

RDD

Regional Development Dialogue

Vol. 35, 2014

Urban-Rural Linkages in Support of the New Urban Agenda

Brian H. Roberts

Rural Urbanization and the Development of Small and Intermediate Towns

Sarfraz Alam

Urban-Rural Linkages and Shifting Livelihood Strategies in Rural India

Remy Sietchiping, Jackson Kago, Xing-Quan Zhang, Raf Tuts, and Jane Reid

The Role of Small and Intermediate Towns in Enhancing Urban-Rural Linkages for Sustainable Urbanization

Innocent Chirisa, Abraham Matamanda, and Elmond Bandaiko

Ruralised Urban Areas vis-à-vis Urbanized Rural Areas in Zimbabwe

Christine Platt

Strengthening Linkages along the Urban-Rural Continuum through Urban and Territorial Planning

Thomas Forster, Guido Santini, David Edwards, Katie Flanagan, and Makiko Taguchi

Strengthening Urban-Rural Linkages through City-Region Food Systems

Karim Hussein, David Suttie, and Zak Bleicher

Inclusive Economic Development and Investment, Markets, Infrastructure, and Finance in Rural and Urban Areas



United Nations Centre for
Regional Development
Nagoya, Japan

RDD

Regional Development Dialogue

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Editorial Introduction

Chikako Takase, Director, UNCRD
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Remy Sietchiping, UN-Habitat
Xing-Quan Zhang, UN-Habitat

We are pleased to present this issue of *Regional Development Dialogue* (RDD) which is a collaborative effort of the United Nations Human Settlements Programme (UN-Habitat) and the United Nations Centre for Regional Development (UNCRD). The origins of this RDD issue lie with a call for papers which were subsequently presented at an Expert Group Meeting on the “Role of Intermediate Cities in Strengthening Urban-Rural Linkages towards the New Urban Agenda”. This meeting was held in Monteria, Colombia on 27-28 October 2015.

The editors, other experts, and contributors peer-reviewed the relevant commentaries prior to their publication together with the articles contained in this volume. The theme “Urban-Rural Linkages” is pertinent for both UNCRD and UN-Habitat as it articulates an integrated territorial approach to both analysis and action.

Urban and rural spaces are inextricably linked economically, socially, and environmentally and cannot be adequately dealt with in isolation from one another. The need for consistent urban policies for urban to rural areas which involve local, regional, and national actors is important to understand and effectively address the complexities of people’s livelihoods and the strategies they employ, which include mobility, migration, and the diversification of income sources and occupations. Urban-rural linkages promote sustainable development and the role of trade in this process while, conversely, a lack of optimal rural-urban linkages leads to inefficiencies, poverty, and inequality which all inhibit growth. Strong linkages enhance sustainable development because they channel resources to where they have the largest net economic and social benefits

UNCRD was established in 1971, some 45 years ago, in Nagoya as a UN overseas office to assist the development efforts of developing countries through regional development. The Centre is one of the overseas offices of the United Nations Department of Economic and Social Affairs (UN DESA) and conducts policy forums and training courses on various aspects of regional development. The topic of urban-rural linkages is very pertinent for UNCRD since we take the region as the basic unit for analysis and action. UNCRD promotes Integrated Regional Development Planning (IRDP), which is a process of planning that can transcend sectors as well as admin-

istrative boundaries to pursue holistic and integrated approaches to sustainable development. The approach is multi-scalar so as to effectively cover the issues that are being addressed.

UN-Habitat on the other hand is the United Nations (UN) leading agency on sustainable urban development and human settlements, mandated by the UN General Assembly since 1976. For forty years, UN-Habitat has been working in human settlements throughout the world, focusing on building a brighter future for the people in villages, towns, and cities of all sizes.

In September 2015, the UN Sustainable Development Summit adopted a new development agenda, *Transforming our World: the 2030 Agenda for Sustainable Development*. The 2030 Agenda has Sustainable Development Goals (SDGs) as its framework in which, rightly, SDG 11 is devoted to making cities and human settlements inclusive, safe, resilient, and sustainable. The world is now committed to working towards these agreed goals and targets. Countries will begin reporting their progress on implementing the SDGs at the 2016 High-Level Political Forum of the United Nations Economic and Social Council (ECOSOC). Moreover, the Third United Nations Conference on Housing and Sustainable Urban Development (Habitat III) will be held in Quito, Ecuador in October 2016 and will provide a forum for member states to engage on the *New Urban Agenda*. This *RDD* issue will capture contributions on the development and implementation of this global process in its entirety.

About the Articles

The articles appearing in this issue of *RDD* centre on the importance of strengthening urban and rural inter-relationships; a number of articles take or define a region as a unit for consideration and analysis, enabling the promotion of regional/territorial approaches.

Some of the articles consider the theme of rural urbanization and the development of small and intermediate towns. Brian Roberts, in his article, focuses on the governance of small and intermediate towns to improve the sustainability of rural urbanization or “rurbanization”. He discusses current and emerging factors which drive people from the rural areas to small and intermediary towns, which are the front line of rural-urban migration, and points out that how to manage the development of these towns in rapidly urbanizing economies is proving to be a challenge. The article explores the possible policy response of central and local governments to improve the sustainability of rural urbanization and the development of small and intermediate towns. Similarly, Safaraz Alam’s case study of Muradih village in India demonstrates ways in which rural urbanization can operate effectively. The author argues that while closer linkages with urban centres bring the rural areas new livelihood opportunities, if not well governed, the more dominant urban economy may exploit the rural economy. Remy Sietchiping, Jackson Kago, Xing-Quan Zhang, Raf Tuts, and Jane Reid focus on the role of small and intermediate towns and the multiple and varied ways in which they contribute towards balanced regional development and sustainable urbanization. The article by Innocent Chirisa, Abraham Matamanda, and Elmond Bandaiko presents an interesting perspective of how rural areas are increasingly gaining urban orientations as a result of the penetration of information and communication technologies (ICTs) to these regions while, conversely, urban areas are deteriorating towards informal settlements – a process the author refer to as the “ruralization” of urban life.

Other common threads in the articles point towards a flexible regional/territorial scale to effectively address urban and rural issues with particular emphasis on the territorial approach from several different aspects. Christine Platt in her article emphasizes the continuum of settlements and that rural and urban areas are not two competing contexts. She emphasizes the role of planning which is integrated and relevant in context to meet the development needs of all parts of the continuum. The article highlights the significance of the International Guidelines for Urban and Territorial Planning. The article by A. Contin, P. B. Ortiz, and A. Zammataro argues that the conflict between the economic, environmental, and social spheres in urban development can be solved if we treat urban and rural areas as elements of a complete system rather than isolated dimensions. It calls for a systemic approach towards urban and rural development and articulates them in an organic framework.

Food systems in the context of urbanization constitutes an area that has gained momentum and interest among many actors. Thomas Forster, Guido Santini, David Edwards, Katie Flanagan, and Makiko Taguchi focus on the city-region for viable food security systems and propose a new paradigm on how cities can shape policies in regard to food systems. Accordingly, strengthening local food policy and increasing the participatory governance of the food system can generate a range of environmental, social, and economic benefits. Related to this, Karim Hussein, David Suttie, and Zak Bleicher discuss how the strengthening of agricultural value chains can contribute to urban-rural linkages. They further document the links between agriculture and urbanization. Paolo Veneri considers multiple governance approaches represented as forms of partnerships in addressing different ways of interaction between urban and rural areas to strengthen regional economic development. The article makes the point that territorial challenges should be addressed at a scale that accounts for functional linkages between urban and rural areas.

Some of the articles in this *RDD* issue focus on regional perspectives with regard to urban-rural linkages. Debolina Kundu, in her article, analyses urban-rural linkages with a focus on the dynamics of urbanization in Asia. She not only offers a detailed discussion on differentiated urbanization across Asian countries, but also addresses the diverse policy interventions in different countries. The article by Li Sun and Zhi Liu examines how urban-rural linkages were affected by the unprecedented urbanization that China experienced during the past three-and-a-half decades both in terms of its massive scale and its rapid pace. It advocates that the priorities of government's urbanization policy should be given to the improvement of urban-rural social linkages.

The Expert Group Meeting (EGM) held in Monteria, Colombia on 27-28 October, 2015 produced relevant discussions on ways to strengthen urban-rural linkages through small and intermediate cities, with particular focus on post-conflict contexts. The EGM adopted the *Monteria Communiqué*, presented in this *RDD* issue immediately following this Editorial Introduction, with recommendations for a way forward including developing tools, approaches, indicators to support the role of small and intermediate cities; and strengthening the capacity of actors in small and intermediate cities and rural communities to promote good governance and management through multi-sectoral and multi-scale approaches. The EGM was designed to contribute to HABITAT III and the *New Urban Agenda*. Additionally, participants committed to sustaining the dialogue, developing and sharing knowledge as well as developing and implementing projects on urban-rural linkages and small and intermediate cities.

It is our profound hope that the articles contained in this issue of *RDD* together with the informed commentaries accompanying each article will contribute to building an understanding of urban-rural linkages and to promoting regional/territorial approaches to strengthen sustainable regional development.



MONTERIA COMMUNIQUÉ

"The Role of Intermediate Cities in Strengthening Urban-Rural Linkages towards the New Urban Agenda"

27-28 October 2015, Montería, Colombia

Background

The Habitat Agenda in Para 43 (i) committed to: "Promote the development of more balanced and sustainable human settlements by encouraging productive investments, job creation and social infrastructure development in small and medium-sized cities, towns and villages"; in Para 76. (m) the agenda commits to: "promote comprehensive rural development through such measures as equal access to land, land improvement, economic diversification, the development of small and medium-scale cities in rural areas and, where appropriate, indigenous land settlements." Para 165. (b) seeks to: "take appropriate measures to improve the living and working conditions in regional urban centres, small towns and rural service centres;" and Para 169 advocates for: "an integrated approach to promote balanced and mutually supportive urban-rural development. Through among others provision of: an appropriate legal, fiscal and organizational framework that is suitable for strengthening the networks of small and medium sized settlements in rural areas."

In Sep 2015, 193 member states of the United Nations adopted the **post-2015 development agenda**, Transforming Our World: 2030 Agenda for Sustainable Development, with SDG (Sustainable Development Goals) as its framework. In particular, Goal 11 seeks to "make cities and human settlements inclusive, safe, resilient and sustainable," with Target 11.a seeking to "support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning."

In 2015 UN-Habitat Governing Council enacted resolution HSP/GC/25/L.9 that seeks to **strengthen the capacity of small and intermediate towns**. The resolution "Invites Governments to promote the reduction of disparity along the rural-urban continuum through, inter alia, inclusive public and private investments in infrastructure and services across the rural service centres as well as of small intermediate and secondary towns to strengthen linkages as appropriate, and promote sustainable and balanced integration of the economic, social and environmental dimensions of sustainable development;" it also "invites Governments to support strengthening the capacity of rural service centres, and small, intermediate and secondary towns to attract populations, increase investments, create jobs and reduce reliance on primate cities, as a strategy to promote decentralized growth."

The resolution further "requests the Executive Director to **develop tools and disseminate good practices to promote urban rural linkages** through investments in market towns and in the intermediate towns through integrated regional and territorial planning to strengthen development corridors;" and also "invites member States, with the assistance of UN-Habitat, as requested and in line with its work programme and budget to initiate or enhance programmes and projects at national or sub-national level to strengthen the capacity of rural service centres, small and intermediate towns to improve the access of rural and peri-urban inhabitants to sustainable urban basic services, including water, sanitation, transportation and energy, as well as access to social and economic services such as health, education, banking, retail and market services."

Communiqué

1. UN- Habitat, United Nations Centre for Regional Development (UNCRD), *Andalucia Agency for Development International Cooperation*, and Monteria City Council collaborated to organize the Expert Group Meeting (EGM) on "The Role of Intermediate Cities in Strengthening Urban-Rural Linkages towards the New Urban Agenda";
2. The EGM took place from 27 to 28 October 2015 in Monteria, Colombia and brought together over 20 international and national participants from both developing and developed countries, with expertise in a variety of fields, representing academia, International Development and Inter-governmental Organizations, Development Finance Institutions, government and local authorities, the private sector and NGOs;
3. The overall objective of the EGM was to exchange practices and experiences on how to strengthen urban-rural linkages through small and intermediate cities, with particular focus on post-conflict situation;
4. More specific goals of the EGM included promoting urban-rural linkages and highlighting the importance of the system of small and intermediate cities as critical space for enhancing urban-rural linkages;
5. WE appreciate the sponsorship of the Andalucia Agency for Development International Cooperation, and the hosting by Monteria City Council with support from UN-Habitat and UNCRD;
6. WE took note of the recent development and endorsement of processes, such as the one embodied in the Sustainable Development Goals, the International Guidelines on Urban and Territorial Planning, the Milan Urban Food Policy Pact, City Region Food Systems knowledge platform, and , and the Colombia "Agropolis" territorial framework;
7. WE underscore that small and intermediate cities are a key locus of operationalizing urban-rural linkages.
8. WE acknowledge the critical role of technology (including Information and Communication) and knowledge exchange in strengthening urban and rural areas;
9. WE appreciate the role of partnership collaboration between all spheres of governments, and stakeholders in all sectors to ensure that alignment and integration are supporting urban-rural linkages;
10. WE highlight the negative impacts of climate change, conflicts, weak decentralization and global economic instability in realizing the effective and inclusive urban-rural linkages;
11. WE also recognize the challenges facing small and intermediate cities in achieving inclusive and aligned territorial development, including through ensuring and enhancing social inclusion, access to infrastructure and services (both virtual and physical), access food and natural resources, financing and resourcing, and improved institutional and governance systems;

12. WE take note of the diversity in definitions of concepts, such as urban rural linkages, systems of small and intermediate cities;
13. WE recognise the importance of territorial approaches and contexts that consider urban, peri-urban and rural areas as part of the same systems;
14. WE further recognize that people living in urban and rural areas share similar social concerns and economic aspirations, such as the need for sustainable livelihoods, adequate food and nutrition, environment and natural resources management, and peace and security;
15. WE therefore suggest that the following principles could support sustainable urban and rural linkages: equity, accessibility, affordability, governance, participation, inclusiveness, resilience, and people centred development;
16. WE make the following recommendations to support the effort of strengthening urban-rural linkages:
 - Develop principles, roadmap and policy papers articulating a new narrative on urban-rural linkages;
 - Develop and sharing inspiring good practices to exchange across cities and regions;
 - Strengthen the capacity of actors in small and intermediate cities and rural communities to promote:
 - good governance and management through multi-sectoral and multi-scale approaches;
 - leadership and long-term vision, strategy and plans for the city and region;
 - Developing tools, approaches, indicators to support the role of small and intermediate cities to enhance the development of both urban and rural areas;
 - Strengthening dialogue with partners to enhance intervention at country level in order to operationalize urban-rural linkages;
 - Improving information and knowledge on the small and intermediate cities – e.g. documenting proven successful experiences, collecting data on the sector jointly with other partners and promoting and assisting governments on consumer information;
 - Developing and mainstreaming a community of practices, and networks on urban rural linkages;
 - Monitoring and assessing interventions at country level, at various stages of development/implementation;
 - Publishing the papers prepared for the EGM in the Regional Development Dialogue, a Journal published by UNCRD, for wider dissemination.
17. Moving ahead,
 - WE recommend that the EGM and its outcomes should be taken as contribution to Habitat III processes, particularly to the relevant policy units, regional and thematic meetings to

ensure that the issue of urban-rural linkages and small and intermediate cities will be included in the outcome document of Habitat III Conference in October 2016;

- WE call for the outcomes of this EGM to inform the deliberations of the group setting the indicators for the SDGs, in particular the indicator for integrated urban, peri-urban and rural planning (11.a);
- WE urge that the recommendations of the EGM form part of a proposed UN-Habitat position paper and corresponding guidelines on promoting urban-rural linkages.
- WE invite interested partners to sustain continued dialogues, develop and share knowledge, develop and implement projects on urban rural linkages and small and intermediate cities;
- WE decide to develop a network of experts and concerned partners based on the participants of the Expert Group Meeting and invite interested partners to join and link with existing networks.

Montería, Colombia, 28 October 2015



Agencia Andaluza de Cooperación Internacional para el Desarrollo
CONSEJERÍA DE IGUALDAD Y POLÍTICAS SOCIALES



List of Participants of the Expert Group Meeting on “Role of Intermediate Cities in Strengthening Urban-Rural Linkages towards the New Urban Agenda”, Monteria, Colombia, 27-28 October 2015

1. Carlos Eduardo Correa, Mayor of the City of Monteria
2. Carlos Montoya Baquero, Secretary of Planning, City of Monteria
3. Chikako Takaso, Director, United Nations Centre for Regional Development (UNCRD)
4. Francisco Gomez Diaz, Andalusian Agency for International Development Cooperation (AACID) and the Ministry of Public Works and Housing of the Junta de Andalucía
5. Brian Roberts is an Emeritus Professor at the University of Canberra and Director of the company Urban Frontiers based in Brisbane Australia
6. Sarfaraz Alam, Assistant Professor, Department of Geography, Faculty of Science, Banaras Hindu University, Varanasi, India
7. A. Contin, PhD-Assistant Professor, Poltecnico di Milano, School of Architecture and Society Department of Architecture and Urban Study
8. Innocent Chirisa, Senior Lecturer University of Zimbabwe, Department of Rural & Urban Planning.
9. Thomas Forster, Fellow, EcoAgriculture Partners, Faculty, New School Food Studies, Principal, Practice2Policy LLC
10. Paolo Veneri, Regional Policy Division – Public Governance and Territorial Development, OECD
11. David Raymond, Suttie, Policy Analyst, Strategy and Knowledge Department, IFAD
12. Christine Platt, Honorary Vice-president & Immediate past president of the Commonwealth Association of Planners
13. Debolina Kundu, Associate Professor at the National Institute of Urban Affairs, New Delhi, India
14. Li Sun, Post-doctoral researcher, Peking University–Lincoln Institute Center for Urban Development and Land Policy
15. Anaclaudia Rossbach, Regional Adviser – Latin America and Caribbean Cities Alliance
16. Guido Santini, Technical Advisor - Food for the Cities & Programme Coordinator – City Region Food Systems Assessment
17. Maruxa Cardama, Executive Coordinator and Co-founder, Communitas
18. Joseph Nasr, Associate, Centre for Urban Studies and Food Security, Canada
19. Luis Fernando Ulloa, Vice President, Sustainability, Findeter, Colombia Programa Agropolis in Monteia
20. David Simon, Director, Mistra Urban Futures, Chalmers University of Technology
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29. Maria del Pilar Tellez, Metropolitan Area of Bucaramanga, Colombia
30. Cesar Mauricio Salcedo, Department of National Planning, Colombia

Towards a Metropolitan Approach for the Definition of a Network of Intermediate Cities

A. Contin, P. B. Ortiz, and A. Zammataro

TOWARDS AN ECOSYSTEM APPROACH

Premise

Metropolitan regions redefine the classic opposition between urban and rural areas whose edge is actually blurred and negotiated in a continuous conflict. Therefore, we rather propose to consider rural and urban areas as part of a new entity articulating them in an organic framework by means of a systemic approach which interweaves the different sectors and scales characterizing contemporary cities.

Firstly we must define the upper scale which is most effective for analysing the rural-urban linkage. In this sense, the correct scale is the metropolitan one, where ecological connections (green infrastructure) and transport networks (grey infrastructure) can be projected onto an integrated system, where the ecological infrastructure, or eco-armature, can reconnect different parts of the territory and deliver ecological services, i.e., benefits provided by an ecosystem. Ecological services are an inalienable common good for the metropolitan city dimension and the base for the ecosystem approach which can improve metropolitan planning by integrating management of land, water, and living resources while promoting conservation and sustainable use in an equitable way.

Thanks to the conceptual framework of the ecosystem, rural and urban areas are both recognized as parts of the same physical entity constituted by several interacting components whose relationships can be operated towards a sustainable model of territorial growth.

The Role of Agriculture in Urban Areas

According to the *Milan Charter* discussed for Expo 2015, the great challenge for contemporary societies is to reconcile growth and sustainability by doing more with less. This could break the link between economic development and environmental degradation to enhance or preserve present levels of wealth with fewer resources. The argument for pursuing this objective is that ecosystem services have monetary and non-monetary values that can be assessed by means of multi-criteria methods such as virtual water and environmental accounting. Indeed, the present system of accounts

does not include the full economic value of environmental resources or the role that they play in productive activities. This is the reason why environmental accounting has emerged as a new set of aggregate data that links the environment to the economy. Thanks to this tool, investors can understand how the environment is related to the current and future value of their assets in order to invest in a responsible way. Environmental accounting and responsible investing also apply to urban development as the environmental and social attributes of real estate assets are related to their investment performance. It is therefore necessary to promote smart growth transit-oriented development, walkable communities, mixed-use development, social equity, and affordable housing linked to new built forms that integrate urban agriculture. Finally, we need a metropolitan strategy that defines, from the outset, which local data to use for estimating local project impacts, which territories to develop through real estate investments, and where to link the agro-urban areas with housing projects.

Actually, many ecosystem services are threatened. In particular, according to the *Milan Charter*, the water cycle and food production are among the most damaged by climate change, urbanization, and population growth. Sustainable agriculture is therefore a mandatory issue in metropolitan management. In particular, according to the COST-Action Urban Agriculture Europe (UAE),¹ urbanization and food security can be addressed by urban agriculture (UA) which can also contribute to sustainable and resilient urban development, as it creates and maintains multifunctional urban landscapes whose greater complexity guarantees a dynamic equilibrium.

Land Tenure and Commons

Of course, agriculture in urban, peri-urban, and rural areas must compete against urbanization for the available land whose value is often too high for food production. Especially in developing countries, as governments or markets make land available to prospecting investors, large-scale land acquisitions may result in local people losing access to the resources upon which they depend for food security and also their agricultural and traditional expertise. Therefore, since local communities' right to land is so central to identity, livelihoods, and food security,² the *Milan Charter* asks for the identification and registration of land property and tenure. Thanks to the resulting certainty in short- and long-term rights, this would also allow long-term agreements among farmers, producers, and sellers in the food sector and achieve improved planning and forecasting of consumers' demands.

In the pincer between privately owned property and state assets, a third paradigm can be put in place to guarantee communities' right to land, i.e., that of the commons.³ It refers to the principle of the inalienability of resources for the shared use of all the townspeople. For this purpose, the law must activate self-governance dynamics among the subjects as a complementary way to state and market mechanisms: resources should be allowed to be appropriated or not because of an instituting decision born by men acting together, as Hannah Arendt would express it.⁴

The property regime as it relates to agricultural territory is an interesting field of study concerning the commons issue. Indeed, in the agricultural field, water and animal paths are common, i.e., there is a law that allows situations of hybrid property that could illuminate the definition of the contemporary commons tied to the space of flows.

A Tool: The Agricultural Park

In the European community, the defense against private pressure on agricultural land has been addressed by means of the agricultural park. The instrument is based on the balance between the values that need to be preserved and the functions that should be developed.⁵ Its aim is to consolidate and develop the local dimension and facilitate the continuity of agricultural activity. It depends on a cooperation network founded on the sensitivity and receptivity of the involved agents and their agreement to maintain contact with each other, coordinate activities, and assume joint responsibility. The agricultural park, however, is a constraining instrument, while our proposal of generating a metropolitan entity is based on a project that must activate the territory by means of a trans-generational strategic plan. This plan enables innovative functions for a green economy that brings new categories of users and entrepreneurs to the territory. At the same time, our proposal is an urban design and architectural project framing a new relational public space.

From this perspective, the agricultural park as a constraining instrument is an ambiguous tool. Indeed, if we imagine the agricultural function along the concepts of a park, farming activities must fit new vocations and their productive aim must be preserved, that is to say that the park should have all the necessary infrastructure and logistic support to be economically competitive. Therefore, if we want to adopt this instrument, we have to consolidate the threatened open spaces so that they have a new value for citizens, providing for the inclusion of the weaker inhabitants, but also to transform rather than simply manage those spaces by means of constraints. At the end, the agricultural park will be the object of citizens' care, a physical/cultural space that is the only real guarantee for a participatory development that promotes a feeling of belonging. This is the reason why we are thinking of urban agriculture's proactive role in fostering a spatial and cultural integration and inclusion. Indeed, the occupants must perceive themselves on the one hand as inhabitants who take care of their land, and on the other hand as being linked to the global cities network by means of new infrastructures that prevent the creation of marginal ghettos. But for that to happen, a regional and metropolitan approach within an agricultural development is mandatory. This is because the network of the intermediate cities can fulfil the function of anchoring the bigger and global cities to the territory, feeding them literally and culturally. Urban agriculture can provide not only the integration among citizens, but also their inclusion in the world of work.

Metropolitan Landscapes

We are talking about a new aesthetics of landscape that is not so much picturesque since it is a land inhabited according to our new environmental awareness. In the context of the metropolitan scale, this kind of agricultural landscape, both productive and recreational, represents the "other side of the city". It is a local dimension whose different realities are networked in a "slow metropolis" superimposed on to the fast one of grey infrastructure, and communicating with it through nodes of a mental map made of memorable images.

The strategic linkage between rural and urban can therefore be achieved through two main strategies. The first is constituted by a molecular re-appropriation of the territory, starting from local values that are enhanced by creating new relationships between the settlement and the territory, transport infrastructure, and landscape. In this case, the local dimension preserves its positional value which is contemporarily rediscovered at

the new scale, improving its role. The second strategy builds upon the exchange nodes between the territory and the city, where the agricultural activities become a transforming driver for intercepting entrepreneurial demands, which are emerging and innovative.

THE AFRICAN CHALLENGE

The Need for a New Approach (Metro-Matrix) and Model (Desakota) for the Rural-Urban Linkage provided by the Middle City Network

Actually, a different trend of growing fast, or a deceleration of it is noticed in some African regions. The figures suggest that the small and intermediate cities in the very poor countries start to grow fast, and they need capital investments.⁶

Our proposal is based on a metropolitan vision that encompasses a systemic approach to the sustainable management of intermediate cities within their territories – sustainable in terms of economic, energy, and cultural development. In developing countries, the network of intermediate cities can play a relevant role in this. An intermediate city, being mostly rural, should follow a model of organizing and bringing services to bigger cities. The mission of such a network is to organize service partnerships to deliver them with continuity, quality, and affordability. That is the reason why it can work in building a strong economy of scale through the development of industry, agricultural networks, and clusters. To move in this direction, these cities need an economical project and a clear definition of the role of local government and community. It seems strategic, therefore, to decentralize services related mostly to the agricultural sector, but the quality of services must be guaranteed, especially in the decentralization of landscape and transportation sectors.

About this, one of the issues that seems most relevant is the need to rewrite the rules of the relationships among the different authority levels (in terms of alignment, not hierarchy), the legal concept of new urban spaces (more common than public), and the approval procedures for great public works. The intermediate cities network therefore ought to determine, within the other actors of the metropolitan territory, a new balance without altering the established one. All this should be done in the interest of the territory, not of an individual municipality. The fundamental concept will be entered in the motto: “To grow together”.

In short, the intermediate cities will consequently be involved in the new statute for a metropolitan vision. They are intended not only as a chance to pursue a model of efficient management, but also as a new urban paradigm (and its policies) that shifts from a radial conception to a linear and multicentered one. The shift is from a network of cities structured as an archipelago to a network resembling a gridiron. For this, we are following the metro-matrix approach.⁷ This approach leads to a new type of metropolitan structure and it is able to relate the different layers and scales of the metropolitan territories to each other. Then, the actual land transformation issue can also be read in terms of changing modes of production from industrial to post-industrial ways (or to “2.0”). It is not only a model of a general plan that we need, but a traditional master plan at the local scale. It is therefore a cultural leap to a new intermediate city network identity, which must represent form and territorial vocations within common strategies and rules through its regulatory physical structures. It must be possible to share the objectives, not just the rules.

This perspective leads to new combinations of building types, new land uses, and the technologies of high-speed transport within the traditional ones. These can give a new physical structure and a robust image to the transition territories between the urban, suburban, rural, and natural landscapes. Then, the environment — our context or field of action — changes. It is considered as a complex social product, and as architects, our role also changes. So finally, a radical reconfiguration of the city at the metropolitan scale is vital to the physical aspect of today's development. This is due to the unprecedented dimension of the growing phenomenon and the formal discontinuity in the development process.

Our research must then concern a paradigm of physical development for the network of intermediate cities and their integration into the broader metropolitan context. We naturally refer to a model which is programmable in the short-term, but is one that has a long-term objective — the sustainable development of the network. The two models must be compatible. They must share the rules that govern the presence of new quantities (physical and economical) compared to a locally-existing situation that cannot resist the pressure of explosive growth. Neither can they resist the future reality that Ortiz assumed as organized according to a territorial grid that must be harmonized with the local context.⁸ The goal is to understand where an evolution of the local model may succeed and where its radical transformation is possible. The metropolitan territory physical project must begin, then, from the hydraulic system and the economic and social environment at the scale of intermediate cities that are strongly rooted in the physical territory. The model at this scale should analyse patterns of life and environmental structure and interpret their sustainability as it currently exists. Then we find the places of densification and future interchange and where to introduce the contemporary physical maintenance, development, or transformation. The research question at this point should be where and how to strengthen the existing territorial structure and governance to ensure that communities can be participants of this developing growth.

Because the network of intermediate cities is surrounded by agricultural areas, a *desakota* model is practicable. A *desakota* hybrid urban-rural model⁹ defines urban growth together with the resources that are needed to sustain it by means of on-site systems that have proven to be affordable. After an initial development period, an on-site archipelago system should be linked to a reticular metropolitan one, realizing the territorial coordinate vision.

A Proposal for the Physical Development of Middle Cities

Many fast-growing cities, especially in Africa, lack the possibility of such an integrated planning practice because administrative authorities do not have the resources necessary to deal with the rate of their urbanization. Fast-growing cities consequently develop temporally and spatially in an informal way, responding only to proximity logics. The outcome is a system lacking wholeness and so characterized by many negative externalities from both individual and communal perspectives. According to the current literature and our experience in many developing contexts, these negative externalities are mainly related to the overexploitation of resources, the lack of citizenship, and the uncertainty of land tenure. Moreover, these three dimensions are tightly interrelated, as the recognition of land tenure for city dwellers is of extreme importance for their integration into the decision-making mechanisms that could promote their interests for the equitable and sustainable exploitation of resources.

The Metro-Matrix approach and the *desakota* model both address the question of resources by guaranteeing the continuity of the agro-ecological system (green and blue infrastructure). Moreover, because of the dimension of the settlements in developing countries, the agro-ecological system and urban centres cannot be physically separated, but must be integrated into a structure that couples green and blue infrastructure with grey. The development we propose is therefore based on a reticular linkage between rural and urban areas into a continuous productive landscape. The reticular structure produces urban economic mechanisms that can allocate and recognize as citizens even marginal groups because of a balanced distribution of land values in the metropolitan region. In the radial structures, by contrast, the same groups are usually neglected in informal settlements where the land values are low, such as on the outskirts or in obsolete central areas. Their recognition allows the integration of top-down strategies and bottom-up tactics in the decision-making mechanisms and through the intermediation of local institutions and civil society organizations.

For the definition of this intermediate cities development model we start from three main considerations:

- Rural and urban areas in developing countries are currently separated because there are neither functional nor spatial links between them;
- Current hierarchical and non-aligned governance mechanisms do not allow the management of the territory as a whole since it is constrained by administrative boundaries and sectoral policies; and
- The exclusion of informal actors and activities constrains a governance that ranges from the global to the local dimension and the integration of different sectors into a single complex system that links rural to urban and spreads economic growth.

Consequently, we deal with these considerations as follows:

- The linkage between rural and urban areas can be mainly established by the agricultural and ecological functions that the former can deliver to the latter and the logistic and productive ones that the latter can deliver to the former;
- The complex network of relationships that would emerge between rural and urban areas requires multi-scalar and multi-sectoral infrastructure and policies directed by governance mechanisms that go beyond administrative boundaries and sectorial actions; and
- Since many sectors are characterized by informal dynamics, their integration requires the recognition of informal actors who are the majority, especially in our target sectors of agriculture and related activities.

The next paragraphs will explain these points one by one.

Territorial Integration

The lack of integration between rural and urban areas is common in the majority of African cities. Indeed, since the countryside does not provide enough to feed an increasingly large urban population, and cities characterized by high density do not allow inhabitants to grow crops in their own plots, urban areas are increasingly dependent on expensive imported food rather than on cheaper regional staples.¹⁰ Consequently, the affected dimension of food security in the countryside is availability, i.e., the physical access to food while in cities, accessibility, i.e., the economic access to food. To overcome this situation, we propose a model of settlement following a *desakota* scheme where urban areas are alternated with agricultural land that feeds the city inhabitants.

McGee¹¹ described the *desakota* city as a sustainable model for urban growth because it determines the development of the urban centres together with affordable resources that are necessary for their increasing populations. McGee also defined the model as a trans-active environment in which the agro-urban tissue is served by a well-developed network of roads, railways, and channels that connect productive locations to markets and, conversely, deliver useful inputs from the latter to the former.

We can therefore say that the linkage between rural and urban areas provides mutual benefits. Food provision from the countryside would alleviate food inaccessibility in urban areas, and the urban market pushes investments to upgrade the agricultural sector and related fields. This could overcome the rural subsistence economy and achieve an exchange one that could make rural and urban areas work as a whole. Economic growth concentrated in urban areas would consequently spread to rural ones. According to the World Bank, the agricultural sector in Sub-Saharan Africa, which employs 65 per cent of the labour force, presently shares only 32 per cent of gross domestic product (GDP) because staples are not processed and value added is very low. This is why more than 70 per cent of poor Africans live in rural areas where farming activities predominate. The engagement of agriculture into a value chain promoted by urban market demand can increase the rural share of GDP and, consequently, rural income. This explains why GDP growth in agriculture has been shown to be at least twice as effective in reducing poverty as growth that originates in other sectors.¹²

To sum up, when we talk about *desakota*, we must not consider agriculture as an isolated sector, but rather as a sector integrated into a systemic framework encompassing market access, value addition through food processing, and infrastructural management for surplus production. Such a network is required to bridge the chasm between a subsistence and an exchange economy based on innovative activities and maintaining the identity of a place/culture at the same time. We are speaking about an identity related to a landscape born within an economy and a society. In fact, the green economy can affect the physical dimension because it carries economic and social patterns that transform the territory and determine a metropolitan typology characterized by new relationships among:

- The settlement and the infrastructure that is necessary to receive inputs and deliver outputs (grey infrastructure);
- The settlement and its environment, which will change due to water management and new productive models related to agriculture (green and blue infrastructure);
- The different parts of the settlement that will need a structure they do not currently have because the differentiation of activities will produce new physical hierarchies (nodes at the intersection of the green and grey infrastructures); and
- Building types and the use of ground, agricultural land, and technologies of high-speed transport.

The *desakota* model also requires the coordination of the metropolitan and local scales. Indeed, even if agricultural land delivers ecosystem services at the local scale, the management of water and biodiversity must consider the scale of the water basin and the ecological corridors. The large-scale management of energy and material fluxes can be addressed in the short-term by an archipelago of economically affordable on-site systems, serving the local settlements and communicating among them by exploiting the topographic and geographic characteristics of the area. This is a viable solution because the *desakota* model represents a diffuse urban settlement and population density is there-

fore suitable for locally closed energy and material cycles. When the density and economic resources increase, the on-site systems will be integrated into an off-site one. The planning practice must therefore be based on the metropolitan matrix and on the rule of the local particular form at the same time. Moreover, the spongy tissue of low-density *desakota* settlements represents a formality gradient that allows the evolution of land uses over time, from the agricultural activities of the initial settlement stage to the more urban functions of consolidated tissues.

Multi-scalar and Multisectoral Dynamics

The previous description of the development approach demonstrates how it acts at different scales, from the local (nodes) to the regional (continuous infrastructure), and the way it interweaves different sectors into a system whose complexity guarantees stability and coordination. For its implementation, consequently, a new kind of governance is required to manage these multi-scalar and multisectoral dynamics. In particular, there is need for new administrative tools able to manage the unclear institutional perimeters of the different scales that city governance is supposed to influence. One of the key principles is the definition of a new metropolitan level of governance and the alignment of power and functions among the various institutions and levels of government that must activate a dialogue in order to build consensus. In particular, the new statute of the metropolitan institution and its functions will be defined by the intermediate cities, moving from a shared starting point. They will share not only the rules, but also the objectives. It is a cultural leap to a new identity that must represent, through its regulatory structures, forms, and territorial vocations within common strategies. The dialogue must be based on a clear vision of an explicit policy and programming of investments in infrastructure and equipment over time. Since scenarios are unstable due to the speed of urbanization, temporal horizons shift rapidly and periodic revisions of the plans are required. These revisions must not completely substitute the previous actions, but organically follow each other in a coordinated way. We therefore envisage an urban structure that is invariant concerning relationships with higher systemic levels while being malleable according to its constituent parts, which differentiate physically and functionally through a process similar to stem cells. New tools are also required for the integration of different sectors. There is therefore a need for a systemic and interdisciplinary view by the administrative institutions, a view that encompasses the engagement of the stakeholders representing each specific sector. This is why strengthening the relationship between local authorities and civil society organizations by means of participative organizational arrangements and feedback mechanisms is necessary.

Formal-Informal Interface

All social actors must be taken into account, also the informal ones who represent the majority in many sectors, above all the ones which can link rural and urban areas such as the informal food sector, which is defined by the Food and Agriculture Organization of the United Nations (FAO) as a series of activities ranging from urban and peri-urban food production to retail sale of fresh or prepared products, as well as catering and transport. This sector is therefore able to promote multi-stakeholder dynamics and sectorial integration due to its complexity and variety of activities. To play its catalytic role towards rural-urban linkages, it nevertheless must be improved because the activities mentioned above are presently carried out by the single producer who cannot attend to

each one continuously in a proper manner. Discontinuity in delivering important agricultural functions to the city is also due to the shifting boundary between household and market production because food is firstly produced for consumption by household members; only in the case of surplus is it sold on the informal market.¹³ The various activities must consequently be improved to provide a stable income. They must also be distributed among specialized actors who must learn how to carry out their tasks and coordinate among themselves in a sort of food supply chain. The objective is twofold because the individual sectoral training must be complemented by the promotion of partnerships among actors engaged in the same value chain. These partnerships can be incubated by civil society organizations that can activate cooperation among farmers with such positive effects as:

- Concentration of capital sufficient to buy agricultural inputs and implement small on-site systems for water management, which are necessary to upgrade the sector;
- Constitution of a support network able to mitigate risks by differentiating among them; and
- Prevention of a monopsony caused by a plethora of producers who cannot agree on a price for their produce to the buyer, which is often a single foreign company that decides the price at their place.

Finally, civil society organizations would be the interface between formal authorities and informal actors, whose single and conflicting interests must be coordinated into a global strategy by inclusive and transparent governance. This formality gradient, from formal authorities to informal actors through civil society organizations, takes place easily at the neighbourhood scale. This is in fact the scale where an articulation between formal and informal service provision systems can take place. Services such as water, electricity, sewage treatment, and public transport can be provided at the neighbourhood level by formal institutions, while the final provision to individual households can be provided by semi-informal and informal mechanisms. The physical structure able to manage this transition between formal and informal by allocating service infrastructures and communal institutions builds upon the natural interface of Alexander.¹⁴ It is considered as a section device characterized by the combination of functional and morphological features that can address formal and informal city mechanisms. Obviously, the synergy between the formal and informal city requires recognition of the latter, and especially for land tenure by the most marginal groups, by means of an analysis and reform of administrative and private law. In particular, the acknowledgment of property rights or land-use grants must be accompanied by equitable administrative and judicial systems to prevent large landowners and enterprises from land grabbing and to promote socially responsible real estate investments. This represents the only way to spread economic growth equitably.

CASE STUDIES

We will now introduce three case studies that represent the application of the proposed approach to African contexts characterized by different territorial roles and rates of urbanization. The first study concerns the forthcoming urbanization of Cabo Delgado, a mainly agricultural province in northern Mozambique. The second concerns the recovery of fragile agricultural land occupied by informal settlers in the centre of Dar es Salaam,

Tanzania. Finally, the third study is related to the preservation of the Cairo edge between rural and urban areas.

The methodology will therefore be aimed at three metabolic operations, which are: (a) transformation for Cabo Delgado; (b) recovery for Dar es Salaam; and (c) conservation for Cairo. In all case studies, agriculture is always considered an integral part of the environmental system and an indivisible function of the metropolitan entity.

Transformation of the Fast-Growing Cabo Delgado Province

Cabo Delgado's transition from its agricultural vocation to a new industrial one will be disruptive, as it was caused by the discovery of huge gas deposits whose exploitation is expected to push urbanization processes. The management of these processes at the metropolitan scale with the engagement of several urban centres and rural areas is of uttermost importance to spread the benefits of economic growth to the whole province. For the same objective, the development of activities complementary to the extractive sector is necessary, as is the use of expected infrastructure to develop other productive sectors, such as food processing, wood processing, fisheries, animal husbandry, and tourism. These are all based on the extraordinary natural resources and the important ecological functions they deliver to the population and must be preserved.

The definition of our proposal starts from the analysis of the present context, characterized by a constellation of small villages in the inland and a few cities on the coast – a scattered settling model based on subsistence agriculture. This double-striped situation is typical of underdeveloped coastal regions that evolve into a triple-striped model when they achieve economic maturity. The proposed grey infrastructure, then, takes form as three parallel lines that are devoted to specific activities and connected by a penetrative axis to integrate the inland and the coast. In our proposal, tourism and gas extraction are made compatible along the coastline, while the inland is devoted to agro-alimentary production and food processing to feed the coastal cities. The new third axis is located between these two stripes and is the main infrastructure for transport of energy and goods. Because of its accessibility, it is suited for industrial activities related to gas extraction and other sectors that will benefit from logistic services.

The environmental continuity of the central wetlands and the agricultural areas of the transversal valleys is protected and enhanced to complement the development of the intermediate city centres that must be linked to the rural areas. This global vision affects the local scale by determining new architectural typologies, which must prevent the occupation of open areas through a functional and spatial relationship. We envisaged many of these typologies, which are able to realize the global vision from the bottom-up according to the parametric rules of architectural morpho-typology.

Recovery of Dar es Salaam's Green Infrastructure

In Dar es Salaam, informal housing has occupied many dangerous areas that are periodically flooded due to the complex urban topography. The objective here is to recover these areas as green infrastructure, able to absorb the floods in a resilient way by water management systems that could also be exploited for agricultural production to feed targeted neighbourhoods. Urban agriculture is also a tool of regeneration for neglected urban areas, which are characterized by several levels of marginality. This is an exemplary case of the *desakota* megablock, a metropolitan unit characterized by a simple square geometry with vertexes defined by the crossing of linear infrastructure, and whose

accessibility is guaranteed by a multimodal node. A *desakota* megablock is also crossed by green infrastructure that continues beyond its boundaries and is coupled with the grey infrastructure at the node. It thus creates a new metropolitan architectural typology that mixes the usual functions of multimodal stations (commercial and business functions) with agricultural and leisure ones related to green open areas. This is also the tropic point where the formal provision of services interacts with the informal mechanisms at the neighbourhood scale. We call this point, where the green and grey linear devices meet, the **geographical skin of the infrastructure**, as it represents a reference element in the metropolitan citizens' mental map. In this case, for the recovery of the green infrastructure crossing the megablock, small open areas have been highlighted and empowered by engaging them into greater units. Their protection for the future is based on the blue infrastructure that delivers water for agricultural use and absorbs floodwaters during the wet season. Infrastructure related to water, as it acts at the scale of the water basin, links local elements into a more complete system at the required metropolitan scale, thus overcoming the local logics of urban sprawl and orienting growth towards a network of intermediate cities linked to rural areas managed at the level of the whole territory.

Conservation of Cairo's Urban-Rural Edge

Cairo is a metropolis expanding into rural areas that are becoming increasingly scarce as the Nile territories are being urbanized. In our vision, we propose an urban growth transversal to the river, occupying the arid regions unsuitable for agriculture and preserving the fertile lands whose edge must be protected. The field of action is always the regional block, but in this case, the design efforts are directed to the square margins whose linear character requires section strategies for their definition. These strategies are both morphological and functional and differ according to the dimension and the location of agricultural land in the urban tissue. Concerning the small open areas inside the tissue, the conservation of free plots can be based on their engagement with a local transport system linked to the major accessibility node by attributing to them collective functions at the local scale, such as education, leisure, and commerce. Their integration by means of a light transport system linked to the metropolitan network increases the strategic value of these plots as areas for communal use and spontaneously prevents their occupation. From a morphological perspective, the section of the light infrastructural spine must manage diverse layers that are related to different scales and functions, and that must be integrated and hybridized. Instead, when the open areas are bigger and located on the blurred urban edge, free land can be devoted to food production. The element that allows the edge morphological robustness is the section of the terrain which has been operated in order to manage the water system for agriculture. We therefore imagine a synergic relationship between the preservation of rural areas and the growth of the urban ones by defining rural-urban edges whose value can be recognized by the citizens best by integrating them into a metropolitan vision where new intermediate districts take advantage of their agricultural hinterland. This needs an accurate project of the physical consistency of the buffer zone, i.e., the margin between urban and rural landscapes, within the reasoned policies of protection of what needs to be protected.

CONCLUSION

The concentration of most of the population into the cities seems to have accelerated the trend of adapting the landscape to man. This has led to an increasing contrast between and mutual isolation of the natural and anthropogenic environments. This does not allow the urban ecosystem to interact with the countryside and take advantage of its benefits, even in cases of a limited extension of the city. When our cities grow, the more productive agricultural territories are removed from the greater part of them and they lose their eco-systemic advantages. The project of an accessible eco-armature therefore acquires new significance both for the environmental quality of the city and for the definition of public spaces that play an important social role.

We consider the metropolitan scale to be the correct scale for the subject. We are thinking about networks of intermediate cities. Such networks would consist of configurations of spaces that integrate the two dimensions (urban and rural) through a synergy between the grey and green infrastructure that we consider to be the matrix of the metropolitan scale. This integration must take place in different time phases and its result is an actual project in the short term referred, however, to the long term.

We outlined a multi-scalar approach for the sustainable integration of intermediate cities in the vast geography of a "global cities network" at the metropolitan scale by means of an experimental vision defined by the metabolic approach that considers the growth issue in the framework of the urban life cycle. According to this perspective, the possible operations are substitution, transformation, and conservation. Each of them addresses different questions arising from explosive urban growth, such as the urbanization of formerly agricultural areas or the recovery of neglected urban realities scattered in a territory characterized by a blurred edge between urban and rural. We started from the hypothesis that cities are inventive systems,¹⁵ i.e., organisms able to operate on their environment according to an inventive analysis of the landscape. This contrasts with a simple management activity that a-critically accepts and reasserts the given conditions. The city as a system is not only a physical entity, but also a conceptual one susceptible to cultural evolution, which provides intentions and means for the proactive transformation of the environment into cultural landscapes that interweave ecology and technology. The balanced wholes that constitute the digits of the metropolitan dimension are called **landscape figural units**. Ortiz named them balanced unit development (BUD) and defines them as new centralities of the net where green and grey infrastructure can interact without cutting each other.¹⁶ The transition between the different BUDs must be the target of the design efforts.

These observations lead us to reflect on the role of the forms of agricultural parks, of the new types of public or common areas, and of the new building types that include areas of peri-urban agriculture. These forms exist in relation to the characters that must have the "system of the metropolitan green", which is a structure of the urban edge, and in relation to the actual accessibility of these areas so that they can enhance the value of the environmental quality of the system, integrating the urban and the rural.

Two considerations in particular emerge. The concept of the European agricultural park is reductive if it is not considered together with a system of urban areas and suburban green areas. Their connections with outlying agricultural areas, including any project of ecological networks, can, in some cases, become an important complement. The areas that are part of the eco-armature can thus be understood as a diversified patch, in

both structure and function, within the interconnected system of urban, suburban, and metropolitan green highly conditioned and conditioning the urban fabric of the city and its architecture.¹⁷

The structure of the green spaces network derives from spatial and functional relationships that exist between the green areas and connection corridors. It also greatly affects the affordances of the urban territory to react to negative changes, making it less vulnerable.

The forms and margins of any digit can have unfavourable and highly disturbing effects on the structure and functions of the eco-armatures that frequently are immersed in a “matrix”. Their edges between rural and urban landscapes can become useful “filter strips” that mitigate the mutual interference between natural, agricultural, and urbanized areas. Their physical definition through a section strategy driven by an architectural project is mandatory to guarantee the continuity of the green and grey infrastructure that constitute the structural form of the metropolitan dimension.

Finally, we outlined a specific proposal for developing cities in Africa, where radial development was leading to huge sprawling at their edges. This radial development must be substituted by a reticular one that is able to articulate sustainable intermediate cities in a new metropolitan entity where rural and urban areas coexistence is guaranteed by means of a functional and spatial interdependency.

In particular, we discussed three cases, two of them related to the sprawl typically associated with rapid and uncontrolled growth of cities (Cairo and Dar es Salaam), the third related to totally new urbanization and founded in a context still cultivated or natural (Cabo Delgado).

In this framework, the role of architects is to define projects articulated in space and time. We should inaugurate a new discipline that we name Metropolitan Architecture (M.A.). It promotes precise/detailed physical actions that introduce a set of scales and landscapes. “Precise” means that the metropolitan architecture project is able to recognize which relations and at what scale should be intensified. The metropolitan architecture project context is a vast area (1km x 1km, usually). It deals with the context and creates it because it selects the durable values (it is a process) and relations among the metropolitan elements – new and old architectural forms, urban areas, and set of landscapes. M.A. builds a gradation between related scales by decipherable physical architectural signs that allow the formation of a mental image (map) at the vast scale of the metropolitan region. The architectural project at the metropolitan scale determines the passage of one scale to another through forms of introduction that consist of:

Large differentiated containers, multi-scale and multipurpose, in the infrastructural nodes;

- New built forms capable of introducing urban agriculture at the metropolitan fringe or for the new urbanization of the countryside; and
- New forms of land use that introduce the theme of a new conceptualization of what we, in a generic way, name the “green” space.

The method has three phases:

- Study of the urban biography, i.e., the way a settlement has interpreted and consequently operated the geography during its history;
- An assessment of the present value of the urban biography in relation to the new conditions, and especially the new scale that requires an integration of elements that were previously separated, by means of parameters that measure vulnerabilities and potentialities; and

- The definition of the metabolic operations that, according to the previous assessment, must reassert (conservation), update (transformation), or negate (substitution) the previous growth logics of the settlement.

We talk mostly about forms because as architects we think that that our discipline must be relevant at the scale at which, up to now, we had not been directly involved. We must, in fact, lead thought concerning new areas and land uses that can connect in a sustainable way the diverse landscapes of the metropolitan scale, making them habitable and accessible. A new chapter of the urban biography, then, is written and communicated by means of a powerful image of the territory that constitutes the intangible potential of the landscape, able to determine identity and, therefore a feeling of belonging and care.

NOTES

- ¹ COST, Domain Committee, "Transport and Urban Development," COST Action (TD 1106) starting 14 March 2012; "Monitoring Progress Report" (5 June 2013 to 13 March 2014) (Available at http://w3.cost.eu/fileadmin/domain_files/TUD/Action_TD1106/progress_report/progress_report-TD1106.pdf; retrieved in 2015); also available at F. Lohrberg, L. Lička, L. Scazzosi *et al.*, eds., *Urban Agriculture Europe* (Jovis edition) (Berlin, 2015).
- ² L. Cotula, S. Vermeulen *et al.*, *Land Grab or Development Opportunity? Agricultural Investment and International Land Deals in Africa* (London and Rome: International Institute for Environment and Development (IIED), Food and Agriculture Organization of the United Nations (FAO), and International Fund for Agricultural Development (IFAD), 2009).
- ³ E. Ostrom and C. Hess, *Understanding Knowledge as a Commons: From Theory to Practice* (Cambridge, MA: MIT Press, 2006).
- ⁴ Hannah Arendt, *The Human Condition* (Chicago: Chicago University Press, 1958).
- ⁵ J. Montasell and R. Roda, "Present i futur dels espais agraris en zones periurbanes," *Quaderns Agraris*, 28 (Setembre 2003) (Barcelona: Institució Catalana d'Estudis Agraris, 2003):73-107 (Available at <http://revistes.iec.cat/index.php/QA/index>; retrieved in 2015).
- ⁶ I. Chirisa, "Ruralised Urban Areas vis-à-vis Urbanized Rural Areas in Zimbabwe: Implications for Spatial Planning" (Paper presented at the Expert Group Meeting (EGM) on the Role of Intermediate Cities in Strengthening Urban-Rural Linkages towards the New Urban Agenda, Monteria, Colombia, 25-27 October 2015).
- ⁷ P. B. Ortiz, *The Art of Shaping the Metropolis* (New York: Mc Graw Hill, 2014).
- ⁸ *Ibid.*
- ⁹ Terry McGee, "The Spatiality of Urbanization: The Policy Challenges of Mega-Urban and *Desakota* Regions of Southeast Asia" (UNU-IAS Working Paper; no. 161) (2009).
- ¹⁰ W. J. Garvelink and K. Wedding, "Nutrition and Food Security in the City" (Available at <http://csis.org/publication/nutrition-and-food-security-city>; retrieved on 21 August 2013).
- ¹¹ McGee, "The Spatiality of Urbanization".
- ¹² International Bank for Reconstruction and Development (IBRD), *World Development Report 2008: Agriculture for Development* (Washington, DC: World Bank, 2008).
- ¹³ M. Floro and R. B. Swain, "Food Security, Gender and Occupation Choice among Urban Low-Income Households" (Working Paper, Department of Economics, American University, 2010).
- ¹⁴ C. Alexander, S. Ishikawa, and M. Silverstein, *A Pattern Language: Town, Buildings, Construction* (New York: Oxford University Press, 1977).
- ¹⁵ Z. Naveh, "Towards a Global Human Ecosystem Science of Landscape Ecology: A Bio-cybernetic System Approach to the Landscape and the Study of its Use by Man" in E.U. von Weizsacker, ed., *Beiträge zur chemischen Kommunikation in Bio-und Ökosystemen (Contributions to Chemical Communications in Bio — and Ecosystems)* (Festschrift fuer R. Kikhut) (Witzenhausen: Gesamthochsch Kassel, 1978), pp. 57-77. (in German)
- ¹⁶ Ortiz, *The Art of Shaping the Metropolis*.
- ¹⁷ R. T. T. Forman, *Land Mosaics, the Ecology of Landscapes and Regions* (Cambridge, UK: Cambridge University Press, 1995).

ADDITIONAL REFERENCES

- Asada, T., Vu Than C., "A Case Study on the Effects of Vegetation on the Climate in the Urban Area," in Breuste J., Feldmann H., and Uhlmann O., eds., *Urban Ecology* (Berlin: Springer Verlag, 1998), pp. 78-81.
- Callau, S. and Montasell, J., "The Baix Llobregat Agricultural Park (Barcelona): An Instrument for Preserving, Developing and Managing a Periurban Agricultural Area" in V. Dewaelheyns and H. Gulinck, eds., *Rurality Near the City* (Proceedings of the International Conference held in Leuven, Belgium, 7-8 February 2008).
- Contin, A., *Questo: Metropolitan Architecture* (Maggioli Editore,, Santarcangelo di Romagna (RM), 2015).
- Contin, A., Chiesa, A., and Patelli, P., "Refracted Cairo: Mapping Change on the Move, from Within," *The Electronic Journal of Communication (La Revue Electronique de Communication)* 24 (1 & 2, 2014) (Available at: <http://www.cios.org/www/ejc/v24n12toc.htm>; retrieved in 2015).
- Contin, A., and Ortiz P., "Dar smart the city territory. towards a new dimension" (Proceedings AESOP 26th Annual Congress, Metu, Ankara, 11-15 July 2012).
- Diamond, J., "The Island Dilemma: Lessons of Modern Biogeography for the Design of Natural Preserves," *Biological Conservation* 7 (1975):129-46.
- Geddes, P., *Città in evoluzione* (Il Saggiatore, Milano, 1970, Ed.It, 1915). (in Italian)
- Shane, David G., *Recombinant Urbanism: Conceptual Modeling in Architecture, Urban Design and City Theory* (London: Wiley & Sons, 2005).

Comment

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Urbanization is one of the most defining phenomenon of the changes in the global development arena. The increase in migration flows in the 20th and 21st centuries helps us to understand the dynamics of urbanization. Each day thousands of migrants arrive in cities around the world looking for opportunities for a better life. The movement of people from rural areas to cities is widespread and has a tremendous impact on the way people live and work. Cities have improved many people's lives but have also created huge problems such as congestion, crime, and environmental degradation. The footprints of cities are much extend far beyond their city boundaries. As urbanization accelerates and cities in a number of developing countries are growing the fastest, the challenges for sustainable development mount commensurately. Governments and societies face the urgent challenge of changing current urban development patterns. The adoption of sustainable development goals and the call for sustainably transforming our world, during the UN Summit in September 2015 is the testimony for action towards sustainable development.

It is very clear that we cannot continue doing things in the same way as we did over the past five or six decades, when cities are experiencing such explosive growth, particularly in developing countries. Within a period of 10 years, Beijing expanded its population outside the core districts by 99 per cent, Rio de Janeiro by 95 per cent, and Delhi by 90 per cent. Such rapid urban changes have never been experienced before in human history. Built-up land areas are growing even faster than population. Car ownership is growing faster than road network expansion. Cities sprawl well beyond the reach of pedestrian distance. Suburbanization and decentralized development preclude the efficient operations of public transport systems. Many new towns or newly-large neighbourhoods turn into "ghost cities" because they are out of economic reach of residents for their work and daily life. Cities become disconnected and continuously encroach upon green open spaces.

What are the potential solutions ahead? The article by A. Contin, P. B. Ortiz, and A. Zammataro entitled, "Towards a Metropolitan Approach for the Definition of a Network of Intermediate Cities" is one of the efforts to explore the methods to promote sustainable urban development. It argues

that the conflict between the economic, environmental, and social spheres in urban development can be solved if we treat urban and rural areas as elements of a complete system rather than isolated dimensions. Therefore, it calls for a systemic approach to urban and rural development and their articulation in an organic framework. The sustainability of modern cities can be achieved only by transforming the paratactic syntax into a hypotactic one, that is to say a set of relations interweaving several levels of trans-scalarity and multi-sectorality. In other words, the city's functions and land uses should be organically organized in an integrated natural and built system. In such a wider integrated system, the relationship between cities and rural areas is built according to principles which recognize the long-term and sustainable future of the city's wider area and beyond. It emphasizes the correct scale and connections among the different parts of an integrated system. That is, to examine the city at the metropolitan scale, as well as from the perspectives of the ecological productive/reproductive capacity and the transport system to allow the interaction of different areas in different ways, through human intervention of protection, re-naturalization, and reconnection. This creates a real ecosystem infrastructure, which delivers ecological services, i.e. benefits provided by an ecosystem while overcoming the separation between goods and services typical of economic practice. The article calls for a metropolitan development strategy from an ecosystem perspective or approach, to manage land, water, and natural resources in a way that promotes conservation and sustainable and equitable use.

Based on the ecosystem approach, the article proposes a new type of human settlements development model which encourages a closer relationship between city and the rural areas to enhance a network of advanced services and mobility structures within a larger metropolitan area. Rural areas can better serve urban areas with agricultural products, and enjoy urban facilities due to their close proximity. The article uses examples of African cities to emphasize the importance of the agricultural sector to urban development and its natural resources management in developing sustainable urban development patterns. It offers new lifestyles incorporating close urban-rural relationships and linkages promoting smaller-scale living apaces in closer and more walkable neighbourhoods, which can preserve the ecosystem and manage urban population growth and built-up area expansion at a time of declining per capita access to natural resources. This will promote economic growth while minimizing damage to ecosystems.

The article proposes urban development approaches which treat human settlements in an integrated system where there are different scales/sizes of cities and towns distributed according to topology, natural conditions, and technologies which enhance their natural conditions and efficient and sustainable use of natural resources rather than treating cities as separate entities competing against each other. Each city should function as an inter-linked node of this network which incorporates unique values. Human interventions should focus on three types of operations: conservation, transformation, and substitution from a life cycle perspective, i.e., to preserve the ecosystem, to transform the urban development through positive and balanced approaches, and to substitute negative impacts of urban sprawl by emphasizing the middle ground – cities where rural and urban areas' coexistence is guaranteed by means of a functional and spatial interdependency, which makes living smaller and closer possible.

However, as the article points out, agriculture and green spaces in urban and peri-urban areas faces great urbanization pressure for more economically-productive land use. Especially in developing countries where cities and governments are hunger for

investment, governments or market forces often favour large-scale non-agricultural urban development projects. Another obstacle is that private property rights to landownership are weak in many developing countries, private landowners lack the political and legal means and financial incentives to protect their land for agricultural land use or green space retention. Therefore, achieving sustainable urban development requires not only advanced concepts and approaches to preserve the ecosystem, but also it needs to address the financial and legal issues surrounding private landownership and benefits of individuals, investment needs of local governments and cities, the larger development horizons by the central governments, and the welfare and value of the entire society.