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EuroMesCo: Connecting the Dots is a project co-funded by the European Union (EU) and the European Institute of the Mediterranean (IEMed) that is implemented in the framework of the EuroMeSCo network.

EUROMESCO PAPERS

Published by the European Institute of the Mediterranean

Academic Peer Review: anonymous

Editing
Jorge Piñera Álvarez

Design layout Maurin.studio
Proofreading Neil Charlton
Layout Núria Esparza
Print ISSN 2565-2419
DL B 27445-2011
Digital ISSN 2565-2427

July 2023

IEMed.
European Institute of the Mediterranean

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Urban Farming and Its Socioeconomic and Environmental Benefits for Ensuring Sustainable and Inclusive Growth in Jordan

Karolina Zubel
Economist, Center for Social and Economic Research (CASE) and SGH Warsaw School of Economics

Introduction

Around 92% of Jordan's citizens live in cities (World Banka, n.d.). The Kingdom also hosts a large refugee population from the conflict-ridden neighbouring states. More than 80% of them live in urban areas (Gray Meral et al., 2022), which are particularly sensitive to climate-related shocks and resource shortages (Abumoghli & Goncalves, 2020). Jordan's urban centres are also "increasingly exposed to broader sets of adverse shocks beyond natural risks, which can also jeopardise hard-won gains and affect their stability" (CMI, 2014). Such shocks, including the COVID-19 outbreak and Russia's war in Ukraine, impact food production, processing, and distribution along the entire food supply chain. Jordanian cities are highly vulnerable to the disruption in critical food supplies, and climate change only exacerbates this vulnerability (The National Food Security Strategy 2021 – 2030, 2021). Moreover, climate shocks disproportionally affect the urban poor and vulnerable groups, such as older people, youth, people with disabilities and refugees, a large percentage of whom live in informal settlements (Alja'afreh et al., 2022) with limited access to viable livelihoods and precarious food and nutrition security, including the "silent hunger" of micronutrient deficiencies (WHO, 2019). Even before the pandemic, a percentage of the country's city dwellers was already vulnerable to growing food prices; COVID-19 and Russia's war in Ukraine added an even larger pool of people who lost jobs, or at least some part of their incomes typically spent on food-related products.

Urban farming, which indicates growing food in cities, can be crucial to feeding these groups. The Food and Agriculture Organization (FAO) highlights its efficiency as innovative urban farms can provide up to 15 times higher productivity than conventional agriculture techniques (FAO, 2019). Beyond its potential impacts on food security, health, and urban environmental management, urban agriculture has also been recognised for its essential role in improving cities' resilience. With proper implementation, urban farming can contribute to the much-needed employment creation and standard of living improvement, potentially absorbing those entirely or partially jobless. Furthermore, urban farms have great potential to become centres for local community engagement; their educational potential should not be underestimated, i.e., by showcasing the appropriate urban farming techniques to the youth. At the same time, the ecological benefits of appropriately managed urban farms are immense. Hence, this paper aims to showcase the environmental, ecological and socioeconomic benefits of urban farming development in Jordan from a sustainability and inclusivity perspective. The rationale behind this approach is that the development process may either contribute to fostering environmental and socioeconomic sustainability inclusively or to reinforcing the dynamic risks which deepen vulnerability and exclusion when programmed poorly without ensuring social dialogue and involvement of local communities in the planning process (i.e., in case the farms are developed in a way where only the wealthiest benefit from such inventions). The secondary objective of this paper is to showcase possible solutions for accelerating urban agriculture while guaranteeing inclusion and societal support and acceptance, which typically ensure successful urban regeneration (Szelagowska & Bryx, 2015). These policy-oriented recommendations will be formulated to guide future actions accelerating urban farming development across Jordan and beyond.

Other multifaceted and complex issues discussed in this paper – additional research questions in a sense – are the following:

- Is the development of urban farming a means to mitigate climate-induced risks?
- Is the development of urban farms linked to the societal context of Jordan?
- What are the critical socioeconomic, environmental and ecological implications of such developments?
- What are the stakeholders' perceptions of such a process, and what is their level of convergence?
- Who are the intended beneficiaries, winners and losers, and is there any mismatch?
- Who is involved or excluded from relevant decision-making processes, and are these processes legitimate and inclusive for all stakeholders?
- What are the main governance challenges related to urban farms' development?
- What are the prospects of such developments within the perspective of the European Green Deal diplomacy?

The research methods included desk research – both primary (laws and regulations, including acts of local law) and secondary (policy and academic literature) sources review, as well as more interactive semi-structured interviews with representatives of Local and Regional Authorities (LRAs), policy-makers and representatives of foreign donors responsible for relevant projects' execution, as well as with entrepreneurs and initiators of already existing urban farm installations from across the European Union (EU) and the broader Middle East and North Africa (MENA) region, where, given limited arable land resources (UfM, 2016), climate-friendly technologies and processes of food production are becoming more and more popular.

Urban farming – a theoretical overview

It is worth commencing theoretical considerations by clarifying some nomenclature-related "urban farming" concerns. First, other terms are treated as synonyms or related concepts, with semantic differences that are sometimes difficult to grasp. Nevertheless, this paper uses urban agriculture, city farming, and urban cultivation interchangeably, as the term is ambiguous. Sroka defines urban cultivation as all manufacturing activities located inside the city (metropolis) or in suburban areas, consisting of cultivation or breeding, production and distribution of food and non-food products, using (also reusing) material and human resources, products and services derived from this urban and suburban area, and in return providing human and material resources, products and services primarily for this metropolitan area (Sroka, 2014: 2). All these actions can lead to economic gains as the produce at stake can be sold when agriculture is discussed. For a change, urban gardening does not allow any form of capitalising as all of the crop needs to be auto-consumed, never sold. This division between farming/cultivation/agriculture and urban gardening is reflected in this paper.

The essential feature of urban agriculture, distinguishing it from conventional agriculture, is not the location in urban areas but its integration with the urban economic and ecological ecosystems (Mougeot, 2000: 10). This means that farming practice uses city resources (land, water or human re-

sources) and has an impact on the urban ecosystem (including city policies, market processes, e.g., competition for land), as well as the other way around – there is an impact of urban agriculture on the urban ecosystem, e.g., in terms of food security, ecology, health, social and cultural aspects. According to one of our interviewees who developed a mid-size urban farm in the EU country, urban agriculture is distinguished by unique features, such as proximity to the market, spatial limitation (resulting in a high level of competition for land, but also the use of degraded and abandoned land), agricultural use and even potential biowaste and municipal sewage, a relatively low degree of organisation of activity (sometimes not treated as agriculture at all). A representative of LRAs sees one more characteristic feature of urban agriculture as a sizeable internal diversity. This applies to the scale of forms of occurrence (from home gardens and even balcony gardens and cultivation on green belts on sidewalks to intensive agricultural production in agricultural enterprises), forms of organisation and entities involved (individual or group, private and public), and goals of functioning – commercial, educational, social, artistic (Gulyas & Edmondson, 2021). There are some technological repercussions involved, too – due to the limited land availability, conventional and advanced agricultural technologies appear in cities, e.g., on roofs and inside buildings using soilless crops and high-tech farms (Specht et al., 2014).

Considering food production in urban areas, it is also necessary to highlight the various manifestations of its output. The most important include agriculture using the available space in the form of agricultural land, roof surfaces of buildings, as well as hydroponics, production carried out in greenhouses, aquaculture, aquaponics (combining fish farming with plant cultivation), apiculture (beekeeping), and breeding other animals and mushrooms using coffee and tea grounds. Furthermore, it is worth emphasising that urban agricultural production can also be carried out for non-consumption purposes. In such a scenario, it can be based on targeted crops, e.g., energy crops used for biomass production, biogas and biofuels, or flowers.

Nevertheless, according to one of the interviewees, the design concepts promoting the idea of urban farms are based primarily on three basic organisational and spatial arrangements in the existing urban space:

1. The extensive farming model in which farms use vacant land, including land already used for agricultural purposes. This model uses medium-advanced building technologies and production (middle-tech), and farms are located mainly on city outskirts and suburbs.

2. A model of distributed agriculture, in which the existing buildings — roofs and interiors, garden and allotment areas — are used to create small farms for local needs. This model uses uncomplicated construction and production technologies (low-tech, unless a technologically advanced aquaponic system is chosen).

3. The intensive farming model often takes the form of vertical farms. In this model, farms are located in high-rise buildings using advanced construction and production technologies (high-tech).

The traditionally understood form of food production conducted on agricultural land requires the availability of free space. For this reason, extensive agricultural cultivation occurs primarily on the outskirts, peripheral areas of cities and in suburban zones, while horizontal farms usually occupy open, undeveloped areas detached from the existing buildings.

All special arrangements are different, and hence it is difficult to assess their acceptance as a way to reinvigorate urban spaces. Nevertheless, the perception of urban agriculture in the light of the concept of ecosystem services shows its importance in providing all types of these services: provisioning (this type of service is particularly important in Jordan in the context of food security) (Armanda et al., 2019), supporting policy changes, regulating (e.g., the land), and ensuring cultural shift (according to a representative of LRAs, agriculture is seen a purely rural-oriented exercise). Hence, it is essential to emphasise the need to consider the broader context (a form of farming, method, type of products, location, etc.) in assessing the importance of urban agriculture for the development of sustainable urban food systems, but also issues such as food safety (Goldstein et al., 2016). In the following three chapters, we will try to assess how appropriately developed urban farming practices can ensure environmental, economic and social benefits, not just for particular groups but the urban populations of Jordan overall.

Climate-smart and environment-friendly urban agriculture

Environmental benefits might be the most apparent result of urban agriculture. With the steady trend of introducing green growth from a bottom-up perspective (OECD, 2013), special attention should be paid to urban agriculture in the context of its environmental and ecological functions, enabling the development of the circular economy and maintaining biodiversity, among others. In addition, urban agriculture plays a vital role as a "catalyst" to stimulate systemic changes in consumption and food culture, manifested in the shift from highly processed imported food to food products based on locally available raw materials, e.g., from urban crops (Ackerman, 2012). Urban agriculture, as an alternative to globalised food production, is also an opportunity to develop a bioeconomy in urban areas, referring to using local resources and considering innovative and ecological production methods.

The Sustainable Energy Action Plan (SEAP) and climate action plans are strategic documents adopted by the local government to prepare the city for the increasing number of climate change shocks and effects. A carefully crafted document, based on proven data sources, indicates the most advantageous and possible to implement identified adaptation solutions in a given area. At the same time, it makes it possible to apply for funds to implement investments included in the adaptation plan for the city to climate change. To sum up, the urban adaptation to climate change plan is one of the tools for shaping the urban adaptation policy. In Jordan, climate action plans are binding acts of local law in Amman (Greater Amman Municipality, 2019), Municipality of Karak (n.d.) or within the Aqaba Special Economic Zone (n.d.). Since all these plans need to be evaluated and updated regularly in accordance with the general guidelines for creating SEAPs, perhaps adding chapters on the environmental benefits of urban agriculture, as suggested by one of the representatives of foreign donors, could be an idea worth considering.

The resource, which is characterised by extreme scarcity in Jordan, especially in the country's cities, is water. Even though some 88% of wastewater is treated (Deboos, 2018) and numerous guidelines focusing on water resources, such as the USAID and Ministry of Water and Irrigation of Jordan "Office Buildings Water Efficiency Guide" are in place, the lack of good water management policies, especially with re-

gards to agriculture, is still an issue (MedECC, 2019). At the same time, it is assessed that urban agriculture not only uses 90% fewer water resources when compared to conventional agriculture, but according to private sector representatives, it can also have the potential to save water resources – e.g., when green roofs, which naturally clean the rain, and stormwater – are installed. Work is also underway to improve the efficiency of plant cultivation, reduce water and land consumption, and become independent of atmospheric factors, including natural disasters and the effects of environmental pollution, to highlight the benefits and risks of such installations (Al Baz et al., 2016). In EU countries, plant cultivation is experimentally introduced into buildings in the city using hydroponic and aeroponic systems. Creating and improving new technologies allows growing plants indoors without daylight or with limited access to natural lighting. In such installations, plants are grown independently of the soil. One such urban farming method is called aeroponics, which until now could be associated with strange, mysterious ways of production in the laboratory. However, aeroponic cultivation, contrary to appearances, is simple – it provides micro and macro elements and all minerals in the air with the help of mist sprayed on the roots of plants. The devices work automatically, add water to the nutrient mixture, and spread the seeds on a special sponge. This way, the plants get the perfect amount of nutrients and grow much faster. Given the water scarcity in Jordan, these hydro-, aqua-, and aeroponic methods seem to be the most advantageous. Unfortunately, they are also the most expensive technologies. Hence, it is worth looking for private partners interested in testing their technologies in Jordan in pilot or public-private partnership (PPP) projects.

Improving air quality is another environmental benefit of urban agriculture mentioned by practitioners of urban farming, as spaces adapted for cultivation guarantee better air circulation. This, in turn, provides a softer climate, relieving urban citizens from the heat of hot concrete and ubiquitous dust. In addition, the air is fresh and free of pollutants thanks to the prominent role of plants that produce oxygen and absorb carbon dioxide present in considerable amounts in urban space.

Nevertheless, a higher concentration of plants also ensures biodiversity and natural ecosystem protection so that no species are put at risk. Thanks to local edible plants, city dwellers can access good quality, proven food. There is no need to worry about the value of fruits and vegetables grown this way, as research shows that, despite urban pollution, the content in plants does not exceed acceptable standards (Amato-Lourenco et al., 2017). In addition, by buying local products, we support the economic development of the city where we live – in other words, we co-create it with equal rights. It is undoubtedly also facilitation for the farmers, who deliver their products to the regional market without transporting them hundreds of kilometres. Creating local, urban farms can positively impact reducing the carbon footprint. Proximity to fresh food reduces the need for imports, thereby significantly minimising carbon footprint. Fresh food production centres designed this way in the city would allow Jordan authorities to create a resilient and reliable food system, even when only an estimated 15-20% of the food-related needs could be ensured thanks to urban cultivation (interview with an urban farming expert).

Noise pollution in urban areas is another emerging challenge for Jordan's cities (Odat, 2015) that urban farming could potentially reduce. The factor influencing the spread of noise is the greenery, the terrain on which it is located, and the microclimate

(temperature, air humidity, wind intensity). Hence, sound waves disperse thanks to trunks and branches and are absorbed by leaves. Of course, the effectiveness of suppression depends on the density of farms, their area, height, width and type (different plants bring different effects), and the size of the area occupied by greenery, which has a sound-absorbing effect mainly when it occurs in dense groups. Nevertheless, according to one of our interviewees, adequately planted trees, flowers, and vegetables can reduce noise audibility in the closest areas by up to half.

Greater land efficiency is undoubtedly needed in cities as densely populated as Amman. Vertical farms require less space because crops are grown vertically rather than horizontally. The cultivation area can be significantly reduced using columns, towers and shelves without sacrificing production efficiency. This technique makes it possible to install farms in warehouses, vacant buildings, hotels or supermarkets – even in the very centre of the city, as pointed out by one of the entrepreneurs. This allows city residents to enjoy the food produced near their residences. Referring to the concept of sustainable development, one cannot omit the issue of such multifunctionality of space, which is extremely important when one considers that space is a rare commodity and its quantity is finite and cannot be increased by production, it can only be managed more or less rationally

(Domański, 2002). This rationality of management becomes even more critical in the case of densely urbanised areas, such as Amman, where the need to meet the needs of space users must be confronted with its limited amount. Therefore, all projects that enable combining functions are precious, e.g., production (production of food and energy raw materials of agricultural origin), ecological (increasing the area of green areas, reduction of air pollution, noise, effective retention, maintaining biodiversity, etc.) or social (integration of local communities by creating shared spaces for leisure and recreation).

The popularisation of sustainable development also means society's growing awareness regarding consuming high-quality food produced locally based on endogenous resources (e.g., the idea of slow food). Although, as pointed out by one of the interviewees, organic produce is still rare and expensive in Jordan, the opportunities of scale can lead to significant cuts in the prices of such products in the medium-term perspective. Urban agriculture products can successfully meet the conditions of organic certificates but also, when scaled, lead to the price cuts mentioned above.

Urban agriculture as a tool for creating economic development

Farms in cities and suburbs can offer various services. However, they are costly endeavours when high-tech such as aeroponics or aquaponics is involved. Ideally, different sources could be blended in accordance with "Financing the climate transition in the MENA" recommendations (UNEP FI, 2020) to scale up development or innovative urban farms, as their economic potential can be immense, even when barriers to entry are considered.

Potential economic gains of urban agriculture start with creating local employment and income for vulnerable groups, e.g., the refugees. Although most refugees can now work in some sectors of the economy, with an unemployment rate of more than 20% across the country, even refugees who hold work permits still struggle to find jobs (UNHCR, 2022). Working in urban food

production could be one of the ideas to change this status quo. In the case of urban gardening, bartering or auto-consumption would still allow those vulnerable to save the funds typically spent on food-related purposes. Overall, urban agriculture offers opportunities for the development of social entrepreneurship and additional income for low-income families.

Opening farms to different audiences would also allow income generation. During special workshops, children from urban areas could learn how to live in the countryside, make dumplings or bake bread. Older audiences could visit a local farmer to learn about his farming methods and often take advantage of a special offer. This brings additional profits to the farmer, ensures potential consumers, and provides residents with entertainment and relaxation among nature, which can be experienced so little in the city.

Inefficient urban planning in Jordan is a common problem limiting the path for the urban areas towards becoming resilient (UNDP/RBAS, 2018). Spatial urban expansion of cities in Jordan, especially in Amman, needs to be limited. According to one of our interviewees, it is necessary to separate the boundaries up to which the city can develop, and, on its outskirts, to designate a district where new constructions are not allowed. An example of separating agricultural zones is ecological corridors or green rings. These ventilate cities ensure biodiversity and facilitate the movement of animals. However, there is also no fear that agriculture will stop the development of cities in this way because financial issues are at stake, and profits from commercial activities will always exceed income from agriculture (interview).

On the contrary, agriculture is the best form of maintaining green areas in urbanised areas, e.g., for economic reasons. If the farmer properly cares for these areas, he will conduct appropriately adapted production; the city will not bear the costs. Moreover, one of our interviewees who developed an urban farm in the EU country pointed out that, in his city, urban farms improve the perception of residential and commercial areas and increase the value of the properties in the nearby neighbourhood. Nevertheless, local spatial plans in Jordan's cities would have to ensure that the farmer's land could not be converted for construction purposes if the developer offered a higher price for the plot.

Urban agriculture can also bring some health-related economic benefits in the long run. It is easy to imagine that organic produce could reduce the incidence of obesity and chronic diseases by increasing the availability of healthy food options in the future. One of the interviewees sees urban agriculture as a means to increase physical activity. In his opinion, thanks to the variety of sounds, smells and colours of the plants, it can also significantly affect the mental health of urban citizens.

From a customer point of view, the most important economic aspect of urban farming relies on its efficiency and access to the foods produced. According to a 2016 report by the Johns Hopkins Center, while much of the demand for fresh produce could theoretically be met in urban farms, such a solution would only work where urban farms were widely implemented and focused on highly intensive and efficient forms of production, such as rooftop gardens. Unfortunately, this is difficult to achieve, if not impossible, in Jordan in the short term. However, the limitations of urban farming do not make it unnecessary. On the contrary, community, rooftop and home gardens significantly and positively impact the lives of those living in the neighbourhood and could give poorer communities access to

fresh, free food in return for labour in producing it.

Advances in urban agriculture are changing the overall view of agriculture and food production. However, while urban farming has many economic benefits, more than these methods are needed to provide enough food to feed a growing population. To ensure that people have sufficient access to food in Jordan, urban farming must co-exist with traditional farming methods.

Role of local communities and social dialogue in urban food-oriented endeavours

The most significant potential of urban farming lies in revitalising local communities from the inside out. Such installations build and sustain critical social networks not measured by traditional economic development studies. In other words, urban farming may only partially feed a city like Amman but, most of all, it can help to rejuvenate it. Green spaces bring additional profits to the farmer, ensure potential consumers, and provide residents with entertainment and relaxation amidst nature, which can be experienced so little in a city as concreted as Amman.

It is worth considering the example of community gardens. Community gardens indeed allow the expansion of green space in cities. Moreover, they make the inhabitants of blocks of flats, common in Jordan's cities, gain places where they can catch their breath for a moment, calm down, get closer to nature, and relax surrounded by greenery.

What makes community gardens unique, however, is primarily their communal character. Urban green oases are a place of integration of local communities. Taking care of the garden together helps to deepen the relationship between neighbours. It builds a sense of community and promotes more frequent social contact. Community gardens often help break down intergenerational and social barriers and get to know and understand each other better. This could translate into greater satisfaction with life in the district or housing estate where predominately vulnerable groups reside.

Participation in the actions of community gardens shapes a proactive attitude among community members. It teaches cooperation to achieve a common goal, builds responsibility for the immediate area, and establishes strong bonds with the place of residence and other community members. It can also give a sense of being needed and, based on examples of urban farms from three EU countries, makes people more interested in their surroundings and involved in community affairs. Moreover, community gardening can be the beginning of other neighbourhood initiatives. Thus, creating social gardens in Jordanian cities can be a natural remedy for the excluded citizens of the inhabitants of urban agglomerations.

Such green city areas could also become great places to organise meetings, social activities, cultural, entertainment and educational events, family picnics and workshops. Community gardens already cooperate with schools and educational institutions, thanks to which exciting events are organised for a broad audience (NextCity, 2022).

Garden care raises ecological awareness and knowledge of nature. It allows one to learn the principles of space arrangement

and plant cultivation and put the acquired skills into practice. Caring for a community garden could be the beginning of a long-term passion for some people. The opportunity to participate in gardening and observe nature could play a unique role in the lives of the community's youngest members. It is an excellent form of natural and ecological education and building children's interest in nature. Nevertheless, as one of our interviewees pointed out, agricultural production in urban areas is an unprecedented opportunity for educating older representatives of local communities, both in terms of activities related to the rational use of local natural resources and the implementation of modern technologies and innovative solutions used in agriculture, including those relating to non-consumer, e.g., energy and use of agricultural products.

An undoubted advantage of city community gardens, especially as dense and vulnerable to climate shocks, is their universal dimension. They can be used by all community members regardless of age, citizenship, occupation or health condition. Everyone can find something for themselves in such a green oasis. Moreover, the diversity of interests and skills of people caring for the garden is conducive to achieving outstanding results. Community members can share responsibilities so everyone can get the most out of their urban gardening potential.

Conclusions and recommendations

The crop's quantity and quality largely depend on the weather and other uncontrollable environmental factors. Permanent drought or invasion by pest species can cause significant damage to produce. This, in turn, causes economic losses for farmers and further disruption of food supply chains. Monoculture crops also contribute to the degradation of soil and water systems. In a situation where there is already less and less land available for cultivation in the MENA region, this is another problem that can affect both farmers and consumers, who, in many cases, have to rely on imports.

At the same time, limited space and climate change are some of the significant problems cities face, including those in Jordan. Keeping all these limitations in mind, the importance of developing sustainable and inclusive practices in urban areas has begun to receive increased attention nationwide. Nevertheless, implementing climate-resilient technologies and processes is a challenging and holistic task, especially given the standard view that there is no need to pursue urban agriculture, considered by some as an archaic and financially disadvantageous way of using land and water. However, with the right design and implementation, urban farming can perform many complex functions, especially in MENA cities. Therefore, a significant challenge for local authorities is identifying these functions and formulating appropriate strategies. The following recommendations and guidelines targeting predominately urban administrations are intended to highlight priorities observed throughout the research phase so that they are transformed into concrete actions fostering sustainability and inclusiveness. At the same time, regional, national, Union for the Mediterranean (UfM) and EU-level policy-makers should empower Jordanian LRAs to implement the abovementioned policies and tools.

Prioritising inclusion in urban development plans

Besides ensuring economic growth, cities should be centres of intergenerational coexistence and prosperity for all citizens.

Open spaces can have different functions for different groups of residents, and this diversity of functions needs to be considered when introducing new concepts in open public spaces. Inclusion, in its three dimensions identified by the World Bank — Spatial inclusion (ensuring affordable housing, access to potable water and sanitation); Social inclusion (equal rights and participation for all citizens, taking care of the most marginalised groups); Economic inclusion (providing economic development, e.g., by ensuring a job market is open for all) (World Bankb, n.d.) — must be ensured to avoid the costs of exclusion for the most marginalised groups, such as migrants, people with disabilities, or the elderly. An inclusive urban area will embrace their differences and offer tailored services that address their needs.

Raising awareness and communicating the benefits of urban farming

The role of LRAs is essential in the adaptation to climate change, both in terms of decision-making and the development and implementation of specific solutions. Much investment is made to inform citizens about what is happening in the city. However, a fully functioning local community also requires maximum awareness of citizens on why it is going through these changes and the importance of their individual and collective actions in addressing climate change effectively

Local governments have several characteristics that make them an essential element of climate endeavours, an ideal element for campaigning strategies for sustainable development, and a simple and vital course of action for engaged citizens who want to put climate action at the heart of urban processes.

From a political point of view, the essential aspect of the municipal level is its close contact with the citizens. At this level, for example, in the elections of mayors or councillors, citizens see a more immediate connection between their vote and the impact of that vote on their daily lives. They can see the changes that have affected them, often more directly than at a national or supranational level.

Earmarking local budget for urban farming development

Earmarking refers to a fund allocation practice in which local authorities can dedicate a predetermined portion of total revenue or revenue from a tax or group of taxes for designated, typically social purposes. For example, while some percentage of resources could be spent on initiatives aimed at promoting urban agriculture and well-tailored training for those interested in urban farming, the rest could be spent on providing interested households with simple small-scale hydroponic kits or even giving tax incentives for commercial enterprises that use high-tech climate-friendly agricultural techniques.

Enabling new business models

Frequently, in other countries where urban farming is already well-developed, individuals or private entities initiate the most successful initiatives. However, as one of the interviewees mentioned, there is high uncertainty about the legal environment for food-tech initiatives, creating a severe obstacle to their growth in Jordan. Therefore, enabling PPPs and innovative financing of such initiatives (e.g., emission of green bonds) and simplifying the legal environment for local and distributed food production in the country could be a driving force for urban farming development.

Ensuring that EU Farm to Fork Strategy objectives are reflected in national regulations

The Strategy, a major component of the European Green Deal, assumes that all food chain participants must play a role in creating and running a sustainable food system. Accordingly, the so-called eco-schemes are being introduced to provide significant funding for sustainable farming practices such as agroecology and organic farming, precision farming, and carbon farming (which contributes to reducing CO2 emissions) and agroforestry, as well as practices that enhance animal welfare.

Residues from agricultural production, the food industry or municipal waste will now be used in biorefineries producing biofertilisers, protein feed, bioenergy (biogas) and biochemicals, creating new jobs and diversifying the income of both individual farmers and their cooperatives. Perhaps similar regulations could be developed within the broad European Green Deal diplomacy framework in Jordan.

It is food processors and retailers who shape food choices. Their scale and concentration give them considerable power to put food production and consumption on a sustainable path. Through both regulatory and non-regulatory initiatives, they could be encouraged to use practices that help consumers make healthy and sustainable food choices.

In addition, to encourage the food industry to offer healthy and sustainable food products, the national authorities could propose mandatory nutrition labelling and launch initiatives to encourage reformulation, including through nutrient profiling, to reduce the promotion (with nutritional or health) of foods high in fat, sugar and salt. Furthermore, like the European Commission (EC), Jordan's authorities could consider working on a proposal extending the obligation to indicate the origin or source of certain products, which, in the long term, would benefit the production of healthier and organic produce from urban farms.

Signing the Milan Urban Food Policy Pact (MUFPP) and partnering for sustainable food systems initiatives

Collaboration under the MUFPP framework could become one of the most critical opportunities for the LRAs to meet face to face and share their experience developing inclusive urban farming initiatives. Last but not least, it could be vital in building partnerships with private actors, i.e., in the form of PPPs and looking for investors overall.

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Co-funded by
the European Union