

Pablo Torres-Lima, Alfonso Chávez-Muñoz, Gerardo Ávila-Jiménez and Sergio Contreras-Prado

## **Urban agriculture as a part of a sustainable metropolitan development program: A case study in Mexico City**

---

### **Warning**

The contents of this site is subject to the French law on intellectual property and is the exclusive property of the publisher.

The works on this site can be accessed and reproduced on paper or digital media, provided that they are strictly used for personal, scientific or educational purposes excluding any commercial exploitation. Reproduction must necessarily mention the editor, the journal name, the author and the document reference.

Any other reproduction is strictly forbidden without permission of the publisher, except in cases provided by legislation in force in France.

**revues.org**

Revues.org is a platform for journals in the humanites and social sciences run by the CLEO, Centre for open electronic publishing (CNRS, EHESS, UP, UAPV).

---

### Electronic reference

Pablo Torres-Lima, Alfonso Chávez-Muñoz, Gerardo Ávila-Jiménez and Sergio Contreras-Prado, « Urban agriculture as a part of a sustainable metropolitan development program: A case study in Mexico City », *Field Actions Science Reports* [Online], Special Issue 1 | 2010, Online since 20 November 2010, Connection on 10 October 2012. URL : <http://factsreports.revues.org/573>

Publisher: Institut Veolia Environnement

<http://factsreports.revues.org>

<http://www.revues.org>

Document available online on: <http://factsreports.revues.org/573>

This document is a facsimile of the print edition.

Creative Commons Attribution 3.0 License

## Urban Agriculture as a Part of a Sustainable Metropolitan Development Program. A Case Study in Mexico City.

Pablo Torres-Lima<sup>1</sup>, Alfonso Chávez-Muñoz<sup>2</sup>, Gerardo Ávila-Jiménez<sup>2</sup>, and Sergio Contreras-Prado<sup>2</sup>

<sup>1</sup>Ph.D., Professor, Department of Agricultural and Animal Production,  
Universidad Autónoma Metropolitana, Mexico. Visiting Scholar, Global Environment Program,  
Watson Institute for International Studies, Brown University, USA

<sup>2</sup>Ms.Sc., Adjunct Researchers, University Program for Metropolitan Studies,  
Universidad Autónoma Metropolitana, Mexico

**Abstract.** Planning land use processes are indispensable for designing policies and activities in peri-urban areas, above all because of the impact of the conversion of agricultural land for urban purposes and the possibility of reducing poverty and assuring the food supply. In Latin America, there are a limited number of studies which discuss institutional involvement and proposals for participative and multi-sector planning with the aim of generating viable conditions for urban agriculture in megacities, within the framework of sustainable development. This article analyzes the principal components of a planning process which promotes the development of agricultural production zones in Xochimilco-Tlahuac, Mexico City. The experience was conceptualized in 2008 with the integration of data obtained through fieldwork, interviews, ethnographic techniques and geomatics, in order to intervene in policies and strategic activities. The positive aspect of this work includes promoting the idea that it is critical to support urban agriculture, by district or metropolitan authorities, in order to address various issues on the city's development agenda, from the perspective of strategic planning and the practice of their implementation. We conclude that it is also necessary to re-assess the aspect of socio-territorial organization in the study region, in order to achieve an integrated, habitable and sustainable city by organizing agricultural activities in the rural areas of Mexico City.

**Keywords.** Urban agriculture, metropolitan, sustainable development, urban planning, Mexico City.

### 1 Introduction

As part of new tendencies at the international level to analyze the potential for food production in cities and explore the implications inherent in programs and policies concerning land use, as well as the management of natural resources and changes in the rural landscape of mega-cities (Howe, 2003), the possibility for reducing urban pressure on strictly rural areas by the design and application of territorial planning in metropolitan zones has been conceived (Paul and Tonts, 2005). As a result, within the multitude of varied planning and policy problems for peri-urban areas, agriculture has been a constant issue in these types of studies, particularly because of the impact resulting from the conversion of agricultural land into urban areas, as well as the possibility of reducing

poverty and assuring food supply (Thornton, 2008). Lately, there have been numerous attempts at using the results of the Latino American urban agriculture studies in the practice of strategic planning. However, along with useful ideas and procedures, the processes of territorial planning often have borrowed some methods of strategic planning from corporations with their characteristic terminology. Moreover, the lacks of actors and civil society's participation and of multi-sectorial methodologies design have caused many errors in estimating the opportunities and identifying the advantages and disadvantages of urban strategic planning, including the formulation of successful policies (Treminio, 2004). Particularly, in Latin America, policies and strategies potentiating urban and peri-urban agriculture as an aid to assuring a secure food supply are lacking, especially at a municipal level.

Due to the understanding of the importance, nature and food security implications of urban agriculture is plagued by a lack of good quality and reliable data and since studies for several major cities are based on evidence which is still

qualitative if not anecdotal, by using a recently created dataset bringing together comparable, nationally representative household survey data for 15 developing or transition countries, Zezza and Tasciotti (2010) analyzed in a comparative international perspective the importance of urban agriculture for the urban poor and food insecure. They concluded that the evidence presented seems strong enough to urge urban planners and policymakers to think twice before taking drastic action against urban agriculture, despite the fact that it is well known from the literature that every city as a case study is different in the characteristics of its urban agriculture, and that even different neighborhoods in the same city might require different approaches. Since there is an evident lack of institutional involvement and methodologies for participative and multi sector planning, for generating viable and sustainable conditions for this type of agriculture, concerning both assisted projects as well as in self-managed situations, with the aim of establishing urban sustainability (Redwood, 2009), urban agriculture is worthy of appropriate institutional recognition and direct public policy support towards its integration into urban planning and development goals (Drechsel and Dongus, 2010).

In the world literature, there are very few descriptions of procedures for food and ornate plant production in megacities with historic antecedents and on a broad scale in terms of intra and peri-urban agricultural development, such as that found in Mexico City. Similarly, ignorance prevails concerning the systematic tasks necessary for designing and applying institutional operative policies, including the analysis of future scenarios which will result from current activities in the rural intra urban areas (Steinberg, 2005). There are also only a limited number of studies focusing on the implementation of strategic planning processes for the development of urban agriculture in terms of territorial organization, where public and private initiatives are synergically articulated for the city. In the light of this panorama of scarce public information and within the framework of the insecurity of the world food supply and also in the light of the general economic crisis, it is necessary to identify proposals for institutional orientation in terms of planning aims and strategies for the sustainable development of cities and appropriate types of urban agriculture.

Many Mexican cities have turned to the experience of strategic planning, which has included the restructuring of production due to problems in transport, the engineering infrastructure, and in the sphere of services. In these experiences has been common to see the city as a point of economic growth, whose development would allow economic impulses to spread to the surrounding territories. In some cases, authors have analyzed the Mexican development strategy without consideration of the environmental crisis (Moreno-Brid et al., 2009). The neglect of this issue by researchers and practitioners affects not only the agenda of social and territorial programs but also the orientation of economic policies that have become increasingly essential if Mexico needs to achieve rapid and sustainable economic growth along with a substantial reduction of poverty.

Mexico City is one of the biggest urban centers in the world. This megalopolis includes within its metropolitan

area, the Federal District with 16 districts, as a central nucleus, along with 59 surrounding municipalities. Today, the Federal District currently suffers from many problems related to environmental sustainability. The policy for integrating criteria to be included in public policy and strategic activities for the conservation of the resources of land, water, and air, as well as maintaining positive environmental influences, required by the Mexican capital are issues which have been taken into account in the General Development program for the Development of the Federal District 2007-2012 (PGDDF). The strategic axis which concerns environmental sustainability in development is particularly concerned with establishing criteria for public policy oriented towards the conservation of those spaces, which in spite of enjoying judicial status ensuring their ecological protection have experienced very strong pressure from urban expansion. One of the areas of greater cultural and environmental significance is situated in the south east of the Valley of Mexico, occupying the last lake area of the Xochimilco-Chalco system. Since the 1980's, this zone has been the object of an intense process of urbanization, with consequent degradation of natural resources and of agricultural and livestock activities.

The aims of this work are firstly to *show* that it is critical to support urban agriculture, by district or metropolitan authorities, in order to address various issues on the Mexico City's development agenda, from the perspective of strategic planning and the practice of their implementation. Secondly, to document the principal components of a planning process that promotes the development of zones for agricultural production in Xochimilco-Tlahuac. Thirdly, the case of policy interventions and strategic actions facilitating local development of urban agriculture are presented, guaranteeing certain quality of life for the population, as well as maintaining natural resources and rural landscapes.

## 2 The study area and the context for an urban agricultural program

Currently, 0.3% of the population of the Federal District is considered rural; that is 30,366 inhabitants located in 450 rural localities. Xochimilco and Tlahuac consist of 64.6 per cent of rural localities and 17,006 people reside here (INEGI, 2005). Even if this is a small percentage compared with the total population of the Federal District, this population suffers from social exclusion, evident in indicators of well being, as well as in social and human aspects, which rate below the average for city inhabitants. However, historically, the farmers have built up social capital to mitigate the negative impacts of urbanization and also employ a strategy offer a broad range of ways to adapt agriculture as well as other unrelated matters. These include a tendency to continue growing both traditional crops as well as introducing strictly commercial crops, and they overcome the limited opportunities for breaking into the wider market by processing foodstuffs to create added value. Farmers in these sub-urban rural areas have also adapted by taking advantage of emerging local market centers, as well as urban infrastructure, transportation, health, education, and communications, all of which create new employment opportunities and

typical urban demand for goods and services (Torres-Lima and Rodríguez-Sánchez, 2008).

The megalopolis of Mexico City still coexists with a zone of chinampas<sup>1</sup> and wetlands covering nearly seven thousand hectares, which are the relic of the ancient freshwater lake agricultural system of Xochimilco-Chalco. Xochimilco-Tlahuac make up an area of 220 Km<sup>2</sup>, which represents 14.6% of the total Federal District area. The lake plain of Xochimilco-Tlahuac is located at an average altitude of 2,240 msnm, on land that was originally lake bed which acts as the main recipient for water from tributary sub basins, consisting of a total run off area of 277.8 km<sup>2</sup>, and it represents 17% of the conservation land area of the Federal District, which consists of 86,774 hectares, or 58% of the total land area. The districts of Xochimilco-Tlahuac still represent the most important agriculturally productive zones and gardens growing vegetables and ornate plants, in the Federal District (i.e. 17,600 tons of flowers and 3,635,000 potted plants) and their continued existence is narrowly linked to the system of traditional values and social representations conceptualized by the farmers, with reference to earth and water (Torres-Lima and Rodríguez-Sánchez, 2008).

Owing to the process of urban expansion which Mexico City has experienced from the 1980's onwards, huge conservation areas were settled, in particular in the southern basin of the Valley of Mexico. In 2008, with the aim of slowing down and reverting these processes of degradation in the area of the chinampas and wetlands of Xochimilco-Tlahuac, the government of the Federal District organized a meeting for various social representatives, academics and institutions, with the aim of designing criteria towards a strategy of sustainable development. As a result of the joint diagnosis of the region, an integral program was implemented permitting the formulation of criteria for policies orienting human settlements and agro-productive activities in the conservation area, with the aim of promoting sustainable urban development in the city. The Program for Sustainable Development in the Integral Metropolitan Zone (PDZIMS) was created within a methodological scheme for territorial organization which would permit the preservation of the environment and its natural resources for the benefit of the population. In particular, our planning experience consisted in defining a part of this program in order to promote the development of the agricultural production zones which are situated in Xochimilco-Tlahuac, as a strategy for ensuring the environmental viability of the Federal District. This planning project has the aim to: control urban settlements; ensure rational and sustainable use of resources; protect agriculture, fishing and forestry activities, as well as prioritizing the containment of urban growth; along

with the maintenance of environmental services that the peri-urban zones provide for the rest of the city.

In the planning process specifically designed for Xochimilco (where the production of flowers, ornamental plants and vegetables takes place) and Tlahuac (which grows vegetables, maize and amaranto), the importance of these geographical spaces and their natural resources refers to the following considerations: it represents a territorial generator of environmental services and provides agricultural products for the population which inhabits the Federal District and the metropolitan zone of Mexico City; it includes basic elements for maintaining water cycles and nutrients, for stabilizing soils, permitting CO<sub>2</sub> capture, as well as the retention of dust particles resulting from contamination; it also registers one of the richest and most important reserves of endemic plant species in the country; constitutes a basis for the development of the original lake villages; and represents a historically relevant space for local, national and international tourism. In this sense and facing the lack of returns from agricultural activities, this experience reestablishes the criteria for public policy which contemplates the articulation of agricultural activities for ecotourism, commercialization of rural products; restoration and environmental conservation of the chinampas; payment for environmental services; and surveillance and active social participation on the part of the local population, through the formation of organizations integrating citizen participation.

### 3 Civil society actors and planning process

In this experience, we assumed that planning implies making representations of future states and investigating actions that will bring the organization of Mexico City's space from the present state into the future state. Similarly, we recognized that the authority, values and reference frames of urban planning experts are increasingly put into question. Therefore, during the planning process the main question involved not only a process of territorializing public policies and potential actions; it also involved the redefinition of ways of mobilizing horizontal relations between different groups of actors in Xochimilco-Tlahuac. In order to act within this context, we focused on the forms of collective action in a local context. This actor's participation derives from a complex dynamics of actions and territorial organizations, in which power relations and conflicts of interest guide the behaviors of a great diversity of local actors that emerge as a function of the various situations.

According to some views, urban planning is nothing more than a strategic act of fluid negotiation, disintegrated and sporadic, the product of compromises between different influences. However, if urban planning cannot be defined as a technique, it is certainly more than a procedure of conciliation that regulates the agreements and conflicts of the protagonists of territorial organization. In this context, in Xochimilco-Tlahuac there is a great diversity of forms of participation in 'city government', which have different levels of impact and visibility, as well as different fields of action. The "regional system of action" is present across almost all sectors of intervention. At the social level, there

---

<sup>1</sup> Palerm (1972) defines the origin of the word "Chinampa" as derived from the Nahuatl Word chinamitl: "a cane enclosure". Ancient Meso-american agricultural method which consists of small rectangular areas of fertile soil extracted from the mud at the lake bottom in order to cultivate flowers and vegetables at the lake surface and in the superficial ponds of the Valley of Mexico. In 1987, the UNESCO enrolled the chinampa system of Xochimilco and Tlahuac in the list of "World Cultural and Natural Heritage Sites", because of their exceptional and universal character which should be preserved for the benefit of mankind.

are local committees for the monitoring of the guaranteed minimum income, committees for the protection of the environmental conditions, local education councils, social networks, and so on. At the economic level, there are different entrepreneurial associations, agricultural associations, trade associations, farmers' and tourist's associations, etc.

Despite the proliferation of forms of associations of interests, the starting point of the planning process was the recognition of their differences, the heterogeneity of their projects and the existence of contradictory interests. We tried to clarify the forms of constructing collective action, the roles of the different actors, and particularly the role of the public agent. In other words, we started from the premise that the 'social significance' of living regionally together is only recognizable through the analysis of specific processes, and this demanded a strong involvement from researchers. Since new forms of participation in Mexico City potentially emerge as ways of expanding participatory democracy, there are new forms of structuring diverse interests that have been set in motion through concrete processes of participatory planning, at municipal and regional level.

During the 2008, we focused on the practical experience of accompanying different levels of this strategic planning process. The data used are based on different structures of participation: neighborhood committees, local development associations, cultural and recreational collectivities, environmental associations, social, religious and business associations, and so on. An intensive fieldwork was carried out in the two agricultural production zones which are situated in Xochimilco-Tlahuac districts of Mexico City. In the planning process, a variety of qualitative sources were drawn upon. These included over 15 focus groups and ten community meetings at which the current status and the future of the peri-urban agriculture were discussed by all the attendants. A yearlong ethnographic fieldwork was also conducted including a combination of unstructured and semi-structured events lasting 1 and 3 hours, conducted at the homes or fields of farmers discussing local actions and urban and farming changes in the two periurban districts.

Particularly, there were four meetings with the executive committee of the government of the Federal District and city planning bodies in order to evaluate the progress of this planning exercise. A special impact on the process of planning was made by this participation, the main Mexico City body of power and control. Since many of the urban planning policies for urban ecosystems and regional production systems in Mexico City have taken the form of regulations, which have been carried out on a sectoral basis with no governmental or social coordination, this approach has heavily complicated the long-term planning of agricultural production zones development. Therefore, attention had to be paid to the fact that the decisions of administrations, in particular, of local administrations, influence something that is more than the regional or local livelihood. They act on the life of people as administrators and providers in supplying commodities and/or services for the satisfaction of public needs, such as housing, education, nutrition, health care, etc. In this sense, the role of practitioners should reflect on the question of how the ideas, concepts, objectives, and tasks of existing strategies

can be applied in operational management and how much the strategic plans are viable in a rapidly changing economic, social, and institutional environment, such as is occurring in Mexico City.

#### **4 Metropolitan contexts and policies for urban agriculture in Mexico City**

According to the recent urban tendencies in the metropolitan zone of Mexico City, a number of problems and barriers for the development of urban agriculture are foreseen, caused specifically by the type of urbanization and housing development taking place in the region. In spite of the judicial status of this zone, as a natural protected area, radical changes in land use are sure to take place. The urban areas and anthropic activities will expand and with this there will be a significant reduction in primary vegetation, which is important for rain water capture and sustaining the existing biodiversity. The diversity of species in the region will be seriously threatened. On the other hand, speculation will intensify involving the real estate of ejido lands and chinampa areas, with a view to urbanization and the creation of irregular human settlements. It appears that the hydrological conditions of the lake system will continue to be maintained artificially, by refilling with treated water from treatment plants. The levels of the water surface will continue to decrease, owing to an increase in cracks and fractures caused by the continued extraction of subterranean water. In addition to this, productive farming activities are experiencing greater economic losses from traditional crops; producers will thus be forced to eliminate environmental care in favor of business improvements; and urban tourism will become a greater threat for ecosystems and agriculturally productive areas, favoring urban populations over environmental considerations such as factors of scenic and natural importance. These and other human activities generate significant problems in terms of the loss and alteration of biological diversity, water contamination, deforestation, soil erosion and changes in the hydrological balance of the basin of the Valley of Mexico.

In this sense, the principal scenarios and problems of urban agriculture in the study area of Xochimilco-Tlahuac are associated with processes linked to rural production itself and the flow of inputs and agricultural products within the region, owing to: 1) Rupture of the agro-ecological equilibrium of systems of production linked to chinampas; 2) Rupture of the networks of exchange and economic cooperation, owing to the differential between urban and rural income; 3) Low level of social and human capital for the development of market activities, outside the Federal District which has better price conditions; 4) High cost of inputs and poor local technological development for producing these; 5) Poor development of agro-industrial capacities and for recycling of waste products; 6) Scarce integration of tourism and educational activities within agricultural production and a weak focus on cultural and ecological conservation; and 7) Lack of a system of technological-scientific support of broad coverage, permitting the promotion of models of sustainable organic production or those environmentally compatible with the surrounding wetlands.

The institutional policies which support urban agriculture in Xochimilco-Tlahuac were combined since the 2000 year, when they were published in the General Program for Ecological Organization in the Federal District; the judicial regulating body for the zone. In 2004, a management plan was published for this region, declared as a natural protected area. Besides this, a Program was created called Funds for Environmental Conservation and Rural Development as well as the Integrated Program for employment aimed at environmental conservation and the efficient use of natural resources and promoting agro-ecological activities for the entire Federal District. Also in 2004, environmental regulations were published establishing the conditions for ecological agriculture. In 2005, the Program for agricultural production free from agro chemicals and transgenic was published, as well as the program for urban development in Xochimilco-Tlahuac. In 2008, the Law for Sustainable Rural Development in the Federal District was published, where the Ministry for Rural Development and Equity for the Federal District Communities is deemed responsible for implementing a policy of government support for the promotion of back yard agriculture and ecotourism. In our analysis, we found that the concepts of complex strategic social and economic development of Mexico City are often treated as static documents, that are adopted once and for all and which do not require constant work for their renewal, supplementation, clarification and correction.

We think that all this assumes a new policy of institutional coordination for land conservation in the Federal District which has to have the following priorities: 1) To reactivate local economies by revitalizing the commercial network for agricultural products, services and inputs, with a regional emphasis; 2) To develop programs which permit the internalization of environmental costs; this implies payment for environmental services; and 3) To invest in infrastructure projects for water and land conservation (dams and reservoirs for capturing water; pumps using renewable energy; mechanized centers for producing compost from solid urban wastes; artificial wetlands and low cost water treatment plants). "Structured" projects should be designed as planning strategies, capable of coordinating institutional intervention. These consist of: 1. Activities for reversing the hydro-geological deterioration of the wetland and chinampa zone; 2. Considering Xochimilco-Tlahuac as a cultural landscape relic and conserving the surroundings by means of projects designed for the rescue, conservation and promotion of ecotourism in the chinampa and wetland zone; 3. Rescuing the chinampa zone by promoting and supporting agricultural production with limited ecological impact and with increased profits; 4. Improving the urban structure to permit greater mobility of citizens by improving connections with the rest of the city; 5. Reversing the impacts caused by irregular settlement, by generating conditions for appropriate popular housing and urban improvement; and 7. Establishing a system of geographical information relating to the zone, which will permit increased efficiency in the public administration of the Federal District Government concerning area management and in terms of planning methods for decision making concerning public policy implementation for regional urban agriculture.

## 5 Planning strategies and projects for the development of urban agriculture

As a part of this planning process, we perceived that a new way of understanding rural areas of the Federal District should emerge, as public policy. For instance, the accelerated changes in the area should be characterized by the construction and rehabilitation of water reserves and canal systems as a substantive part of the strategy for the re-establishment of agriculture. The urban part of the zone will gradually organize itself according to its extended capacity for providing networks of public services. The articulation of combined schemes supporting rural development in the Federal District will permit the producers to gradually increase their capacities and current levels of production. Payment for environmental services will help promote initiatives for innovating technology and for supporting productive processes. The potential for eco-agro-tourism will permit the generation of an important social product having impact on local, as well as national and international tourism, thus increasing the possibility of added value offering high quality and standards in terms of tourist services.

Based on this, and as a result of the planning process conducted, the principal objectives for urban agricultural development in Xochimilco-Tlahuac within Mexico City should be: 1) To rescue and conserve natural resources of the area, making sustainable use of the productive tendency of the land and the ecological functions of the natural resources; 2) To recover the conservation area by totally eliminating physical spatial expansion and growth of human settlements; 3) To control the process of occupation of the land and to protect and increase areas for refilling the aquifers, by organizing the zones of human occupation; 4) To rescue regional biodiversity, by applying permanent and systematic monitoring, substituting non-native species for local species; 5) To establish integrated programs for managing basins in order to protect natural areas and contribute to the maintenance of soil and water; and 7) To restore the natural presence of the lake system, by the rehabilitating all the canals and chinampa areas (in order to increase infiltration), the capture of rain water for refilling aquifers and augmenting the capacity for residual water treatment, thus increasing the contribution of treated water to the system.

It is hoped that the benefits and impacts from the project for Xochimilco-Tlahuac correspond to three areas of institutional intervention: A) to promote agroecosystems; B) The proposal to recuperate and restore the areas with greatest environmental value; and C) Payment for environmental services and products as a mechanism for compensating the costs of conservation.

The promotion of agroecosystems and the sustainable management of natural resources should be considered as a priority measure, involving owners and users of agricultural production zones in integrated and democratic management of the peri-urban rural area of the Federal District. This is a priority area for the sustainable management of water and biodiversity. Concerning the recuperation of areas with greater environmental value, the sustainable management of water and the lake system of Xochimilco-Tlahuac should be

based on the preservation of the hydrological cycle. Water management implies reversing the trend towards a hydrogeological deficit, in order that the sustainable hydraulics of the lake system should stabilize. Thus it is necessary to support projects which take advantage of rain water, by providing containers for collection of runoff from the upper parts of sub basins in order to channel water into the system, before it reaches the urban zone and disappears into the drainage system. Finally, concerning payment for services and environmental products in order to compensate costs of conservation, this conservation and restoration of the agro-ecosystems of Xochimilco-Tlahuac must be ensured, guaranteeing the continued environmental services for the inhabitants of Mexico City.

## 6 Lessons learned from this planning experience

Urban processes in the Federal District exacerbate the conditions of poverty and unemployment and the lack of basic services (health, education, clean water and water irrigation, housing, electricity, urban infrastructure and management of urban waste and road communications); all these causing problems of contamination, damage to natural resources and loss of biological diversity. In the peri-urban agricultural areas, these social conditions cause problems such as; contamination from waste water, irregular human settlements and alterations in the regional landscape and tourism resources. Thus, the agroecosystems of Xochimilco-Tlahuac offer recognized environmental and social benefits which are important for Mexico City, but whose current use seriously threatens urban sustainability.

However, the project for developing rural productive processes in Xochimilco-Tlahuac, within the framework laid out by the PDZIMS envisages the promotion of new types of citizen participation and organization for agricultural production, based on regional social and human capital and within a robust judicial framework; with the aim of responding as much to the need for local planning for urban agricultural development, as well as for environmental conservation and promotion of economic activities. The objective is to respond to all these planning needs in the area including; the development of the urban area, the conservation of the environment, the promotion of economic activities, the provision and maintenance of services and security of land tenure. The benefit of the project consists in promoting the idea that in terms of planning, urban agriculture should not result in agricultural land becoming part of the regional real estate market and for the benefit of micro basins; there should be investment in infrastructure for environmental projects and production, as well as in long term research and technological development. It is also important to reorient the sense of socio-territorial organization in the area of study, in order to achieve an integrated city, which is habitable and sustainable, by organizing agricultural activities in the rural areas of Mexico City. In the implementation of projects for the development of urban agriculture in Mexico City the availability of an efficient system of governance, providing feedback, is a guarantee for the performance of the decisions made and acquires great importance. This feedback is achieved through

the use of instruments for monitoring and evaluation of the implementation of strategic goals and tasks. Regular monitoring should be carried out rigorously along with the obligatory implementation of projects and measures within the framework of the PGDDF.

The strategic planning for the integral environmental, economic and social development of agricultural production zones in Xochimilco-Tlahuac, Mexico City were strictly seen as instruments for the implementation of coordinated functions, legislatively available to city councils. It was assumed that they would be the basis for managing the districts economy, and would provide the Federal District bodies with the possibility to become aware of a wide circle of problems in the life of Mexico City and of basic sectors of rural production.

In this agricultural urban planning process of preparing the sustainable metropolitan program of social and economic development of Mexico City, a lot of difficulties arose because of insufficient methodical and information support. Statistical data more or less fully presented the state and dynamics of the rural sector of the district economy and environment, and to a lesser degree its social portrait. Many parameters and methods for analysis were borrowed from the planning practice of territorial units of other levels or were developed anew at high cost in terms of efforts and time.

In this experience, the practice of the development of areas of institutional intervention for the environmental, economic and social development of agricultural production zones in Xochimilco-Tlahuac showed that in most cases the Mexico City councils and executive bodies in the person of planning commissions not only should perform through a “sustainable metropolitan development program” the bulk of their works in this most difficult and responsible field of planning activity but actually they should have the possibility to do so. The key problems of the long-term development of rural districts must be decided either by the regional link of the system of local government, or by the planning acts of local stakeholders. At the same time, the share of district planning bodies (which involved also regional centers of political power) should consist of subsidiary work and participation in the development of decisions on items of development of those objects of the Mexico City’s economy. In this sense, city planning bodies must be able to coordinate the district projects in the interests of the Mexico City as a whole, even in sections of the environmental resources and social capital and infrastructure.

## References

- Drechsel, P. and Dongus, S. (2010), "Dynamics and sustainability of urban agriculture: examples from sub-Saharan Africa", *Sustain Sci*, Vol. 5 pp. 69–78.
- Howe, L. (2003), "Growing food in cities: the implications for land-use policy", *Journal of Environmental Policy and Planning*, Vol. 5, No.3, pp. 255-268.
- INEGI (Instituto Nacional de Estadística, Geografía e Informática). (2005), "II Censo de población y vivienda 2005", INEGI, México.
- Moreno-Brid, J., Pardinas, J., and Ros, J. (2009), "Economic development and social policies in Mexico", *Economy and Society*, Vol. 38, No.1, pp. 154-176.
- Palerm, A. (1972), "La base agrícola de la civilización urbana en Mesoamérica", In Palerm, A. and Eric Wolf, E. (eds). *Agricultura y civilización en Mesoamérica*, Mexico, SepSetentas, pp. 65-94.
- Paul, V. and Tonts, M. (2005), "Containing urban sprawl: trends in land use and spatial planning in the metropolitan region of Barcelona", *Journal of Environmental Planning and Management*, Vol. 48, No. 1, pp.7-35.
- Redwood, M. (ed.) (2009). *Agriculture in urban planning: generating livelihoods and food security*. Earthscan and the International Development Research Centre. London. pp.248.
- Steinberg, F. (2005), "Strategic urban planning in Latin America: experiences of building and managing the future". *Habitat International*, Vol. 29, pp. 69-93.
- Thornton, A. (2008), "Beyond the Metropolis: Small Town Case Studies of Urban and Peri-urban Agriculture in South Africa", *Urban Forum*, Vol.19, pp.43–262.
- Torres-Lima, P. y Rodríguez-Sánchez, L. (2008), "Farming dynamics and social capital. A case study in the urban fringe of Mexico City", *Environment, Development and Sustainability*, Vol.10, pp. 193-208.
- Treminio, R. (2004), *Experiencias en agricultura urbana y periurbana en América Latina y el Caribe. Necesidades de políticas e involucramiento institucional*, Oficina Regional para América Latina y el Caribe, FAO, Chile.
- Zeza, A. and Tasciotti, L. (2010), "Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries", *Food Policy*, Vol. 35, pp. 265–273.