for the future food and nutrition security of cities and for coping with the pressures and consequences of agricultural intensification to meet a largely urban global population. In fact, food and nutrition is not only a new sectoral area of concern in managing climate or economic volatility. It is also an important crosscutting sector that links many of the issues of concern to urban, rural, biodiversity, climate, health and economic development professionals and practitioners.

Where to start on a path to integrating rural and urban

To adequately confront the complexity of “food environments” in urban and peri-urban areas together with the complexity of rural food production and natural resource management systems actually requires a multi-sector or trans-disciplinary approach. Those municipalities and regional planning authorities that successfully address these complexities often do bring multiple stakeholders and sectors to the table to help address the challenges described here.

The organizing nuclei of these initiatives and multi-stakeholder dynamics can vary in their origins: In some cases such as Detroit in the US, it is the planning department of a city or a region, in others such as Toronto, Canada it is the health department that convenes an urban food systems planning process (see case study on page 25). In the majority of other instances the convening may be by nongovernmental or civil society organizations that invite local authorities and agencies to the table, perhaps along with farmers, business and consumer associations. The “trigger” can start from a wide variety of sources: a natural disaster in which food supplies were disrupted; dramatic food price fluctuations; a policy barrier to market development for local producers; a food safety or contamination event; a new mayor’s office bringing a food system vision to their constituents, or in response to their organized demands.

Overcoming the challenges inherent in convening actors across disciplines or departments in a municipality and/or a rural landscape requires fresh thinking. Skills and tools needed to address “convening challenges” will vary but may include professional facilitation such as: structuring processes of discovery of different perceptions and knowledge, including tools for social learning, scenario building, mapping, inventories, network and systems analysis, participatory planning and more. High level leadership, whether from a planning commissioner, a mayor, a provincial leader or other civic leaders is often very helpful to break down walls and encourage dialogue and communication flows within (vertical dimension) and across (horizontal dimension) institutions, and to ensure follow-up action.

Framing win-win goals and anticipating obstacles

There is a challenge to clearly framing all the different perspectives that may be brought together. Often the success or failure of these processes depends on diligence to reach a common goal and the best ways to frame the challenges of improving the food systems at the city region scale. Local stakeholders from local government to the private sector and community organizations need to know why it matters to work together for desired outcomes, whatever constraints and administrative obstacles exist within and between institutions. There are a variety of tools available, some of which are identified in this paper. One excellent example of co-benefits of ecosystem planning including food systems can be found in “Implementing Sustainable Urban Growth”, section 5 of *Urban Patterns for a Green Economy: Working with Nature*, published by UN Habitat.¹²

Administrative and cost-related obstacles are often presented as institutional barriers to doing anything differently, including simply convening a cross-agency or multi-stakeholder meeting. In the framing of initial meetings, based on research of where institutional barriers exist, it may be necessary to confront the administrative, cost, political or other barriers up front, for example showing the cost savings of prevention. Overcoming professional and institutional barriers may also be assisted by having a designated institution that is devoted to governance of food systems as will be discussed in section six on governance and food systems.

Thinking “upstream” from urban to rural, from food and nutrition security challenges of the urban environment to rural agricultural communities and their challenges is categorically difficult, as is thinking “downstream” from rural to urban. Often it is necessary to either use examples from other city regions or find an unexpected example of successful work of other cities in the same region or in other regions. For example Navaisha, Kenya (see Box 4) and New York City, achieved protection of their city’s water sources through different means of rural biodiversity or agricultural intervention. Biodiversity planners in another city region such as Bobo-Dioulasso, Burkina Faso (see Box 3) have found they need to think about agricultural practices in connection with protecting green corridors of open space forests or even farming landscapes, as will be discussed in section five on linking biodiversity and food systems.

12. UN Habitat. 2012. *Urban Patterns for a Green Economy: Working with Nature*. Nairobi: UN Habitat.

“The solutions to access to food and resources that are most promising do often link urban to near rural areas in city region landscapes around the world. First however, the particular situations in specific urban and rural landscapes need to be much better understood in relation to each other.

3. Equity, Economic Development and the Right to Food

Equity, poverty reduction and economic development are often issues at the top of the agendas of subnational and local authorities as well as national and international policymakers. Equity issues, such as structural income disparity and unequal access to resources – across and within rural and urban areas – are a driving concern for the future sustainability of mixed landscapes and hence for the achievement of cohesive territories from the social, economic and environmental points of view. “Equity”, as opposed to “equality”, is used in the sense that culture and context matter at a global level, the way urban equity is framed for the 2014 World Urban Forum.¹ The complex interrelationships between food access, hunger, food insecurity and malnutrition in the context of poverty and economic inequity will be examined in this section. Our question is how the economic and social development professional can relate also to the issues that arise from food access and nutrition security in their communities.

Inequity as a core food system issue

In many urban areas, disparity between urban slums – which have grown 26 percent from 656 million people in 1990 to 827 million in 2010² – and the middle and elite urban classes is at the root of many civil and resource conflicts. This disparity also adds to the urgency to manage and prevent crises including disasters, food insecurity, hunger and poverty, housing and sanitation, transportation, economic opportunity and many critical issues for cities and towns. In rural areas there is disparity between zones of deep rural poverty and areas of rural prosperity. Smallholder subsistence farms and prosperous commercial agribusinesses are sometimes adjacent to one another. Similarly, urban slums are often adjacent to elite gated communities or high-rise and high-cost apartments.

Access to food in urban areas is almost always in relation to market sources of food and targeted ways to access food affordably or for free. In rural areas access to food is often supplemented by foraging vegetables or meat in natural landscapes, or from surplus production of family or neighbor farms when available. Wage workers in rural areas such as farm or plantation workers often suffer from hunger in the midst of plenty. Humanitarian food aid is of course distributed in both poor rural and urban communities in rich and poor countries. However, relationships between food poverty in urban and rural areas is not well understood, including the complexities of multi-spatial urban and rural households that link urban and peri-urban gardens or farms with informal food markets, urban-rural remittances, access to credit and other survival strategies that families use across the urban rural continuum.

With relentless global urbanization projected to accelerate, the need to understand both rural and urban food poverty accurately and in relation to each

1. UN Habitat. 2013. Urban Equity in Development – Cities for Life. Draft Concept Paper. Nairobi: UN Habitat.

2. United Nations Population Fund. Linking Population, Poverty and Development. <http://www.unfpa.org/pds/urbanization.htm> [accessed 8 October 2013].

other is becoming more and more urgent. The severity of political pressures bears down not only on local authorities, but even national authorities, and erupts when a crisis reveals the structural and often historic divide between the rich and the poor in urban and rural landscapes. From Haiti to New York, crises born of disaster have pushed need for solutions to radical income disparity to the forefront in many cities and countries. One approach has been to call for more accurate and contextually-sensitive information. Another has been to call for more inclusive or people-centered and comprehensive policy approaches to address the challenges.

The right to food in city region food systems

Yet another approach has been to call for a rights-based approach to resource access in the city, including the right to food. The rights-based approach to rural resource access has also been pronounced, especially in terms of secure land tenure and farmers rights to knowledge and technology.³ The right to food links all rural and urban people in a rights-based approach to food and nutrition security.⁴ Progressive realization of the right to food includes establishment of safety nets, and equal access to resources for food production by the majority of smallholder farmers as well as to food by all urban dwellers. Dar es Salaam, in Tanzania, for example has strong recognition of urban and peri-urban food production in ordinances as a result of food system shocks in the recent past.⁵

Targeted social protection programs for the urban poor and direct payments for the rural poor are among the solutions many nations and local authorities are pursuing, though these programs are rarely integrated in ways that distribute benefits equitably among rural and urban poor. Perhaps the best-known exception is Brazil's "Fome Zero" program designed to benefit both producers and consumers with integration of policy and programs at federal, estate and municipal levels. In some countries such as the United States, a national distribution system for food banks, sources of food for both urban and rural poor, has been established. In rich and poor countries alike, the debate over how poverty is eradicated through empowerment and access to resources instead of merely managing poverty and food insecurity without eradication can in some cases look to city region food system innovations for success stories. One such story is that of Belo Horizonte in Brazil (see box 1, next page).

The challenge of good information

Rural and urban planners and agencies charged to address the economic and social challenges of poor neighborhoods and districts need accurate and up-to-date information, including data on poverty, health, sanitation, housing and food access. Because food access and poverty are so intertwined and because much of the data on hunger and malnutrition are gathered by national and international agencies, data on the extent of urban hunger and food insecurity

“Access to food is an important issue in the framing of the “right to the city”, and also must be connected to access to natural resources necessary to grow food in urban, peri-urban and rural areas.

3. Voluntary guidelines on the right to land were negotiated by governments in 2012.
4. Food and Agriculture Organization of the United Nations [FAO]. 2004. Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security. Rome: FAO.
5. See the case study in UN Habitat. 2012. *Urban Patterns for a Green Economy: Working with Nature*. Nairobi: UN Habitat.

Box 1. Food and nutrition security in Belo Horizonte

In 1993, Belo Horizonte, Brazil implemented a policy to reduce food insecurity in the city that ultimately became a model for a low-cost program to reduce hunger and malnutrition while strengthening the city region food system. In a context where 38 percent of families lived below the poverty line and 20 percent of children showed signs of malnutrition, the program tackled three main challenges: supplementing food consumption needs for poor families and individuals, improving access to food in underserved areas of the city, and increasing food availability through support for regional farmers and enhanced rural-urban market linkages.

Food security policy and programs are directed through the Municipal Secretariat for Food and Nutrition Security (SMASAN), which functions as a centralized body for food security policy. Current programs include a school feeding program that provides the city's children with 23,000 meals per day and a subsidized public restaurant serving 14,000 nutritious meals per day at low cost. Initiatives also address the food system more broadly, through interventions to support suppliers that deliver fresh food to the city and to foster urban agriculture. Education around healthy eating habits, as well as professional training for food workers, represents a final focus area.

The program started as a measure to address an urgent need for improved food security. A comprehensive food and nutrition security strategy also created space to strengthen food production and distribution across the rural urban continuum, and to reduce poverty and increase equity in the city region as a whole. This underscores the need to integrate municipal and subnational food governance.

Sources: Rocha, C. Urban Food Security Policy: The Case of Belo Horizonte, Brazil. Journal for the Study of Food and Society, Vol. 5, No. 1, Summer 2001, pp. 36-47.

Government of Belo Horizonte. ICLEI presentation, 1 June 2013.

For more information, see World Future Council: http://www.worldfuturecouncil.org/fileadmin/user_upload/PDF/Future_Policy_Award_brochure.pdf

in particular places is often masked or unavailable.⁶ In some urban areas the mapping and community-based assessment of food access disparity, and the extent of poverty and hunger has been accomplished and is supported by GIS mapping tools and the gathering and analysis of disaggregated data, which cities have begun to assess and share.

Rural planners and agencies assess and map poverty and hunger by different data sets developed by national or international agencies who in turn consider and focus only on the rural component of their mandate. The extent of food poverty, even in the midst of agriculturally productive landscapes, and the different character of food access in rural areas, is not often compared to hunger and poverty assessment in urban areas, especially in contiguous urban rural landscapes or on the “rural urban fringe” (RUF). Mapping of food access in urban and rural areas has begun, for example in urban “food desert” mapping in the US.⁷

Equal access for all urban and rural citizens to resources necessary to lead dignified and sustainable livelihoods is becoming an outstanding issue of the 21st century, witnessed by many struggles from the Arab Spring to the Occupy movement in the US, and by the prominence of debates about equity and social inclusion in the follow up to Rio+20 and the debates on post 2015 UN Development Agenda. At the landscape level urban and rural communities co-exist and must find productive means to overcome the challenges of food insecurity hunger and poverty. Those city regions that have linked pro-poor economic develop-

6. Cohen, M. J., and J. L. Garrett. 2009. The food price crisis and urban food (in)security. Urbanization and emerging population issues – 2. IIED Human Settlements Working Paper Series. London and New York: IIED and UNFPA.

7. USDA Food and Environment Atlas. <http://ers.usda.gov/data-products/food-environment-atlas/go-to-the-atlas.aspx#.Ui9Ai7Igd5Y> [accessed 11 November 2013].

ment goals with the planning for biodiversity and environmental protection, climate change, and food system development to alleviate hunger and food insecurity may have found scalable solutions to some of the world's most difficult challenges. Ecosystem services and poverty alleviation is a relatively new interdisciplinary intersection, with active discussions in sustainable development, trade policy and biodiversity research circles. The next section will provide an overview of the ecosystems services that can be applied in the context of city region food systems.



Setembro 2012. Downtown Belo Horizonte. Photo by Copagov, Flickr: <http://www.flickr.com/photos/copagov/8203284506/>

4. Planning to Link Biodiversity and Agriculture

Economic and social development professionals and the agencies who are concerned with poverty and sustainable livelihoods in rural and urban areas were the entry point for approaching food access disparity, hunger and food insecurity in the last section. A different set of professionals and agencies are charged in most cities and regions with protection of natural resources including biodiversity, planning for resilience, disaster preparedness, and climate change adaptation and mitigation. These planners and managers are also becoming interested in the links of their usual scope of work to food, nutrition and agriculture. This section discusses approaches to city region food systems through linking biodiversity and agriculture in the context of climate change.

Ecosystem benefits integrating non-food and food producing landscapes

The benefits of well-managed natural resources in rural areas including soil, water, and biodiversity go well beyond the production of food, fiber and fuel products in agriculture. The multiple benefits of protected and managed rural areas include diverse working landscapes that:

- can help mitigate severe weather from drought to flood conditions,
- balance agricultural production with biodiversity protection,
- bring aesthetic and recreational value with economic and tourism value,
- provide clean water to downstream uses including urban water sources, etc.

Figure 3 depicts elements of a rural agricultural ecosystem framework. Many of the farm and landscape management elements at the top of the chart and the ecosystem services that link agriculture to the larger environment or landscape apply to urban and peri-urban environments as well. The scale, relationships to the built environment and socio-cultural factors differ, but the services are similar and potentially integral to the sustainable city agenda.

Ecosystem services bring the rural into urban landscapes

Ecological science and urban and regional planning are converging into a landscape ecology that focuses upon urban regions. This shift may catalyze a new land change science as it relates to ecosystems, local food system resilience and numerous other dimensions of spatially-explicit urban and region sustainable development. "Ecosystem services" have been brought to the attention of urban planners and include some of the same benefits of rural ecosystem services as seen in the chart above, such as biodiversity and water management. These services applied to urban areas have begun to be drawn out, for

example in the toolkit, The Economics of Ecosystems and Biodiversity (TEEB).¹ There are examples of combined benefits to urban and rural communities that have a long history, such as New York City’s Watershed Agriculture Council that protects the water supply of millions of urban residents by supporting farming practices that are protective of water quality, while also reducing land fragmentation in forest areas.² What is new is the combination of environmental, social and economic services from ecosystem-based approaches to landscape management in a direct application to urban rural linkages and city region food systems.

Urban areas with largely built environments have both hard and soft infrastructure that are capable of being integrated, such as storm water retention in

1. TEEB [The Economics of Ecosystems and Biodiversity]. 2009. Summary: Responding to the Value of Nature. Wesseling, Germany: Welzel + Hardt.
2. UN Habitat. 2012. *Urban Patterns for a Green Economy: Working with Nature*. Nairobi: UN Habitat. pp. 38-9.

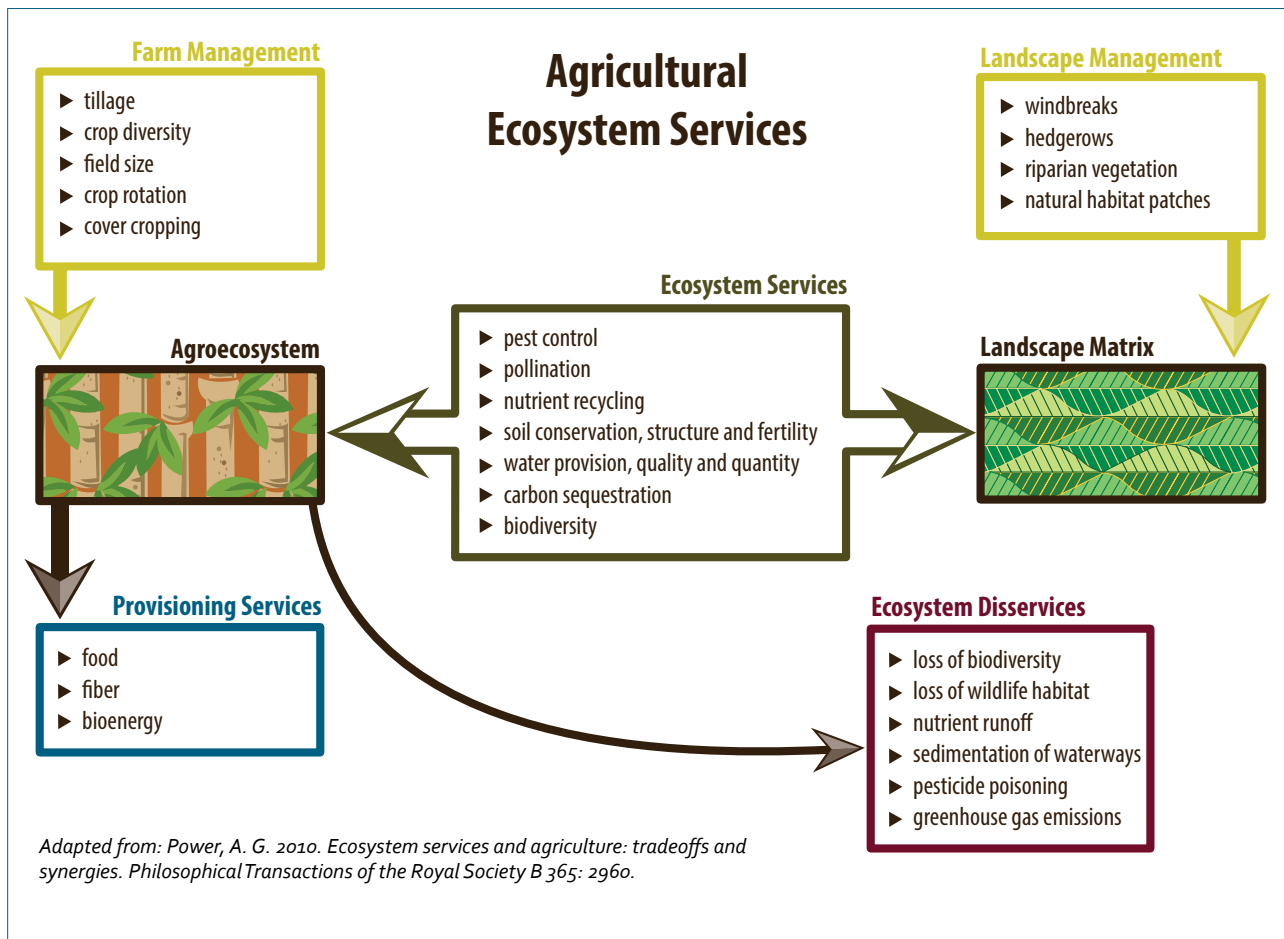


Figure 3. Impacts of farm and landscape management on the flow of ecosystem services and disservices to and from agroecosystems

Box 2. Ecosystem services in Naivasha, Kenya

Lake Naivasha is an important natural resource for vegetable and flower production, geothermal power production, and tourism. Small-scale farmers act both as important stewards as well as users of this environmental service. To combat reduced reservoir capacity that pushes up costs for water users, CARE and WWF introduced an Equitable Payments for Watershed Services (EPWS) scheme. Downstream water users, including water companies, horticulture growers, ranchers, and hotels, buy environmental services from upstream providers in order to protect the watershed. The city of Naivasha has a vested interest in how stakeholders care for the water resource in the lake.

785 farmer households in sensitive areas within the watershed participate in the program as providers of environmental services. They gain cash incentives that allow them to purchase farm inputs for improved production.

Providers of the environmental service use a combination of methods like grass strips to filter water and prevent erosion, agroforestry, riparian rehabilitation, and cultivation along contours. Improving water quality downstream will reduce operational costs related to water use, and could potentially lead to new market linkages between users and providers, such as the direct purchase of vegetables for company canteens or hotels.

Sources:

FAO Case studies on remuneration of positive externalities (RPE)/ Payments for Environmental Services (PES) Prepared for multi-stakeholder dialogues 12-13 September 2013.

PRESA: <http://presa.worldagroforestry.org/blog/2011/07/25/lake-naivasha-communities-in-kenya-get-second-payment-for-catchment-conservation/>

For more information: http://www.fao.org/fileadmin/user_upload/pes-project/docs/FAO_RPE-PES_WWF-Kenya.pdf [accessed 3 February 2014]

swales, vegetative buffers, green buildings, roofs and open spaces for gardens, etc. These can provide important ecosystem services as well as food. Until very recently, urban sustainability and resilience planners taking up the ecosystem services framework had not often included food and agriculture infrastructure in urban, peri-urban and near urban rural landscapes. This is changing. In fact, food is beginning to be incorporated into resilient city strategies as evidenced in the recent “Resilient Urban Food Systems Forum” at the ICLEI Resilient Cities Congress in June, 2013.³

The green infrastructure that is so important to both adaptation and mitigation strategies for cities in planning for severe impacts of climate change requires maintenance to provide ecosystem services for the long term. Much as ecosystem service payments can provide incentives to rural farmers to maintain diverse working landscapes with a mosaic of land uses, so too a system of incentives is needed to secure long term management of urban landscapes of diverse tree, crop and other plant species. These incentives are best positioned when they link the knowledge and management of rural and urban places. Most horizontal surfaces in cities and towns that are not used for continuous traffic or transportation can include vegetative cover. That includes open spaces, roofs, gardens and public parks, edges of transportation corridors and waterways.

3. ICLEI. 2013. Resilient Urban Food Systems: Opportunities, Challenges and Solutions, Outcomes of the Resilient Urban Food Systems Forum. Bonn: ICLEI.

Agricultural ecosystem services scaled to the city region

Agricultural ecosystems provide services (as highly managed systems designed to provide food, fiber, biofuels and medicinals) and in turn, they depend upon natural ecosystems for their function – supporting services like protection of biodiversity, provision of water, soil formation, nutrient cycling, etc.⁴ Benefits from agrobiodiversity enhancement in certain types of farming systems (e.g., agroecology, agroforestry, organic farming, sustainable livestock and integrated pest management, etc.) are important for urban and regional biodiversity planners to better comprehend and factor into spatial planning. This is where active examples of practitioner-based innovation and recent studies from the research community are valuable, helping translate technical aspects of rural agricultural practice that is ecosystem-based and biodiversity friendly into city region landscapes that are spatially complex interactions between the built and unbuilt environment.

Components of food related ecosystem services along the urban rural continuum

In 2011 FAO completed a study titled “Cities, Food and Agriculture: Challenges of food and nutrition security, agriculture and ecosystem management in an urbanizing world”. A wide consultation across FAO and globally through the interdisciplinary listserv “Food for Cities” – a multi-stakeholder group of scientists, UN professionals, NGOs and practitioners – was carried out. These

4. Power, A. G. 2010. Ecosystem services and agriculture: tradeoffs and synergies. *Philosophical Transactions of the Royal Society B* 365: 2959-2971.

| Domains | Dimensions | Ecosystem Services |
|-----------------------------|--|---|
| Natural resource management | soil/water land tenure energy forest/trees | clean water for food, pollination, genetic diversity, nutrient flows, energy production, biological pest control, etc. |
| Food and agriculture | agrobiodiversity livestock/aquaculture food markets food loss/waste | food, fiber and fuel, diverse food sources, energy production and nutrient recovery from food loss/waste, etc. |
| Socio-economic and health | hunger/malnutrition shifting diets/health food safety/street foods migration/labour | increase supply of nutrient dense foods, new farm and natural resource management jobs, local knowledge resources, etc. |

Table 1. Components of Food Systems.

From FAO 2011. *Food, Agriculture and Cities: Challenges of food and nutrition security, agriculture and ecosystem management in an urbanizing world*. FAO Food for the Cities multi-disciplinary initiative position paper. Rome: FAO. p. 18.

“A comprehensive, ecologically based landscape approach to agri-food system planning and implementation joins the planning and research communities’ interests in a new agenda featuring knowledge creation and exchange across the full range of food system components.

consultations identified 12 components of food systems across the urban rural continuum that occur in nearly every city region. These components are described in part I of the FAO study and summarized in Table 1 below, which divides them among three domains.

Food ecosystem services reduce risk for resilient city regions

Any discussion of planning for city region food systems today cannot avoid discussion of the relation between the food and nutrition security of cities to planning for resilience and disaster risk reduction (DRR) in the context of climate change and protracted crises. Food security in the face of protracted crisis will be a subject of increasing international concern, and a topic in the 2014 Committee on World Food Security meeting at FAO.⁵ The recent inclusion of food and nutrition planning in disaster planning for cities is partly a result of increased severe weather from hurricanes and typhoons, from tsunamis and earthquakes and from the impact of these natural disasters on cities and their surrounding hinterlands. From international coordination to national and subnational disaster plans, to emergency preparation, strategy and analysis geared to local planning authorities, the food system is becoming a sector for critical attention alongside water and flood control, coastal defense, energy, transport, shelter, health and other sectors. From more frequent severe weather to failing economic conditions and areas of ongoing civil conflict, the food system will need to be integrated into all levels of planning for protracted crises, from local to international.

The FAO study *Food, Cities and Agriculture* states unequivocally:

*The trends of recurrent severe storms, floods, drought, earthquakes and other disasters with significant impacts on the food supply for cities and regions, have led to new planning approaches to disaster risk reduction and management. As a result there is an emphasis on the “continuum of care” from pre-disaster planning through emergency response of donor agencies, to smart re-development for long-term resilience. The disaster risk reduction (DRR) and management approach includes joint engagement of community-based and agency-level managers of crises in pre-emergency planning for disruptions in the food supply.*⁶

As with previous food system entry points for addressing equity, poverty and economic development and linking biodiversity and food systems planning, planning for resilience is also an entry point for urban and rural communities to dialogue and develop action and contingency plans. In planning for “ecosystem resilience” FAO calls for “investment in urban, peri-urban and territorial food system development [that] contributes to disaster risk reduction measures with co-benefits for the longer term livelihood sustainability for both urban and rural poor”.⁷ For example in Rosario, Argentina food production is en-

5. See <http://www.fao.org/cfs/cfs-home/cfs-fipc/en/> [accessed 3 February 2014]

6. FAO. 2011. Food, Agriculture and Cities: Challenges of food and nutrition security, agriculture and ecosystem management in an urbanizing world. FAO Food for the Cities multi-disciplinary initiative position paper. Rome: FAO. p. 29.

7. Ibid. p. 30.

8. Dubbeling, M. 2013. Can cities be more self-reliant in food? Presented at: Resilient Urban Food Systems Forum, 1 June, Bonn.

couraged in flood-prone areas, keeping informal settlements out of the hazard zone, while providing livelihoods and more direct access to food.⁸

Local management of trade-offs, synergies and benefits

As recent research into ecosystem services and agriculture explores the potential for tradeoffs and synergies, the degree to which any particular agricultural system provides services (such as those listed in Figure 3. Impacts of farm and landscape management on the flow of ecosystem services and dis-services to and from agroecosystems on page 19) “depends upon management, and management is influenced by the balance between short-term and long-term benefits”.⁹ More recently, these positive ecosystem services from agriculture, managed in ways to provide these services and intensify production through diversity of cropping, forest and livestock systems have come to be called *ecofunctional agriculture*. As FAO puts it in the description of their new LIBERATION program, “Ecological intensification is the optimization of all provisioning, regulating and supporting ecosystem services in the agricultural production process.”¹⁰

These management practices are currently being analyzed and quantified as biodiversity-friendly practices from plot, to field, farm and landscape levels in order to provide better linkage between the science and the policy goals for intensifying food production while improving the environmental services that agriculture can provide at these multiple scales.¹¹ A key question linking

Box 3. Urban agroforestry in Bobo-Dioulasso

Bobo-Dioulasso, Burkina Faso's second largest city, used urban agro-forestry to address risks from climate change and ultimately enhance its food system. The city is vulnerable to climate threats like flooding, extreme windstorms, increasing temperatures, and irregular rainfall, with major implications for city residents. Using climate change adaptation as an entry point, government at national and municipal levels, with local community involvement, launched a 1.65 km long greenway of urban and peri-urban forest.

As of 2013, Bobo-Dioulasso still counts 60 hectares of greenways that can be preserved with mixed functions for recreation, environmental education, and small horticulture plots. The city refers to the space as its “green lungs” which provide relief from the urban heat effect, and also offer opportunities for food production, recreation, and more. The legal statutes for management of these spaces have been adapted to allow for such future multi-functional use.

Source:

Green mosaic planning in Bobo Dioulasso. Hamidou Baguian, Climate Change Focal Point, Municipality of Bobo Dioulasso, Burkina Faso, ICLEI presentation 1 June 2013. http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/Resilient_Cities_2013/Presentations/D5_Baguian_RC2013_RUFS.pdf [accessed 3 February 2014]

9. Power, A. G. 2010. Ecosystem services and agriculture: tradeoffs and synergies. *Philosophical Transactions of the Royal Society B* 365: 2959.

10. FAO. FP7-project LIBERATION. Home. <https://sites.google.com/site/fp7projectliberation/> [accessed 3 February 2014].

11. Ibid.

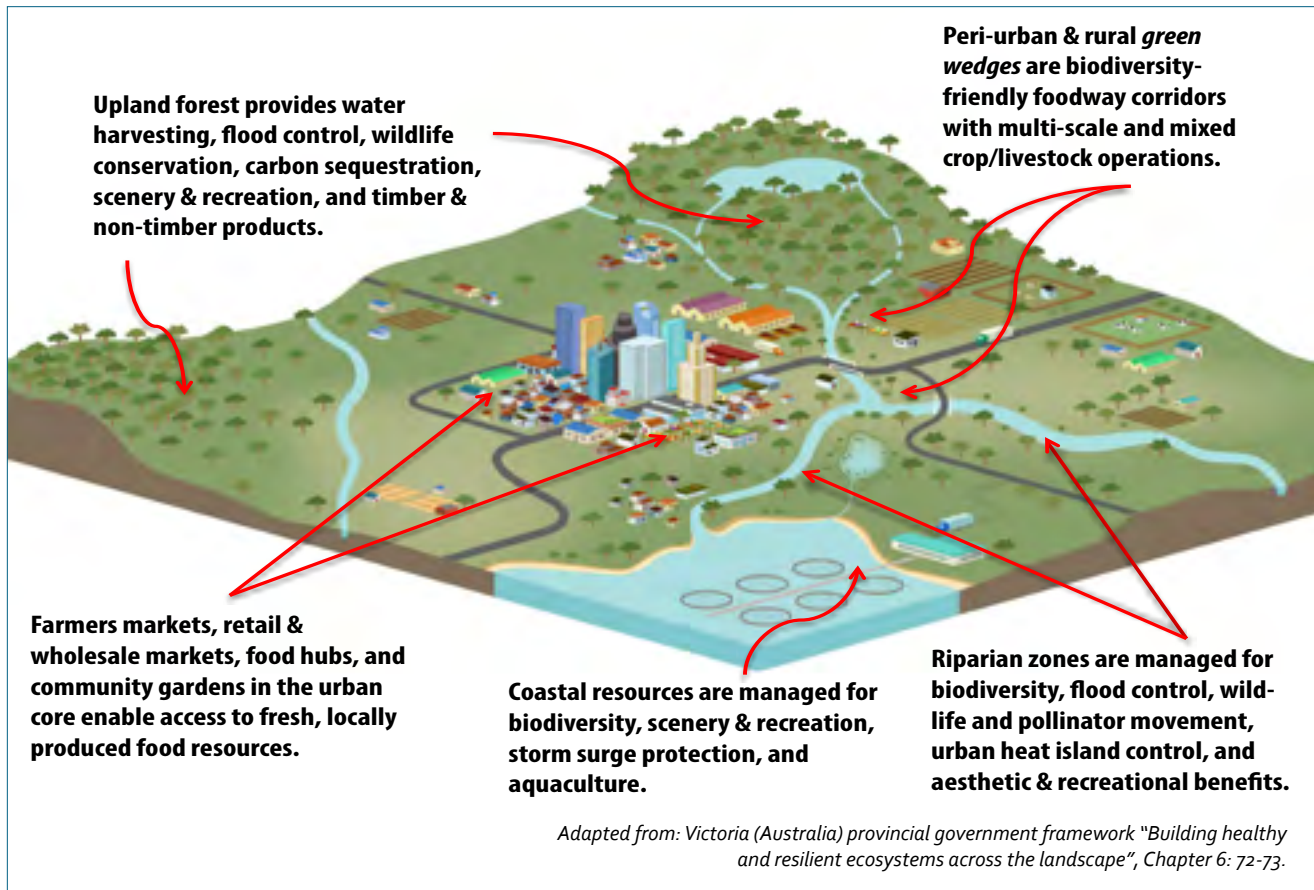


Figure 4. Ecosystem service flows along the urban rural continuum

ecosystem services to the issues of equity in the last section is who receives the benefits of ecosystem services that may benefit "downstream" populations in towns and cities. In particular, how small rural producers, women and indigenous communities receive benefits directly from their ecosystem services. As the ecosystem benefits of urban and peri-urban agriculture become clear and measurable, the same issue will be important in urban food landscapes. How will urban neighborhoods, especially the most vulnerable, benefit from managing the natural resources and food systems of which they are a part?

The degradation of ecosystem services can be reversed

Management practices can and do influence the potential for ecosystem disservices – ranging from nutrient runoff and pollution of waterways, to exhaustion of water supplies, pesticide poisoning, biodiversity loss, production of greenhouse gases, and encroachment on wilderness habitat (i.e., rainforests). These documented disservices from agricultural practices are why many en-

vironment planners do not have a positive sense of the biodiversity enhancement of agriculture in general. Insights developed around prioritizing nature conservation with spatial concepts of land mosaics, patches and corridors could have significant implications for city region food systems policy and planning. A deeper understanding of agro-ecosystem services and disservices as they relate to landscape management has significant implications as well. We will return to this in the final section.

Inclusion of food production in urban, peri-urban and near rural landscapes has begun in the context of planning for resilience within the new framework of the green or adaptive mosaic. There are a few pioneer city regions, such as Navai-sha, Kenya, where the adaptive mosaic framework is currently being implemented (see Box 2, above). However there are a number of emerging cases of city region resilience planning that incorporate rural linkages and food security that will contribute to deliberations around sustainable development goals and targets being discussed in forums as varied as the United Nations and international associations of local and regional authorities such as Local Governments for Sustainability (ICLEI), Network of Regional Governments for Sustainable Development (nrg4SD) and United Cities and Local Authorities (UCLG), and global NGOs such as EcoAgriculture Partners, World Resources Institute, RUAF and many others.¹²

The challenge of measurement, valuation and policy tools for effectively linking ecosystem services across the urban rural continuum is itself an entry point and valuable reason for convening urban and rural planners, land managers, agencies and experts. Technical discussions are needed between professionals and practitioners concerning the challenges and entry points for integrating ecosystem services across food production, processing and supply as it applies to city region food systems. These discussions in turn can lead to plans, actions and policies that integrate food systems into the green and open spaces linking cities to rural landscapes, built environments to natural environments.

12. See for example the Resilient Cities Congresses in 2011 and 2012; ICLEI. 2013. Resilient Urban Food Systems: Opportunities, Challenges and Solutions, Outcomes of the Resilient Urban Food Systems Forum. Bonn: ICLEI.

5. Health, Food & Nutrition Security in an Ecosystem Context

From development and planning perspectives we turn now to the health perspective. As a profession, and as an important sector at all levels of government, the public health sector is vital to the future of food and nutrition security in urban and rural areas. Public health systems have many components, including hospital systems, health clinics and public health agencies, not to mention the many specialized medical and health professionals who work in these systems in all countries and cities. Fundamentally mandated to address the health and safety of all citizens, when it comes to food and nutrition security, public health professionals have been most concerned with protecting the public from food-borne diseases or poor sanitation in developing countries, as well as food safety, biohazards and environmental health in developed countries.

As discussed in Section 4 on equity, poverty reduction and economic development, there are health access disparities as there are food access disparities. In fact, the demographics of poor food access and poverty in urban areas and hunger and poverty in rural areas often directly coincide with poor health care access in general and non-communicable chronic nutrition-related disease in particular. As the landmark 2011 Chicago Council on Global Affairs report, *Bringing Agriculture to the Table: How agriculture and food can play a role in preventing chronic disease* stated, “if farm and food systems are to meet human needs and contribute to human health and longevity, they must produce affordable, diverse, and healthy food”.¹

Combatting malnutrition from noncommunicable diseases (NCDs) such as obesity is as big a challenge at the global level as combatting hunger, undernutrition or infectious diseases. As nutrition-related diseases such as obesity, cardiovascular disease and diabetes, have soared, the public health community has begun to consider the complex causality of these forms of malnutrition from a systems perspective. A systems approach to understanding human health in the context of urban and rural environments has yielded new perspectives on the interrelationships of employment, natural resource use, food access, physical activity and livable places, infrastructure, living arrangements and governance. Agriculture and public health systems have, in the process, begun to be understood in closer relationship to each other, even though most public health professionals have not been trained in food production systems beyond the nutrient content of food.

Ecohealth: the ecology-health nexus

One new systems based approach is the “Ecohealth” perspective. Ecohealth, a participatory methodology to understanding and promoting health and well-being in the context of social and ecological interactions, emphasizes

1. Nugent, R. 2011. *Bringing Agriculture to the Table: How agriculture and food can play a role in preventing chronic disease*. Chicago: Council on Global Affairs

multidisciplinarity and the importance of agriculture and ecosystem-based interventions. The sustainable livelihoods framework brings many of these elements together, but interrelationships of food systems and human health are still in need of more understanding and data from specific city region landscapes. Some cities have begun to assess and map the spatial and social relationships of food environments and the geography of health related vulnerability and disease, similar to the food desert mapping mentioned above. Rarely does this mapping of food and health extend across the urban rural continuum.

In the urban food environment, health agencies are most often concerned with sanitation in urban food markets and street food vending, or in potential contamination or hazards related to food and animal production in congested areas. In the rural and urban food environments, health professionals are concerned with food and animal borne diseases, or over contamination of soil and water by overuse of agricultural chemicals. When the urban rural continuum is assessed from a food systems and health perspective, other concerns arise.

Food production systems tend to intensify as they get closer to urban areas, both in terms of diverse smallholder production in near rural, peri-urban and urban farms and gardens, and with regard to the mix of cropping and livestock systems. Such intensification is inherently positive from the perspective of increasing the supply of urban markets from the city region landscape. However, the health risks and the need

Box 4. Ecohealth in urban and peri-urban agriculture in Kampala, Uganda

Kampala has a long history of agriculture in urban and peri-urban spaces, which has served as a livelihood strategy for city dwellers. The vegetables, fruits, poultry, and meat produced contribute to income if sold and contributes to household diets. Yet urban and peri-urban food production often raise health concerns based on risks deriving from bacterial and toxic contamination of soils, air pollution, and transmission of disease from livestock to humans.

In 2004, the Kampala City Council passed a number of ordinances to guide agricultural practices to improve safety and health. The policies were the result of study coordinated by the Consultative Group on International Agricultural Research (CGIAR) that included a health-impact assessment and a participatory survey of perceptions related to urban and peri-urban agriculture. The study enabled policymakers to identify specific health challenges related to urban and peri-urban agriculture in Kampala, such as risks from contaminated wastewater, and test-pilot solutions with local residents to address the problems.

The case is an example of employing an “ecohealth” perspective, where a participatory study sheds light on the link between ecologically-based factors and human health. The study and resulting ordinances underscore the potential gains that targeted policy for urban and peri-urban agriculture present for livelihoods, employment, and food, as well as public health.

Sources:

Lee-Smith, D. and Prain, G. Understanding Links between Agriculture and Health. IFPRI Focus Brief 13 of 16, May 2006.

Lessons from Kampala: Will Urban Farming Make a Difference? Alliance of the CGIAR Centers Collective Action News, Issue No 3, October 2008. http://www.ddrn.dk/filer/forum/File/Collective_Action_News_Issue_3_October_2008.pdf [accessed 3 February 2014]

for active mitigation of these risks also increase as food production intensifies closer to human population centers.² More engagement of the public health community in assessment and mapping exercises discussed elsewhere in this paper is needed to better understand the food health nexus along the urban rural continuum. For example, the public health dimensions of access to green spaces, exercise, and community gardens – linked to land planning – are attributes of a healthy environment with measurable impacts on human health.

Sustainable diets link rural and urban landscapes

A variety of new processes have emerged in the past 10-15 years as diet concerns have been placed closer to the center of agriculture. One example emerged from consultations hosted by FAO and Bioversity International in 2010. These multi-stakeholder consultations examined the nutrition density of foods and the agrobiodiversity required to support both cultivated and foraged food sources in a variety of city region contexts. A resulting framework for sustainable diets has emerged from this work, linking the health of agricultural environments including the natural resources of soil, water and diverse habitats in rural areas to the downstream health of populations consuming demonstrably more nutrient dense foods. In both rural and urban areas this includes micro-nutrient availability (vitamins and minerals) accessed from farms and gardens.

The issue of nutrient density is at the core of both the hunger and malnutrition challenges. Often it is the ingredients in processed foods with low nutrient density (e.g., sugary beverages and snack foods) that are subsidized and therefore cheaper (i.e. more accessible) than more nutrient dense foods such as fruits, vegetables, grains, pulses, meat and dairy. The public health burdens placed on cost-constrained municipal and federal budgets by this problem have impelled campaigns – such as former New York City mayor Michael Bloomberg’s – to encourage healthier eating.

The rise of low nutrient processed foods produced by the agrifood industry found in the markets of many urban and rural areas is increasingly prevalent alongside fresh local food which sometimes has higher nutrient densities. Foraged and locally sourced foods, including those from uncultivated natural habitats, are a valuable source of affordable, nutrient dense foods for the rural and urban poor, especially in poor countries. Work on sustainable diets is producing new tools available for local authorities, planners and stakeholders to assess the availability and sustainability of the nutrient dense food supply for their communities.³

The environments in which such foods are gathered are often the biologically diverse habitats that planners are increasingly seeing as important to the ecological health and resilience of the larger city region landscape, as in the adaptive mosaic framework for greening urban regions described in the last section. This landscape mosaic framework is not usually thought of in terms of food

2. World Health Organization. Guidelines for the safe use of wastewater, excreta and graywater. http://www.who.int/water_sanitation_health/wastewater/gsuww/en/ [accessed 3 February 2014].

3. FAO. 2012. Sustainable Diets and Biodiversity: Directions and solutions for policy, research and action. Rome: FAO.

and agriculture. But if we hope to achieve resilient, sustainable and healthy city regions, working farms and gardens must become part of the adaptive mosaic.



Land reserved for horticulture has survived Maputo, Mozambique's exponential growth Source: DigitalGlobe, appearing in FAO. 2012. Growing greener cities in Africa. First status report on urban and peri-urban horticulture in Africa. Rome: FAO.

“ We envision a strategy with complementary roles: subnational and municipal governments promoting investments in infrastructure, training and business development for local/regional agriculture, and civil society, universities and the private sector researching, innovating and implementing.

6. Local Governance and City Region Food Systems

Sections three to five presented clusters of issues that provide entry points for both urban and rural stakeholders. These stakeholders often comprise different sectors including nongovernmental organizations (NGOs) and civil society organizations (CSOs), subnational and local urban and rural authorities and leaders, the business community, and agencies representing national or international organizations. These stakeholder groups have differing degrees of interest, levels of participation, and capacity to engage in governance. Yet, as noted in section two about the challenges for urban rural linkages, in most cases some sort of multi-stakeholder process is required to effectively and equitably manage the city region food system.

These processes usually start with dialogue and lead to assessment, prioritization, new practices and reformulated policy. It should be acknowledged that food-centered planning at the local or subnational level is new, especially across urban and rural boundaries, and there are very few governments with permanent units whose primary duty is to monitor and manage the food system that supplies the population they look after.

It is also a fact that many such processes are initiated by citizen groups and NGOs and may not be able to engage municipal or local authorities at first or for some time, whether due to lack of access, lack of interest, or lack of jurisdiction. In south and southeast Asia, for example, municipal authorities' exposure to food in the cities they help run is usually limited to regulation of food vending, food distribution and storage. In many cities there is negligible interest amongst urban administrators and planners about food and agriculture.

Evolution of local food system governance frameworks

We will address specific policy tools for improving urban rural linkages in section seven. Here we treat the institutional frameworks that support dialogue, assessment, prioritization and new practices, which are often themselves the result of political will, charismatic local leadership and/or policy design. For example, local food councils are a mechanism for multi-stakeholder dialogue, assessment and recommending action that may be created by citizen initiative or by public policy. For innovative practices to take root and grow, leadership needs to be sustained and match critical levels of stakeholder support and ownership. The evolution of these processes from early adoption through implementation and ongoing adaptive management are usually part of larger governance processes, whether informal or formal.

Informal governance processes may be convened by nongovernmental actors or non-local agencies, and after creating a level of ownership, perhaps with for-

mer or current public officials involved, the process may develop into a more formal governmental process. On the other hand, there may be leadership or incentives to have the process begin at the outset under more formal sponsorship by local government.

In either informal or formal approaches, ultimately subnational and local government, both urban and rural, should understand and adopt new measures that secure and promote the development of city region food systems. Such local governmental support may begin on the rural or urban side, but if the full potential of a comprehensive and integrated urban rural approach is to be institutionalized, there should be at least some bridges where policy and practice are adopted by both urban and rural authorities who understand the benefits of the practices to both their communities.

Inclusive stakeholder engagement is vital

Including the private sector is critical, as businesses small and large are involved along the supply chain in food production, processing and manufacturing, wholesale and retail. Engaging with business is important from the beginning, though the character of engagement and kinds of businesses to engage are important as well. Business actors who feel that city region food systems may threaten their practices or markets may try to obstruct or steer the process. But there will be many that see the economic value of this work and will appreciate the invitation to equitably collaborate in community decision making processes.

Box 5. Food Policy Council of Toronto, Ontario, Canada

The Toronto Food Policy Council was launched in 1991 to advise the city on food policy issues, as well as to serve as an advocate for community food security strategies and foster dialogue between stakeholders across sectors. The Council connected grassroots initiatives with city and municipal planners to focus on food strategies that look beyond municipal borders to rural areas and farmers. Members include regional farmers, retailers, elected officials, community organizers, researchers, and policymakers focused on the environment, economic development, public health, food security, and more. The Council serves as an innovation in institutional linkages that bring together rural and urban actors across government, civil society, and the private sector.

Harnessing the knowledge and perspectives from throughout the city region food system, the Toronto Food Policy Council has played a role in several initiatives including the Toronto Food Strategy, healthy food retail mapping, mobile food markets with fresh produce, and disaster planning for the food system. In the coming years, the Toronto Food Policy Council intends to deepen its engagement in supporting new legislative frameworks for the city region food system, as well as to strengthen capacity for food policymaking at a regional and national level in Canada.

Sources:

Resilient Urban Food Systems: Case Study, Toronto, Canada, ICLEI presentation 1 June 2013.

Toronto Food Policy Council. <http://tfpc.to> [accessed 3 February 2014]

Integrating urban and rural governance

In addition to food insecurity and lack of access to healthy food, urbanization and encroachment on agricultural land creates additional need for planning alternatives and policies that aim to reconcile growth management, food security and the enhancement of agriculture. Numerous strategies are being proposed and tested, including zoning changes to capture and direct land values toward both more dense urban development while transferring value shift to protect zones of dedicated peri-urban agriculture. From examples such as Vancouver, Canada (see Box 6) it is evident that when seeking to gain access to agricultural resources in the peri-urban and territorial (near rural) landscape, metropolitan governments working with civil society can play important roles. Often, they can balance development pressures on the edges of urban landscapes with zoning, market and financial incentives for food and fiber producers. But first, local governments need to care about the provenance of their community's food supply and have the vision and determination needed to maintain that supply in perpetuity.

The power of urban procurement to benefit rural communities

Beyond the usual land-use planning tools of zoning and financial or tax-related incentives, there is an extremely important set of governance tools for city region food systems development. For example, through public procurement practice and policies, urban agencies regulate or shape markets by sending signals concerning the source and character of foods purchased in either the commercial or public markets. Many institutions in urban areas that are either public or semi-public have feeding programs and must purchase food for these programs.

Examples are public markets (including farmers and public markets and street vendors), schools, hospitals, jails, orphanages and many other kinds of institutions. Targeted social protection programs often do support some kinds of institutional food service, such as school, hospital food and emergency food or food banks. These programs may receive financial support from municipal, national or international sources. Local authorities from urban and rural communities can promulgate policy that incentivizes foods produced in the urban, peri-urban or rural areas. Procurement policy that encourages direct linkages between rural producers in the city region and local markets may require changes at the national level.

In Brazil for example, there are three levels of governance working in tandem and as a tiered system. The federal programs (like the umbrella *Fome Zero*) link purchases from family agriculture producers for food security social support. The Bolsa Familia conditional cash transfer combines with programs of provincial government and depends on municipal governments' roles in policy coordination.¹ In several cases it is leveraged by municipal efforts of localized pro-

1. Linder K., J. Linder, J. Hobbs, and B. de la Brière. 2007. "The Nuts and Bolts of Brazil's Bolsa Familia Program: Implementing Conditional Cash Transfers in a Decentralized Context." World Bank Social Protection Discussion Paper 0709. Washington, DC: World Bank; Rocha, C. 2009. Urban Governance for Food Security: The Alternative Food System in Belo Horizonte, Brazil. *International Journal of Planning Studies* 14 (4): 381–392.

curement, infrastructure development and public provisioning.

Multi-level governance for food systems

Multi-level governance, including local, subnational and national governments, has been approached in several ways and has been summarized by the FAO in *Food, Agriculture and Cities*.² Levels of multi-stakeholder governance can include civil society and the private sector, local authorities both rural and urban, subnational and national government, and the international level of normative policy. There are specific contributions of each level to coherent development of city region food systems. For example, to change procurement practices it is vital to work across the supply chain with farmers, processors, distributors, markets and consumers represented. However, to scale innovations, it may be necessary to have a tiered approach to policy support from different levels. Also the great diversity of conditions in landscapes around the world may require a “polycentric” governance approach in the sense that the integration of levels of governance is organized in systems of interrelated city regions rather than centralized at national or international levels.³ A real concern about the value, respect and empowerment of rural voices in an urbanizing world will also have to be factored into new food system governance frameworks.

City region systems can approach good governance practices through any of the issue-based entry points when governance challenges and opportunities arise. Municipally-supported agricul-

Box 6. Municipally Supported Agriculture in Vancouver, British Columbia, Canada

In 2011, Vancouver implemented precedent-setting land use regulation to conserve agricultural land and enhance agricultural viability, especially for soils of high quality. The Regional Growth Strategy for 2040 protects agricultural land near the city from urban encroachment and simultaneously promotes food production activities. The strategy is intended to create a compact but economically dynamic urban area to accommodate a burgeoning population, alongside protected rural land.

A key component of the plan is an Urban Containment Boundary that serves as a limit to urban growth. From a rural perspective, the boundary protects agriculture and provides conservation for rural land. From an urban perspective, the containment boundary offers predictability in the coming years for the development of the built urban environment and uses for regional growth activities.

To encourage opportunities for commercial activities, services, and employment, the plan targets a 40 percent increase in the number of dwelling units within the designated urban centers in the metropolitan region, and a 50 percent increase in the number of jobs. Meanwhile, protected rural areas slated for the Agricultural Land Reserve will receive support in the form of improved transportation, increased irrigation infrastructure, and a protected agricultural land base. Municipalities and the greater region are taking steps to ensure the viability of this important economic asset in the region, and to promote food production in conserved agriculture areas to serve the growing city’s food needs.

Source:

Regional Growth Strategy: Metro Vancouver 2040 – Shaping our Future. 2011. <http://www.metrovancouver.org/planning/development/strategy/Pages/default.aspx> [accessed 3 February 2014]

2. FAO. 2011. Food, Agriculture and Cities: Challenges of food and nutrition security, agriculture and ecosystem management in an urbanizing world. FAO Food for the Cities multi-disciplinary initiative position paper. Rome: FAO. Table 2.

3. Seitzinger, S., et al. 2012. Planetary Stewardship in an Urbanizing World: Beyond City Limits. AM-BIO 41: 787-794.

ture linked with rural authorities in multi-stakeholder, multi-sector partnerships can provide large-scale results over short periods of time. There are few examples that explicitly integrate food provisioning for local and regional markets, ecosystem health, biodiversity protection and diversification of landscapes across the urban rural continuum. However, there are increasingly city regions that do combine food provisioning and environmental goals, like Vancouver, Canada (see Box 6).

Strategies and tools emerging from city regions

Tools available to subnational and metropolitan governments and local rural authorities are being applied to re-align and reinforce urban-rural linkages, and to balance regulatory 'sticks' and financial 'carrots'. Table 2 (on the following page) lists some strategies at work in various city regions around the world with a short abstract of a use case. Most of these strategies and tools are closely linked to policy, discussed in the following section. The good news is that these strategies and tools are already being elaborated, implemented and copied by local governments, nongovernmental and private sector actors around the world.



City of Curitiba, Brazil. Photo from the Secretariat of the Convention on Biological Diversity.

| Strategy/Tool | For Example... |
|---|--|
| The power to convene and to facilitate engagement with stakeholders for the region's future direction | holding a series of visioning and planning sessions that bring together representatives of different sectors and interests. |
| Conventional tools applied in novel form (including zoning, permitting, taxation, raising of bonds, attraction of investment, the power to map and characterize resources with specific value, etc.) | adding tax incentives to zoning for food processing or distribution centers that have a strong commitment to local producers. |
| Efforts to apply existing knowledge and to create new knowledge on how to prioritize land most suited for food production, while identifying other functions that can be "stacked" in those areas | Using soil surveys and local knowledge to identify the most valuable areas to preserve for agriculture and supporting housing for farmers in those areas. |
| Opportunities to create equitable value chain structures for high diversity, low impact ecological agriculture | finding private sector businesses and investors to match producer interests and explore markets and policy tools together with local authorities. |
| Research and development of monitoring tools to confidently connect food production sites for environmental services (green water, flood control, biodiversity, water quality, pollination, etc.) | identifying those services needing clear spatial characterization, and placement in ways that tie to other functions and landscape values. |
| Designing financial incentives and market mechanisms at local and regional scales to reward the provision of environmental services of businesses and land managers | convening a stakeholder process to establish a system of payments to farmers to revegetate a critical watershed providing urban water supplies. |
| Reform and promulgation of procurement policies and practices to incentivize sourcing of local and regional foods for urban markets as well as ecosystem approaches in urban, peri-urban and regional food production | convening appropriate agencies and stakeholders to design policy incentives such as assigning preference for certain products from certain geographic areas. |
| Creation of public-private-nonprofit partnerships to institutionalize multi-stakeholder collaboration | linking a farmers association to processors or distributors with donors in order to provide schools with local foods at affordable prices. |
| Coordinated collection of socioeconomic land use and environmental data by both public and private sector actors, disaggregated and spatially explicit, that facilitate integrated and systemic policy-making | creating a food systems institute at a local university, empowered (and funded) to coordinate, direct, or conduct regional data collection across all food system related variables and make that data available to all interested stakeholder groups. |

Table 2. Strategies and tools and example use cases for local and regional governance of city regions

7. Policy Pathways for Resilient City Region Food Systems

Following section six, it is clear that governance mechanisms for linking food systems with existing or new institutional frameworks may be initiated by civil society or by government, by informal initiative or through policy reforms. This section is about the more formal pathways of government implementation. Policy and governance is a “chicken and egg” situation, one may come before the other, but they are integrally linked. Here we focus on the policy that indeed will be necessary to institutionalize city region food systems at government levels in relation to all the issues that are of concern to citizens and their representative leaders regarding a sustainable future.

While there is a key role for municipal and rural local authorities to plan for city region food systems, the roles of other subnational, national and international agencies are also vital. Elected leaders (mayors, county executives, governors, etc.) and their parliamentary bodies (city councils, legislatures etc.) will need to pass resolutions, new laws and empower existing or new programs to promote resilient city region food systems. These actions will need national and international support. The roles of government are many and include policy shaper, regulator, enabler, purchaser and educator, among others. Historically, governments have not often been supportive of the sorts of actions indicated here. This is largely because agricultural policy has not been a concern of local authorities and because the impetus to integrate policies related to issues like food, biodiversity, water, climate change and poverty alleviation is a relatively recent development. Government is also often the slowest sector to take action, and often follows the lead of the private sector and civil society. As one pioneer in the institutionalization of sustainable business practice stated recently, “In my judgment to execute at scale we need business. To make sure that the commons are stewarded and justice is ensured we also need the organizing and expertise of NGOs, and we need the rule-making power of government.”¹

Policy pathways at the city region level that link urban and rural communities

As policy is adapted to foster more sustainable and resilient cities, food and agriculture will need to be included at municipal and rural levels of local government, supported by national and international policy. Such policy reform will need to integrate all the issues treated here including holistic planning for agro-biodiversity, equitable food access, secure access to land and natural resources, economic and market resources, sustainable diets, public procurement and more.

Policy frameworks that promote an ecosystem approach for city region food systems in the context of urban rural linkages will most likely need to authorize multi-agency collaboration. That collaboration across agencies will likely

1. Hamilton, H. 2013. Why Sustainable Food Needs Big Business, and Why Business Can't Do it Alone. May 16. Sustainable Food Laboratory. p. 3.

lead to parallel formal and informal partnerships and even other policy processes at other levels, such as from the city to the province or from national to the local. For example, retention of land for food production in or near cities, promotion of biodiversity protection through ecological agriculture practices, or procurement of more foods produced locally, will in most countries require supporting policy or resources from national government. Further, collaborative policy pathways will open doors that lead to processes that continuously need new leadership and ongoing adaptive management from one elected administration to another. Support from civil society and the private sector will be essential to delivery of new rules through policy that strengthen the urban rural continuum.

Policies will be needed at the level of subnational and local urban and rural authorities, to guide and improve food system development. Policy priorities that are shared between local and subnational authorities will help bring national support in most countries. A comprehensive approach to the policy tools that are needed from production through to waste and nutrient recovery may follow any number of model policy platforms developed in cities around the world.

For example, the ICLEI led Local Action for Biodiversity (LAB) planning processes take the CEPA approach (communication, education, and public awareness).² While these action planning processes are designed for biodiversity protection, they can adapt to include food systems. Similarly climate action plans can evolve to include food and nutrition security. Broad food system action plans that call out roles for different agencies, such as planning, health, economic development, etc., and enumerate the policies needed to integrate an approach across the urban rural continuum, will most likely be a product of a well-designed and executed multi-sector, multi-stakeholder assessment and priority-setting process. Two of the most comprehensive city region examples today may be Belo Horizonte in Brazil (see Box 1) and the City of Toronto in Canada (see Box 5)

Political leadership and initiative taking may start a multi-stakeholder process, but in many instances a policy resolution or mandate may be necessary and the subsequent steps are likely to require policy support in the form of resolutions and legislative mandates to provide guidance to planning, health and other municipal or rural agencies. More often it is citizen groups who organize and advocate for a new approach to problems that have either been ignored or even made worse by government at different levels. It is the citizen advocates who ultimately will be the arbiters of transparent, effective and multi-stakeholder food system governance.

2. ICLEI. CEPA Evaluation Design Toolkit <http://cbc.iclei.org/cepa-toolkit> [accessed 8 October 2013].

Steps to institute a city region food system policy framework

The following are nine steps generalized from many concrete cases in food system assessment and planning that usually require policy support in the form of a resolution, authorization or administrative initiative.

1. Convene multi-stakeholder groups to do collaborative planning: At city or rural local authority level: agency heads may set up a task force that is cross-sectoral or cross-agency to conduct assessment and policy analysis;
2. Authorize disaggregated data collection for adjacent urban and rural areas (for examples showing the extent of subnational food and nutrition insecurity in urban as well as rural areas) including mapping tools for planners and business actors;
3. Determine appropriate funding mechanisms (public budget, external donors, or other). Funding availability will determine the scope of what a government agency can do and whether external donors are needed to build capacity where there is no budget commitment to new work.
4. Initiate an internal or third party designed survey instrument that interviews urban and regional planners, local authorities and other stakeholders working on biodiversity, climate change, food and nutrition security, resilience and sustainability;
5. Task specific engineering and technical expertise in agencies and research institutions that explicitly looks at the relationships between green infrastructure potentials and the food systems: full-cycle nutrient management, storm water mitigation with more rooftop and open space horticulture, waste recovery from water, sewage, solid waste (biomass and food) fractions, etc.;
6. Direct planning and procurement agencies to conduct analysis of how municipal contracts for services (food procurement, recreation, public health, etc.) might leverage and shape synergies in the food system, including research on other policy instruments, public financing for facilities design, and market incentives for locally produced/environmentally-friendly products;
7. In relation to sustainable, resilient or livable city agendas, direct agencies to explore how food system elements can be integrated into a larger package of green infrastructure to make city regions more attractive to private investors and businesses, new residents, and commercial enterprises seeking to locate there;
8. Integrated strategies where planners and city managers integrate food with other critical resource and service issues, such as water and sanitation, transportation, infrastructure, architectural, engineering and other

systems managers with guided facilitation and if possible, public participation from both civil society and private sector;

9. Call for a deliberative community online and/or participatory forum that builds and sorts thematic coherence around the material and engages leaders from civil society and business, both practitioners and researchers more effectively. Learn from and utilize experiences from other successful examples.

The policy pathways listed above are just a starter kit to support integrated planning processes for development of resilient city region food systems. There are specific planning and policy initiatives to promote equity in food access and reduce hunger and poverty, and others that link food systems to biodiversity and climate change policy and yet more which incorporate food systems into health policy at urban and rural levels.

Such policy tools and methodologies for city region food systems are emerging in both developing and developed countries. One example of the former is a methodology to “assess, design and implement” a food system, based on the output of a 2011 multi-stakeholder workshop in Nairobi called “Ensuring Resilient Food Systems in African Cities.”³ Another example is “Guidelines for Joint Planning for Nutrition, Food Security and Livelihoods” developed by FAO in 2011, which can be adapted to other cross-cutting issues treated here.⁴

Municipal and regional authorities can through policy and programmes support the urban market infrastructure from informal markets to wholesale and retail markets. Terminal markets are still important food system infrastructure in many city regions and yet often are not linked directly to local or regional agriculture as a matter of priority. The growth of hybrid market models in some countries that bring together wholesalers, retailers, farmers and consumers to buy and sell can serve as a model for a combined approach to territorial or short supply chains as well as long distance and global supply chains. The role of municipal and regional governments and their planning and economic development agencies to prepare for a more integrated and flexible approach to provisioning urban populations cannot be underestimated.

Support from national governments and the international community

As mentioned, national governments can provide critical leadership and policy support to help urban and rural communities adapt to changing circumstances, including enabling provision of foods critical to the supply of urban populations from near rural, peri-urban and urban agriculture. The “Let’s Move” campaign of United States First Lady Michelle Obama, which began in 2010, is a recent example of leadership from the national level that links individual behavior and food system change. Leadership is needed to allow countries to link local and subnational domestic food market development to domestic agriculture as na-

3. FAO. 2011. Ensuring Resilient Food Systems for Cities: Regional Project Proposal, output from the Ensuring Resilient Food Systems in African Cities regional workshop, Nairobi, Kenya, 13-14 December 2011.

4. FAO. 2011c. Guidelines for Joint Planning for Nutrition, Food Security and Livelihoods. Rome: FAO.

tional food security and climate adaptation and mitigation measures. National support can come in the form of either individual policies or more strategically integrated initiatives, such as:

- making local and domestic market access to farmers a higher priority;
- reform of land tenure frameworks providing more secure access and tenure to farmland remaining near urban areas;
- linking environmental, economic and social objectives through mechanisms for payments for ecosystem services;
- support for linking economic viability of farmers to social protection programs for the urban poor and hungry.
- More decentralization of access to financing mechanisms to the sub-national and local levels – for example to fund infrastructure and social services linked to food provision.

Mainstreaming urban rural linkages to enhance city region food systems at all government levels

At the international level, normative policy is made by countries through intergovernmental decisions in the United Nations and in international financial institutions such as the World Bank and the International Monetary Fund. Normative policy can encourage national government policy to support sub-national and local authorities in developing policy tools that incentivize local and regional food system development as part of long-term sustainability and resilience planning. Some of the steps listed for planning and policy development at local and subnational levels (see list on p. 38) can in fact be supported as a result of policy decisions from programs in the United Nations, the World Bank and national official development assistance (ODA). Beginning in early 2014 there will be new opportunities to develop normative policy that supports these goals as part of the United Nations post-Rio+20 and post-2015 processes that embrace new development goals in a sustainable development framework. These efforts could promote an urban lens and perspective in nutrition, agriculture, and the environment.

In promoting a vision of a “dashboard approach” to integration of the sustainable development goals for the global post-2015 agenda, the government of Colombia proposed establishing a core set of targets with respective indicators for each goal, targets that would “seek to capture basic deliverables across a range of needs” – and used the possible example of targets for food waste, including indicators that spanned from production to consumption. Countries “would determine which targets and indicators are relevant for them, and define national milestones.”⁵

Similarly, in framing a new approach to sustainable development, a wide coalition of international and regional research and knowledge organizations

5. Colombia, Government Position Paper. 2013. “A Global Dashboard for the new Post 2015 Development Agenda – A proposal from the Government of Colombia”. Available at <http://sustainabledevelopment.un.org/content/documents/3621colombia.pdf> [accessed 3 February 2014]

working together in support of sustainable development as the Independent Research Forum provide insight into how development should be addressed in a more integrated way. Among their recommendations are an emphasis on going from business models based on shareholder value “to those based on stakeholder value,” and that “like people, businesses need more resilient ways of operating that protect the environmental services and human resources on which they depend.”⁶

The debate around a sustainable development goal (SDG) for cities in early 2014 will be followed by the UN Habitat World Urban Forum (WUF 7), Milano Expo in 2015 and Habitat III in 2016. Other benchmark international processes, including ongoing processes in the Biodiversity and Climate Change Conventions, are all occasions where the vital importance of city region food systems will find traction if the message is delivered.

As these opportunities arise, they need to be well integrated with other important issues for sustainable cities as they are being articulated and advocated for by nations as UN member states. This is well on its way with many stakeholders (governments at all levels, civil society, the private sector and UN agencies) in these processes becoming aware of and supportive of mainstreaming urban rural linkages. The thematic issue areas discussed in sections three, four and five have complementary processes in the intergovernmental arena that need inclusion of city region food systems in the context of urban rural linkages.

Many of the policy provisions that are indicated in this report are in danger of being perceived by trade liberalization advocates within the WTO as localization efforts that throw up barriers to trade. This poses a clear threat to integration efforts, and champion countries, cities and civil society organizations need to stress to their trade delegations that national policy support for linking rural smallholder agriculture and food insecurity populations in both rural and urban areas is an essential priority.

Summary of policy precedents in UN

Urban-rural linkages for food security was included in The Future We Want, the normative policy outcome of the 2012 UN Conference on Sustainable Development (Rio+20).⁷ In the context of post Rio+20 and post 2015 agendas, the post 2015 Thematic Dialogues that occurred in early 2013 and the UN Open Working Group (OWG) in charge of the elaboration of the Sustainable Development Goals until September 2014; all begin to make some but not all the connections developed here.

The UN Technical Support Team (TST) policy brief for consideration by member states in January 2014 on a Sustainable Development Goal (SDG) for sustainable cities and human settlement builds on these and other intergovernmental policy inclusion of urban rural linkages. The report calls for integrated ecosystem approaches to urban rural linkages and states, “well-developed and

6. IRF [Independent Research Forum]. 2013. “Post-2015: framing a new approach to sustainable development” IRF policy paper. March 2013. Available at http://www.irf2015.org/sites/default/files/publications/IRF%20briefing%20paper_FINAL.pdf [accessed 3 February 2014]

7. United Nations. 2012. The Future We Want. Outcome Document adopted at Rio+20, June 2012. UNCSD. Available at <http://www.uncsd2012.org/content/documents/727The%20Future%20We%20Want%2019%20June%201230pm.pdf> [accessed 3 February 2014]

managed rural-urban infrastructural, economic, and social linkages are also critical to enable rural areas to provide vital goods (including food) and services to urban centers. Localized food systems including in mid-size towns can promote these links through trade, local procurement and rural employment.”⁸

As intergovernmental recognition develops, other UN agencies and research institutions are becoming more aware of the importance of including urban rural linkages at a landscape level and city region food systems in policy analysis in greater depth and technical detail. The UN agencies who are at present critical to this building policy momentum include:

- the *urban focused* agencies such UN Habitat, parts of the UN Development Program (UNDP) and UNESCO.
- the *rural focused* agencies, including the International Fund for Agricultural Development (IFAD), the Food and Agriculture Organization and the reformed Committee on World Food Security (CFS) hosted by FAO.
- *urban rural crosscutting* agencies including the World Food Program, the UN Convention on Biological Diversity (UNCBD), the UN Environment Program (UNEP) the UN Framework Convention on Climate Change (UNFCCC) and the UN Division of Economic and Social Affairs (UNDESA).

Research institutions outside of the United Nations are helping to frame and articulate issues that become part of the policy discourse and many of them have been referenced in this paper. The inclusion of food security, nutrition and sustainable agriculture issues as a part of sustainable cities should draw attention to the critical role of city region food systems. One example is the Bonn Declaration of Mayors that calls for the implementation of a holistic ecosystems-based approach for developing city region food systems that ensure food security, contribute to urban poverty eradication, protect and enhance local level biodiversity and strengthen urban resilience and adaptation.⁹ The targets, indicators, metrics and means of implementation that are needed for the international level (beginning with the sustainable development goals (SDGs) and targets for food, nutrition, agriculture and sustainable cities) should be a result of networking with the communities of practice that already exist to promote a landscape, territorial, foodshed or city region framework for balancing food and non-food priorities from an ecosystems approach.

Private sector pathways are equally important. To implement change at scale, business at all scales, both rural and urban, must contribute to the solutions. To quote Hal Hamilton of the Sustainable Food Laboratory, “Most of these contributions are most efficiently made through pre-competitive collaborations. Business decision makers need experts, community partners, and civil society organizations to hold them accountable and to provide expertise and community engagement... When the incentives and rules are right, businesses can actually compete in a race to the top rather than a race to the bottom, with encouragement and support from civil society.”¹⁰

8. United Nations. 2013. Technical Support Team Brief for the Open Working Group: Sustainable Cities and Human Settlements. Available at <http://sustainabledevelopment.un.org/content/documents/2306TST%20Issues%20Brief%20Cities%20FINAL.pdf> [accessed 11 November 2013] p. 3.

9. ICLEI. 2013. Bonn Declaration of Mayors. Results from 4th Global Forum on Urban Resilience. Available at: http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/MAF_2013_Bonn_Declaration_of_Mayors.pdf [accessed 3 February 2014]

10. Hamilton, H. 2013. Why Sustainable Food Needs Big Business, and Why Business Can't Do it Alone. May 16. Sustainable Food Laboratory. p. 4.

Networks and mechanisms to support resilient city region food systems

In order to promote policy pathways at the local city region food system level and promote policy support from national and international governmental processes, it is most practical to work with and through networks of regions, cities, subnational and local governments, as well as other stakeholders and major groups of civil society to generate common priorities and messages to deliver to national and international processes.

In fact, there are new and emerging relationships among these stakeholders, including partnerships, coalitions and networks that do aim to formulate strategies and action plans toward these goals. Some work from a “macro” level with national and international processes. Others gather policy and practice innovations at the city region level, share them between city regions, and elevate them to the policy discussions at national and international levels. Both are needed.

Regional and global associations of local and regional governments have been taking up the intersecting issues of climate adaptation, biodiversity protection, and natural resource management in recent years. The pre-eminent venue for cities seeking to integrate their approaches to planning for greater resilience may be the Resilient Cities Congress hosted by Local Governments for Sustainability (ICLEI) since 2010. In June 2013 the 4th Congress included a one-day Resilient Urban Food Systems Forum (RUFS). Food systems in cities’ disaster and resilience planning were a major topic for the cities gathered in Bonn. For the first time the traditional “Bonn Mayors’ Declaration” from the event included a paragraph on city region food systems.¹¹

From events like these, new networks of city regions are considering food issues, and emerging networks concerned with food are being sponsored by local authorities associations, philanthropic organizations, NGOs, and the research community. One such network was launched soon after the Resilient Cities Congress in 2013. Called CITYFOOD, it is a partnership between the Resource Centers on Urban Agriculture and Food Security Foundation (RUAFF) and ICLEI to link cities working on urban agriculture and urban rural linkages. Similarly, the Landscapes for People, Food and Nature Initiative is establishing an international network of ‘learning landscapes’ to support documentation and knowledge-sharing among landscape leaders that is seeking partners in urban landscapes.¹²

In addition to networks of local governments and networks in civil society, there are networks of private sector actors, such as the World Council of Businesses for Sustainable Development and networks of agricultural businesses of all kinds, from farmers organizations to food manufacturing and marketing associations, such as the World Union of Wholesale Markets. Many communities also have local associations of businesses, small and large, such as

11. ICLEI. 2013. Bonn Declaration of Mayors. Results from 4th Global Forum on Urban Resilience. Available at: http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/MAF_2013_Bonn_Declaration_of_Mayors.pdf [accessed 3 February 2014]

12. See <http://landscapes.ecoagriculture.org>

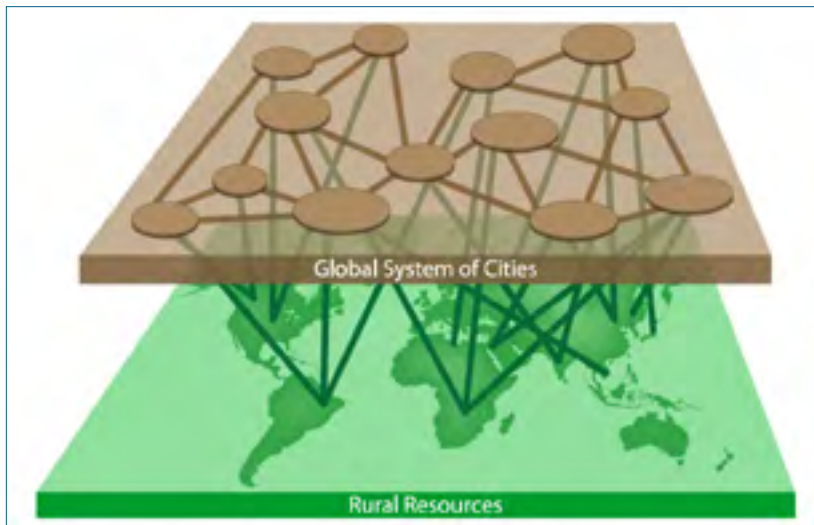


Figure 4. Towards a Global System of Cities Linked to Rural Landscapes
From: Seitzinger, S., et al. 2012. *Planetary Stewardship in an Urbanizing World: Beyond City Limits*. *AMBIO* 41: 791.



Figure 5. Conceptualizing collaboration across a global system of cities and rural areas

From: Seitzinger, S., et al. 2012. *Planetary Stewardship in an Urbanizing World: Beyond City Limits*. *AMBIO* 41: 791.

local chambers of commerce that can be mobilized to support city region resilience.

From planning for ecosystem services linking biodiversity and food systems, to planning for city region resilience, there are significant issues that should increasingly bring colleagues and agencies working in urban and rural landscapes together to develop linked approaches to similar challenges. The Resilient Urban Food Systems (RUFFS) forum at the 2013 Resilient Cities Congress included discussions about urban links to rural stakeholders, for example Dumangas, Philippines where training is provided for farmers in meteorological data and prediction, land and cropping decision making for climate adaptation. This was an initiative taken up by the municipal authority itself. More examples and lessons learned from these innovative forms of urban rural collaboration will be needed in the future.

Active networks of city regions are needed, connected to rural regions near and far. There must be simultaneous support for building knowledge networks, linking everyone from forest managers and indigenous farmers to scientific and research institutes, that work together to strengthen the sustainability and resilience of food systems in landscapes both urban and rural. Such a vision of networks of city regions and rural areas, linked to critical sectors, is presented in Figure 5. The authors of "Planetary Stewardship in an Urbanizing World: Beyond City Limits" note that in the interest of planetary stewardship of resources, a "global system of cities must operate within a

framework of other actors such as national, regional and local governments, multinational corporations, and civil society” and prioritize user-engaged research. “Co-design, co-production, and analysis of results by scholars, professionals, decision-makers and civil society” are critical to this endeavor.³³

With this kind of vision, engaged networks working at all levels from the local to the international, and using the strategies and tools outlined above, the challenges of a rapidly urbanizing world can be overcome, and we can transform our city regions into true landscapes for people, food and nature.

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13. Seitzinger, S., et al. 2012. *Planetary Stewardship in an Urbanizing World: Beyond City Limits*. *AMBIO* 41: 790.

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