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Redefining a sustainable role for Urban Agriculture in the Middle East and North Africa

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Food security in Arab countries is being jeopardized by increasing prices of food and agricultural commodity around the world. Arab countries import at least 50% of the food calorie they consume, (World Bank, 2009) hence their food security will be deeply affected by the fluctuations in agricultural commodity prices. Projections of the region's food balance indicate that dependence on imports will increase by almost 64% over the next twenty years. This is why it is essential to urgently take action to improve food security. Urban agriculture (UA) offers the potential to play a significant role in food security.

Urban Agriculture in the MENA: a long tradition

Agricultural production in and around cities is an ancient activity in the Middle East and North Africa (MENA). It is integral to Mediterranean cultural landscapes and a long standing traditional practice (Nasr, Padilla, 2004). The capital of Yemen, Sana'a, for instance, is characterized by a traditional agricultural heritage. Agriculture evolved in the older part of the historic city which is now a UNESCO world heritage site. The old neighborhoods still contain orchards and vegetable farms (Almaqashim or the mosque gardens) which supply the population with part of the local food needs. The Middle East has one of the highest urbanization rates in the developing world but despite the negative pressures and increasing demand for land and water, crop cultivation and animal husbandry remain common throughout the region's cities. Fertile agricultural areas are still considerable and are expected to remain productive for years to come; they consist an important source of income and job opportunities. At the beginning of the 21st Century, In the MENA, 6% of the population was involved in UA as compared to an average of 2 % for other regions (FAO, 2001). In Lebanon, Arable land constitutes 36 % of total area; more than 70% of the fresh vegetables consumed all year round and all banana plantations are produced on the urban coastal strip of the country and provide income to around 2000 households of the population. Moreover, around 10 thousand hectares of agriculture land in Sana'a is producing more than 40 thousand tons of vegetables and fruits providing income to more than 1000 households (YASAD, 2007).

Nevertheless, UA suffers from poor or lack of recognition from the planners, agriculturists, policy-makers, researchers and even by its practitioners. Until now, some of the most pronounced success of widespread urban agriculture has been in cities and regions where conflict and extreme poverty has defined life such as in Gaza-Palestine and refugee camps (Hoekstra, 2009, 2010). In these places, a need for survival and subsistence has led communities towards UA as a solution to food insecurity. The following sections describe the status of UA in Egypt, one of the most populated countries, however lacking institutional frameworks; and the status of Jordan, one of the poorest countries in the region in water resources where UA is getting recognition and support by the government.

UA in Egypt

Egypt's total population is 82 million and Cairo has a population of 17 million, located in about 6600 km^2. Cairo faces a unique challenge in that it has one of the highest population densities in the world (32,000 people/km2). Egypt has an extremely limited area of arable land relative to the size of the country and depends highly on food import. Only about 3.5% of the country's area can be used for agriculture. Almost half of the population is considered poor and lacks the purchasing power to adequate food. The major agricultural practice is small-scale animal husbandry. With little green space in the city, animal husbandry has played a larger role in urban farming in Cairo; an estimated 16% of families raise animals, though 95% of that production is for home consumption (Gertel, Samir 2000). Most of the fruits and vegetables are produced in rural areas at low prices. Crop production in the city is confined more to peri-urban areas, where agricultural areas have been incorporated into the city. Informal settlements are also typically where this practice occurs at high levels; sheep and pig raising is also common, though pig raising in the Christian Coptic community has decreased since the mass slaughter of pigs during the 2009 swine flu epidemic. The Ministry of Health has offices in every district of Cairo.

The representatives consider animal husbandry inside the city a health hazard and a source of pollution and usually stop the activities and fine the person responsible (ibid).

The primary water source has been groundwater, a costly source, but low cost irrigation canals have been buried beneath development and wastewater is illegal to use. Large producers are moving their production to desert areas, but the small-scale urban farmers do not have this luxury. The practice of farmers' cooperatives has been increasing, though they remain marginal factions and have little access to capital, resources, inputs, services and markets thus depriving them of income generation and employment opportunities and their ability to contribute to food security. There is increased need for facilities, support in the production chain, and connections with credit institutions (for example the Ministry of Agricultural and Land Reclamation, its departments for co-operatives, and the Principal Bank for Development and Agricultural Credit). UA is of increasing importance as urban population continues to grow and house a growing number of low-income groups whose access to food continues to be threatened.

The Egyptian government has regard urbanization as a political priority and policy has been in effect since the 1980s to preserve agricultural land by guiding sprawl to desert areas. Nevertheless, much of the arable land has already been developed and due to illegal building as much as half of expansion remains in these areas. (El Naggar and Bedier, 2007). Studies conducted by the FAO demonstrated the general insecurity of these lands, meaning it was located in rented, privately owned or public regions (FAO, 2006). UA, which is a key food source in urban areas, is not recognized as a policy issue. Environmental policy is an issue in Egypt and is receiving increasing attention such as city greening however parks and public gardens are extremely scarce and are located only in low-density high-income areas. Up to now, there are no official policies regarding urban agriculture within Greater Cairo although in 1996 a military order prohibited transforming agricultural land into housing land, however, it excluded land that is located inside cities. Therefore, valuable agricultural land within Greater Cairo can still be illegally transformed and used for housing.

UA in Jordan

Jordan offers an example where governments and communities have successfully addressed urbanization, food security and urban poverty through an approach that focuses on UA. Jordan's total population is 6 million and the city of Amman, the capital of the Kingdom is 2.2 million and is the main urban area. Amman is situated in the Northern part of the Kingdom, covering an area of 1700 km2. The annual average rainfall is 275 mm (but total rainfall varies between 200 and 500 mm depending on the location within Amman). The main sources of water for Amman rain and underground water; these are limited, and humidity is relatively low. Amman lies in a mountainous area, and has mostly fertile soils and suitable for agricultural production. Almost 60% of the land is not constructed and hence available for agriculture in the city of Amman. The total agricultural area in the city of Amman is around 32000 hectares on which 18.4% of total crop production and 19% of total livestock production of the Kingdom is produced (GAM, 2007):

- Peri-urban full-time farmers, who own large areas of land (between 0.5 and 10 hectares), which are used for vegetable production, olive trees and animal production mainly goats and sheep;
- Small scale urban farmers who, often part-time, produce a variety of crops on their home gardens, mainly vegetables (of 200 to 1000 m2 each).

The poverty rate in Amman was 8.5% in 2008 and the unemployment rate 12.7% (Directorate of Statistics, 2010). It is expected that UA will positively affect the standard of living in Amman. Several initiatives have been completed and several more are in progress to foster UA in Amman.

The Multi-stakeholder Policy Formulation and Action Planning in Amman

The environment and sustainable development unit (ESDU), located in Beirut, is the seventh center of the RUAF network serving the MENA region (RUAF is the Resource Centers network on Urban Agriculture and Food Security); ESDU is supporting the integration of urban agriculture in urban policies and planning in the MENA and mainly in Amman since 2007 when it first conducted an exploratory study on UA. ESDU trained a team there by applying participatory methodologies and tools to conduct the study and develop a city strategic agenda (CSA) and establish a multi-stakeholder forum (MSF) aiming at supporting the sustainable development of UA. The study included a review of the existing data and statistics about UA and food

security, a critical review of existing policies and regulations related to UA, an extensive stakeholder analysis, mapping of UA land in the city and of vacant spaces that can be potentially used for agriculture along with a study on gender in selected areas of the city. This program started the Participatory and Multi-stakeholder Policy formulation and Action Planning (MPAP), a process of collaboration between the urban authorities with citizens, farmers, civil organizations, private sector companies and other governmental entities in the preparation, implementation and evaluation of policies and related action plans. This initiative paves the way for coordinated activities of both public and private organizations focused at supporting UA. The main output of a MPAP is the joint development of a CSA on UA - an operational tool designed in a participatory way by the MSF, and includes key issues for UA. The MSF is responsible for the execution of the CSA, allowing for mobilizing relevant technical and in kind support and funding.

The most important challenges identified in the survey are: water scarcity; urban sprawl on agricultural land; high increase in prices of land since 2005 (land rent varies between 130 USD for rain fed land and 390-650 USD for irrigated land); land ownership fragmentation and prohibitive legislation (although the authorities often overlook livestock husbandry in areas of low population density or areas that have been recently added to Greater Amman, it is officially forbidden). The MSF that was established following the completion of the study brings together 28 permanent participants and includes in addition to Greater Amman Municipality, the Ministry of Agriculture and the Ministry of Environment, as well as the Royal Directorate for the Environment, the University of Jordan and a number of Civil Society organizations. In addition three working groups were formed: the media, the technical and the legal work group. Finally, a policy narrative (situation analysis) was elaborated to serve as a basis for the development of the city strategic agenda for the mentioned work groups. The CSA identified strategic lines of action: access to reliable and cost effective water resources; human resources which aimed at education, skill building and support through necessary inputs; legislation from local, regional and national governmental institutions; effective marketing; and access to credit as well as support and advice regarding credit.

The efforts to identify key action points culminated in the municipality of Greater Amman taking the initiative to establish a specialized UA bureau with dedicated human and financial resources, which gives solid sustainability and institutionalization prospects for the Agenda. The GAM and other interested and influential stakeholders adopted the CSA as part of the city strategy for developing agriculture in 2009. In parallel, pilot projects were implemented: GAM implemented rooftop gardening in poor neighborhoods and ESDU implemented a pilot project with one local women cooperative to improve the production chain of selected produce. This institutionalization of UA through the MPAP and the MSF has had dramatic success. The UA bureau at GAM and the Amman Institute have worked diligently to include UA as a major component of greening initiatives in the city and rezoning initiatives. It has also included UA as two points to a fourteen-point policy initiative to allow the city to capitalize on CO2 credits in the global market. The initiative, dubbed Amman Green Growth, mark a major shift in the outlook of urbanization in Amman and Jordan as a whole. It also marks significant progress in bringing UA to table as a major policy point.

Conclusion

UA, although a tradition, is still playing a crucial role in MENA yet no concrete action is being taken to promote it; the situation in Cairo is one of the most complex due to high population and density and there remains a great deal of government action that could be undertaken to improve UA; alternatively, MENA does not offer examples where governments and communities have successfully addressed urbanization and food security through an approach that focuses on UA; Jordan is a good example where UA has been institutionalized through the municipality.

In conclusion, research, extension, resources, suitable policies and strategies pertaining to existing urban agricultural lands and other urban fertile areas are insufficient. Consequently, the absence of attempts to address these needs means an increasing abandonment of existing urban agricultural lands and moreover, avoidance of adding new lands that are out of cultivation, which hinders food security and resilience in the region. Legislation that supports nascent UA organizations and their entrepreneurial activities is much needed as well as immediate restrictions of the re-zoning of agricultural land for non-agricultural use and the development of informal housing in or near agricultural areas. Facilitating integration of urban agriculture in urban policies and programs, building capacity among local authorities and other local stakeholders and facilitating multi-stakeholder policy making and action planning will find solutions.

The experience in Amman of the MPAP and MSF has proven effective in finding solutions that meet the varied needs of involved parties in the community. The level of awareness and the knowledge regarding the concept of UA has increased through this approach. Consequently, UA has increasingly become integrated in the development strategy of the city; cooperation has been enhanced among institutions and different public authorities especially through the forum and the establishment of working groups who are responsible for the development of projects on the key issues identified in the CSA. Furthermore, the MSF is now serving as a key interlocutor for major donors.

UA has been recognized as a stepping stone for building an asset base and for investments in other activities related to agriculture such as investments in larger projects and businesses but also as a key instrument for development as a source for economic growth and employment and a tool for food security and natural resources management.

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Urban and periurban agricultural issues in Tunisia

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The relationship between town and country is as strong as it is difficult, as are all relationships characterised by interdependence and domination. The periurban environment in Tunisia is the result of a rural crisis in the nineteen-thirties, rural-urban drift, and spectacular urban growth. It is particularly conspicuous in areas around the coastal towns, where it has overrun nearby agricultural land (Belhardi, 1992). These changes have been going on since the seventies and the phenomenon of uncontrolled urbanisation is therefore increasingly apparent, particularly in urban regions, where it threatens the continuing use of the surrounding fertile land for agricultural purposes.

The periurban environment is one of the main areas where agricultural land near cities has undergone transformation. Its expansion raises a number of questions relating to the improvement of the living environment, food security and socio-economic development. The periurban agricultural areas, which have been an important issue in economic and social policy for more than 50 years, are now the subject of a debate on the quality of urban and periurban landscapes. If periurban and intra-urban agriculture is to be developed and incorporated into sustainable development projects, it is first of all necessary to understand the process of change and development these areas have been subjected to. Moreover, it will only maintain its multifunctional role if indeed it is included in sustainable development programmes. Its economic, social and environmental value must therefore be recognised by the appropriate territorial authority. On the basis of representative analyses taken from different situations, this summary account focuses on one possible typology of urban and periurban agriculture (UPA) in Tunisia and on the related territorial issues.

General assessment of urban and periurban agriculture in Tunisia

The UPA is closely linked to the city, which has varying degrees of influence on its development and integration into neighbouring territory, the strategies employed by farmers and also the distribution of primary resources (land, water, manpower and other factors of production). An attempt to classify the Tunisian UPA reveals the existence of two types of food producing UPA: heritage and commercial. Moreover, another non-food producing type of UPA is increasingly found, with good reason, on Tunisian urban and periurban territory. A summary analysis of the existing types of UPA is put forward here.

The heritage food producing UPA is characterised by its community aspect. It is practised in traditional family orchards, like those of Sfax, or in market gardens. It is a family-based form of agriculture which requires temporary manpower, especially during the soil preparation season and at harvest time. Several *senias* are maintained to this day in the intra-urban and periurban areas of Hammamet and Soliman or in Mornag, Mannouba, Oued Ellil, Mornaguia and la Soukra, all of which are in the vicinity of Tunis. Other senias in the immediate periphery of Tunis have been entirely urbanised and transformed into residential areas or industrial and commercial zones (Bouraoui, 2000).

The commercial food-producing UPA tends to be more trade-related. It serves to provide the city with fresh products, some of them highly perishable (the sign of a local product), such as vegetables, which are sold at the side of the road, in the city or at the farm gate. This activity is mainly to be found in periurban areas and small towns in Tunisia. Quality demands are highest in these areas since the consumer lives near the producers of the products (Meddeb, 2009). Moreover, it is necessary to distinguish between the following two types of operation:

- First there is *non-irrigated UPA*, which is practised away from urban centres, in areas that still have a rural character. Its output is limited to cereal and forage crops and fruit from rain-fed trees and shrubs (olive, almond, pistachio, fig, wine grape, etc.). The main crop cultivated in the Tunisian urban and periurban areas is the olive, since it does not require permanent attention like other crops. Whether or not olive growing survives the urbanisation of these areas depends on the strength of the farmer's attachment to his land, the amount of land he owns and the climate conditions, which are very variable in Tunisia and influence the profitability and quality of the product.

- Second, there is *irrigated UPA*, which produces market garden crops and different kinds of fruit (citrus fruit, apricots, peaches, apples, pears, table grapes, pomegranates, plums, medlar, etc.). Today, intensive agriculture is directed exclusively towards vegetable production. It provides the bulk of foodstuffs required for everyday consumption in the region and for inter-regional trade (Houimli, 2008). Recently other sub-categories of this type of food–producing UPA have been developing in central and southern parts of Tunisia, where geothermal energy is used to produce early crops.

Non-food-producing UPA is mainly devoted to urban greening and agrotourism. Green city planning is mainly about improving the environment and the landscape (developing relaxation and leisure areas, improving urban microclimate, increasing biodiversity, establishing green belts, setting up ornamental plant markets, etc.). Enhancement of the urban setting through green city planning does not merely involve planting trees and decorative plants but also promoting urban biodiversity, harmonising built-up areas with natural and semi-natural spaces, and using specialised manpower, notably for urban arboricultural work (Rejeb et al. 2011). A new trend is emerging in the North and South of Tunisia, where farmers in urban and periurban areas are attempting to rely on tourism and recreational activity to maintain agricultural activity and its potential and safeguard its genetic resources.

Urban and periurban agriculture: landscapes and territorial issues

In Tunisia, periurban areas are altered as a result of the rapid changes in land use. The irreversible degradation of soil and plant cover and the deterioration in the quality of the water and the air are factors that amplify the environmental crises. In order to allay the fears raised by the degradation of man's natural environments, it is necessary to identify the stages in the process whereby urban areas lose their natural character by employing new interdisciplinary tools. In this way it should be possible to gain some understanding of how these environments are organised and why they become dysfunctional. It is precisely by adopting a crosscutting approach to the study of country areas where the material, symbolic, cultural and sustainable aspects of places come together that we might make progress in analysing the urban and periurban environments.

As far as the UPA is concerned, we will begin by addressing the changes in the natural or "naturalised" space and in the living environment (in terms of social practices and the way they are manifested). We will also analyse the changes in the organisation of these territories in relation to major socio-economic developments and public planning policies for urban, periurban or rural areas. Study of the relationship between the subjective and objective spheres, ie the way the landscape is perceived and the way the land has actually changed, will provide a basis for considering the role played by the very notion of "landscape" and the way it is used by the authorities. It will also bring to the fore the role played by the demand for quality of life in the organisation of Tunisian territory.

A general review of the Tunisian UPA shows that there are two types of agri-urban relationship whatever the nature of the territory (in terms of proximity or of town-country interrelation):

- The first is based on the *material and market-driven* production of agricultural products, in which farmers use their own technical skills, which are transmitted from one to another. The farmer, endowed with specific skills, has the professional capacity to adapt to different types of urban constraint by choosing to diversify his activity or not to. We should draw attention here to the pluriactivity of farmers (Houimli, 2008), the work done by women (agricultural, handicraft, etc.), the management of microplots (the *Souneys*), animal husbandry and the production of added-value agricultural goods by the farmer. This type of production may, subject to certain conditions (labelling), lend itself to organic agricultural methods (Hammami, 2010). The importance currently attached to production contracts and short distribution channels plays a very significant role in maintaining UPA. However, farmers working in this type of UPA are scattered and they adapt and develop in very different ways, taking advantage of the proximity of the town (Meddeb, 2009).

- The second is based on provision of services, which is integrated into regional development strategies, as it may make the urbanised territories more attractive. In this context the UPA may be used in one of two ways:

  i. *as a way of enhancing the urban landscape.* From this standpoint, agriculture and arboriculture in urban areas simply become the means of reducing the environmental effects of development or greening the environment to bring it into compliance with international standards governing the amount of green space per inhabitant. We then overlook the fact that the UPA landscapes are also cultural references for the inhabitants, as they are for tourists. "Post cards" of idealised, typical landscapes play a part in establishing or maintaining the identity of an urbanised area, as do the numerous palm trees growing up alongside the main highways.

  ii. *as a way of upgrading an area*, in order, for example, to satisfy the aspiration to live in a quality residential district. Numerous trials are being conducted in this area, notably those designed to promote agrotourism. Lastly, we should refer to the pride felt by the farmers in the oasis of Tozeur, who come together around the landscape that constitutes their capital (the palm grove) in order to devise strategies designed to develop agrotourism activities. It would therefore be possible to increase the number of periurban agricultural activities by developing the multifunctionality of agriculture, arranging rural leisure pursuits for tourists and holidaymakers, and by labelling the products of the *terroir*.

Conclusion

Tunisian UPA may be regarded as a multifunctional undertaking, which not only produces food but also provides landscape and environmental services. It is very important that Tunisia, which is becoming increasingly urbanised, develop this type of agriculture (traditional and heritage). It guarantees that

territorial land will be properly managed, relations between town and country will be maintained and maximum benefit will be gained from the urban regional landscape.

It is therefore essential to give due consideration to the landscape and environment – just as it is to find the right architectural forms for buildings and to provide attractive residential conditions – if territorial performance is to be enhanced. The integration of agricultural areas and activities into the landscape to enhance its performance will be the characteristic feature of the Tunisian UPA. Urgent measures are needed to support this area of urban agriculture, including the establishment of a better institutional structure (bringing the urban administrations into closer contact with those responsible for local agriculture). This structure should direct its efforts towards mapping the local agricultural/landscape (to ensure that specific local agricultural features are respected), identifying agricultural and urban jobs, and modernising local sectors by providing them with tools that will enhance their competitiveness by providing for a harmonious mix of the traditional and the modern.

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Multifunctionality of periurban agriculture in Italy

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If we ponder the future of agriculture in the Mediterranean countries, we cannot fail to take account of the areas within and around cities or address the broader issue of urban growth. Cultivated urban and periurban areas have always existed, playing an important role in food production and commerce, and are to be found in all eras and cultures. Evidence of built-up areas existing side-by-side with open spaces is to be found in maps and paintings, dating back to the first half of the 20th century, of large cities such as Rome and Florence.

However, modernity has marginalised these urban and periurban agricultural areas, using them for other purposes or dividing them into smaller and smaller plots, often haphazardly and to the detriment of producers and small villages. Agriculture nevertheless continues to exist with new social functions. In developing countries the agricultural areas just outside cities still have a high productive value, providing subsistence

nourishment for the most fragile urban classes and periurban communities, while in the developed countries they are increasingly associated with new services that highlight the multifunctional nature of agriculture.

Multifunctionality of urban and periurban agriculture

Agriculture is by definition multifunctional, producing food while at the same time ministering to other collective needs (economic, social, environmental, territorial, etc.). The concept of multifunctionality arose in 1992 during the Rio Summit, at the same time as that of sustainable development. The concept has therefore emerged as a reaction to the negative effects of the productivist agricultural system: pollution of resources, food hazards, reduction in biodiversity, desertification of rural areas, etc. We also speak, by extension, of the multifunctionality of territories where agriculture is the main structuring factor and an important source of positive and negative externalities, especially amenities.

In urban and periurban areas, these amenities can be used to develop very fruitful relations between the city and the cultivated areas, where production is associated with other areas of interest to the community: protection of the environment, involvement of marginal groups, promotion of local culture, or provision of leisure and educational activities. In this sense the shift towards multifunctionality in agriculture would appear to offer an opportunity to develop a single sustainable agri-urban area (Pascucci, S. 2007).

Urban vegetable gardens in Italy

Urban agriculture in Italy represents the most concrete and also the oldest expression of this linkage between modern urban life and peasant culture. The visible signs of this link are the urban vegetable gardens, or allotments. These tend to be small areas of land cultivated by the owners in person or by people who rent them. The characteristic features of these urban allotments, where they are not regulated, are the diversity of their shapes and sizes, the use of protective covering materials for fencing, and their location on the outskirts of cities (near riverbanks, railways and arterial roads, or in neglected areas of public and private land). Having accompanied urban development and change since time immemorial, they enable urban horticulturalists to maintain a link with peasant culture which, in the collective imagination, is regarded as the primordial culture.

Vegetable gardens were already to be found in Italian urban areas in the first half of the 19th century. They subsequently existed in towns at the time of urban reconstruction, particularly in the north of Italy. During this period and in the first decades of the following century, the urban vegetable garden phenomenon in all its autonomy and spontaneity coexisted with more organised attempts by industrialists to provide employees with allotments to be managed under "workers' village" schemes.

But urban allotments assumed particular importance with the advent of industrial production in the second half of the 20th century. The large-scale industrialisation of northern Italy between 1959 and 1970 transformed the periurban areas, ie the areas of transition between town and countryside that were destined to be the site of new developments (large industrial facilities, rail infrastructure, airports, cemeteries, etc.) and brought within the urban compass. At the same time these areas were characterised by widespread deterioration and the social isolation typically found in the outermost suburbs of a city. It was here that the tenements to house workers from southern Italy were to be built and here that the phenomenon of urban allotments was to be most highly developed.

The case of Turin is particularly significant. In 1980, for a resident population of 1.1 million, allotments covered a total area of 146 hectares. These figures prompted the municipal authorities to conduct a study on the situation regarding urban allotments – the first of its kind in Italy – as part of a project to reclassify marginal areas of the city and regulate its horticultural space. The project was preceded by a careful analysis of the actual situation on the ground, which revealed that the gardening boom in Turin was the result of immigration from southern Italy. Farmers and shepherds, forced to work in large factories following their move to the north, were endeavouring to maintain links with their original culture by working one of the thousands of small allotments. This work also enabled them to supplement the household's earnings, which meant that the allotment provided immigrants both with a means of asserting their identity and a source of income. It also gave them a hobby and an opportunity to meet other gardeners on a regular basis (Rete Rurale Nazionale).

In the nineteen-eighties, the municipal authorities, recognising the social importance of urban allotments and the need to preserve them where they violated no laws, were prompted to draw up the first regulations on the allocation of horticultural areas to citizens who were interested in working them. Associated with policies to aid the more deprived sections of the community (the elderly, unemployed or handicapped), these

regulations, based as they were on social criteria, spelled the end of the spontaneity of the phenomenon. Under the first Italian regulation on social community allotments, drafted in Modena in 1980, six plots of land in an area unsuitable for development were allocated to retired persons over 55. From then on, many municipal authorities, mainly in the north of Italy, followed suit in an effort to satisfy residents' growing demand for gardening land.

Organic gardens

In a significant number of cases, local authorities and institutions have been mobilised to provide organic vegetable gardens. These plots of land are numerous and are spreading rapidly in a variety of urban areas in Italy. The organic gardens of the city of Ferrara are part of an age-old tradition of crop-growing in this area and the authorities have recently made them available to amateur gardeners and other members of the public by introducing cycle paths and connecting them up to other green spaces in the city. The "Cascina Santa Brera", near the entrance to Milan is experimenting with communal gardens sited on private property, which are worked by numerous families using the same sustainable methods. Those involved normally regard this type of gardening as a cultural or leisure activity, but at the same time it provides a means of maintaining a very high quality environment in a context of substantial urbanisation and expanding infrastructure. There are also dozens of municipalities throughout Italy that that have assigned vegetable plots to young, retired and unemployed people under their social support programmes (Calori, A., 2009).

In the Puglia Region in the south-east of the peninsula, a very interesting and very recent instance of improving the landscape by reorganising land use is to be found in the town of Ostuni. The vegetable gardens on the other side of the city walls, owing to their natural setting and the way they have been developed, provide a typical example of Mediterranean scenery, reflecting until quite recently the strong interaction between man and his environment (ie between people and such natural resources as water, land and stone).

The area of periurban vegetable gardens cuts across the historical centre from North-West to South-East. It is an area whose steep slopes have been tempered by the construction of agricultural terraces, which were still to be seen in the nineteen-eighties. Agricultural activity was divided between horticulture, which was highly profitable and carried out within the walls on the terraced plots, and olive growing, practised outside the walls and along the coast where the land was flatter. Man's perennial exploitation of soil, stone and water, is to be seen in the landscape of enclosing walls, canal networks and reservoirs, as well as in the ancient Roman basins used for collecting rainwater and the square stone plaques dating back to the time of the Messapi (an Italian population who, in the 8th century BC, settled in Messapia, an area corresponding to southern Murgia and Salento). From the 1980s onwards, this activity gradually ceased. The crisis of the functional model was the consequence of the change in the economic structure of the local community, which in turn was due to the development of tertiary activity and provision of services, together with industry and traditional craft. The agricultural sector was fragmented and underwent a serious crisis, which took it away from the rich resources of this territory. The allotment area had been run by horticulturalists, who had seen to its daily upkeep and placed their rigorously geometrical stamp upon it, thereby demonstrating how agricultural activity could help make the landscape more picturesque, to the benefit of the community as a whole. In the 1960s and 1970s, the residents' gradual abandonment of the historical centre of the town for new urban districts went hand in hand with the gradual abandonment of the gardens and the slow degradation of the cultivated terraces. The vegetable gardens remain as a historical record for the local community, reminding them of the charm of the former landscape.

For this reason, the municipal authorities of Ostuni have recently taken steps to recover the land, with the enthusiastic participation of the local community. Volunteers have even come in from abroad to refurbish parts of the vegetable gardens, removing the scrub that has gradually built up, restoring the terraces and giving the job of working them to the students of Ostuni, the object being to make the population aware of the historical and cultural value of the medieval gardens and the need to re-establish them.

The restoration of the periurban vegetable gardens by the students with the collaboration of the Messapia section of *Italia Nostra*, Slow Food's *Condotta Piana degli Ulivi* and the municipality of Ostuni has been judged one of the region's most successful agrarian landscape conservation projects by the Puglia authorities. When the Regional Territorial Landscape Plan (PTPR), was being devised, it was decided that a price should be awarded for *"observing good practice, as laid down in the guidelines of*

the Landscape Plan, in reinterpreting the complexity of land use in periurban and other areas and in realising the potential it offers, recognising that such areas constitute a resource and are not merely ripe for urbanisation; for involving and mobilising new players, namely schools and gardening associations; for upholding the values of personal and local consumption; for setting an example of good practice, which may be applied in other places; and for raising public awareness". With this project, the gardeners who have remained active and still live in the zone have set up the *"Community of Periurban Vegetable Gardeners of Ostuni"*. A brand has been established to promote products from this area of great historical and landscape value and information boards have been produced for the purpose of identifying items of historical interest and guiding visitors to the gardens, where produce is sold directly. As a result of the active steps taken by a few civil society players, the gardens of Ostuni now represent one of Puglia's most important regional projects. Under its policy of improving the urban environment, the region has provided one million euros in funds in order to reclassify this area and restore its terraces by providing of social and educational gardening facilities.

Conclusion

The examples presented here show how urban and periurban agriculture can be made to perform functions of common interest other than that of food production. The activities it gives rise to are often enriched by new forms of social relationship between farmers, citizens and economic operators, who come together in a way of life in which protection of the environment, food safety, and promotion of local culture, as well as the integration of marginalised or deprived sections of the community are matters of fundamental importance. It should be noted that this type of "virtuous circle" represents only a small area of the vast panorama of urban and periurban agriculture.

If we look at the full picture nationwide, a great many Italian suburbs still have small producers who supply urban markets with fruit and vegetables and thus remain highly productive. The challenge we face is that of improving the quality of their produce. In these conditions it is obvious that pollution, mainly that produced by road vehicles, is hindering the effort to increase knowledge, capacity and the responsible behaviour on the part of farmers and thus stands in the way of improving the quality of urban gardens. The future of agriculture and urban growers depends on the ability of the government and local institutions to define and implement effective policies to reduce the effect the citizens' own activity is having on their food supply.

Remerciements

The authors would like to thank Gianfranco Ciola, agronomist and expert in rural development, for his invaluable contribution to this study of the urban vegetable gardens of Ostuni.

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Feeding cities in Algeria: a multidimensional challenge

Mohamed Naïli
Journalist with the Algerian daily El Watan

While it may be regarded as a critical factor in the regulation of the consumer products market, urban and periurban agriculture (UPA) seems to have been given low-priority in Algeria. And yet at the same time we find that UPA is growing in importance throughout the world. At the 5th Research Symposium on Cities and Climate Change, held in Marseille in June 2009, it was noted that "*urban agriculture can play a critical role in helping the world's urban poor by providing a practical solution to the food crisis in the shorter term, and by providing a climate change adaptation mechanism in the longer term*". The FAO estimates that practically all population growth in developing countries over the next two decades will be concentrated in urban areas, and that by 2030 more than 60% of the inhabitants of these countries will be living in cities. The United Nations agency therefore insists on the importance of UPA as a source of food for cities.

In order to gain an adequate grasp of the prospects of the UPA sector in Algeria and the impediments to its development there, it is necessary to examine the subject from two standpoints:

- the state of the cities and the rapid decline of urban agricultural areas;
- the main constraints on supplying cities with agricultural products, despite the strategic nature of market regulation policy.

More rapid conversion of urban and periurban areas

The agricultural policies implemented over the past few years take no account of AUP. Since the National Agricultural Development Plan (NADP) of 2001, no development programme implemented in the agricultural sector has provided for measures to promote this type of agriculture. Over this period, all measures to revitalise agricultural sub-sectors have targeted the sub-sector as a whole without distinguishing between urban or periurban activity on the one hand and rural activity on the other.

The laws promulgated to this end strike UPA from the list of priorities, inasmuch as they contain no regulatory provisions addressing it. This exclusion (or legal vacuum) can be easily ascertained from an examination of two important laws promulgated in recent years: law 16-08 of 3 August 2008 on agricultural orientation and law 03-10 of 15 August 2010 fixing the terms and conditions for the farming of agricultural land on private state property. These two texts make no reference to the promotion or protection of areas where UPA might be developed, nor do the laws governing town and country planning, despite their proliferation.

Quite the contrary: since the beginning of the millennium, the country's cities have embarked upon an impressive process of expansion and are now being completely transformed by the large-scale introduction of public facilities and infrastructure. This urban and financial dynamic has been made possible by the mobilisation of oil revenue (Algeria is a member of the leading oil producers' club, 98% of its export earnings being derived from hydrocarbons).

Urban development has been increasing apace to the detriment of agricultural land, as was highlighted by former minister of agriculture Elyas Mesli in 2007. He spoke of the incessant destruction of agricultural land, pointing out that the area covered by the city of Annaba had increased from 1,200 ha in 1962 to 3,900 ha in 1987 and that the city of Algiers now covered more than 17,000 ha compared with just 7,500 ha in 1970. Another study conducted by the University of Blida showed that agricultural land in the wilaya of Algiers had shrunk by 5,074 hectares (15%) in the space of 16 years, or by an average of 317 ha per year (Saadi, 2008).

Uncontrolled development of the coastal cities

There is no sign at all that this trend is likely to be reversed in the future. At present, 63% of population live in cities, compared with 58% in 1998, and prospective studies carried out to date suggest that the proportion will have risen to 73% by 2020. With 70% of the population concentrated in the coastal regions to the north, which moreover account for less than 10% of the country's total surface area of

2.38 million km² (RGPH, 2008), we must expect strong pressure on the coastal cities to the north of the country in the medium term.

It follows that the areas that ought to be kept for UPA are the first to disappear in the wake of the increasing pressure of urbanisation. Neglect of the practice of UPA is apparent in the laws currently in force that are supposed to provide for urban development and which ascribe no importance at all to this type of activity. Large-scale reforms have nevertheless been underway since the beginning of the millennium, the general object of which has been to incorporate sustainable development strategies into urban policy. This trend is to be seen in, for example, the law on territorial planning and sustainable development of 2001, the law on the protection of the environment in the context of sustainable development of 2002 and the law on new city planning of February 2011.

In concrete terms, demographic growth in urban areas and the ongoing rural-urban drift have caused areas inside cities to become more densely occupied, with the urban green spaces being taken over by the poorest sections of the community. The stifling urban environments presented by Algeria's cities are the outcome of complex processes: the implementation of a policy of urbanisation designed to encourage private initiative has given rise to an almost universal tendency to grab the smallest piece of land for housing projects. Developers have been under no supervision and no obligation to comply with the standards governing rational use of space.

With reference to its negative effects, Professor Ali Hadjiedj has written: "*Urban sprawl has come in for the standard criticism. (…) We know that the figures are much more significant for the Mitidja. Whatever the official land regulations may be, these changes are often brought about by the prospect of an immediate profit to the farmer, equivalent to up to 20 years of income earned from working the land*" (Hadjiedj, 2003).

Supplying the cities with agricultural produce

In the absence of internal production inside the urban area, which could have covered at least some of their requirements, cities obtain all their supplies of fresh produce (fruit and vegetables) from large farms situated in rural areas, while all supplies of processed foods, cereals and dairy products are from imports.

The resulting situation is difficult from many standpoints:

- Agricultural products are considered expensive even at the farm gate, owing to the rising cost of basic materials and inputs (seeds, fertilizer, plant protection products, equipment, etc.), most of which are imported. But by the time they reach the urban centres they will have doubled in price with the addition of further costs for transport, rent, taxes, etc. By way of example, the price of tomatoes may be as high as 100 dinars/Kg in the capital (Algiers) but no more than 50 dinars/Kg in Boufarik (outside Algiers) in the heart of the agricultural region of the Mitidja. This surge in prices, caused by the aforementioned costs, is usually at the root of popular discontent, as in January 2011 when the urban populations revolted against the high cost of living. In order to quell the situation, the public authorities intervene with direct subsidies on the price of essential commodities. For 2011 alone, the government earmarked 300 billion dinars (3 billion euros) to prevent the rise in the price of food products such as sugar, vegetable oil, vegetables and cereals products. These financial allocations, taken from oil revenue, thus enable the public authorities to "buy" social peace.
- When the sources of supplies are a long way from the cities, it cannot be taken for granted that the very popular agricultural products will be available in the market. The problem is particularly apparent in the case of the potato, average consumption of which is 55 kg/inhabitant/year in Algeria. Given that 63% of the population (nearly 22.7 million people) live in urban centres, nearly 1.3 million tonnes of potatoes have to be supplied to them in the course of the year. At times when climate conditions are bad (snow, wind, rain, etc.) or road traffic is disturbed (major road works, events, etc.), the supply chain to the big cities may well be interrupted.
- In the absence of urban and periurban agriculture, the massive recourse to external supply sources has encouraged the rise of an unofficial market, whose scale is increasing throughout the urban world. In addition to depriving the treasury of income (the Trade Ministry estimated that this market was worth 32 billion dinars, or nearly 320 million euros in the whole of 2010), it also helps to tarnish the image of the city, damage the environment and increase insecurity. The emergence of unregulated markets in poorer areas is detrimental to urban waste manage-

ment, since it prevents the municipal cleansing services from operating properly. Urban crime also flourishes in them, creating a climate of insecurity in the cities. Informal trade also presents risks to consumer health as the products on offer are often bad or have not been packaged or stored in accordance with required standards.

Conclusion

In view of the foregoing and, regulation of the market in agricultural goods proves to be essential in the present economic climate, whatever the scale of the resources (notably financial) currently mobilised by the authorities to maintain the fragile market equilibrium. In order to avoid popular protests in the urban centres, the government continues to pursue two objectives: to ensure that products are available and to keep prices at acceptable levels. The government regards these objectives as strategically important, particularly in view of the riots that broke out in cities across the country at the beginning of January 2011 in protest against the cost of living. Since 2008 the market in fresh agricultural products has been regulated by Syrpalac (System of regulation of wide-consumption agricultural products), which involves building up intervention stocks and placing them on the market when production is low.

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Insuring Food Safety and Security: Vertical Farms for Europe and the Middle East

Dr. Dickson Despommier
Emeritus Professor, Columbia University (USA)

Agriculture began some 11,000 years ago in many parts of the world as a soil-based approach to creating sustainable food supplies. For a while, things were looking good, but then climate change and a variety of other problems (mostly political) interfered. Whole civilizations arose and fell by the wayside, as their fledgling agricultural strategies first rose to encouraging levels of productivity, then began to implode. This was because farming had just been invented and we did not have clue as to the biological needs of our recently domesticated crops (corn, wheat, rice, barley). Many of those early civilizations tried to compensate for their hard to sustain farming efforts (diminished annual floods was the most common cause of crop failure in the fertile crescent region of the Middle East) by inventing elaborate irrigation schemes to compensate for the lack of a reliable source of freshwater. When that proved insufficient, they began subjugating newer emerging cultures from the surrounding landscape whose crops had not yet failed. Even that simplistic approach was difficult to maintain, and ultimately the imperial cultures and their empires succumbed to the relentless pressures of time (Diamond, 2005).

While pillaging may have slacked off a bit in this recent millennium, climate change has not (Cohen, 2010), and is as busy as ever, determining where we can and cannot grow things. This makes it

extremely challenging (often impossible), year in and year out, to obtain high yields of crops in many parts of the world (Fereres & al., 2011). Political upheaval, and soil erosion due to severe droughts and floods have eliminated the possibility of farming in many places, while other more fortunate growing regions have continued to flourish for thousands of years. That is until the present. With the advent of the industrial revolution in the early 19th century, the world is now quite a different place from the one that originally gave rise to cultivated fields of grain crops. Again, it is climate change that is the main reason that farming is becoming impossible in areas that used to have stable agriculture-based economies (e.g., China and India) (Parrya & al., 2004).

The year 2011 will go down in the history books of weather as one of the worst, if not the worst, on record for many growing zones. The Midwest of the United States has witnessed its most devastating flood ever, and Europe (Germany, France) has experienced its most destructive drought in 100 years. In Queensland Australia, the worst flood in a hundred years occurred, causing an estimated 6 billion dollars (Australian) in crop and coal losses. The overall economic loss to global agriculture in that same year is staggering (perhaps exceeding $100 billion US), and the price of food, high enough already, will undoubtedly go up even further as the year progresses and demand increases beyond the carrying capacity of today's failing farms. Finally, Along with climate change comes an increase in a wide variety of plant diseases and insect pests that take advantage of these changes, consuming and destroying our crops that would ordinarily escape their notice.

Can traditional farming continue to exist on a global scale to support an ever increasing human population employing methods not dissimilar from those invented until now, or are we now willing and ready to consider moving on to the next phase of our evolution by re-designing growing strategies to take advantage of today's modern high tech greenhouse methods. I am referring to water-conserving hydroponic and aeroponic systems. Taken together, these two approaches can save up to 70% of the freshwater we now use to irrigate our outdoor crops. This leaves a lot more water left over for us to drink. Every human needs at least 2.3 liters of clean, freshwater every day just to stay alive, and many parts of the world are struggling to meet this demand. Some are failing altogether, with tragic results: transmission of lethal diarrheal diseases and even death from lack of safe drinking water. Outdoor farming not only uses up valuable freshwater, in the process it despoils the excess not consumed by the plants by mobilizing fertilizers, herbicides, and pesticides from the surrounding soil. This toxic runoff ends up in our rivers, and eventually into the oceans, where it causes wide-spread disruption of sea life in the estuaries (Halpern, 2008). The more we try to fit the 'square peg' of outdoor farming into the ever-decreasingly small 'round hole' of the changing natural landscape, the results will be even more severe, with huge losses of ecosystem services that will eventually affect each and every one of us on this planet.

I cannot imagine what the world will look like 50 years from today if we do not act now to change the course of human history by scrapping our current farming methods and switch to environmentally friend ones. Indoor farming represents one approach to this solution of this seemingly intractable problem. If taken to the next stage, indoor farming has the promise of providing large populations with fresh produce year round, and at the same time, allows the return of farmland to its original state, mostly hardwood forests. This two-pronged approach would help to bring our global carbon budget back into register with natural process by sequestering huge amounts of carbon back into the cellulose portion of hardwood trees.

Vertical farms (multi-story highly engineered greenhouses) employing hydroponics and aeroponics are a good answer as to how to get more safe and reliable food items to city dwellers (Despommier, 2010). This approach is already being developed in Japan (Nuvege), Korea (Rural Development Agency), in Holland (PlantLab), in England (Manchester), and in the United States (Cevesca Vertical Farm, Seattle, Washington – personal communication). Urban farming in tall buildings means that a country such as Holland can now think about restoring the water budget so that encroachment from the ocean is abated without raising the water table even further by irrigating already saturated soils. I am confident that the rest of Europe will eventually catch on to this concept, as more examples of vertical farms come on line. It is hard to predict just when and where the next vertical farm will arise, but of this I am certain. They will continue to be built, perfecting the technology with each new iteration, so that the rest of the world can benefit from their efforts.

Those living in the Middle East have the same concerns and issues that the rest of the world has with regards to food security and safely. The big difference here is that most of the Middle East lacks enough

sources - water and proper soil types - necessary to sustain a robust agricultural initiative. For that reason, most Arab nations rely heavily on agro-food imports. With droughts and floods the norm throughout most of the food growing countries (Europe, Australia and the United States), the Middle East and North Africa (MENA) will be severely challenged, to say the least. At the same time, people throughout the MENA region will undoubtedly continue their quest for more rights and freedom. At the top of their list of demands are affordable, sustainable essential resources; water, food and energy. Vertical farming offers this entire region a solution to many of these chronic problems, and could eventually lead to a better food sovereignty for many of them that have the resources to afford to do so. It's a matter of re-thinking their situation and then beginning the process of constructing facilities. So far, there are none.

But there is hope on the near horizon. Masdar City, a planned urban community for approximately 40 thousand people, with an expected zero carbon footprint, is being partially financed and hosted by Abu Dhabi. Completion of construction of its main buildings is expected to take place over the next 10 years. A height limit of just five stories will encourage the development of structures that take advantage of that restriction. Their vision of the future city includes multiple versions of vertical farms scattered throughout that built environment. Transportation will be provided by an extensive public network of electric vehicles. No privately owned cars will be permitted, and no fossil fuels will be used for anything. Photovoltaics will rule, as solar energy is abundant all year round in that part of the world. To quote from their own web site: "*Aspiring to be one of the most sustainable cities in the world, approximately 6 km^2 Masdar City is an emerging global clean-technology cluster that places its resident companies in the heart of the global renewable energy and cleantech industry. Situated 17km from downtown Abu Dhabi, Masdar City is a high-density, pedestrian-friendly development where current and future renewable energy and clean technologies are showcased, marketed, researched, developed, tested and implemented. The city, which at full build out will house 40,000 residents and hundreds of businesses, will integrate the full range of renewable energy and sustainability technologies, across a living and working community. As with most dynamic technology clusters, the city has a top-notch research university that is a source for innovation, technologies, R&D and highly skilled graduates. The Masdar Institute, developed in cooperation with the Massachusetts Institute of Technology, is already operating in Masdar City, and its students are the city's first residents. Other major partners include Siemens, which will establish its Middle East headquarters and Centre of Excellence in Building Technologies R&D centre; GE, which will build its first ecomagination Centre; Schneider, which will operate an R&D centre; BASF; the Swiss Village Association; the Korea Technopark Association, and the International Renewable Energy Agency (IRENA)*".

Another example to mention is Egypt. This country has gone through massive re-structuring over just the last six months. Its citizens are bravely embarking on a new urban agricultural initiative that promises to take hold and revitalize the city of Cairo. Roof top crops abound and purification of gray water is encouraged, especially after the recent lethal outbreak of E. coli 0104 was traced back to some fenugreek seeds that came from Cairo. Food insecurity and food safety issues will continue to grab the headlines in the world's news media so long as we continue to conduct "business as usual". We will suffer again and again from these events if this is the case. A solution to this dilemma should emerge from those that have the financial ability to effect long-term changes in the economies of those countries less fortunate, particularly those in sub-Saharan Africa. The G20 countries must encourage the development of any approach that will alleviate these two serious problems with robust government-sponsored research and development grants. In this regard, vertical farming comes up high on my list of things to explore and perfect.

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Interview

Kamal Mouzawak

Founder of Souk el Tayeb, the Lebanese farmers' markets association

Q – Could you outline the different stages in the development of Souk el-Tayeb, an initiative you yourself launched?

Souk el-Tayeb began as a personal initiative, which I launched in 2004. It has now turned into an association whose activities are intended to support small-scale producers and maintain agricultural and culinary traditions in the Lebanese rural world. *Souk el–Tayeb's* vision is reflected in its two essential areas of interest: celebrating food and traditions and encouraging work carried out by farmers in accordance with the principles of sustainable development.

From being a farmers' market, held every Saturday market, *Souk el-Tayeb* has extended its field of activity by, among other things, developing educational activities in schools and organising agricultural and culinary festivals in villages. As part of this activity we have just initiated a project known as *tawlet* (an Arab word meaning "tables"). This is a daily event focusing on a Lebanese producer or cook, who has been invited to prepare the typical, traditional dishes of his or her village in front of a large audience. Similar projects have been carried out in other countries with our support and drawing on our expertise.

Q – What are the main lessons to be learned from this initiative in terms of food security and urban and periurban agriculture?

Many lessons can be learned from our experience. I would like to mention two that I consider particularly important:

- The town is not an independent entity but rather a living organism whose food requirements are enormous, hence its essential and age-old link with the countryside that gave birth to it and provides it with nourishment. That being the case, we need to take a new look at the relationship between town and countryside, which should be characterised by exchange and complementarity, not mutual rejection;
- In view of the important contribution made by farmers and rural producers to supplying the population in general and city dwellers in particular, it is important to have a direct relationship between rural producers and urban consumers. Members of the first group need to be given greater recognition and higher incomes, together with a chance to improve contacts with each other. As to the second group, they need to understand that their food is not simply a "consumer product" that they "buy" but something derived from a living process, whose scope and implications go far beyond the mere process of production.

Q - The practice of growing vegetables and sometimes fruit on the roofs of buildings and houses is on the increase in many countries in the North and the South. What is the situation in Lebanon?

This practice used to be widespread among Beirut residents, as most of them come from rural villages and they wanted to maintain the rural atmosphere in the urban environment. But it is no longer so today. Nevertheless, new green spaces are being established in cities as a result of new initiatives now underway. The *Akhdar* (green) launched by *Souk el-Tayeb* is part of this process. It seeks to make urban agriculture, neighbourhood gardens, community gardens and roof gardens a normal part of city life.

Q - Outside Lebanon, what are the experiences on which we might draw in developing urban and periurban agriculture in the southern Mediterranean countries?

Farmers' markets have enjoyed extraordinary success throughout the entire world, which is a reflection of the growing interest shown by city dwellers in unadulterated, quality products. But I think it would be premature to move on to the next stage, that of turning city dwellers into farmers and developing urban agriculture. It is not even necessary to pursue this avenue to any significant extent, except in the case of local small-scale activities on green spaces, which are actually part of the urban recreational economy. As far as I am concerned, agricultural production should continue to be the affair of rural farmers, and

particularly those whose land is near the towns. It is therefore necessary to rethink the relationship between town and country, two entities close to each other because they complement each other.

Q - In your opinion, how are the financial obstacles to the development of urban and periurban agriculture to be overcome?

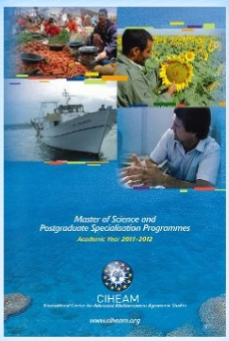
First of all it is necessary to appreciate that there is a genuine need to develop agriculture and ensure food security when considering possible solutions, whether they are offered by urban, periurban or rural agriculture. The question does not actually have to do with funding but rather the priorities to which solutions have to be tailored. It is necessary first of all to make large amounts of food available to citizens quite cheaply. It is then necessary to appreciate that the true cost of each product not only covers the specific production costs but also those relating to the social and environmental dimensions of agriculture. Whatever the source of funding for agricultural projects, it is therefore essential to include all these dimensions.

Q - Judging by your own experience in this area, how can Mediterranean city dwellers be encouraged to show more interest in the challenges posed by urban agriculture?

Town dwellers need to understand the importance of food, its traceability, freshness and quality. It is then necessary to help then understand the impact these qualities may have on their health and that of their families. The climate of the Mediterranean and the diversity of its landscape ensure that the region's food and agriculture is quite out of the ordinary: rich, diverse, nurtured by the traditions of coastal and mountain regions, all which should make the Mediterranean city dweller more sympathetic to those who extol the merits of agriculture and food diversity.

Interview by Hassane TLILI

Journalist specialising in agricultural and environmental issues



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Activities of our Institutes

MAI BARI

GEWAMED Project - International Workshop

From 13 to 14 July 201, within the framework of the GEWAMED Project, the Mediterranean Agronomic Institute of Bari (MAIB), in collaboration with the Gender and Water Alliance (GWA) and the GEWAMED Project Partners, held an International Workshop in Brussels on "The Integration of Gender In Integrated Water Resource Management: Lessons and Challenges". The workshop was an opportunity to review experiences, knowledge, results, and socio-economic tools and to share, at the institutional level, the achievements as to the integration of gender in water resources development and management. The workshop was attended by 45 participants representing 10 Euro-Mediterranean countries including four members of the EU Parliament as well as experts from the European Commission.

The opening session of the workshop took place at the European Parliament and was chaired by Paolo De Castro, Chair of the Parliament's Committee on Agriculture and Rural Development. The International Workshop was organized in four main sessions that addressed some major questions and themes. For each of them, existing experiences were reviewed in order to assess what works and what does not work in order to improve the future actions of all concerned participants. The major questions have been selected to represent the areas where the major challenges for the future remain and they include several relevant issues that will be analyzed separately. The Workshop outputs were:

- Communication of the most important results achieved by the GEWAMED Project, as a matter of fact GEWAMED partners illustrated the experiences gained in the implementation of the work packages during the project life;
- Identification of good practices from participants' experiences that may contribute to the gender mainstreaming in IWRM;
- Preparation of proposals for action plans at regional and country level.

For more information, contact quagliariello@iamb.it and visit www.gewamed.net

A Call for Action for Sustainability of the Mediterranean Diet

Considering that most current agro-food systems are not sustainable due to loss of biodiversity, natural resources degradation, climate change, high energy input, erosion of the Mediterranean diet, urgent measures are needed to promote and disseminate the concept of "sustainable diets" in the various contexts worldwide, both in industrialized and in developing countries.

Based on such a shared definition, the secretariat of the Cross-cutting Initiative on Biodiversity for Food and Nutrition (Convention on Biological Diversity, FAO and Bioversity International) welcomes CIHEAM's proposal to collaborate in the organization of the International Workshop to be held in Bari in November 2011 to formulate Guidelines for the Sustainability of the Mediterranean Diet. These Guidelines comprise the following elements:

- Features of the Mediterranean diet common to the different Mediterranean food cultures;
- Steps and measures to safeguard and promote the Mediterranean Diet;
- Recommendations for multi-sectoral policy instruments to ensure the sustainability of the Mediterranean agro-food systems.

The workshop will also identify the characteristics of the Mediterranean diet that can serve as a model for sustainable diets in other ecosystems. The Mediterranean Diet was recognized by UNESCO, in November 2010, as intangible cultural heritage of humanity. On May 26, 2011, the Steering Committee of the International Workshop held its first meeting at CIHEAM-Bari to prepare the program around the following research and action priority areas:

- contribution of the Mediterranean diet to biodiversity promotion in Mediterranean agro-food systems;
- social and economic sustainability of the Mediterranean diet;
- nutrition and health aspects of the Mediterranean diet;
- relationship between the Mediterranean diet and traditional knowledge in Mediterranean communities;
- environmental impacts of Mediterranean agro-food systems on natural resources in the region, particularly climate change.

The Steering Committee invites national and regional governments of the Mediterranean Basin, International Organizations, research institutions, civil society and the private sector to contribute to the success of the workshop.

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www.iamb.it

Activities of our Institutes

MAI CHANIA

Erasmus Mundus Master Course (MEDfor – Mediterranean Forestry and Natural Resources Management)

The MAI Chania, as a member of a consortium of 13 Institutes and Research Organizations, originating from Portugal, Spain, France, Italy, Greece, Turkey, Tunisia, and Morocco, under the coordination of the Technical University of Lisbon, was recently granted an Erasmus Mundus Master Course by the European Education, Audiovisual and Culture Executive Agency. The Master Course MEDfOR (Mediterranean Forestry and Natural Resources Management) has duration of 24 months and focuses on the sustainability in Mediterranean forests and woodlands. It answers a call from the Mediterranean forestry community for a coordinated approach to develop reliable information and tools - based on sound science and a multidisciplinary approach -, to improve Mediterranean forestry and natural resources management. Ties with the Mediterranean forestry community are further strengthened by a Consultation panel that includes Mediterranean Forest Owners Association, the World Wildlife Fund Mediterranean Office (WWFMed) the International Association for Mediterranean Forests, and FAO.

MEDfOR brings together high expertise, human resources, and facilities in order to provide students with advanced knowledge on (i) the assessment of impacts of climate and land-use change on Mediterranean forest ecosystems functions, (ii) the integration of the risk of wildfires on Mediterranean forested landscapes planning, (iii) the design of policy, economic and institutional instruments for sustainable provision of Mediterranean forest goods and services, and (iv) the development of advanced decision support tools for Mediterranean forest management planning.

MEDfOR provides study environments that excel both professionally and culturally. Students may choose between two or three countries to spend periods of at least one semester. All MEDfOR students will meet in a Summer School that will combine field work, seminars, further communication and exchange opportunities between all partners. This will be influential to foster an integrative view of Mediterranean forestry and to promote cooperation ties.

MAICh will provide expertise mostly in Remote Sensing and Geographical Information Systems, and their application to Forest and Environmental Management. MAICh's international experience in networking and training around the Mediterranean along with its implication in contents' definition, selection of dissertation topics, and provision of scientific co-supervision are highly appreciated from the consortium.

XXIV European Society for Rural Sociology Congress

The XXIV European Society for Rural Sociology Congress entitled "Inequality and Diversity in European Rural Areas" was organised in the Mediterranean Agronomic Institute of Chania (MAICh) between 22-25 August 2011. The ESRS Congress addressed this issue by looking at the following large themes:

- "*Growing inequalities at the global scale: what is the role of food, natural resources, rural areas?*". With globalisation has come an increase in disparity among individuals, groups, territories, and states. Current economic and financial crises are expected to have a major impact on rural territories and people although the detail of this impact is as yet unknown.
- "*The multidimensionality of inequality and the importance of diversity: what implications for rural sociology?*". Inequality has several interconnected dimensions. The same income levels can hide huge differences in quality of life or in happiness. Depending on specific contexts, diversity can be a source of discrimination - and therefore of inequality – or of empowerment.
- "Diversity in space and rural areas". The rural is a privileged point from which to explore the complexity of the links between diversity and inequality. As a result of processes of change, rural areas have been characterised by both homogeneity and diversity and as such have been associated in some places with the reproduction of inequalities while in others they have been drivers of change.
- "Diversity and inequality – Implications for the governance of European States and Institutions". The principle of equality is largely taken into consideration in different EU policies. Social and territorial cohesion are increasingly seen and used as means to counterbalance divergence caused by the creation of a single market and related economic policies of market liberalisation. Rural areas are among the most interesting fields of implementation of innovative cohesion policies

The congress attracted rural social scientists from Europe and the rest of the world and provided important opportunities for participants to explore new evidence and approaches to understanding rural diversity and inequality. It sought to pose new questions around both traditional and emerging conflicts.

More information on http://esrs2011.maich.gr

www.maich.gr

Activities of our Institutes

MAI MONTPELLIER

Development of the EDAMUS Master

The candidacy of the Erasmus Mundus Masters Course (Action 1) entitled "EDAMUS Sustainable Management of Food Quality", which involves the four MAIs and was submitted in April 2011, has been accepted by the European Union.

The Edamus Master's, a two-year course on the quality, safety and management of food products, will begin in September 2012. It will be coordinated by the University of Montpellier 1 (UM1) and the MAI of Montpellier, which will see, among other things, to the administrative and financial management and the promotion of the project. The other partners in the project are MAI Zaragoza (MAIZ) in Spain, MAI Chania (MAICh) in Greece, the University of Basilicata (UNIBAS) in Italy, and the University Mentouri Constantine (UMC) in Algeria. The associate partners are MAI Bari (MAIB) in Italy, the Hassan II Institute of Agriculture and Veterinary Medicine in Morocco, the University of Tsukuba in Japan and the University of Sherbrooke in Canada.

An Erasmus Mundus Master's is intended to offer integrated high-level education with a distinct European added value and to attract students from the European Union and all over the world. The Erasmus Mundus programme also provides for a system of grants. Students are required to study in at least two of the consortium's partner institutions and are eligible for various diplomas at the end of the course.

The first semester will be devoted to the common core curriculum, organised in Montpellier and devoted to fundamental aspects of nutrition. There will also be cultural integration sessions and courses on basic language skills. In the second and third semesters, students will study in Italy (UNIBAS), Spain (MAIZ), Greece (MAICh), Algeria (UMC), Japan (Tsukuba) or Canada (Sherbrooke), depending on whether they wish to specialise in food safety, food quality or food management or to embark upon research. In the course of the fourth semester, they will complete internships in the country of their choice, at the end of which they will present a Master's thesis. All means will be put in place as of September 2011 to promote the project and recruit students for the first EDAMUS intake in 2012.

For more information, contact roskams@iamm.fr

Project on biodiversity in the Balkans

The project "Conservation and valorization of biodiversity: sustainable rural development of Balkan mountains" has been approved. The project was submitted by the French Ministry of Foreign and European Affairs to the French Global Environment Facility (FFEM). MAI Montpellier is the co-funder of the project and is also responsible for its implementation, working alongside the Albanian partner MADA (Mountain Areas Development Agency). The €3.7 million project covers the period 2011-2014. Around 20% of the funding is assigned to study, research and training. The project will contribute to the Institute's work in "cooperation" and strengthen the link between this aspect of its mission and its work in education (vocational training, Master's degrees) and research (doctorates, analysis and field work). It will serve to enhance and shape the academic and institutional partnerships in the region.

The project is mainly targeted at Albania but also concerns Montenegro, Kosovo and the former Yugoslav Republic of Macedonia (FYROM). Three groups of products have been jointly selected by MAI Montpellier and MADA as being particularly important for mountain regions: wild aromatic and medicinal plants, products of pastoralism and products of agrarian systems in the mountain valleys (notably arboricultural).

The project seeks to identify products provided by biodiversity and to study existing sectors; to build institutional capacity and improve legislation with respect to indications of origin and quality; to increase the added value of certain selected products; to ensure that "agroecosystemic" concerns, biodiversity conservation, and heritage issues are taken into account in the development of sectors; and lastly to set up a collaborative regional network on these themes.

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www.iamm.fr

Activities of our Institutes

MAI ZARAGOZA

Short advanced courses

The IAMZ organizes short advanced courses of one or two weeks in duration aimed at university graduates with professional experience related with the subject matter of the course. The course contents have a fundamentally applied orientation and explore technical aspects or particular methodologies in depth, providing high-level updating of knowledge, which is complemented by the opportunity to exchange experiences within an international framework. The range of courses offered is renewed each year, the topics being selected according to their current relevance and interest. The courses programmed for the following months, whose registration is open, are:

- "Use of remote sensing for irrigation management" (Zaragoza, Spain, 21-26 November 2011, organised in the framework of the EU project TELERIEG).
- "Aquatic animal health risk analysis" (Zaragoza, Spain, 12-16 December 11)
- "Medicines from plants" (Zaragoza, Spain, 16-21 January 2012)
- "Advances in fish reproduction and their application to broodstock management" (Castellón, Spain, 23-27 January 2012, organised jointly with CSIC-IATS)
- "Use of molecular markers in plant breeding" (Barcelona, Spain, 20 February-2 March 2012, jointly organised with IRTA and CRAG)
- "Forest fires in the perspective of global change" (Zaragoza, Spain 13-17 February 2012, organised in the framework of the EU project FUME).

More information on www.iamz.ciheam.org

International Meeting on Mediterranean Stone Pine for Agroforestry (AGROPINE)

The meeting will be held in Valladolid (Spain), on 17-19 November 2011 and is organised by: FAO-CIHEAM Inter-Regional Cooperative Research Network on Nuts, National Institute for Agricultural and Food Research and Technology (INIA), Mediterranean Agronomic Institute of Zaragoza (IAMZ-CIHEAM), Catalan Institute for Food and Agriculture Research (IRTA), Forest Service and Promotion Centre Castilla y León (CESEFOR) and Forest Technological Centre of Catalonia (CTFC).

The pine nut, the edible kernel of the Mediterranean stone pine, Pinus pinea, is one of the world's most expensive nuts. Although well known and planted since Antiquity, pine nuts are still gathered mainly from natural forests in the Mediterranean countries, and the crop has only recently taken the first steps from wild harvested to domestication as an attractive alternative on rain-fed farmland in Mediterranean climates.

During the last century, the Mediterranean stone pine has experienced a range expansion, especially in the Southern and Eastern Mediterranean Basin, as well as a large increase in planted area in its native countries, both by forest restoration and farmland afforestation. The species performs well on poor soils and needs reduced cultural practices, it is affected by few pests or diseases and it resists drought and extreme or late frosts. It is light-demanding and hence has potential as crop in agroforestry systems in Mediterranean climate zones around the world. The knowledge about stone pine as crop in grafted plantations is increasing by ongoing researches. Plantations on farmland could yield in the future more pine nuts than the natural forests and contribute to rural development and employment for local communities.

AGROPINE2011 aims to get the main research groups and potential users together, to gather the current knowledge on Mediterranean stone pine as nut crop and to analyse its potential and current challenges. The discussion will be structured by the following general themes:

- Genetic improvement, selection and breeding
- Management of stone pine for cone production in forests and agroforestry
- Pine nut industry and markets
- Modelling growth and production

More information on www.iamz.ciheam.org/agropine2011

www.iamz.ciheam.org

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TORRE André, **TRAVERSAC Jean-Baptiste**, *Territorial Governance: local development, rural areas and agro food systems*, Physica-Verlag, 2011

Events

28-30 September – Tunis (Tunisia)

4th Green Med Forum: Fresh Produce Networking in the Mediterranean
http://www.greenmedforum.eu/

12-13 October 2011 – Rabat (Morocco)

Colloquy on water erosion and the vulnerability of soils in the Maghreb.

13-15 October 2011 – Corte (France)

Seminar on Grabbing of agricultural and pastoral land in the Mediterranean.
http://www1.montpellier.inra.fr/daume/writeable/documents/foncimed.pdf

22-24 November 2011 – Tangiers (Morocco)

2nd Mediterranean coastal and maritime conference – understanding the sea, a basis for sustainable development http://smsmp.org/portal

1-3 December – Tabarka (Tunisia)

2nd international colloquy on sylvo-pastoral resources and sustainable development in the Mediterranean http://www.isptabarka.agrinet.tn

Latest publications on www.ciheam.org

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Summary of 02/2011 issue of the review, July 2011.

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Financing Agricultural and Rural Development in the Mediterranean, n°17, June 2011

News on agriculture, food and the environment in the Mediterranean area

Press Review, June 2011

Press Review, July 2011

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Forthcoming Watch Letter

No 19 will be issued in December 2011 and will address « Establish Labelling for Mediterranean Foodstuf: Risks and Opportunities »

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