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

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Content

Foreword

Urbanization is one of the key drivers of change in the world today. The world's urban population currently stands at around 3.5 billion. It will almost double to more than 6 billion by 2050. This is a challenge not only for urban areas but also for rural areas, because many people, especially the young, will migrate from rural areas to urban areas over this period. When addressing urbanization challenges, we are also addressing, directly or indirectly, rural and territorial development. What do we have to do to ensure people's access to good nutrition in cities? What do we have to do to produce enough food for urban dwellers? What infrastructures are needed and what kind of food production is possible in cities? How can cities preserve the services of the surrounding ecosystems? A very wide range of important issues links urbanization and food security.

The "Food for the Cities" multidisciplinary initiative started in FAO in the year 2000. It has covered a great variety of areas such as food supply, nutrition education, school gardens, urban and peri-urban agriculture and forestry; how to support small producers in urban and peri-urban areas, waste management and re-use of wastewater. The experience shows conclusively that we all need to work in partnership when addressing issues of urbanization and food security, from the public sector, the private sector and civil society.

Local authorities are key players in this context, however, urban actors have often not considered the food system an important issue when designing, planning and managing cities. The perception has been because food is there and one can easily buy it in the supermarkets or along the streets, that food will always be there. This perception was altered for many in 2008, when the food prices peaked. More than 20 countries around the world experienced food riots in urban areas. Hunger, now in both rural and urban areas, has now become vocal, and this is changing the political scene. All stakeholders need to work together at global and local levels, for advocacy, for project implementation, but also for raising awareness on urbanization and food security as one of the key issues of our times.

This position paper addresses a wide audience, from field workers to decision makers, to help understand the challenges that continuing urbanization brings to food, agriculture, and the management of natural resources. The approach proposed here is based on four dimensions that characterize, design and implement food systems for cities. The paper has been prepared as a support for all actors to help advocate for political support and to assist in developing operational strategies adapted to local realities.

Food and nutrition security in cities can not be taken for granted. It is part of a complex system. Supporting the most vulnerable groups in an urbanizing world demands discussions on food, agriculture and cities in the context of rural-urban linkages.

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Assistant Director-General – Natural Resources Management and Environment Department
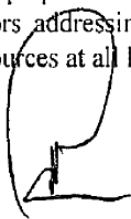*Food and Agriculture Organization of the United Nations*

Acknowledgments

Acronyms

ADG	Assistant Director-General
APA	American Planning Association
COR	EU Committee of the Regions
DCP	FAO Decentralized Cooperation Programme
ESA	Agricultural Development Economics Division
FAO	Food and Agriculture Organization of the United Nations
FCC	Freetown City Council
G-20	The Group of Twenty Finance Ministers and Central Bank Governors
GHG	Greenhouse Gas
HLPE	High Level Panel of Experts on Food Security and Nutrition
IASC	UN Inter-Agency Standing Committee
ICLEI	Local Governments for Sustainability
IDPs	Internally Displaced Peoples
IFAD	UN International Fund for Agricultural Development
LAB	ICLEI's Local Action for Biodiversity
LAC	Latin America and the Caribbean
MAFFS	Sierra Leone Ministry of Agriculture, Forestry and Food Security
MLCPE	Sierra Leone Ministry of Land, Country Planning and Environment
NCD	Non-communicable Diseases
NFE	New Food Equation
NR	Natural Resources
ODA	Overseas Development Assistance
OECD	Organisation for Economic Co-operation and Development
PNTD	Participatory and Negotiated Territorial Development
Rio+20	UN Conference on Sustainable Development
RUAF	Resource Centres on Urban Agriculture & Food Security
SARD	Sustainable Agriculture and Rural Development (from Agenda 21)
Sarnissa	Sustainable Aquaculture Research Networks in Sub-Saharan Africa
TC	Technical Cooperation
UN	United Nations
UN-Habitat	United Nations Human Settlements Programme
UNICEF	UN Children's Fund
UPA	Urban and Peri-Urban Agriculture
UPA&F	Urban and Peri-Urban Agriculture and Forestry
UPA&L	Urban and Peri-Urban Agriculture and Livestock
WARDC	Western Area Rural District Council
WFP	World Food Programme
WHO	World Health Organization

Introduction

The feeding of humanity, the majority of which now lives in cities worldwide, involves a complex system of ecological, social and economic relationships. The world community has acknowledged that the human right to food must be progressively realized despite the enormous challenges and inequities that exist in the food systems of both rich and poor countries. The diverse array of present "food systems" is changing rapidly on a global scale and will be transformed even more rapidly as a result of powerful forces. This transformation has become a major issue for debate amongst traditional and non-traditional actors and institutions engaged in agriculture. This includes United Nations (UN) agencies, national governments, research institutions, mayors, planners, producers, private sector, social movements and civil society organizations in high, medium and low-income countries. All parties to the debate are increasingly concerned with the impacts of food price volatility and climate change on food systems. Amidst calls for "sustainable intensification" of production[1], or producing more food with fewer non-renewable inputs and less arable land relative to growing populations, a new paradigm is emerging for ecosystem-based, territorial food system planning. This new paradigm seeks to build diverse supplies of food geographically close to population centers, not to constrain the global food supply chains that contribute to food security for many countries, but to improve the local management of food systems that are both local and global.

> *"Building resilient food systems for the future through integrating rural and urban areas and strengthening their linkages will benefit both small farmers and the urban poor"*
> *-- Alexander Müller (FAO ADG-NR Dept)*

Urban, peri-urban and rural food systems are increasingly important to the food and nutrition security of cities, as rural farm communities will continue to supply much of the food for most urban populations. The real capacity of city and nearby rural areas for food self-reliance should be taken into account however, including the land and water resources, production practices, transport, access, consumption patterns and political feasibility. A more localized food system approach can and should be promoted in connection to national and international food systems. Interactions of local and global food supplies should be governed in ways that promote trade and local procurement to improve the conditions for small and limited resource farmers in all regions.

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[1]   FAO. 2011. Save and Grow: A Policymaker's guide to the sustainable intensification of small crop production. (Also available online *at http://www.fao.org/ag/save-and-grow/index_en.html*)

This paper examines the interaction of urban and rural food systems, not as separate systems, but as two complementary sides of the food system everywhere that are a *continuum*[2] between urban and rural landscapes and actors. While this study emphasizes the "continuum" between rural and urban, it is recognized that there are significant conflicts and competition for resources such as land and water, as well as significant differences between food systems found in urban, peri-urban and rural areas. Nonetheless, this paper stresses the potential for complementarities and synergies resulting from dialogue, planning, and action led by actors across the urban rural continuum. At local levels, dialogue should begin with a multi-stakeholder assessment of key problems and issues, identification of possible strategies for solutions and actions, clear demarcation of actors and their implementation roles, harnessing of resources and institutional capacities and including monitoring and evaluation throughout the process. This paper provides an overview of why and what should be considered in developing such a process in towns and cities linked to rural areas.

Among global agricultural institutions, the UN Food and Agriculture Organization (FAO) has a long-standing role in the fight against hunger, malnutrition and poverty, and in promotion of sustainable food and nutrition security for all. With the support of its member states and in collaboration with other intergovernmental organizations, FAO has developed its extensive technical and policy resources primarily to address the *rural* side of agricultural production with a focus on farmers, including small farmers, in the developing world. This paper addresses corollary complex issues of food and nutrition security in the context of a rapidly urbanizing world where low income countries already face the most severe pressures from soaring and volatile prices and climate change. To date, global agriculture institutions have not been able to adequately approach the urbanization challenges for agriculture and food system transformation in a holistic manner. Can actors at global and local levels join together and take on both rural and urban dimensions of an *integrated* food system for food and nutrition security?

"Increasing population growth and urbanization rates, especially in developing countries, call for enhanced partnerships and innovative approaches to support food systems resilient and adapted to the evolving demographic trends – in other words, there will be a need to support systems which will allow production of more food with less producers.

> *The Food and Agriculture Organization of the United Nations will help its Members and their partners to make strategic use of its capacities in order to address the challenges of feeding the cities and feeding the nations, working both in rural and urban settings."*
> Laurent Thomas (FAO ADG-TC Dept.)

The FAO *Food for the Cities* multi-disciplinary initiative [3] has developed this paper and commissioned complementary technical reports at a time when the complex

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2   The term "continuum" has been used to address the need to link emergency humanitarian response to long term development in a "continuum of care". Here the word is employed in the characterization of relationships between urban and rural landscapes that are often divided, in conflict and separated by cultural and political realities.
3   For more information about "Food for the Cities" see: www.fao.org/fcit

changes in food and agriculture systems demand a fresh look at the interplay of rural and urban elements and dimensions of food and nutrition security. The principal purposes of this paper are to:

1. Bring together multiple elements for **a common understanding** of both local and global challenges to address food, agriculture and management of natural resources for health, nutrition and access to food in a context of rapidly growing cities.
2. Identify priorities for implementation of **improved rural to urban linkages** and partnerships to provide for sustainable food and nutrition security across the rural, peri-urban and urban landscape.
3. Facilitate and support **coordinated contributions** at technical and policy levels to existing and new partners, including partnerships of administrators in national and local government agencies, civil society including community based organizations, and private sector stakeholders.

Leading indicators for food and nutrition security in light of rapid growth of medium-sized and mega-cities are daunting and have been documented widely. Chief among the trends that worry national governments, agricultural ministers, mayors and planners are the burdens placed on the carrying capacity and public service agencies from repeated disasters and emergencies bringing new millions of rural people into cities, including migrations in low income countries. Equally troubling is the persistent global hunger and the resulting overwhelming pressure that is placed on available land and natural resources to feed rural and urban populations. Add to these two issues the mounting impact of climate change on the food systems such as the increased frequency and duration of droughts, floods and other natural disasters. Causing even deeper concern is the fact that uncontrolled price volatility has exacerbated all of these challenges, making countries that are dependent on global food imports also at increased risk for food insecurity and civil unrest. This risk is exacerbated by soaring basic living costs, as it was for several countries following the food price rise and riots in 2007 and 2008 and also in 2011.

The result of these trends is rising and greater vulnerability for poor urban and rural households, with reduced capacity to cope with acute or chronic crisis. Climate change will especially impact and magnify the effects of urbanization on food availability (including lower production and vulnerability due to extreme events, change in the availability of land and water, crop varieties, animal breeds), food access (including loss of livelihood assets, infrastructure, income, employment) food utilization (including food safety hazards associated with pests, animal and human disease) and its stability (including food price fluctuation and dependency on imports and food aid). There is therefore an urgent need to both adapt to, and to mitigate against, the effects of climate change.

The transformation of agriculture in response to these pressures is already occurring in both spatial and sectoral dimensions. At the landscape or spatial level, farming systems are shifting and part of this shift stems from increased recognition of the importance of food production and distribution in urban, peri-urban as well as rural areas. Cities are dynamic agents of growth and production, and the impacts of urban purchasing power and market demand have profound positive or negative results in neighboring and distant rural communities. At the sectoral level, new sectors are engaging in food systems change and development, including local and sub-national governments previously less engaged in managing food and nutrition security and agriculture development. Civil society organizations, the private sector and various social movements are partnering with local governments in order to pursue innovative strategies, sometimes with the direct support of national governments and international and intergovernmental organizations.

Mexico capital city: Law on Food Security and Nutrition for the Federal District

The Law on Food Security and Nutrition, approved on the 17th of August 2010 by the Legislative Assembly of the Federal District, is a milestone for the protection of the right to food. This Act means a crucial step for the protection and realization of the right to food for all persons living in food poverty. According to the numbers of INEGI (National Institute of Statistics and Geography), almost half a million people in Mexico City are still food insecure. By approving this new Law, the Mexican capital has made a huge step forward in decentralizing at district level the protection of the right to food. Beside other components, the new Law establishes the Food Security and Nutrition System of the Federal District and reaffirms the role of the Social Development Council, which foresees the participation of society in the planning, design, decision making, programming, execution and evaluation of policies and actions, introduced to realize the right to food in a progressive and sustainable way. Furthermore, the Law creates an Integral Food Security Programme as planning instrument to define priorities, budget allocations, monitoring proceedings and mechanisms to promote the right to food. In addition to the institutional dimension and the human rights principles included in the Law, it is worth mentioning that the Law establishes a system through which people's access to policies, programs and actions undertaken by the Federal Government is facilitated. This is an essential element for the citizens to participate in decision-making process and to hold the competent authorities responsible for their actions and omissions.

The text of the Food Security and Nutrition Law available at:
http://www.rlc.fao.org/frente/pdf/leysandf.pdf   Source: http://www.fao.org/righttofood/news33_en.htm

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This is particularly important in light of the fact that people all around the world should perceive their food and nutrition security as a human right that can be claimed, defended and protected. As defined by the UN Committee on Economic, Social and Cultural Rights, "The right to adequate food is realized when every man, woman and child, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement."[4] In addition to the technical challenges to promote food and nutrition security in cities described here, a rights-based approach focuses on participation, accountability, non-discrimination, transparency, human dignity and empowerment is required in the framework of elaboration of any food system approach. "In the fight against hunger, legal frameworks and national strategies are as vital as technical tools, and participatory institutions or processes as important as investments, if we assess success in the long term. Grounding national efforts in the right to food brings a very different meaning to food security policies and efforts".[5]

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[4]   UN Committee on Economic, Social and Cultural Rights. 1999. General Comment 12, Article 11 and Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security, Adopted by the 127th Session of the FAO Council November 2004 (FAO, 2005)

[5]   De Schutter, Olivier. 2010. Countries tackling hunger with a right to food approach. Briefing Note 01. UN Special Rapporteur on the Right to Food. UN Human Rights Council
(http://www2.ohchr.org/english/issues/food/docs/Briefing_Note_01_May_2010_EN.pdf)

As capacity and financial resources permit, local authorities including city and territorial governments are increasingly becoming engaged on many fronts to help achieve food and nutrition security from the local level. This paper seeks to bring all of these elements together in a holistic framework for support of multi-level, multi-sector and multi-stakeholder food system approaches to rural-urban linkages in relation to food and nutrition security. In the first part, this paper will assess the components peculiar to food production, management of natural resources and other social, economic and health factors when urban and rural are understood as a continuum. In a second part, it will propose a holistic approach to address four integrated dimensions of food systems challenges. The paper draws upon various examples of the increased local management of food and agriculture systems in towns, cities and their territories as well as in direct city-to-city decentralized cooperation.

The recommendations concluding the paper emphasize some potential priorities and actions for partners working together at all levels to improve the food systems for feeding cities. Among recommended actions for implementation are:

- territorial planning for resilient food systems;
- increased engagement with local authorities and communities;
- mainstreaming of urban, peri-urban and rural linkages;
- improving coordination of technical services for implementation, monitoring, mapping and evaluation;
- policy support for effective implementation from the international to local level, including support for city-to-city decentralized cooperation; and
- enabling new institutional approaches to multi-level food system governance.

This paper touches on many issues that deserve fuller treatment. In the future, as already mentioned, there will be added technical papers developed with and for stakeholders at different levels. These are the actors, both in government, private sector and civil society at the most local levels who are directly engaged in the dynamic and often complex challenges that require better linking of rural and urban interests. Even with different perspectives and capacities, all people share an interest in a sustainable and resilient food supply for all towns, cities, and rural areas.

1. <u>Assessing the food system linking growing cities and their urban and rural landscapes</u>

The characterization of food system components and their dynamics, taking into account both rural and urban landscapes, are the subject of this first section. The section is divided into six parts providing an overview of the concentrating food needs of cities, the ecosystems surrounding cities and changing rural-urban landscapes, and the food and agriculture components of the urban rural continuum in terms of natural resource management and important social, economic and health factors. This general assessment lays a foundation for dimensions of engagement addressed in section two by local and national authorities, civil society and the private sector. Such a framework is needed as the pressures on feeding cities rise in the future, including management challenges of acute and chronic emergencies, economic downturns and climate change impacts.

1.1. Concentrating food needs in growing cities

From the 1950s to the present, the world has witnessed unprecedented urban growth. "Cities grew largely beyond our control, inefficiently and problematically," states Jeb Brugmann, founding secretary-general of Local Governments for Sustainability (ICLEI)[6], "Their underestimated and mismanaged growth seeded many of the problems that we wrestle with today: climate change, transnational crime, political instability, terrorism, epidemic disease, supply chain breakdowns, congestion, and riots." Immediate and short term challenges of economic crisis or collapse, political instability, severe weather events and civil unrest are exacerbated by long term challenges of climate change and the displacement of migrating peoples. All these challenges have consequences for the feeding of urban dwellers. Because urbanization has dramatically affected not only the food system itself but also the responses of the local, national and international community to new challenges and opportunities, new approaches are needed to address the future of food and nutrition security for people living in cities.

Furthermore, most of the population growth expected in urban areas will be concentrated in the cities and towns of the less developed regions. Asia, in particular, is projected to see its urban population increase by 1.7 billion, Africa by 0.8 billion, and Latin America and the Caribbean by 0.2 billion. Population growth is therefore becoming largely an urban phenomenon concentrated in the developing world (David Satterthwaite, 2007). There is significant diversity in the urbanization levels reached by different regions. The transformative power of urbanization was felt earlier in today's more developed regions and they have reached high levels of urbanization. Thus, 75 percent of the inhabitants of the more developed regions lived in urban areas in 2009, whereas just 45 percent of those in the less developed regions did so. Urbanization is expected to continue rising in both the more developed and the less developed regions so that, by 2050, urban dwellers will likely account for 86 percent of the population in the more developed regions and for 66 percent of that in the less

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[6] Brugmann, Jeb. 2009. Welcome to the Urban Revolution-How Cities Are Changing the World. Bloomsbury Press, New York.

developed regions. Overall, the world population is expected to be 69 percent urban in 2050.[7]
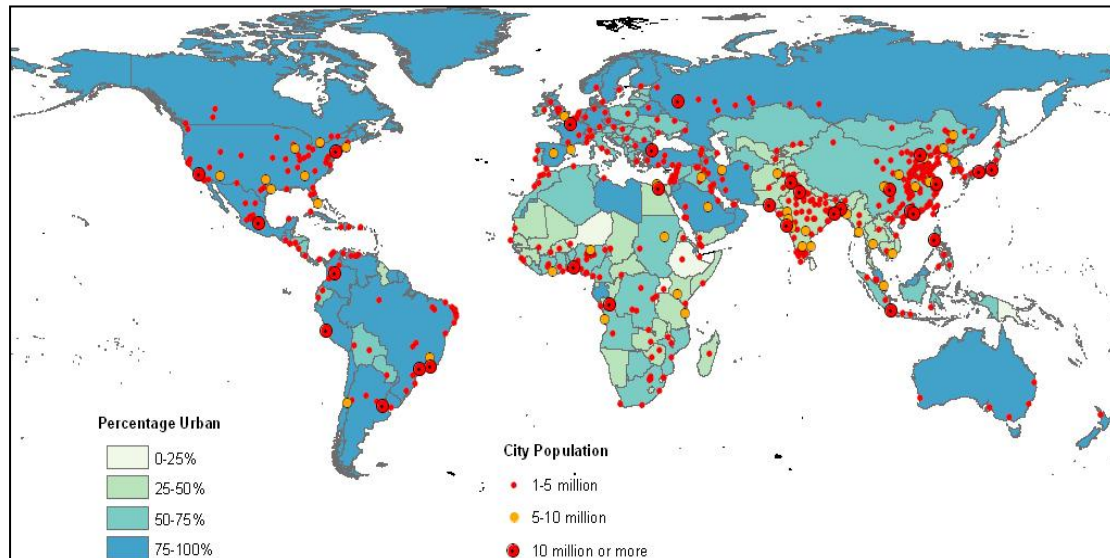
Urban agglomerations in 2025, source: http://esa.un.org/unpd/wup/maps_1_2025.htm / UN Department of Economic and Social Affairs, Population Division: *World Urbanization Prospects, the 2009 Revision*

The negative impacts of urbanization on food and nutrition security without mitigation or deliberate planning for both urban and rural food and agriculture systems include:

- increased competition between urban land uses and agriculture land on the urban and peri-urban perimeter;
- increased food supplies required, leading to greater traffic congestion and pollution, and to stress being placed on overloaded food distribution systems;
- changing food consumption habits, with increased demand for convenience and processed foods, increasing food quality and public health concerns; and
- distance of low-income families from markets increasing, meaning additional costs in time and transport to access food. [8]

According to the UN Population Fund "the fastest urbanizing region is Africa with a current urban growth rate of 3.2 percent per annum. Africa, although least urbanized today, will be home to 1.2 billion urban dwellers by 2050, more than half of the population living in urban areas. More than 60 percent of the increase in the world's urban population over the next three decades will occur in Asia. Latin America and the Caribbean (LAC) is the most urbanized region in the developing world: in 2007, already 78 percent of the LAC population lived in urban areas."[9]

FAO projects that agricultural production must increase substantially in order to meet food demand.[10] The very significant recent and continuing global demographic shift of people from rural to urban locations has many profound implications for the future of food and nutrition security for people in both cities and the countryside, as well as for the structure of agriculture and the food systems. Food systems researchers Kevin

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7   United Nations Department of Economic and Social Affairs/Population Division. World Urbanization Prospects: The 2009 Revision

8   FAO, Aragrande and Argenti (2001).

9   UNFPA, 2007. State of the world population. (http://www.unfpa.org/swp/2007/)

10   FAO. 2011. Save and Grow: A Policymaker's guide to the sustainable intensification of small crop production. (Also available online at http://www.fao.org/ag/save-and-grow/index_en.html)

Morgan and Roberta Sonnino at the University of Cardiff identify a *new food equation* delineated below that has been developing since before the food price crisis of 2007-8.[11]

Morgan and Sonnino suggest that this new food equation is the product of the following five disquieting trends that have emerged in the past decade:
1. higher and more volatile prices – food price surge of 2007-2008;
2. changing consumption patterns from 6 billion to 9 billion may be equivalent to 12 billion in terms of changing demand for meat and dairy products in developing countries;
3. food security now officially a matter of national security;
4. effect of climate change on agro-systems;
5. growing conflicts on natural resources including land, water, forests, etc.

These trends are not confined to developing countries but are occurring in both high and low income countries, in rural areas and cities of all sizes and economic levels. As these researchers have noted, "a third of countries where food price riots occurred were in middle and high income countries. Food security is no longer an issue confined to low-income countries."[12] The economic forces underlying these trends will continue to be debated, but research and development of ways and means to alter or adapt to these trends are underway, including reassessments of the fundamental relationships between towns, cities and their surrounding countryside and of the capacity to buffer the volatility of larger forces.

This was not considered to be an issue in the second half of the last century in the Organisation for Economic Co-operation and Development (OECD) countries because many believed that food industrialization had solved the problem of food and nutrition security in high income countries. "Far from being confined to the countries of the global south, food security is now a major issue for the global north, where cities are most exposed to the new pressures on account of their ecological and political sensitivities."[13] As stated by Tracey-White prior to the food price crisis escalation in 2007 "food supply and distribution systems in most developing countries are undergoing major changes following rapid urban population growth. Expanding urban populations demand increased supplies of food, especially perishable fresh vegetables, eggs and dairy products. As cities and towns grow, in terms of physical size and population, the existing production systems and cropping patterns in the peri-urban areas intensify and the origin of food supplies shifts, with supplies coming from areas further and further afield." [14] What is becoming more apparent since the rise of food prices, is that urban, peri-urban and near rural production is also changing with impacts on access to affordable and nutritious food for the urban poor.

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11   Morgan, K. and Sonnino, R. (2010) The urban foodscape: world cities and the new food equation. Cambridge Journal of Regions, Economy and Society. Oxford University Press, UK. (available online at *www.cjres.oxfordjournals.org*)

12   ibid. p. 2

13   ibid. p. 1 Overview
14   FAO. 2005. Tracey-White, J. Rural-urban marketing linkages – An infrastructure identification and survey guide. FAO Agricultural Services Bulletin 161. Rome.

1.2. Cities within their territories and eco-systems

The mosaic of land uses in and around towns and cities includes both the built and unbuilt or natural environment. As towns grow into small cities and small cities become larger and in every region some larger cities reach the scale of conurbation known as mega-cities (10 million or more inhabitants), the built environment of roads and buildings dominates and often overtakes the unbuilt environment. Urbanization is well recognized to produce heat island effects, worsening climate change. Both the impact of urbanization on climate change and the vulnerability of cities to climate change are shaping urban planning for resilience that brings the greening of cities into new and profound significance.[15]

Even in mega-cities, nature is always present, whether in the form of the margins between roads and buildings, as undeveloped open space, parks and the edges of waterways that course through many cities. In and around cities one finds the flora and fauna in either managed or unmanaged urban forests, gardens, abandoned or undeveloped spaces and buildings (balconies, rooftop gardens). The existence of large open and abandoned spaces occurs in both post-industrial cities in developed countries, such as Detroit in the USA, and in the sprawling conurbations of urban growth in low income countries. In the design and planning of cities, urban planners and architects value and incorporate green spaces for recreational use of urban residents.

Urban and peri-urban food production post conflict in Freetown, Sierra Leone

Due to civil strife in Sierra Leone between 1991 and 2001, nearly 60percent of the population was displaced and migrated from rural to urban areas. Many people fled to the Greater Freetown Area (GFA). In fact, it is estimated that nearly a quarter of the country's population (1 million) now reside in Freetown, increasing the population by 65percent between 1985 and 2004. With the increased number of displaced people moving into GFA, an increased demand for food as well as other urban facilities and services, likewise grew. Sierra Leone is one of the poorest countries in the world, with unemployment in GFA approximately 52 percent. Urban agriculture became an opportunity for displaced people, including the young and women alike. In the situation analysis undertaken in 2007, it was estimated that urban agriculture provides full or part-time employment to over 1,800 people in urban Freetown. Women constitute approximately 80 percent of the urban producers and they also do most of the marketing. Men provide assistance mainly in the preparation of land, such as initial land clearing, building the irrigation channels in the swampy areas. With the collaboration of RUAF a Multi-Stakeholder Policymaking and Action Plan (MPAP) brought together major stakeholders in urban agriculture for joint analysis, decision-making, planning and implementation of projects in Freetown. In 2006, the Freetown Urban and Peri-urban Agriculture Project (FUPAP), bringing together across the various disciplines and organizations, was launched to support the local government in recognizing the benefits of urban agriculture and promoting policies that result in the increased production of urban farmers, such as access to land and security, access to clean water, support in the supply of farm inputs and agricultural extension services.
For more information see RUAF Foundation website:
http://www.ruaf.org/node/1133#mpap

More recently, open space design has incorporated principles of ecosystem planning and biodiversity conservation, including spaces for the growing of food crops, tree crops and small or even large animal agriculture. Many studies have shown non-commercial subsistence or household production can be a significant source of nutrition for people in high and low income countries.[16] This is especially true in times of economic

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15   For more information on how cities growth and climate change are fueling innovations including new city-region governance mechanisms, see: Romero-Lankao, P and Dodman, David. 2011. Cities in transition: transforming urban centers from hotbeds of GHG emissions and vulnerability to seedbeds of sustainability and resilience. Current Opinion in Envrionmental Sustainability. (Available online at *www.sciencedirect.com*)

16   FAO, 2010. Growing Greener Cities - how urban and peri-urban horticulture contributes to food and nutrition security (available online at *www.fao.org/ag/agp/greenercities/en/whyuph/index.html*)

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stress, civil unrest, natural disaster and conflict (see example of Freetown, Sierra Leone below). During and after the Second World War many countries including in Europe and North America relied on gardens and local food capacity for survival. Today food, forest, fish and animal production systems are being brought into urban planning for resilience and adaptation in the face of volatile economic and climate changes in cities in every region.

What city and district administrators will need, far more than state/provincial or national/regional governments, are economic tools to measure and analyze their own urban food security and the dependency on food supply sources. For example, in revitalizing India's agricultural extension system local administrations are being supported to assess their food dependencies - especially in areas where their agricultural produce is exported out of the district to earn higher incomes rather than feeding local populations. Local authorities and their partners need to share experiences and set goals to accomplish action plans in order to improve connectivity across urban and rural landscapes for food and nutrition security, water flows, wildlife biodiversity and other "green spaces". Before discussing the approaches to operationalize an urban rural continuum in section 2, it is important to understand the different elements of the food system within the ecosystem of particular geographic areas.

The *ecosystem* is the biological environment consisting of all the organisms living in a particular area (constituting the area's biodiversity), as well as all the nonliving (abiotic), physical components of the environment with which the organisms interact, such as air, soil, water and sunlight. A *food system* includes 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 and food-related items. It also includes the inputs needed and outputs generated at each of these steps. A food system operates within and is influenced by social, political, economic and environmental contexts. It also requires human resources that provide labor, research and education. A food system is derived from and interacts with the ecosystem in which it is located.

1.3. Changing dimensions of rural-urban landscapes

This and following subsections summarize the components of the urban rural continuum related to the food system. Table 1 on the next page gives an overview of some of these important dimensions that need to be taken into account.

Most urban administrators are understandably concerned with the economic, health and social well-being of their urban citizens, attending to problems of adequate water, food, energy, sanitation, housing, transportation and working conditions under circumstances of unprecedented growth. Local authorities are turning to planners in order to develop disaster risk reduction and management policies covering all sectors that may be potentially vulnerable to economic or environmental disruption. Urban actors and planners have often claimed that the food system is largely a rural issue, thereby positioning it beyond the scope of the urban planning and urban governance agenda. Recently concerns related to sustainable food and nutrition security have brought urban planners' attention to the rural sector within market distance of their towns and cities. Local administrators, under constant pressure to raise and maximize local domestic product, must determine where scarce budgetary resources are allocated. The net savings of small households and self-help groups, engaged in myriad micro-capital investments and transactions in the food economy are often neglected in the financial management and investment planning of local administrations.

Changes in the planning profession are profoundly affecting the way in which food and agriculture are perceived. The expansion of urban interest in rural food systems in turn brings political, institutional and cultural challenges for both urban and nearby rural authorities and their respective populations. The overall sustainable development framework for cities has begun to include a larger territory in which cities are located that can be defined as a *foodshed*[17]. The foodshed for a town or city begins with the territory or catchment's area of the main rural productions serving local markets. Like a community's water supply from a watershed, the food supply can be partly or largely derived from a foodshed. New conceptual framing for urban sustainable development by UN Habitat, ICLEI and others call for a new "green mosaic" connecting rural to urban areas through open spaces for recreation, biodiversity (including urban forests and horticulture) that provide many economic, social and environmental co-benefits.[18]

The origin of agriculture itself is inextricably linked to the growth of cities, as permanent human settlement was associated with a permanent nearby agriculture. The "divide between urban and rural is artificial and counter-productive, and it is increasingly recognized that the two sectors are intimately connected in a larger system," notes food systems researcher and policy analyst Arthur Getz Escudero.[19] Getz suggests that "fundamental challenges of stemming biodiversity loss, improving land use, adapting to climate change and increasing food security are mutually-

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17   There are several terms for catchments area for cities' food production regions (excluding what must be grown in different agro-ecological regions), such as "foodshed", "territory", and "city-region", among others.

18   UN Habitat, Tufts, R,; Kehew, R.p Rudd, A; Petrella, L. 2011. *Urban Patterns for Sustianable Development*: *Towards a Green Economy. (available at*: http://www.unhabitat.org/downloads/docs/9539_39812_3077_alt.pdf

19   ICLEI World Congress on Cities and Adaptation to Climate Change workshop on Resilient Food Systems for Resilient Cities, June 2011, Bonn (proceedings forthcoming and will be available at : http://resilient-cities.iclei.org/bonn2011/)

reinforcing, and a holistic approach to their management can establish 'bundled' solutions – generating results important to each and all of these challenges". Urban, peri-urban and rural food production is a continuum that can be both *spatial* and *sectoral*. It is *spatial* in geographic terms, and it is *sectoral* in terms of interest, stakeholders and economic groups. Other dimensions of the continuum will become apparent through the course of this discussion. As a more integrated urban-rural framework continues to emerge, the institutional models and policy support for urban and territorial or landscape approaches to food system planning will also be a subject of exploration with case studies from different parts of the world. But first, it is important to summarize the key aspects and unique characteristics of urban food ecosystems within the context of the rural urban continuum.

Table 1: Components of food systems across the urban rural continuum

Domain	*Dimension*	*Core issues*
Food and agriculture	Agrobiodiversity	Cities can provide nutrient dense perishable foods and support rural production of other staple foods, integrating local, regional and global supply
	Livestock and aquaculture	Livestock and aquaculture provide important protein sources in urban-rural landscapes, especially in small scale livestock raising and fresh/salt water fish farming
	Food markets	Markets (formal and informal) are the primary spaces where rural production meets urban consumption (formal and informal markets) / sources of food, employment, and income
	Food loss and Waste	Post harvest food loss and post consumer food waste is a key strategy for urban food security and should be a top priority for urban managers
Natural resources management	Soil and Water	Soil resources in urban and peri-urban areas can be compromised in different ways than in rural areas. Water conservation and reuse for food production can serve both urban and rural production / competition for water uses is a concern for UPA
	Land tenure	Tenure in urban, peri-urban and rural areas for food production, handling and markets for cities must be addressed with new policy and support, combining local and national strategies
	Energy	Energy from and for agriculture can be a source of important supplemental energy for production and consumption
	Forest and trees	Urban forests are important for fibre, biodiversity and food crops, especially when integrated in urban-rural corridors and parklands (greener cities)
Socio-economic and health factors	Hunger and malnutrition	Hunger and malnutrition in rural and urban areas is expressed differently and demands both linked and targeted approaches to buffer price volatility and the risk of disaster
	Shifting diets and health	Access to perishable fruits and vegetables is a critical intervention for healthy diets and cities can provide incentives for producers in and near cities to provide healthy food for both urban and rural people
	Food safety and street foods	Food and water contamination in urban areas requires application of sanitary standards and practices that help support local producers (urban and rural) and protect the health of consumers.
	Migration and labour	Rural-Urban linkages and impacts on food system are one of the most urgent pressures on public services, including food supply for cities. Holistic approaches linking rural to urban and urban to rural migrations with a focus on women and youth can help to rebuild healthy and vigorous food systems in and around cities.

1.4. Food and agriculture across the urban rural continuum

The food and agriculture sector in urban and peri-urban areas includes the same activities as are found in rural areas; food and fibre production or agrobiodiversity, forests and agroforestry, small livestock, aquaculture and food processing and markets of all kinds, both from the formal and informal sectors, where urban and rural sectors meet in the exchange of goods and services.

Agrobiodiversity: Across urban and rural landscapes the sustainable production of food and fibre for human needs is intimately related to and dependent on the availability and quality of the soil, water and the biological diversity of the environment. Recent work on nutrition indicators for biodiversity highlights the higher food nutrient content of traditional cultivars from diverse ecosystems as well as non-cultivated gathered foods in many local diets around the world.[20] This is especially important for cities and towns surrounded by vibrant territorial ecosystems that are a mix of cultivated and gathered sources of food (wildlife flora and fauna). Small farmers and subsistence level households are often where the knowledge is retained of traditional cultivars and wild species. Furthermore, these smallholders are a primary feedstock for migrations from rural farming families into urban and peri-urban areas. The *knowledge continuum* from rural to urban areas in terms of nutrient rich sources of traditional food sources is thus important. Many of these products surface in informal and smaller markets, rather than the larger wholesale and retail markets. The interlinkages of agrobiodiversity and biodiversity are one area that deserves more attention by planners and promoters of local food systems.

Livestock and aquaculture: In and near towns and cities, the growing of food, fibre, meat and fish products not only for household use but for sale in informal and formal markets, contributes to urban food and nutrition security and provides means for livelihoods. Livestock demand in cities is rising, particularly in medium income countries as it is associated with a "developed country" way of life. Livestock activities are found particularly in fast growing cities due to the rise of demand for meat, milk, eggs and other animal protein at household level, which as incomes rise across emerging economies, translates into a global rise of demand. With the decline of fisheries in many parts of the world, fish farming is becoming a major source of protein and micro-nutrients, especially in cultures that rely on fish consumption, and its sustainable practice should be considered in strategies for local food security. Aquaculture is receiving a lot of interest as reported in "*Production in Aquatic Peri-urban Systems in Southeast Asia*"[21] and the Sustainable Aquaculture Research Networks in Sub-Saharan Africa[22], the latter recommending that "focus should be on support on farms located in peri-urban areas in order to reduce logistical problems and lower the costs of input supply and marketing".

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20   FAO. 2010. Expert Consultations on Nutrition Indicators for Biodiversity. Rome.

21   http://www.papussa.aqua.stir.ac.uk/phdstudies.html

22   SARNISSA Aquaculture Policy Brief 2 Building Blocks: Specific development perspectives and support needs of three main aquaculture production systems. (Available at http://www.sarnissa.org)

Food markets: The market systems that link urban and rural areas are complex, including organized wholesale distribution and terminal markets, retail markets and informal street markets and vendors of all types. Marketing systems have been changing rapidly, with the rise of vertically integrated supermarkets chains that have moved from North America and Europe into low and medium income countries in recent decades. Formal marketing systems

> **Linking rural cattle producers and urban consumers in Nairobi, Kenya**
>
> The demand for affordable, nutritious and safe animal products is very high in Nairobi. A large proportion of the rural poor in the region are partially or totally dependent on livestock. A host of environmental, economic and social concerns such as animal waste pollution of land and water sources, poor livestock transport and urban livestock-holding infrastructure and the impact of imported large-scale production models that often squeeze smallholders and pastoralists out of local markets led to a locally led project supported by FAO, Heifer Kenya, Heifer International and International Partners for Sustainable Agriculture (IPSA). In 2006, a multistakeholder group of pastoralists, indigenous leaders, slaughterhouse businesses, local and national NGOs and local authorities established the Sustainable Agriculture and Rural Development (SARD) Kenya Livestock Working Group (KLWG). The goal of the project was "supporting and improving the market chains that link poor producers and poor urban consumers so that rural products (meat, milk, cereals, etc.) become more affordable to poor urban consumers." Identified obstacles included severe drought and climate change, lack of enterprise facilitation in rural settings for producers/pastoralists and lack of ease of connecting rural non-farm business with the urban market. The SARD KLWG Livestock Value Chain Field School has trained over 300 pastoralists in pasture management and water harvesting, improved livestock genetics, agro-processing, transport and marketing. The livestock marketing and slaughter business has increased from 30 cattle per day in 2005 to 150 cattle per day today. This has increased the sale price by over 30percent with benefits going to thousands of poor Maasai households rather than middlemen who often took advantage of herders desperate to sell their animals after traveling many miles with their cattle to holding areas near Nairobi. A biogas initiative has been very successful and generates electricity to operate a meat cold room to preserve meat and contribute to food safety for consumers and enhanced livelihoods of producers.
>
> Reference: http://www.fao.org/sard/en/init/2037/2447/2446/index.html

include the aggregation and distribution of products through wholesale and retail markets. Fresh examination of formal marketing systems in light of economic and climate risk, including models for markets that are most resilient, is underway at both national and local government levels in both low and high income countries. Recent studies show the importance of informal markets to the resilience agenda of cities, as street food vendors are often associated with livelihoods of the urban poor. Advantages of informal markets for nutrient dense diets and as buffers to shocks in the formal market system of cities are important to take into disaster risk reduction planning. The informal sector also offers significant economic activities for many urban immigrants to cities from rural areas, engaging all dimensions of the food system. However the legal and economic status of informal markets can be very precarious in urban, peri-urban and rural areas (see more on street foods below).[23]

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23 FAO, 2007. Promises and challenges of the informal food sector in developing countries. Rome

Food loss and waste: Current global food loss estimates are 30 percent from post harvest losses to post consumer waste, making recovery of this loss and waste the first and one of the most important food security strategies for every region.[24] Recovery of food losses for increased food security coupled with biomass recovery for energy production and waste conversion to farm inputs should be an integrated strategy, for which cities and towns can be a proving ground. Such strategies can reduce costs for consumers, provide more profit for producers, and increase efficiencies for transport, processing, wholesaling and retailing of food. Improvements of efficient food chain infrastructure, including the cold chain and storage for perishable products are essential for local food system management. Improved infrastructure, increased efficiency and conversion of biomass to energy, coupled with post-consumer waste conversion to nutrients, can effectively help decouple food production systems from current levels of reliance upon fossil fuels.

1.5. Natural resource management across the urban rural continuum

Urban to rural and rural to urban linkages for food and nutrition security, environmental resilience and economic vitality, requires urban and rural food landscapes to be understood more holistically, but also much more concretely in terms of management of natural resources. Natural resources essential to food and fibre production include soil and water conservation practices, but also extend to the energy inputs, wastes generated, and the potential for cycling and closing of loops in the flows of energy and nutrients across the rural urban continuum. The design, investment and management of these resources in sustainable ways often hinges on the security of access and land tenure systems that give local people the capacity and incentives to manage resources for the long term.

Water Harvesting, multi-stakeholder project – Nepal

Nepal, particularly in Kathmandu, is faced with limited and irregular access to water resources. In the mountainous terrain and scattered living areas using traditional piped water supply is not always feasible. This lack of access for water affects women and girls most directly since they are responsible for fetching water for the family. Several non-governmental organizations have been working in Nepal to combat the problems of water supply. Several government agencies, NGOs, and non-profit organisations have been working together to launch the Rainwater Harvesting Promotion Programme (RWHPP). This has been primarily focused on drinking water and less integrated into irrigation and biogas production as this time. Although harvesting storage capacity of rainwater seems insignificant, when done efficiently, 10 cubic metres can supply a family with drinking water, or small domestic use, for up to a year. Through a massive promotional campaign, demonstration sites have been established; policy advocacy from the RWHPP has lobbied to make RWH mandatory in building by-laws; and through workshops, plumbers, civil engineers, and architects are being trained on RWH.

For more information on water for Asian cities, see:
http://www.unwac.org/new_unwac/pdf/countrywise/Nepal/rh_broc.pdf

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Soil and water: It is impossible to separate the food system from the issues of soil conservation and water use and resources in cities and surrounding territories. Healthy soil is often at a premium in urban, peri-urban and near rural areas. Soil may be compromised by environmental impacts of contamination from dense settlement or industry and may require remediation. Expanding city populations require increased and concentrated water supplies for domestic and commercial activities. A demand for more food translates into more water needed for food production, including urban and peri-urban agriculture, but also for expanding marketplaces, agro-industry and food processing operations.

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24   FAO. 2011. Global Food Losses and Food Waste: Extent, Causes and Prevention. Rome

These increasing and competing demands add to the pressures on urban water supplies and may bring shortages in and around many cities.

Rainwater use and reuse: Ciudad Sandino, sector of Metropolitan area of Managua, Nicaragua

Due to climatic conditions, government regulations and contamination, water for agricultural uses is very limited in Nicaragua. FAO in collaboration with the Spanish Agency for International Cooperation implemented a project funded by Spain in Nicaragua's metropolitan area. The overarching objective of the project was to harvest and storage rain-water for UPA production in metropolitan areas. Using demonstration and training centres, the families were exposed to simple but innovative water harvesting, storage, and irrigation techniques. Growers also learned how to re-use waste water, manage excess water during the rainy seasons and how to monitor water quality for agricultural use. Following the success of the project, Local Water Committees have emerged incorporating municipal health and environmental units, UPA teams, FAO and other actors from the community.

Source:
http://www.fao.org/nr/water/projects_nicaragua.html

On the supply side wastewater reuse and rainwater harvesting in cities hold great potential. On the consumer demand side, water conservation measures will become more important. Sustainable alternatives can provide a year-round supply of water for urban and peri-urban horticulture and, at the same time, minimize competition for domestic and industrial water. The key is to adapt horticultural and aquaculture production to the use of more marginal quality water with affordable technologies, such as treated urban wastewater, in order to minimize health risks for producers and consumers. Urban horticulture can also make good use of rain water harvested from roofs since it is less polluted than other sources of water in urban areas, and – by reducing growers' dependence on the municipal water supply – reduces competition for drinking water, and can help mitigate urban flooding and soil erosion.

Land tenure: The characterization of the environmental, social and economic characteristics of city-region food systems must include the complex and often contentious area of land access and tenure. Land tenure is a very significant problem in the rural sector where it has been the object of long term research and policy analysis, including the recent development of the Voluntary Guidelines of Tenure of Land, Forestry and Fisheries.[25] Land use zoning and local

Availability and access to land for UPA in comunas of Santiago de Chile

Following the World Urban Forum V, the Urban Agriculture Group from FAO/RLC in collaboration with UQAM completed a study regarding availability and access to land by local growers for UPA in Santiago de Chile. Since UPA has not gained recognition or definition until recently within the urban evolutionary process, it forced its actors into a «no man's land» leading them to often act illegally and face possible harassment from authorities by using public land for agricultural purposes. Consequently, access to public-urban land has been central to the debate surrounding urban agriculture and is considered one of the most significant challenges in Chile´s UPA efforts to date. The research program studied land availability and use in four urban comunas of Santiago de Chile. Results provided a snapshot of the situation of UA in the Chilean capital and provided data that will aid both, producers and urban planners in the development of UPA programs in Santiago. A comprehensive manuscript from this study is in preparation; the conclusions are illuminating: Urban agriculture does not exist «per se» in Santiago de Chile. In fact, there is no recognized agricultural land use within city limits and the usage of public spaces to grow food is generally unregulated. Nevertheless, the research identified 25 active urban agriculture projects in only 4 of 37 comunas surveyed, thus implying that urban farmers have indeed been successful in circumventing the system in absence of regulations. The findings indicate the need for non-governmental mechanisms to access and cultivate public-green-areas, creation of municipal land banks, mechanisms to benefit targeted groups such as women, immigrants, seniors, and specific socio-economic classes, the promotion of urban agricultural production, UPA organizations and individuals networks, and the presence of organized groups to pressure municipal and regional authorities to support urban farmers in their quest to access public-urban-land for agricultural production.

For more information see FAO RLC:
http://www.rlc.fao.org/en/prioridades/aup/ and Université du Québec à Montréal (UQAM) study (Granados & Leclerc, 2011)

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25   Land tenure – Voluntary Guidelines website: http://www.fao.org/nr/tenure/voluntary-guidelines/en

planning and policy incentives are within the jurisdiction of most local governments. Secure access and tenure for long term local citizen management of urban and peri-urban ecosystems is an urgent priority for local authorities to provide in both high and low income country city-regions and lessons can be learned from innovative regulatory and legal frameworks put in place by different cities. Urban and peri-urban municipal and rural territorial zoning needs to adapt existing regulations to the demands of food production and handling needs across the urban rural continuum. More in-depth technical research and comparison of land access and tenure models are needed as part of baseline studies on urban food systems. Land tenure in urban and peri-urban areas is critical to establish and build infrastructure upon which a food system relies: wholesale markets, informal markets, transportation and storage infrastructure, etc.

Urban forests: The trees planted in urban areas and peri-urban landscapes are important not only for providing aesthetic green spaces and leisure, but also they can play a critical role in feeding people (agro-forestry products) and providing fodder for animals. In addition to food sources, forests provide important sources of wood energy, particularly useful and needed for cooking. Green landscapes help feed cities through nutrition sources, cooling the environment, offsetting green house gas (GHG) emissions, and also supplying local markets for non-food forest products. Meanwhile, good peri-urban forestry practices can contribute to sound watershed management, safeguarding water catchment and reducing runoff, erosion, and flooding in cities - ever more important as climate change increases the frequency of extreme weather events. Biodiversity and conservation planning is increasingly looking at the *connectivity* of garden, forest and wild margins through mosaics, corridors and watersheds just as much as in rural areas.

Energy from and for food production: In terms of energy for most industrial agriculture systems, there is a net energy loss compared to agroecological production models. A challenge for all agriculture is to develop and push technologies that transition energy from fossil fuel-based inputs to more renewable energy sources based on biological cycles such as photosynthesis. Cities and towns can be engines for the decoupling of agriculture from fossil fuels as part of *"greening the economy with agriculture,"*[26] reintegrating concentrations of biomass in the form of organic waste into the nutrient cycle. Agriculture in and near cities can be a digester of this waste in the form of municipal compost production. Nitrogen cycles can be adequate for many crops by incorporating closer links between rural production and urban consumption.

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26   Greening the Economy with Agriculture (GEA) is the framework for a joint OECD - FAO contribution to the UN Conference on Sustainable Development (UNCSD) or RIo+20 in 2012. For an overview see http://www.fao.org/rio20/special-features/green-economy/en/

1.6. Social, economic and health factors

Among the most challenging socio-economic and health factors related to the food system for local authorities are hunger, malnutrition, shifting diets and health, food safety, efforts to create more sustainable diets and address human migration and labor challenges from rural to urban areas.

Hunger and malnutrition: There has been international attention to the rise of urban hunger and malnutrition, especially in developing countries, resulting from the food price crisis in 2007-8, and also beginning of 2011. The urban hungry added hundreds of millions of people to global hunger figures -- rising to over 1.2 billion -- before dropping below 1 billion in 2010.[27] It is therefore all the more important to accurately map the urban poor and malnourished. Conflicts which rise from food shortages have led to civil unrest or migrations that can affect neighboring territories or even countries as seen in North Africa in early 2011. Hunger and malnutrition in rural areas push people to urban areas in search of better living conditions. In both rural and urban areas, due to socio-professional heterogeneity, it is critical to map different population groups more accurately to understand the dynamic interaction of urban and rural hunger and malnutrition. When such mapping is done accurately, as in maps of "food deserts"[28], the zones where food availability is critical to reduce hunger and malnutrition can be more adequately targeted by local urban and rural authorities through a variety of policy and programme options.

Shifting diets and health: Issues of urban food, nutrition and livelihood security have received much attention in recent years, both in developed and developing

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27   Official figure in 2010: 925 million (1.02 billion in 2009) http://www.fao.org/hunger/en/

         see also http://www.fao.org/news/story/en/item/45210/icode/

28   For example see the USDA Food Desert Locator found at www.ers.usda.gov/data/fooddesert/fooddesert.html

countries. According to the 2011 Report of the Secretary-General on Prevention and control of non-communicable diseases[29] (NCD) - type 2 diabetes mellitus, cancer, and obesity - kill more people every year than any other cause of death. The trends to produce monocultures of commodities such as soybeans, maize and palm oil have replaced what was once a diversity of food crops. Both urban and rural consumers are eating more foods processed with ingredients that have lower nutrient density. As the public health services of countries all over the world grapple with the current and future costs of rising obesity and other chronic dietary diseases, new food system interventions are being tested. The shift towards a food system perspective on the part of health professionals has profound implications for many efforts at work to provide healthier foods to urban as well as rural populations with impacts on education, social policies and food production. These are all domains local authorities can address as a matter of the right to food, with technical solutions tested and proven to work in many cities and regions. Urban food policy and planning efforts are increasingly addressing obesity and chronic nutritional disease at a local food system level through consumer education and appropriate food choices and preparation. From cities in India to New York in the USA and in many other parts of the world, policy and programs to require more fresh, whole and minimally processed food are being instituted. This is one of the areas for intervention by local authorities (working with NGOs, national and international agencies) where accurate mapping, data and information are needed to effectively target the most vulnerable and at risk subpopulations in among dense settlement patterns.

Food safety and contamination: Any comprehensive characterization of the continuum of rural to urban food systems must also address potential hazards of growing, processing and vending food and fibre products in and near to towns and cities. Hazards can be biological or chemical and are largely preventable through implementing phytosanitary and food handling standards. Food safety controls and measures should incorporate an ecosystem approach to health, taking into account food production as well as food handling practices in order to mitigate against these hazards. For example, a comprehensive food systems approach to regulation would include infrastructure for cold storage and a continuous electric supply to avoid any break in the cold chain. Such legal and regulatory frameworks need to be designed so as not to discriminate against small scale producers and processors of food products.

Street foods: Urban lifestyles, increasing distances between home and the workplace, women at work, and changes in family cohesion are all factors increasing the demand for processed, ready-to-eat food. This has resulted in a very active food processing industry in the urban sector found in both high and low income countries. Few countries have specific regulations for street foods and vendors handle their businesses according to informal rules dictated by their social environment in polluted sites with poor environmental hygiene. Thus vendors operate in a permanent state of uncertainty and their vulnerability inhibits investment and long-term development of their activity. Many small street food vendors can however make a living for themselves and their families by preparing and selling foods. If the quality of their products can be assured, their activities will provide adequate and inexpensive nourishment for many urban inhabitants.

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[29]   2011 Report of the Secretary-General on Prevention and control of non-communicable diseases -

http://www.un.org/ga/search/view_doc.asp?symbol=A/66/83&referer=/english/&Lang=E

Migration, labour and economic activities: Migratory movements from rural to urban landscapes due to conflicts, environmental events, long term effects of climate change, and other forces generate displacement of people within and between countries, having profound impacts on food systems. Much attention has been paid to the monetary exchanges or remittances from urban to rural (both domestically and internationally). But there are also significant knowledge, asset, skill, labour and other values exchanged, and these values need more study across different city-region contexts. Not only are the rural to urban migrations important, but so too is the urban to rural "back migration" and the "multi-spatial" homes that are both urban and rural within nuclear and extended families. Gender dimensions are very important here as well, particularly as women move across the urban-rural boundary and find their family positions and status change. Rural to urban linkages at the family level are especially important for food and nutrition security in poor families and for women, children and youth[30]. From this perspective the lines between "producers" and "consumers" are not at all absolute, and appropriate policy and programme development for sustainable food and nutrition security in cities with high percentages of formerly rural producers need to accommodate a more complex reality.

Gaza – Women and food system work opportunities

The 2007 Israeli blockade of the Gaza Strip left the Gaza community with a collapsed formal economy largely dependent on international humanitarian assistance. Unemployment is especially high in Gaza, leaving families food insecure. Since the blockade, women have suffered in particular with their role as the household manager and the primary caretaker of the family due to social exclusion and limited professional skills. Palestinian women only represent 15.2percent of the labour market – one of the lowest in the Middle East and the world. However, women represent a large number of unpaid agricultural work, such as, planting and preparing the land, and harvesting. According to the World Bank, over 30percent of informal agricultural work in the WBGS, is performed by women as part of their domestic responsibilities. The FAO works to implement gender equality by improving agricultural opportunities for women to provide food security and income for their families. According to the FAO, women who participate in women's groups or associations improve their access to markets, as well as facilitate knowledge sharing opportunities (maintaining home gardens, food processing, preserving, etc.). Women play a significant role in maintaining the family structure and help create food security. There is a significant opportunity for empowering women in agriculture within specialty crops, livestock and aquaculture.

For more information see FAO. 2011. Palestinian Womens' Associations and Agricultural Value Chains: Case Studies Series #2. Rome. (Also available online at:
http://www.fao.org/docrep/013/al807e/al807e00.pdf)

Taken together, these and other components of the urban and rural food landscape can contribute significantly to greening the economy, a major goal for many cities and national governments for whom resilience has become a matter of urgent concern.

This first section has illustrated some components of food and nutrition security for urban dwellers and the dynamics of urban-rural linkages, as well as some main issues that confront stakeholders and decision-makers.. In the next section, the discussion shifts to a food system approach to address multi-level challenges in food and nutrition security and natural resources management from the perspective of improved urban and rural linkages.

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30   FAO.2011. State of Food and Agriculture. Women in Agriculture: Closing the gender gap for development. Rome

2. __A food system approach to food and nutrition security challenges: linking urban and rural areas for greater resilience__

Following the previous section where the many components of the food system in an urban-rural context are described, this section proposes four interrelated dimensions to address these elements:

1. a people-centred and social development policy dimension;
2. a natural resource management dimension;
3. a multi-level governance dimension; and
4. an urban and territorial planning.

These four dimensions (see table 2 on page 36) can be mutually reinforcing for stronger urban-rural linkages and are not listed in any order of priority. Rather, the experiences of local or national governments, civil society or private sector stakeholders show that any one of these approaches may each be entry points in efforts to address food and nutrition security and biodiversity management challenges. Eventually, all four are necessary to provide for long term resilience and sustainability. City-regions can approach food systems development from any one dimension and engage other dimensions, even to the point where all four are well integrated.

The four dimensions can be encompassed within action plans or operating frameworks for sustainable development related to social, environmental and economic goals which call for new approaches in governance and new planning tools. Moreover, the role of food systems in the context of planning for resilience and sustainability should be a part of *"addressing climate change across all levels of government. Local involvement through "climate-conscious" urban planning and management can help achieve national climate goals and minimize trade-offs between environmental and economic priorities at local levels"*, as stated by OECD in a recent publication within its Green Cities programme.[31]

An integrated approach to these dimensions for urban rural food linkage development can contribute to connecting food systems to climate change planning as much as to improvement of peoples' food and nutrition security.

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31   http://www.oecd.org/document/34/0,3746,en_2649_34413_46573474_1_1_1_1,00.html

2.1. A people-centred and social development policy

"Participation of food-insecure groups in the policies that affect them should become a crucial element of all food security policies - from policy design, to the assessment of results, to decisions on research priorities. Improving the situation of millions of food-insecure peasants indeed cannot be done without them"
-- *Olivier de Schutter, Special Rapporteur on the Right to Food*

A *"people-centred approach"* involving many different actors, necessarily starts with local realities and local actors. Institutions at national and international levels including FAO, which is a UN agency governed by member states, can also support a people-centred approach to urban rural linkages.

The right to food for urban dwellers: The human right to food depends on people's enhanced capacity to provide for themselves, meaning that for the right to food to be fully realized, short-term interventions must be combined with longer-term measures for tackling the structural causes of hunger and malnutrition. A people centered policy is increasingly associated with a rights-based approach that contributes to increased efficiency and sustainability of hunger reduction strategies, policies and programs by putting emphasis on the principles of participation, accountability, non-discrimination, transparency, human dignity, empowerment and the rule of law. The realization of the right to food tackles the social, political and cultural root causes of hunger.

The recommendations of the Right to Food Guidelines with regard to access to resources are particularly relevant and useful. Activities in this area focus on the creation of a favourable environment that enables people to feed themselves by their own means, either by producing or by having access to income and markets to buy food. It provides voice to a wide array of relevant stakeholders and establishes principles that govern decision making and implementation processes, such as participation, non-discrimination, transparency and empowerment. In addition to these principles, the guidelines provide a legal framework, concepts of rights and

obligations, as well as mechanisms for increased accountability and the rule of law. [32] The right to food offers a coherent framework to address critical governance dimensions in the fight against hunger and malnutrition that needs to be developed in an urban-rural context.[33]

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32   FAO, Right to Food: Value Added for Food Security Work and Priorities for Action, Flyer 2009. See: http://www.fao.org/righttofood/download_2009/ValueAddedForSecurityWork.pdf
33   Ibid.

Food and subsidiarity: Food system governance and re-governance must incorporate principle of *subsidiarity* (recognized by nearly all national governments as one of the Rio Principles in the 1992 UN Conference on Environment and Development). As defined by the European Commission, applying the principle of subsidiarity means that "a larger and greater body should not exercise functions which can be carried out efficiently by one smaller and closer to the citizens, but rather the former should support the latter and help to coordinate its activity with the activities of the whole community. In other words, it means the State should take action if and only if the objectives of the proposed action cannot be sufficiently achieved at a more local level by the local authorities or communities – society - and can therefore, by reason of the scale or effect of the proposed action, be better achieved at the State level."[34]

Consumer driven food system change: Consumers and citizens in urban areas are able through their daily purchases, and through policy and procurement by agencies of local authorities, to make a significant impact on the food system and improve the livelihoods of rural and urban people. It is often easier to establish a balance of affordable consumer food costs and fair producer prices in shorter supply chains beyond the sole control of large retailers or manufacturers, or national policies which can answer to narrower economic interests. As the awareness and capacity increases for food system planning among local governments working with civil society and the private sector, policy and programmes linking food and nutrition security with economic development, biodiversity conservation and climate change adaptation can become more integrated. Considering the importance of the urban-rural continuum, this protection extends beyond the city or town to the surrounding peri-urban and rural territory in close collaboration between sectors and stakeholders across the continuum. Consumer education and understanding can be mobilized to help integrate these objectives.

2.2. Risk management and ecosystem resilience

Increasingly, natural disasters and complex emergencies are having devastating impacts on urban areas. Nearly one billion urban residents live in precarious informal settlements and slums and are among the world's most vulnerable populations. Poorly planned, rapid urbanisation has increased the exposure and vulnerability of these populations to both natural disasters and complex emergencies.

Disaster risk management: The increased strength and frequency of natural disasters and man-made disasters has a direct impact on food and nutrition security, with increased migration to cities, disruptions of urban food supply, food infrastructures and power and water supply failures. Much higher demand for both emergency and ongoing humanitarian relief has been presented to interested/concerned donors at all levels. 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 and management (DRRM) approach includes joint engagement of community-based and agency-level managers of crises in pre-

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34   Commission of the European Communities. 2008. Local Authorities: Actors for Development. Brussels.

emergency planning for disruptions in the food supply. Response to emergency situations in the short term need to be balanced with responses in the medium and long term that help to create the necessary conditions for families in order to guarantee their own food and nutrition security. Moreover, "evidence indicates that relief programmes that adopt a gender perspective and engage women as primary actors in recovery programmes, can avert widespread malnutrition and lead to quick and more widespread recovery in food production and other aspects of livelihoods."[35]

Lessons related to food in Haiti

After the Haiti earthquake it was recognized that "restoring livelihoods and economic opportunities have proven to be an important need after the earthquake in Haiti, to restore cash flow through temporary employment to accelerate recovery and diminish the dependence on humanitarian aid." While the lessons for food system response before, during and after a natural disaster are still being analyzed after Haiti, it is becoming clear that the investments prior to the earthquake in local peri-urban and rural small farms near Port au Prince contributed as a local source of food security during the disaster. Pre-earthquake investment in Haiti with support from Canada demonstrated the value of strengthening urban and peri-urban agriculture as a strategy for emergency preparedness and is contributing to longer term food security. FAO has assisted 360,000 people in producing their own food and selling their surplus food to markets. They also provide seeds, tools, fertilizers and water pumps. In this effort FAO is engaged with the Haitian Ministry of Agriculture, Natural Resources and Rural Development, UN agencies, NGOs and donors to drive projects aimed to increase food security and decrease dependence on food aid.

Source: FAO Factsheet on UPA in Haiti: http://www.fao.org/fileadmin/templates/FCIT/PDF/UPA_in_Haiti_Canada_.pdf

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Ecosystem resilience: Investment in urban, peri-urban and territorial food system development contributes to disaster risk reduction measures with co-benefits for the longer term livelihood sustainability for both urban and rural poor. From humanitarian relief to post-disaster development, incorporating a rights-based approach and the subsidiarity principle can be applied to the food system in a variety of ways. Climate change is generating more recurrent severe weather patterns impacting the "normal" performance of the ecosystem to provide food and fibre for human consumption. In section one the components of food systems were reviewed, including urban forests, gardens, farms and open spaces that tie urban and rural landscapes together in a mosaic of natural green spaces that collectively buffer floods and other extreme weather.

Green Public Procurements in practice: Sustainable food procurement for schools in Rome

In the European Union GPP is defined in the Communication (COM (2008) 400) "Public procurement for a better environment" as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured." GPP is a voluntary instrument. Public authorities are major consumers in Europe: they spend approximately   2 trillion euros annually, equivalent to some 17percent of the EU's gross domestic product. By using their purchasing power to choose goods and services with lower impacts on the environment, they can make an important contribution to sustainable consumption and production. Green purchasing is also about influencing the market. By promoting and using GPP, public authorities can provide industry with real incentives for developing green technologies and products. Since 2001, Rome has employed an incremental approach to designing its food and catering tenders and its food service, to gradually make these more sustainable and innovative. The most recent call for tender for the school food service covers the period September 2007 – June 2012 and has a base value of approximately €355 million. One million organic meals are served in Italian schools annually - a quarter of the total number of school meals (source: Italian Association of Organic Farming). In Rome, the All for Quality food programme has been in place since 2001. In January 2010, Rome's Council adopted a decision on GPP for food and canteens. More than 144,000 meals are served daily across 550 nurseries, primary and secondary schools. 92 percent of the meals are prepared on site with 69percent of them including organic food. A vast number of nutritionists and dieticians advise and monitor the service, which also counts on the involvement of canteen commissions comprised of parents and school canteen staff.

For further info:
http://ec.europa.eu/environment/gpp/pdf/news_alert/Issue14_Case_Study34_Rome_food.pdf

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35   FAO. 2010. The State of Food Insecurity in the World (2010): Addressing food insecurity in protracted crises. Rome

As part of ecosystem resilience, local authorities and national governments should plan for emergency territorial food reserves and water catchments as part of the permanent food safety net. This includes the infrastructure for storage capacity, functioning formal and informal markets, and shorter food supply chains. Such investments will contribute to a community's right to stable food and nutrition security while also preparing for multiple events of severe weather or economic pressure. Local authorities also use public procurements These goals can be incorporated into the disaster risk reduction and management strategies of local authorities.

2.3. Multi-level governance

People-centred approaches to local, bottom-up efforts to address food security and sustainable diets call for new policy tools and implementation of what some call **"multi-level food system governance"** through new forms of participatory governance with enabling support and resources from national governments and donor agencies. As the debate over the future of food evolves, there are efforts underway in many countries to balance the model of product specialization for global markets with protecting or promoting diversification of production for urban markets from nearby territorial ecosystems – in effect strengthening an agroecological "continuum" from rural to urban environments. The notion of a *spatial* continuum of urban and rural landscapes, connects

> **Ethekwini Municipality: governance of the ecosystem management**
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> The Ethekwini Municipality, which governs the city of Durban is located in southeast South Africa. It has been undergoing a sustainable development transformation for the past 25 years to improve the ecosystem, and develop plans to implement more open space within the city. Natural open spaces sustain goods and services, such as water, erosion control, food production, and raw materials for fuel and building materials. Local citizens have been engaged with the local government through the Local Agenda 21 (LA 21) programme to guide the city towards an environmentally sustainable development path. Having a diverse range of citizens with disparate interests, varying socio-economic and environmental backgrounds involved in the discussion makes for a challenging process yet necessary input so that all stakeholders are held accountable.
>
> More information is available online at:
> http://www.iclei.org/index.php?id=1168
> Environmental Management in the Durban Metropolitan Area available online at: http://www.ceroi.net/reports/durban/response/envman/index.htm

to the notion of a *governance* continuum across levels of government and a *temporal* continuum from emergency response to longer term development, in effect, a continuum of "food system care". Finally and equally important is a *cultural* continuum as vulnerability is not homogeneous. Age, gender, ethnicity and other factors greatly influence levels of vulnerability to hunger and malnutrition. The notion of an urban-rural continuum of exchange and interaction across these dimensions (spatial, governance, temporal, cultural) is central to ensure resilience in social dimensions of the food system.

All adaptation is local: Urban food supply is often more connected to the outside market than to locally sourced supply. Urban decision makers can help create a more diversified food supply. In the near future, more cities will be forced to re-examine the mix of food supply sources to people needs and demand, adapt to local climate volatility and economic volatility. Examples from food systems development that are especially relevant to the present time of increasing hunger and volatility, include many innovative and promising solutions to sustainable intensification of food production for nutrition security initiated first at local levels and seeking to scale out

or scale up. All relevant actors at territorial and local levels, from local governments to local businesses, farmers, and workers along the supply chain can build upon their innovations with policy support and resources. Thus, a local people-centred approach implies the decentralization of authority, the policy, resources and tools that empower local actors. A multi-dimensional approach can result in greater capacity for more resilient food and nutrition security in communities.

> *"The spatial and sectoral transformation of agriculture underway today and in the future could result in greater vulnerability and marginalization of smallholder farming but also urban populations unless action is taken. A smoother transition to changes ahead must include actors at all levels of government working together with civil society and the private sector"*
> *-- Kostas Stamoulis (FAO, Director ESA Division)*

Multi-level governance: As stated in a recent report on multi-level governance for food systems, "better responses to the food security problem can be drawn at the lower level (grass-roots movements, food security coalitions, food security networks, peasants' movements, social campaigns, and others) and depend on local level involvement in food governance. This philosophy was laid down as a background of the Worldwide Action for Food Security, which stressed that local governments and their partners have a vital role to play in assessing food insecurity and in planning concerted responses."[36] A people-centred approach requires more than the rhetorical call for civil society participation. The same report attests that "when we look deeper at the problem of food security we can easily observe that there are immense qualitative changes in the food security problem itself, as well as in the processes aiming to solve it, which are missing in the existing decision making system dominated by states and international organizations." [37]

The European Commission, working with the Committee of the Regions (COR) in the EU has developed a territorial framework of *multi-level governance* with applications to food and nutrition security for urban and rural communities.[38] This framework acknowledges that "decentralized cooperation for both policy and development has emerged as a new and important dimension of development cooperation." Local authorities including cities and towns are bringing unique added value to development processes and are key players to mobilizing different stakeholders to work together in collaborative approaches. Key to multi-level governance is the establishment of a structured dialogue on development policy between local authorities at different territorial levels and stakeholders from civil society and the private sector. Such dialogues should be influenced by the concept of subsidiarity and entertain the possibility that multiple types of institutional arrangements are possible as citizens and public officials actively seek solutions to development problems.

City to city decentralized cooperation: International or national support for technical assistance and decentralized city-to-city cooperation can contribute to dialogue, sharing and new governance models. One example is the creation of a shared learning environment between and across local/regional jurisdictions and their

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36   Marzeda-Mlynarsk, K. 2011. The Application of the Multi-Level Governance Model Outside the EU-Context - The Case of Food Security. European Diversity and Autonomy Papers. p. 13
37   ibid. p. 12.
38   Commission of the European Communities. 2008. Local Authorities: Actors for Development. Brussels

respective associations, both urban and rural. City-to-city decentralized cooperation supported by the UN provides support for national and local authorities working together. Decentralized cooperation has numerous benefits, many of which are related to food and nutrition security through urban and peri-urban and small farm development.

Milan/Dakar Case Study on Decentralized Cooperation

The FAO's Decentralized Cooperation Program (DCP) helps to link local government institutions in developed and developing countries strengthen their urban and peri-urban horticulture. It was formally launched in 2002 with a signing of an agreement between the FAO and the Italian Ministry of Foreign Affairs, to mobilize the resources of local governments in Italy in the fight against hunger. It has since evolved in mission and geography with more than 33 projects underway. The program promotes direct region-to-region and city-to-city collaboration with FAO acting as both catalyst and a provider of external support and technical guidance. In one such project, the Milan City Council's International Affairs Department partnered with the Dakar City Council in 2004 to promote micro-gardens in low-income areas with the mission to provide fresh vegetables to poor families for improving their food supply and nutrition. Food produced in surplus could be sold, thereby generating income for families. Another objective is to facilitate access to urban and peri-urban horticulture production for all the city-dwellers who don't have access to farmland due to urban land pressure. Milan has contributed US $500,000, while the Italian Ministry of Foreign Affairs has contributed an additional US $500,000. More than 4,000 residents (mostly women) have been trained on the micro-garden technology, which produce on average 30kg of vegetables per sqm per year. This is an example of a successful relationship between the municipalities of Milan and Dakar.

Reference:
FAO: http://www.fao.org/tc/DCP/docs/dcpbrochure_en.pdf
FAO: http://www.fao.org/ag/agp/greenercities/pdf/FS/UPH-FS-8.pdf
UN-HABITAT: http://www.unhabitat.org/bestpractices/2008/mainview.asp?BPID=1856

In summary, principles for multi-level governance of food systems can include:[39]
1. Systems of governance involving transnational/regional, national, and subnational institutions and actors
2. Highlighting negotiations and networks
3. Emphasizing the role of satellite organizations (NGOs and community based organizations, national or international technical support organization, etc)
4. Avoiding normative pre-judgments about a logical order between different institutional tiers

Participatory governance: Closely related to the recent development of the multi-level governance framework, there are efforts to develop a framework for "participatory negotiation of territorial development". The design and implementation of new and more rational institutional arrangements between urban and rural authorities, including producers and consumers, civil society and social movements in these arrangements, is a very culture and site-specific process. Constitutional amendments on the right to food in Latin American countries are examples. Such arrangements need to simultaneously address social, economic and environmental challenges to improve and protect people's health and ensure resilience. In North America, the definition of what local, regional or foodshed means in a city-region context is one example of a continuously negotiated definition of the geography for food policy and development that can involve many stakeholders.

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39   Marzeda-Mlynarsk, K. 2011. The Application of the Multi-Level Governance Model Outside the EU-Context - The Case of Food Security. European Diversity and Autonomy Papers (Also available online at http://webfolder.eurac.edu/EURAC/Publications/edap/2011_edap01.pdf)

Procurement policy and institutional food procurement: New York, USA

As part of a national movement to change procurement practices in the urban school districts of 33 large cities in the USA, New York's Office of School Food has begun to procure food from local and regional suppliers in the nation's largest school food district serving over 860,000 meals per day. School food officials, procurement managers, vendors and NGOs have worked together to procure over 20 million US dollars annually in foods sourced from New York and neighboring states. Food procurement changes have required policy changes at the national level and coordination with state and local authorities. The model developed first in New York has been used in other US cities through what is termed a "school food learning lab". In this model NGOs help to facilitate school food officials, vendors, farm organizations, processors, distributors, state and local agencies to achieve specific goals including retraining of staff to use local fresh foods in menus, effect changes in supply chains and bring more fresh, minimally processed and whole foods to supply healthy foods to children in low income communities.

Reference: www.schoolfoodfocus.org

Cities in high, medium and low income countries are beginning to combine economic development in urban settings with rural development close to or associated with cities, for example through procurement policy and practice. Many cities conduct public food procurement for targeted food safety nets such as school food, hospitals, prisons, military barracks and other feeding programs. The "power of the public plate"[40] has been newly recognized in the efforts of many urban planners and policymakers to provide co-benefits for food access, economic development, and biodiversity. National and international policy can further foster procurement policy that supports a diverse food system that in turn benefits small and family farmers and increases urban and rural food security for both the short and long term.

Addressing resource and capacity gaps among different food system stakeholders is a key to successful participatory governance mechanisms as there may be wide gaps between local authorities, farmers, workers, businesses and consumers who need to be at the same table. One example is Brazil's Zero Hunger program, which makes specific reference to the inclusion of excluded groups and the need to increase the capacity of historically excluded groups to participate fully. Their strategy "tries to transform vicious circles of exclusion in virtuous circles of inclusion through coordinated and integrated action."[41] A more even playing field is essential as multilevel governance brings players from government, civil society and the private sector together at the decision making level. Action plans are needed for long-term combination of marketing, resource provision and technical interventions plus an enabling policy environment and dialogue. Otherwise it will be difficult to achieve lasting improvements in cities' food supply.

Food and Nutrition Security policy in Belo Horizonte, Brazil

Since 1993, the city of Belo Horizonte (Brazil) has been implementing innovative policies based on the principle of food and nutrition security as a right of citizenship. The results achieved have been impressive, with programs reaching over 800,000 people daily, close to 40percent of the total municipal population. A Municipal Secretariat for Food and Nutrition Security has been established aimed at: supporting urban agriculture; market development and regulation; commercialization of subsidized foods (popular restaurants and food banks); food and nutrition assistance; food consumption education; capacity building and professional training; management of public policies on food and nutrition security. Furthermore, this is done in partnership with the Federal Government, as part of the Zero Hunger Strategy. It is an important example of local governance of the food system.

For further information see:
http://portalpbh.pbh.gov.br/pbh/ecp/comunidade.do?evento=portlet&pIdPlc=ecpTaxonomiaMenuPortal&app=abastecimento&tax=8260&lang=pt_BR&pg=5740&taxp=0&

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40   Morgan, K. and Sonnino, R. 2008. The School Food Revolution: Public Food and the Challenge of Sustainable Development, p. 21. Earthscan, UK.
41   FAO. 2009. Regional Office for Latin America and the Caribbean. A Reference for Designing Food and Nutrition Security Policies: The Brazilian Fome Zero Strategy. Santiago. (available at www.rlc.fao.org), p. 5

Multi-stakeholder food system platforms: Traditional and novel institutional mechanisms for multi-sector urban-rural food and agriculture development already do exist. Some are culturally specific and others are adaptable approaches to institutional development for good governance of local municipal and territorial food system change or what has been called "food democracy" in some countries. Civil society associations, networks, planning and policy councils, independent or commissioned by local authorities, have sprung up in towns and cities of both low and high income countries. Metropolitan food planning units are found in eastern and southern African cities. The local municipal and state food policy councils of North America have spread from only a few to hundreds of councils in just ten years. Multi-stakeholder groups play an important role in holding local governments accountable to their commitments, while at the same time generating debate and ideas about emerging issues that related to food security.[42] Mechanisms and tools for knowledge exchange and dissemination of best practice are needed which could ensure that sustainability gains survive electoral cycles by creating some kind of benchmarking and peer-review pressure within cities and neighboring rural areas.

The key challenge to governance of food systems in an urban rural context lies in working across the levels mentioned above. Which governance level may offer the best future opportunities for spatial interventions to become a tool of social and economic policy, addressing urban and rural poverty and food insecurity? It is good to enhance the need for more direct producer-consumer links but these have some limits so it is crucial to maintain a diversity of marketing channels. Traders play a crucial role in terms of information and logistics, and many farmers who try to bypass them encounter losses and disappointments. Programmes providing support to food traders are scarce and more are needed targeting local supply chains and markets.

Decentralization and devolved law making

The effect of decentralisation of government officers assigned to Kampala City Council (KCC) was, at least initially, negative particularly because KCC saw no role for Agriculture Extension Officers (AEOs) in an urban environment. However, the AEOs developed a good understanding of the role of agriculture in the city and the problems farmers were facing. Political recognition and effective linkages between technical and political 'wings' of KCC following the 1997 Local Government Act led to effective policy change. This is likely to have been more difficult under a more centralised system. However, even with decentralised decision-making, implementing change still requires commitment and resources. The timely availability of funds to facilitate passage of draft ordinances shows the importance of resources in achieving policy change. In Uganda, national policy has lagged behind local changes in attitude and behaviour towards urban agriculture. When it was clearly in the interests of local political leaders to work for change, they did so and had reasonably effective frameworks and mechanisms for achieving this. This is in marked contrast to the national policy. In the wider context of their national concerns, perhaps especially relating to rural poverty, urban agriculture didn't feature high enough to result in change. It has been the change in Kampala that has stimulated moves to change national policy.

Source: Learning lessons from the Kampala Urban Agriculture Policy Process, from page 39:
http://www.ppppnc.org/content/files/documents/Kampala%20report%20final%20WEB.pdf

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Foodsheds can run across current political boundaries: encompassing various urban centres/municipalities, jurisdictions of district (state) and national governments that bear on local land use and marketing. There is thus often a need for planning and investment across boundaries. For example in Kenya, the government recently created a new Ministry of Nairobi Metropolitan Development charged with the development of the Nairobi Metropolitan Region, including Nairobi city and surrounding areas to ensure integrated spatial growth and strategic programmes for the provision of social, economic and infrastructural services.[43]

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42   RUAF Foundation, http://www.ruaf.org
43   Ministry of Nairobi Metropolitan Development, 2008. The Nairobi Metro 2030 strategy document aims for "the visible protection of the region's agricultural and natural support base" (page 32) as "designation of agricultural areas will reinforce objectives of protecting the agricultural land base of the region [...]. and promote agricultural activities by restricting urban growth and also address issues of food security" (page 68).

Concerted efforts with national support are needed to support coherent policy and action across these vertical levels of governance. Just as important are mechanisms that support horizontal learning and linkages of urban and rural authorities to promote people-centred and ecosystem approaches to feeding and greening cities. Mechanisms are needed that embrace multi-level, multi-sector and multi-spatial dimensions that work for very different urban-rural landscapes in diverse political cultures in different countries. Such mechanisms should empower networks with people coming from different places, institutions and levels, all acting together. New networks organized through new social media on the internet can be a vital part of these mechanisms, bringing youth and grassroots leaders to the table.

2.4. The food system in urban and territorial planning

Cities have become aware of just how vulnerable the food availability can be to sudden severe weather or changing economic conditions. Food and agriculture are increasingly counted as one of the vulnerable systems that needs to be included in planning and action for both mitigation and adaptation. As UN Habitat states, "urban vulnerability to climate change is a dynamic process in many ways: climate change and other stresses – including market integration, governmental policies and environmental change – constantly change, as do the dimensions defining sensitivity and capacity to adapt. Adaptation is also a process of constant adjustments and learning that may evolve in response to different exposures and past experiences....In this context, humanity is facing two main challenges that urban centres can help address: the *need to adapt*, at least to some amount of continued warming already under way, and the *need to mitigate* (i.e. to achieve development paths that bring about a peaking of emissions by 2015 and a stabilization of GHG concentrations)". [44] Food system adaptation is now becoming part of the agenda. However, the realities of life in towns and cities in Africa, Asia and Latin America are different than those in North American and Europe.

Food systems planning: Increasing numbers of mayors, planners and biodiversity managers are seriously considering the benefits of urban centered food systems to the health and economy of urban environments as evident from numerous national, regional and global meetings and processes.

"As cities grow by 5 - 10 % per year, meeting the food needs inside the city will create a market for the people who will produce food in the area. This is not to say that we are not going to depend on rural areas: we will have to integrate the urban-rural linkages. Agriculture is a part of the urban mix"
-- David Cadman, President, Local Governments for Sustainability (ICLEI)

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44   *UN-HABITAT, Cities and Climate Change: Global Report on Human Settlements 2011,*
http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3086 (pp. 164-165)

How is food and agriculture part of the "urban mix" of what local authorities and planners need to consider? Even where local administrators are dealing with overwhelming challenges in both poor countries and rich countries, the food sector became a priority. Local municipal governments often come to food and agriculture issues first in terms of urban and peri-urban agriculture, horticulture and forestry and there are many such projects and innovations underway across developing and developed nations. Recently, the food system considerations of local governments and planners have begun to include the rural dimension of food production and distribution, as most cities depend on rural food and fibre production for the majority of their food supply and long-term food and nutrition security.

Moreover as previously discussed, the global growth of cities has been fueled by the widespread migration from rural areas to cities, creating new challenges for urban food and nutrition security.

For planning to lead to actions with effective outcomes, it is essential that there is a solid foundation of good data collected and shared by local authorities, relevant agencies, aid organizations, business and industry, NGOs and other civil society groups. Information is needed about the relationship of local to global prices, procurement practices, the production for fresh versus non-perishable and processed foods, the proportion of local supply, the weaknesses and strengths of markets and food provisioning networks. All actors in the food system need reliable, transparent and up-to-date information and capacity building from which to implement linked interventions.

"Tak(ing) into account the transboundary nature of urban eco-systems,
even when borders are subject to geopolitical dispute,
is of particular significance.
The wider context of the urban metropolis can and should be a source of food for the city,
thereby saving transportation costs and impacting
*the city's footprint in a very positive way."*
-- Naomi Tsur, Deputy Mayor, Planning and Environment Portfolios, Jerusalem, Israel

International specialized organizations, research organizations, NGOs and civil society organizations on the ground, have a wealth of technical experience that can be applied by national and local governments and communities. However, the realities of life in towns and cities in Africa, Asia and Latin America are different than those in North American and Europe. The real challenge is how the urban rural food system agenda can be coordinated in an effective and empowering manner, so that knowledgeable citizens and local authorities own and manage the necessary technical information, policy guidance and action plans for implementation.

The four dimensions to strengthening the urban rural continuum addressed in this section and summarized in table 2 on the following page, are designed to stimulate dialogue, planning and action at all governance levels with civil society and the private sector. Taking a people-centred approach, addressing natural resource management for resilience, adopting multilevel food system governance, and establishing territorial planning across the urban rural continuum are only general guides for local leaders and decision makers. These guidelines need to be adapted for the diversity found in every locale, requiring deeper analysis and planning with support and engagement of all stakeholders, especially at the community level.

All the dimensions described above can be simultaneously implemented, each at different levels, then captured and measured in order to describe the city-region food system as shown in the diagram below illustrating 4 diverse combinations associated to specific approaches and policies.

Food system dimensions across the urban-rural continuum
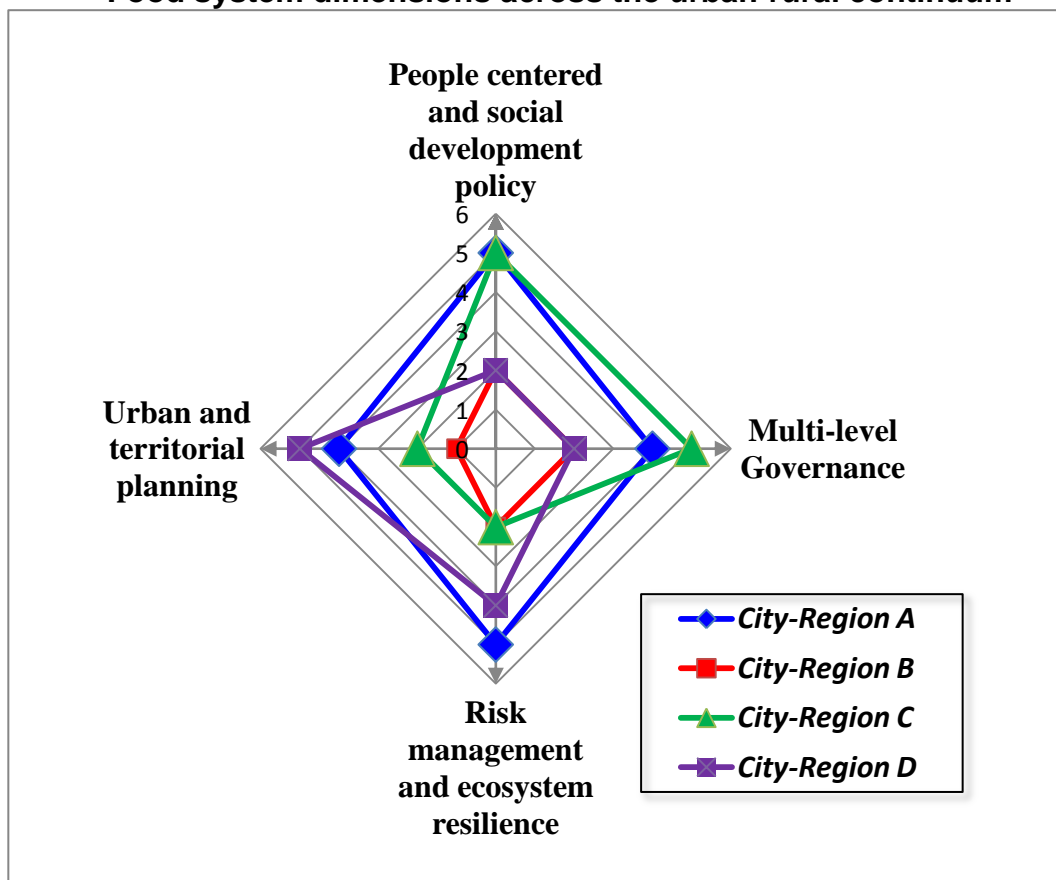
Table 2: Dimensions of implementing a food system approach, from local to global level

Food system pillars and main institutions/actors	Local Authorities	National / sub-national / regional government	Civil Society, including private sector (farmers and retailers)	Associations of local authorities (ICLEI, UCLG, etc)	FAO and other UN-organizations
People-centred	• public procurement mechanisms linked with food and nutrition security • nutrition education components	• Right to Food framework • integrate food and nutrition security into health and social policy • integrate the food system dimensions/ components into development policy	• consumers-producers linkages • consumption patterns / sustainable diets • social resilience	• involve association of consumers and food related private sector partners	• Right to Food – human rights based approach • PNTD – land tenure • nutrition education, food safety • include city-related stakeholders • enhance urban-rural linkages aspects
Risk management and ecosystem management	• territorial approach and urban-rural linkages • climate change adaptation and mitigation	• linking the relevance of sustainability and resilience with NR management for food and nutrition security	• Climate Change adaptation practices • urban-rural linkages for ecosystem services, waste management, green labelling, etc.	• further involvement in NR management platforms supporting FNS dimensions	• land, forest and water management for food and nutrition security expertise and best practices • rural-urban linkages and territorial, regional development strategies
Planning	• including food and nutrition security into urban planning • food system management and monitoring mechanisms at local level	• include multi-level planning for FNS strategies	• inclusion in official participatory mapping and planning mechanisms • Community-led planning • Private sector responsibilities (CSR) and sponsorship	• enhance FNS dimensions • strengthen multi-level strategies and design	• mainstreaming food and nutrition security at different planning levels, including investment • FNS aspects to be integrated in relevant planning activities
Governance	• local food councils • multi-level governance to be driven by urban-rural linkages	• participatory mechanisms of designing policy and strategies of FNS	• advocacy for FSN related aspects with policy makers and governing bodies • contributions to participatory processes	• reinforce presence and role of local authorities in international fora	• enhancing collaboration and joint partnership to be focused on FNS

Conclusion and recommendations for moving forward

Section one of this paper, *"Assessing the food system linking growing cities and their urban and rural landscapes"* provided an overview of key components to consider in the ecosystem approach to food and nutrition security in the context of urbanization. Section two, *"A food system approach to food and nutrition security challenges: linking urban and rural areas for greater resilience"* framed issues and processes in four dimensions including principles for people-centred, multi-level governance, risk management and planning that integrates emergency response with development for long term resilience.

Components of ecosystem resources in urban and rural landscapes include natural resources contributing to agro-biodiversity and genetic diversity including urban and peri-urban gardens, farms, trees and forests, surface and groundwater resources, aquaculture and fisheries, energy and waste resource recovery systems, livestock production, and much more. Social challenges must be factored prominently via participatory solutions in very different environmental and cultural contexts, such as those related to unemployed youth, women's changing economic roles, and displaced rural populations. Both commercial and informal markets are the places where rural products (and urban or peri-urban producers) meet urban consumers through exchanges of goods, culture, knowledge and services. Marketing systems are changing to meet the needs of foods systems in transformation. These changes must accommodate efforts to create a more resilient and sustainable food supply for small and large cities linked to rural areas near and far.

Interventions addressing food price volatility require new forms of multi-sector partnership. In rural areas, high prices are not necessarily incentive enough for farmers to increase production and, in some cases, higher prices did not trickle down to farmers.[45]. The future of food and nutrition security policies for cities will require going beyond price-driven commodity policy approaches, also taking a more holistic multi-stakeholder and multidisciplinary food system development approach. When food and agriculture decision makers deliberately balance specialized crop export for distant markets with diversified crop production to feed nearby cities, there are many consequences for food system research, development and governance, which will be need to be assessed at every city-region level. Global analysis of population trends, food demand and pressures on food supply calls for new partnerships between traditional agricultural agencies at international and national levels with other national agencies and local government agencies responsible for non-agricultural sectors such as planning, health, environment, education, transportation. The correlation between basic food "needs" and nutritional requirements supplied by foods that are low in nutrient density, together with food "desires" of populations needs to be better analyzed in urban areas where obesity and malnutrition is increasing.

Sustainable and healthy diets can link urban and rural agendas. Recent work on the linkages between environmental and human nutrition and health is leading to a policy

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45   FAO. 2009. State of Agriculture Commodities Markets.

and implementation framework for "sustainable diets"[46] that makes important connections between ecosystem health and human diets. Both publicly supported food safety nets and market systems, including the important role of the retail sector, are targets for healthy food access in the context of sustainable diets. Foods that are low in nutrient content, such as highly processed, high sugar and high fat content foods, are increasingly of concern and the object of policy restrictions in increasing numbers of cities in high and low-income countries.[47] Beyond limiting unhealthy foods, urban decision makers including mayors, planners and other managers, are also identifying long term solutions to diseases like obesity through health-promoting planning measures in "healthy city" agendas.[48]

The effort in this paper to articulate a common understanding of challenges and opportunities when confronting challenges to food and nutrition security across the continuum of urban and rural landscapes embraces a **set of core values** including:
- the tenet that people-centred approaches to sustainable diets and the right to food are linked;
- that stronger urban-rural linkages will help buffer price and climate change volatility;
- that disaster risk reduction requires planning for long term food system resilience; and
- that urban consumers will ultimately shape the food system through market choices that support family farmers and the ecosystems on which we all depend.

In Section 2 we have seen how various stakeholders (member states, local authorities, civil society, the private sector, research institutions and global networks) can take action, and how FAO with other UN agencies and partners may contribute and support multi-stakeholder efforts. Collaborative strategies for implementing technical and policy support to be developed in greater detail include:

1. territorial planning and legal frameworks for resilient food systems;
2. mainstreaming urban, peri-urban and rural linkages with supporting policy;
3. improving coordination of technical services for decentralized cooperation;
4. monitoring, mapping, interactive information platforms and evaluation;
5. ecommending areas of policy support for effective implementation from the national level to engaging local authorities and communities in a more coordinated and systematic manner within the FAO mandate.

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46 Sustainable Diets are those diets with low environmental impacts which 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" (from FAO, 2011 following footnote).

47 For more information see FAO. 2004. Globalization, Urbanization and Nutritional Change in the Developing World

(also available at ftp://ftp.fao.org/docrep/fao/009/ah754e/ah754e00.pdf)

48 Morgan, K. 2009. Feeding the City: The Challenge of Urban Food Planning. International Planning Studies, Vol. 14,

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Key recommendations from this report are organized into improvements of the technical competencies of partners to address the challenges to food and nutrition security, and educational and policy guidance to national governments and ministries of agriculture for local urban and rural decision makers and planners. At any time, local actors and stakeholders in every urban rural landscape can begin a starting a dialogue and planning process with phases to be developed with partners at all levels such as the following:

a) Identification of key problems and issues: Assessment of the dimensions of food systems, including agroecological, ecosystem and social issues (subsections 1.3-1.6) can be done by local governments, national or donor agencies, local leaders, NGOs or community based civil society organizations. The validity and effectiveness of such assessment depends on the character of the process established, including both a people-centred approach and including local and sometime provincial/state or national government (subsection 2.1).

b) Different solution strategies (including scenarios for crisis or disaster risk management): For solutions to be validated by both local leaders and by important actors in government at all levels, the development and testing of solutions needs to be grounded in an evidence-based and pragmatic understanding of natural resource and social challenges (subsection 2.2), and developed with multi-level governance approaches (subsection 2.3).

c) Actors and implementation (roles, responsibilities, and mechanisms): The planning process to improve urban rural linkages for food and nutrition security should be built directly upon a) and b) above, combining planning professionals and important leaders from communities of practice and decision makers at critical levels of food system management, including local authorities, the private sector and civil society (subsection 2.4)

d) Resources and institutional capacities (to empower local actors): Adequate resources to plan and implement actions from research and planning to development include soft costs of participatory processes and hard costs of new farm to market infrastructure require resources. Some of the resource needs can be made available by redirecting current budgetary and staff resources of administrations and organizations to issues being addressed here. But new resources are needed and there should be a set-aside of agriculture and rural development funding in rural areas, and urban economic and community development funding in urban areas, to leverage urban and rural co-investments where the benefits will accrue along the urban rural continuum.

e) **Monitoring and evaluation systems (connected to global monitoring systems, to be identified or set-up):** Lessons can only be learned and shared, and progress can only be made if there is adequate data, measurement and evaluation of risks and improvements from baseline information with indicators adequate to the social, economic and environment dimensions of the urban rural continuum. People-centred monitoring and evaluation (PM&E) systems can be adapted to these needs from work in farmer field schools and other forms of participatory action research. The user-friendly development of indicators and data gathering is not just an appendage to an M&E system, but integral to effective monitoring and progress at local levels towards shared goals.

Research and development actors have been engaged for many years in different technical aspects of how food and farming systems (including crops, livestock, forestry and fisheries) impact and engage the urban environment and people living in cities. Now the time is ripe for the next generation of cross-cutting interdisciplinary research, action and assistance for development. New institutional arrangements can bring available technical and policy resources from international agencies including FAO into closer coordination with, and help achieve a more effective response to, rural and urban stakeholders interested in more holistic and comprehensive solutions.

As a result of new multi-sector, multi-stakeholder collaborations, urban and rural authorities and their citizens can come to better understand their food and ecosystem resources and how to manage and adapt to multiple and recurring natural and economic crises. As the primary technical agency for food and nutrition security and a global platform for knowledge and information about agro-ecosystems in the UN system, FAO can and should provide both rural and urban stakeholders with important tools and support. To do any less could lead to greater vulnerability to hunger and malnutrition for urban populations, especially in low income countries, where FAO has the strongest field presence.

Therefore, and taking into account the components and dimensions of food systems development across the urban rural continuum, the FAO can contribute to food and nutrition security in the following ways:

The **technical competency** of a wide range of partners can help contribute to certain key dimensions of food system challenges also in the urban context, including:

- providing nutrition education and program development to advance sustainable diets that link environmental and human health;
- managing ecosystem resources in and around cities to preserve biodiversity including local food and fibre resources in the context of planning for resilience in the urban environment;
- providing legal, policy and institutional advice for improved food security governance, including ways of implementing the human right to adequate food.

Collective contributions to **policy guidance** for national governments and relevant ministries can help urban and rural decision makers and planners by:

- providing tools for mapping food security and ecosystem vulnerability and entry points for addressing problems in comprehensive and sustainable ways;
- showcasing and supporting enabling policy, governance models and institutional arrangements that address a rural-urban continuum of production and consumption;
- utilizing international forums such as the Committee on World Food Security, the UN Conference on Sustainable Development, the World Urban Forum among others.

As an outgrowth of efforts to protect local agricultural diversity and in many cases re-build food systems directly serving towns and cities both in high and low income countries, there are new demands to analyze and better understand how better local management of food systems can be an engine for economic and community development. From this evolving framework for responding to food and nutrition security for cities and their regions, it is important to understand how all partners and sectors can play a role in developing an efficient and people-centred food policy at local levels.

The key roles of local, territorial and national governments, collaborating with civil society and the private sector, need to be acknowledged and formally engaged in coming efforts and collaborations.

Most importantly all partners, including local authorities, need to join together with national governments and international organizations and other stakeholders for the future of food and nutrition security in a rapidly changing and urbanizing world. They need to join to prepare for a world where cities, towns and rural areas are on the front lines of humanitarian crises and will experience new levels of vulnerability. Such collaboration is the key recommendation of this report and a matter of pressing concern that demands *new* actions.

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