URBAN AGRICULTURE AND INNOVATIVE ENTREPRENEURSHIP

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Abstract

Urban agriculture (or urban farming) is a new and innovative field in business development, bridging the gap between the producer and the local urban community, being an area where the entrepreneurship can have diverse initiatives and approaches. Urban agriculture generally refers to the cultivation, processing and distribution of agricultural products in urban and suburban settings, including directions like vertical production, warehouse farms, community gardens, rooftop farms, hydroponic, aeroponic and aquaponic facilities or other innovations.

This type of farming adapted to the limited space available in the city has various advantages but it faces also challenges. The benefits of setting-up an urban farm consist in creating jobs for local low-income communities, waste reduction, urban revitalization, community education and development, while the main challenges refer to the lack of policy and regulations addressing urban farming in statutory plans and zoning bylaws, possible noise or restrictions on farm structures such as greenhouses and storage sheds.

This paper aims to highlight ways to improve entrepreneurial skills through innovative ideas on agricultural activities in urban and peri-urban areas, exemplifying different initiatives associated with effective management in this regard and describing this sector less known and in Romania but with a high growth potential.

Key words: urban agriculture, urban farming, agribusiness, innovative entrepreneurship

The move toward urban agriculture and urban farming is one of the patterns noted in the evolution of agriculture as an economic sector and of cities as structural components in the dynamics of societal development.

The term "urban agriculture" broadly refers to the production, distribution, and processing of agricultural goods in urban and suburban environments. Examples of such practices include vertical production, warehouse farms, rooftop farms, community gardens, hydroponic, aeroponic, and aquaponic systems, among other innovations. Urban gardeners and farmers collaborate with a variety of communities to increase the availability of wholesome meals, promote community involvement, create jobs, teach people about farming, and create more green space. Urban food production encompasses several forms such as roadside urban fringe agriculture, backyard, rooftop, and balcony gardening, community gardening in vacant lots and parks (sometimes spanning multiple city blocks), cattle grazing in open spaces, and intensive indoor hydroponic or aquaculture facilities. One of the key strategies for minimizing harm to the urban ecosystem and its inhabitants is urban agriculture (Yücedağ C., Çiçek N., Gul A., 2023). Urban agriculture eases access to food, reconnects communities to the practice of growing food, and engages the community on a variety of levels.

Urban agriculture facilitates food access, reintroduces the practice of food cultivation to communities, and fosters multifaceted community engagement.

Urban agriculture (UA) has a vital role in promoting local economic growth, reducing poverty, enabling women and the impoverished to participate in society, enhancing the city's greenery, and repurposing waste materials in useful ways. Urban agriculture is still primarily an unorganized industry that is poorly integrated into agricultural policies or urban planning, despite increased awareness of its importance in ensuring food security and reducing poverty for urban inhabitants. The inadequacy of current, high-quality data regarding the advantages and limitations of urban agriculture hinders the development of pertinent policies and interventions that could augment the favorable effects on public health, urban livelihoods, and the environment.

Urban agriculture has become a familiar term in many towns, usually conjuring images of edible landscapes or community gardens (Orsini F., D'Ostuni M., 2022). On the other hand, growing food in the city for commercial purposes is known as urban farming. In order to grow food for wholesale and retail sales to urban consumers,

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farmers must find space in the city, such as backyards, vacant lots, parking lots, rooftops, parks, or other private or public areas. The urban farming industry's ability to generate income presents both local governments and farmers with a whole new range of options and challenges.

An entrepreneur is someone who starts, expands, and grows a business (Brezuleanu S. *et al*, 2019); in doing so, they take on risks in the hopes of making money. A person who builds an enterprise around an idea is called an entrepreneur. The verb *entreprendre*, which means "to undertake" in French, is the root of the English term "entrepreneur". Though there are many essential skills in entrepreneurship, these are some fundamental ones you should check for in your staff the next time a competency assessment is conducted (*figure 1*).

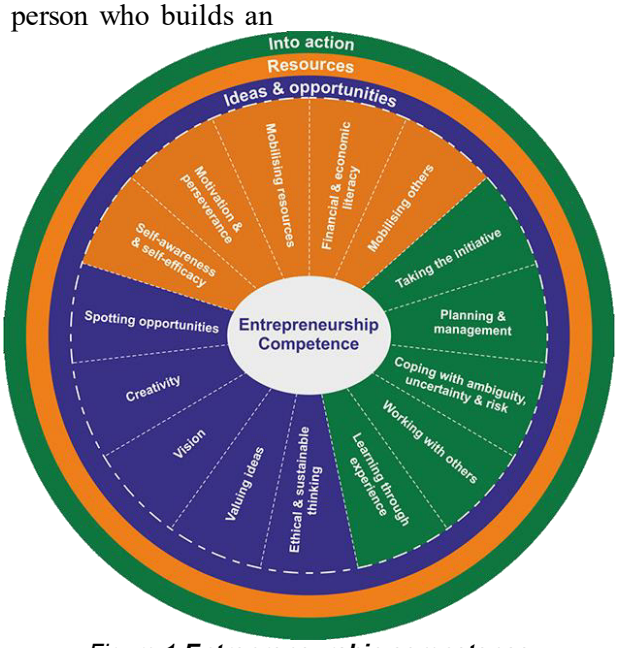

Figure 1 ***Entrepreneurship competence***

The process of establishing and effectively running a business idea, generating revenue, and fostering the expansion of the enterprise is referred to as entrepreneurship. Any person or people who run a business are ideally entrepreneurs, and those who work for them are employees.

The act of starting a firm, or enterprises, and taking all the risks in the hopes of turning a profit is known as entrepreneurship. In addition, entrepreneurship offers self-driven people the chance to design their own professional path and source of income by working for themselves to provide goods or services that consumers need or want.

Research and innovation are crucial tools to achieve a smarter and sustainable agriculture sector (Dovleac Lavinia, Bălăşescu, M., 2016) and the innovation is represented by the ability to continuously transform knowledge and ideas into new products, processes and systems, to the benefit of both the organization and the shareholders. (Popa I. *et al*, 2010).

Innovation represents the potential for creating wealth from already existing means. In other words, innovation can be defined as that ability whereby a means (in economic or social sense) is found to be used for something new. Innovation is the specific function of the business initiative; it is the means by which the entrepreneur either creates new wealth-producing resources or endows the existing ones with an increased wealth creation potential (Viziteu Șt., 2019).

MATERIAL AND METHOD

In order to carry out this work, the resources related to urban agriculture from Erasmus+ KA220-ADU-ECC37414 – Cooperation partnerships in adult education, “AgroBusiness in Urban areaS” – AgroBUS were used. The international project AgroBUS, funded by Erasmus+ is Formed by partner organisations: Proportional Message - Lisbon (Portugal); Creative Innovative Business Incubation Centre - Roznov (Romania); DRPD- Novo-Mesto (Slovenia) And Innovation Frontiers - Athens (Greece).

The AgroBUS project aims to promote entrepreneurship by developing a training programme and bringing knowledge and concepts from the field of Agro-Business to urban areas with the objectives of sustainable community development, continuous training for people who want to set up a start-up in urban agriculture and identifying best practice models for future European urban farmers.

RESULTS AND DISCUSSIONS

Urban farming has many inherent challenges, like distribution, space and production

capacity limitations, concerns with neighbors, and financing challenges.

By considering the barriers up front, you'll have fewer surprises as you get started. The main steps are:

1. Find Training. There is a great deal of knowledge and expertise involved with starting a farm. Consider finding a learning opportunity near you.

2. Make a plan for your business. Producing goods that are in demand or that can be readily marketed is crucial for farmers. To achieve this, find out where there are gaps or marketing opportunities by speaking with local food producers, farmers' market managers, grocery shops, restaurants, and community members. Think about value-added items and the potential impact they could have on your company. Find out the expenses and procedure. Make a business plan with a budget and marketing tactics included.

3. Find Appropriate Land. If you are looking for space, check out your local utility agencies, parks and recreation departments, or research existing vacant lots. Consider local zoning codes and how they may apply to the type of urban farm you have in mind.

4. Test Soil. Some urban soil has elevated levels of heavy metals, such as lead, or other contaminants. Make sure to test your soil and remediate accordingly.

5. Study the Fundamentals of Production. According to our research, a lot of new urban farmers have trouble with the fundamentals of growing crops or keeping animals as they establish themselves. Get as much knowledge as you can about irrigation, planting, controlling pests, and soil. Learn all there is to know about taking care of animals and bees if you intend to keep them.

6. Ensure Food Safety. Learn about how to make sure that the crops you grow are harvested, stored and processed safely, according to best practices.

7. Learn about Other Urban Farms. Read about urban agriculture projects throughout California here, and find out about their challenges and successes.

8.Explore Resources for Beginning Farmers.

Dimensions of urban farming include: land and land access, production, processing and distribution, celebration and education, waste recovery etc (*figure 2*).

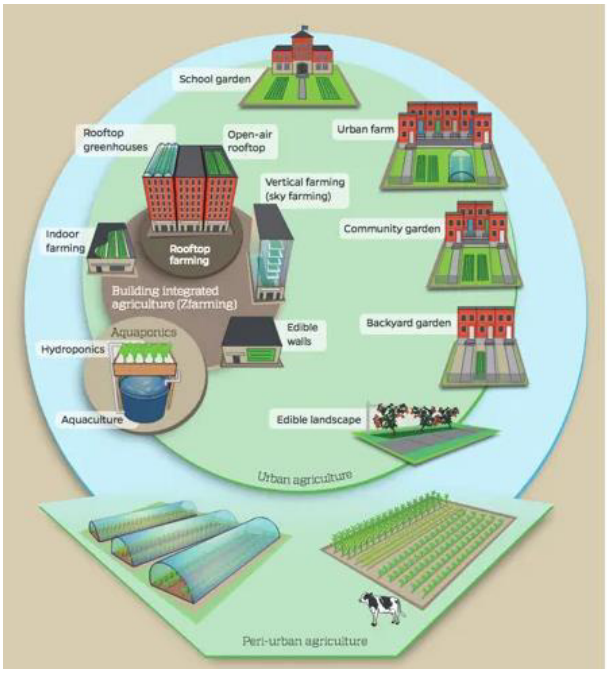

Figure 2 **UA fields**

The Benefits of Urban Agriculture /Urban Farming

The companies that make up the developing urban farming industry assist the community in many ways. Fresh food products are directly sold and supplied to food merchants, farmer's markets, restaurants, and other establishments through alternative or low-carbon transportation systems. Food is often cultivated with little chemical inputs. Farms can serve as a channel for waste recovery, meeting the market's need for organic soil that has been composted. Additionally, the farm's presence is frequently very noticeable to the general public, increasing awareness of food and farming as well as offering chances for teaching regarding the cultivation and consumption of fresh produce.

Green Jobs and Innovation. Urban farms foster innovation and support entrepreneurs. With

limited growing areas, urban farmers are developing creative solutions to generate good harvests at a fair price. Innovations in urban farming include models like aquaponics, vertical farming, micro-green operations, and rooftop greenhouses. Despite their infancy, a lot of these initiatives are gaining support from the community's companies and consumers as well as media attention, which is helping to establish urban farming as a major industry. Urban farming is generating jobs, and employment training in urban settings is enabling aspiring farmers to expand their scope and relocate to larger farms.Urban farms can be set up as a social enterprise to generate revenue and create jobs for local low income communities.

Waste Reduction. Food waste from urban farms might be turned into compost to be used in food production. Since more hydrocarbon energy is required to produce food energy, reusing organics for farming is a sort of energy recovery and a crucial step toward making agriculture more sustainable. In order to promote food waste reduction, urban farms can also educate the public about composting. Reducing the distance traveled to the place of purchase for heavier foods, such vegetables high in water, lowers greenhouse gas emissions and makes more mobility options possible, like cycling.

Urban Revitalization. Many urban farms are located in under-utilized urban spaces such as vacant lots or under-used parks. What was once a derelict space can become a lush green space and hub of activity for the community and urban farmers.

Community education and development. Urban farms have the potential to develop into social hubs that promote and celebrate regional food. DIY projects including cheese production, beekeeping, cooking, and food preparation might be sparked by occasions like festivals, harvest meals, culinary or gardening demos, and educational programs. Certain populations are served by certain programs, including elders, kids, low-income families, and ethnic communities. Urban farmers often host public events that involve other organizations or industry sectors including local chefs and food and farm organizations.

Many farmers are also asked to speak about local farming or teach growing techniques. Some urban farmers are also technically savvy with websites, blogs, Twitter and Facebook accounts dedicated to promoting their farm and educating the virtual world about local food

Challenges in Urban Agriculture

Agriculture in urban spaces can pose a number of unique challenges for both regulators and farmers. However, modern urban farms tend to be smaller scale and focused on higher value crops and lowimpact growing techniques, thereby avoiding some of the historical problems of integrating agriculture where people live, work, learn, and play. Key policy, land use, and administrative barriers for urban farmers:

- A lack of policy and regulations addressing urban farming in statutory plans and zoning bylaws
- Possible noise, dust, traffic, pesticide use, and odour associated with farming activities
- An increase in real or perceived risks to health and safety
- A lack of appreciation of the regulatory and farming realities
- A lack of licensing specific to the nature and operations of farming businesses
- • Restrictions on the selling of produce from farm sites
- Restrictions on keeping small livestock and farm animals (e.g., chickens and bees)
- Restrictions on farm structures such as greenhouses and storage sheds (*figure 3*).

Characteristic	Urban Realities
Crops: Vegetables Micro greens Fruit Berries Chickens (can you sell eggs?) Bees	» Limited space for viable production » Chicken bylaws » Regulations against sale of processed foods (honey, jam, etc) » Community complaints about farm aesthetics
Growing medium: Compost Imported soil Raised planter boxes	» Soil contamination » Limited space for compost production » Community complaints about manure or compost smells
Water City water	» Irrigating with potable water » Water costs (if metered)
Equipment Rototiller Hand tools Bike and cart	» Noise complaints » Sp
Facilities Storage sheds Greenhouse	» Building permits » Limited space

Figure 3 **Urban agriculture restrictions**

Start-up costs in Urban Agriculture. Start-up expenses for an urban farm will vary widely by location because many of the components (such as land or utilities) are site-specific. Start-up expenses can be broken down into a few categories:

Location. This involves purchasing the land, ensuring that it is zoned appropriately, obtaining the required permissions, and having an environmental study completed. Soil tests and land access are frequently eligible for subsidies.

Site Preparation. The farmer must get the land ready for growth after buying or renting it and making sure all the tests and permits are in order for it to function as an urban farm. Soil will be the biggest associated cost—and most likely the biggest cost of the overall operation—but soil costs will differ depending on location and volume. Fencing, signs, and supplying enough water to the location are additional expenses.

Structures. This includes both infrastructure necessary for growing (such as high tunnels) and storing (such as a cooler). What types of structures will be needed will be dependent on location, types of crops grown, and desired length of growing season.

Growing and Selling. These are the expenses that you will expect to incur in your first year of operation (as opposed to true start-up costs, which may involve additional expenses). They include traditional farming costs such as tools, growing supplies and utilities, as well as business costs like advertising and website design.

Administrative Expenses and Operating Costs. These will be ongoing costs associated with your operation, but they are critical to take into account in year one, when you will be getting systems in place.

Costs for Indoor Growing Facilities. The start-up costs for aquaculture and hydroponic systems, as well as other indoor growing facilities, will differ significantly from those of beginning an urban outdoor agricultural enterprise. They will also differ significantly based on the kind of facility you want to construct. A small aquaponics system housed in a greenhouse might be created for a few thousand dollars, or even less if you are able to use recycled components. A large-scale aquaponic facility located in a warehouse-type building may require a multi-million dollar investment.

Examples of good practices for startups in urban agriculture/farming

1. Agricoolm Paris (France). French startup Guillaume Fourdinier and Gonzague Gru created Agricool in 2015. In developed regions of Paris and Dubai, the company cultivates produce like lettuce, strawberries, basil, coriander, and parsley. The produce is then sold in stores within a 15-kilometer radius of the farms.

The startup grows fruit, vegetables, and herbs under LED lights in shipping containers with adjustable humidity and temperature. The start-up wants to reduce water usage and transportation expenses while making it easier to cultivate seasonal crops year-round without using pesticides. To date, Agricool has raised over $39 million. By 2021, the company hopes to have 100 containers in Paris and Dubai in addition to the eight it now has at four urban farms.

2. Infarm, Berlin (Germany). Infarm is a start-up company situated in Berlin that was established in 2013 by Erez and Guy Galonska, as well as Osnat Michaeli. Infarm, like the other startups on this list, aims to close the gap between the farm and the customer's plate. The start-up has placed its produce in Marks & Spencer in the UK, Intermarché in Paris, Irma in Copenhagen, and Kroger in Seattle in addition to sites throughout Germany. The startup creates what it refers to as "smart modular farms" for metropolitan areas by fusing IoT, machine learning, and vertical farming. Because Infarm's solution is cloud-based, a central control hub may be used to monitor and manage the farms.

3. Aquapioneers – Urban Aquaponics, Barcelona (Spain). Urban aquaponics creates a smart water environment that combines hydroponic crop gardening with aquaculture fish production to meet land scarcity challenges in smart cities. With a closed water loop, compact aquaponic farms aim to produce as much food as possible in a very small urban area, including fish and vegetables, sustainably and without the need for water for operation. Aquapioneers, a Spanish firm, creates kits for aquaculture that turn a 54-liter aquarium into an aquaponic ecosystem for year-round food production in homes, workplaces, coworking spaces, hotels, and schools. Their open-source kit is constructed from wood.

4. BIGH Farms, Brussels (Belgium). A Brussels-based start-up called BIGH (Building Integrated Greenhouses) Farms aims to connect urban farms across Europe in order to highlight the potential contribution of urban agriculture to the circular economy. BIGH's designs lessen the environmental effect of a location by integrating aquaponics with existing structures. The first pilot features a fish farm, a greenhouse, and more than 2,000 square meters of outdoor vegetable gardens. It is situated in the heart of Brussels, above the ancient Abattoir. In 2018, they began growing striped bass, tomatoes, herbs, and microgreens.

Additionally, BIGH Farms collaborates with nearby companies and farmers to ensure that the farm's output enhances the current food chain.

5. RotterZwam, Rotterdam (The Netherlands). An urban mushroom farm called RotterZwam spreads knowledge about the circular economy's potential to solve environmental problems. Using spent coffee grounds that are gathered from nearby companies, the farm's closed-loop system converts residual flows into food. The farm's operations and the e-vehicles that transport goods are powered by solar energy at the mushroom nursery, which is constructed out of recycled containers. The staff of the farm trains those who want to launch a mushroom farm and provides tours to the public to teach them about circular systems. Entrepreneurship has an important impact on the economy in several ways, including:

1. Entrepreneurship increases employment. By going into business for themselves, entrepreneurs create their own employment. If they are successful, they may also employ others and help to increase employment related to their operations.

2. Entrepreneurship opens up new markets and stimulates the economy. Entrepreneurs create new businesses all the time by inventing new goods and services or improving on existing ones. By creating new products and services regularly entrepreneurs help to keep the economy healthy and innovative.

3. Entrepreneurship helps to increase national income. Entrepreneurship is a critical driver in creating a healthy economy, and an essential aspect of many economies.

4. Entrepreneurship furthers social change in society. Entrepreneurs break with tradition to push the economy in new and exciting directions. Often, entrepreneurs are responsible for the development of the latest, greatest products. They can also bring more awareness to a gap in social services or goods.

5. An economy in balance and health is produced by entrepreneurship. The governments of practically every nation frequently contribute to the growth of entrepreneurial ecosystems by offering initiatives to encourage business owners in maintaining a strong, stable economy. In order to promote entrepreneurship, the government also funds company incubators, entrepreneur education initiatives, and other initiatives.

There are two categories of factors that drive entrepreneurs: internal and external. Generally speaking, motivations stem from Maslow's hierarchy, with entrepreneurship mostly focusing on the demands at the top needs synthesized by Maslow, entrepreneurship mainly targeting the needs at the top of the pyramid (figure 4).

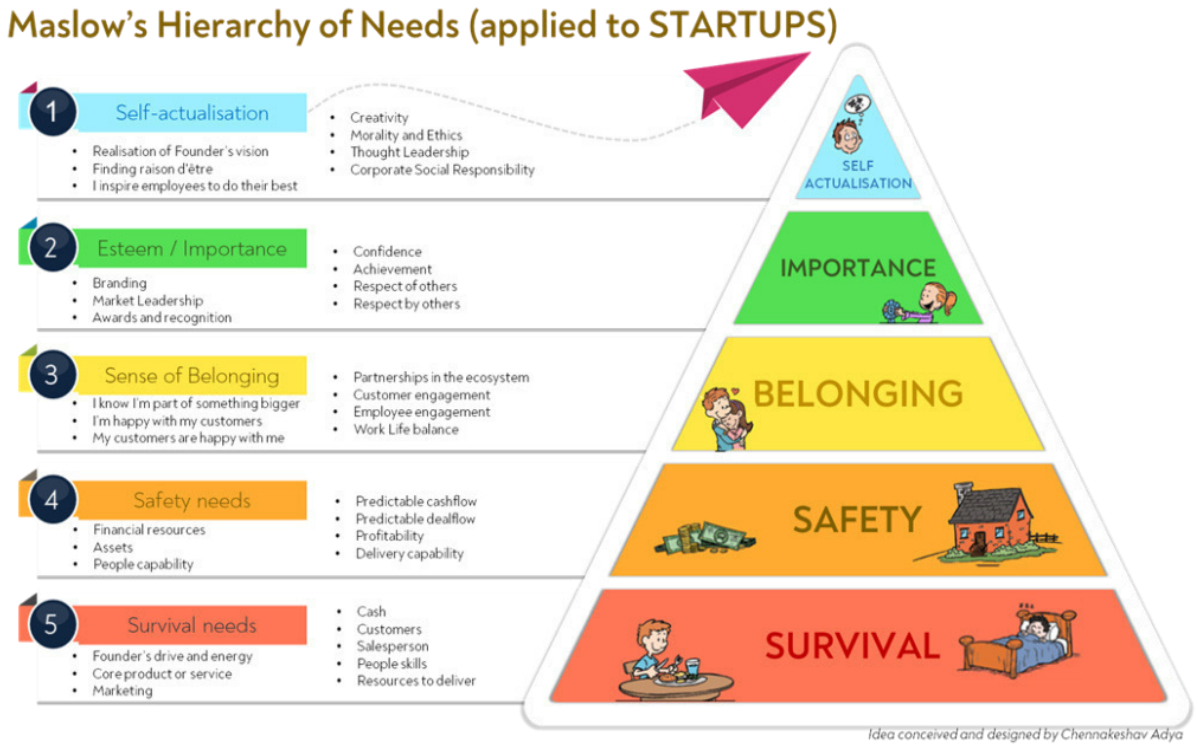

Figure 4 **Maslow's hierarchy for STARTUPS**

Revenue from urban farming is predicted to rise globally by USD 261.1 million by 2032 (*figure*

5), with a compound annual growth rate of 2.7% from 2023 to 2032 (Urban Farming Market Size, 2023).

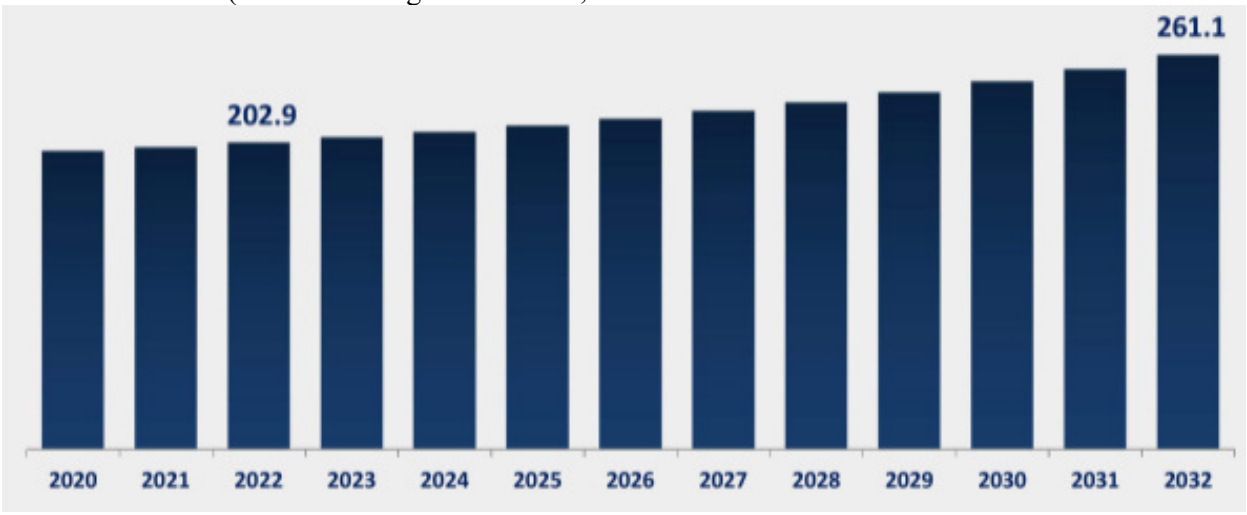

Figure 5 **UA Revenue predictions**

In 2022, the Asia-Pacific area accounted for about 42% of the global market share for urban farming (*figure 6*). Europe is predicted to have the fastest rate of growth between 2023 and 2032.

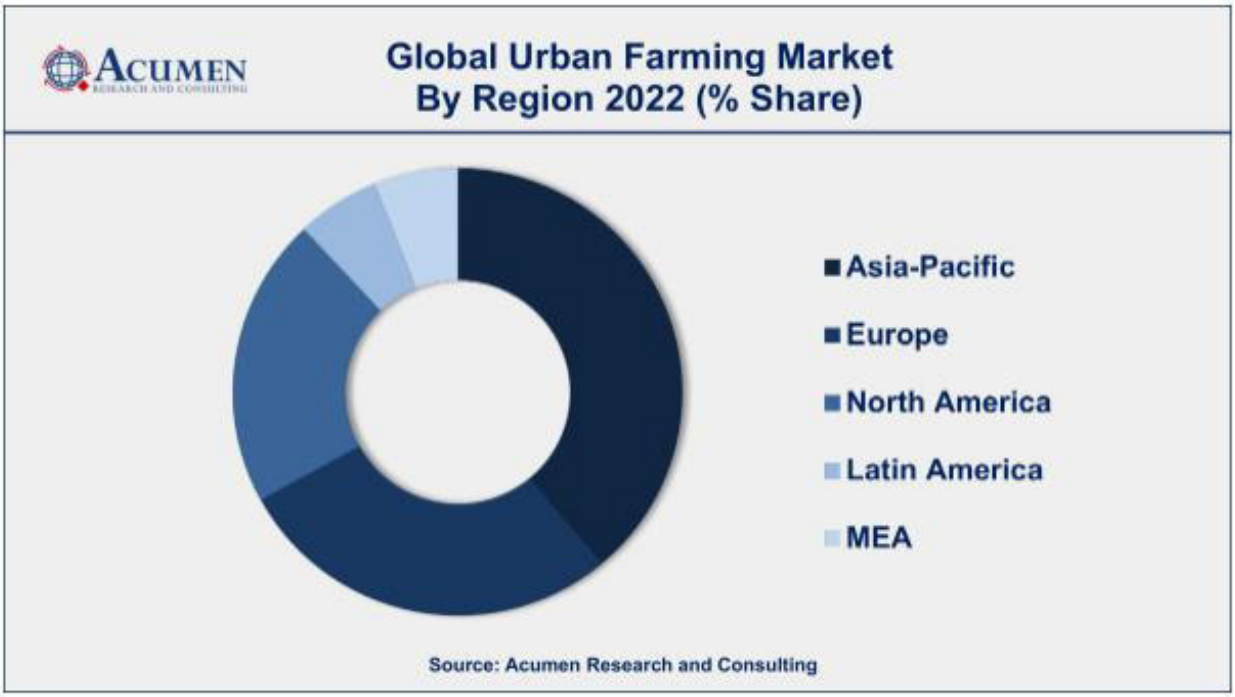

Figure 6 **UA global market – 2022**

It is projected that 68% of people on Earth will reside in cities by 2050, underscoring the importance of urban agriculture. Up to 15% of the world's food supply may come from urban gardening, enhancing food security. Growing consumer desire for fresh, nutrient-dense, locally produced produce is what drives the value of the urban farming industry.

CONCLUSIONS

As presented in the material, with the general characteristics and specifications, urban agriculture is a field for innovative entrepreneurship with a very broad spectrum of activities that can be carried out.

Innovations in production technologies, use of drones or robotic elements, electronic control of vegetation factors or feeding substrate can be successfully implemented.

Through the pleasing landscape appearance and design of urban gardens, the sustainability of cities and the development of smart cities can be managed and developed, with a clean environment and quickly delivered food within reach of all local communities.

ACKNOWLEGMENTS

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