

# Urban Agriculture: Where Urban Pressures Meet City Farmers

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**Abstract:** As agrarian practices return to the urban space, a lack of understanding between the urban farmers and local city officials is stunting the development and economic sustainability of urban agriculture. Many promoters of urban agriculture fail to grasp the modern reality of operating a significant venture within a zoned municipal space. A failure to account for all potential stakeholders in the planning of these agricultural projects can cause unforeseen delays in execution and economic disaster. The needs of the agricultural installation must be balanced with the complexities of the city systems, and modern zoning procedures take multiple perspectives into account. There are numerous variables and considerations that must be evaluated in the creation of an urban farm that developers accustomed to working within the rural environment may not naturally include in their thinking. City planning and neighborhood integration must be addressed to ensure smooth geographic transition between the farming operation and further local real estate market development. The urban agricultural project developer will be required to demonstrate that the logistical needs of the enterprise can be accommodated within the existing infrastructure or be willing to upgrade the lacking requirement. Odor abatement and visual occlusion may be required. These complex elements of successfully installing an agricultural enterprise within an urban environment often frustrate successful project managers with agrarian backgrounds and cause them to pay minimal attention to the requirements of urban operation. Unfortunately, it can be clearly demonstrated that to do so is fraught with peril. Without thoughtful design, many urban agriculture efforts have slow growth, and the impact of these design failures on the progression of these enterprises is immense.

**Keywords:** Community, Local Project Impact, Planning, Urban Agriculture, Zoning

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## 1. Introduction

The field of urban agriculture is quickly becoming a widely adopted method of food production in the global marketplace [1]. The use of this practice promotes economic growth, creates reliable, local food sources, and creates stability in local regions that are not food secure. Consumer demand for local, healthy produce continues to grow [2]. An increase in nearby food sources such as Farmers' Markets has seen excellent growth in Indiana, which can be seen in figure 1. Twenty-five of the twenty-eight surveyed counties have increased the percent change of farmers' markets by greater than 50% in the last seven years [3].

Though the positive effects of urban agriculture are quickly becoming apparent, the spread of this practice has been

slowed or prevented in some instances by local problems. Particularly, the limits in the marketing, distribution capabilities, and public visibility stunt the growth of most local source agricultural production. These factors greatly limit the markets available to the smallholder farmers. The impact of these limited markets is causing the development of local food sources to be economically unsustainable. Additionally, the agricultural production conducted in urban spaces needs to consider the concerns of local stakeholders in the design process [4]. There are already many barriers to entry in the development of urban agriculture. Discourse between local producers at the 2016 Indiana Local Food Summit in Indianapolis alluded to this fact [5]. Many of the lead organizers of urban agricultural efforts voiced their struggles in development and operation, due to failures in their initial planning processes to account for urban constraints.

These leaders did not know to add-in city system considerations, because they did not have the experiences or insight of working within this unique environment, when they began developing their enterprises. Hindsight would have lead them to evaluate these specific concerns earlier. A lack of organized reliable information, initial resource requirements, and a lack of legal precedent in land use laws can prevent the growth of urban agriculture. However, these issues can be solved with effort over time. As the field develops, these problems will decrease, as familiarity with urban agricultural concepts becomes more wide spread. The concerns of the local planners, leaders, and residents need to be evaluated in the design of any project. Barriers surrounding a project placed by the local community can slow the progress of a project, prevent the establishment of a project to begin with, or lead to a project's ultimate failure in the long run. If the needs of the local stakeholders in the proposed urban agriculture effort are addressed in the early stages of the design process, significant time and resources can be saved over the life of the project, and it has a higher chance for success. Some of the difficulties involved in urban agriculture adoption can be eliminated with mindful design and planning.

An exploration of the current difficulties in integrating urban agriculture within city spaces needs to be thoroughly conducted. Sustainable development of this new food supply chain must be carefully designed and implemented to ensure the proper social, economic, and legal infrastructure required for longevity in these circumstances is established. If a farm causes undesirable effects within the urban space, local pressures will eventually get it removed. It is best for all parties if these types of issues are addressed initially and never become a problem. The purpose of this discussion is to evaluate the potential concerns of the community stakeholders to aid pursuers of urban agriculture projects to avoid pitfalls and be good neighbors.

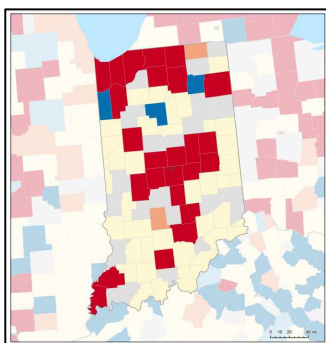


Figure 1. Farmers' markets (% change), 2009-16 [1].

## 2. Background

The idea of agriculture in cities has been on the minds of urban planners for a considerable amount of time. Ebenezer Howard is considered to be one of the most influential city planners in the history of the practice [6, 7]. Many cite his 1902 book, *Garden Cities of To-morrow* [8], as a reference on evaluating ideal city design. The New Urbanist Movement [9]

incorporates many of his principles into their design philosophy [10]. In particular, they focus on his use of greenspace and land use integration in their design concepts. Howard proposed the Garden City, shown in figure 2, where the local agricultural production was easy to access and in close proximity to the local consumers. This design would allow the residents of the city to partake in the greenspace services offered in this class of land use, while providing a secure food source for the consumers. The idealization and use of the Garden City design example in urban planning showed a clear opportunity for urban agriculture efforts to aid in the development of urban spaces when recognized at the onset of urban planning, and it is clearly present in the modern mixed land use design of the New Urbanist Design philosophy. Agriculture and traditionally urban enterprises can cooperate in the urban space. However, urban and area planning efforts may have stipulations that stifle this partnership and lead to complications in the land development process.

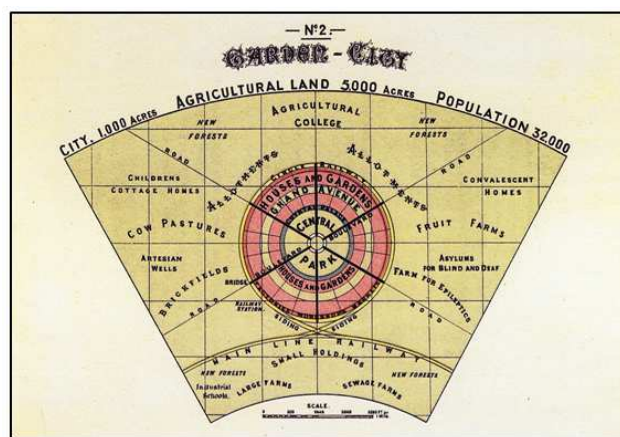


Figure 2. Garden City [3] {Note: Scale Per 1, 320 ft or ¼ of a mile}.

When many current land use regulations were developed, very few developers included provisions for agricultural uses within urban spaces. The idea of having a large scale farm in the middle of an urban center was not considered remotely conceivable or relevant for these developing cities. Provisions were made for the practices that “belonged” in the city spaces. Agriculture belonged in the rural setting [11, 12]. In the modern era, innovations in agricultural technology have made it possible for a farm to fit into the urban space, but the land use restrictions within the city spaces have not kept pace with these developments. While there are many grassroots efforts within cities in the development of small-scale, large-scale, and commercial farms, agricultural production struggles to find an accepted place in the city landscape.

Many city planners lack experience in agriculturally related fields [13]. While some are making efforts to create new regulations and ordinances that allow for urban agricultural production, many others struggle to understand the purpose, benefits, or potential of agriculture projects within city spaces [13]. A severe lack of communication between project organizers and these city representatives can lead to the inevitable failure of an urban agriculture installation. Even

city representatives that do have open lines of communication with these projects and are given the opportunity to understand and support these efforts may still struggle to implement new land use regulations that support certain types of production [14]. The danger of setting an undesirable precedence in the development of new land regulations and ordinances can cause the proceedings to go on for far longer than some projects would have predicted or can economically tolerate. This may lead to further complications and delays, if not properly planned for.

There are also concerns for local planners with the infrastructure resource requirements needed for agricultural production. While some land use laws may accommodate agricultural development, the spaces where these large-scale farms are so restricted, they may lack the infrastructure to provide for the operational requirements for production. The potential water and energy drain that a high density urban agriculture project could have on an urban utility grid is a high concern for responsible planners.

Many local development plans may not have room for urban farms at all. If the area is developing quickly, and parties are quickly moving in and out of the area, the planning efforts may struggle to entertain the idea of local farming into their urban plan. With concerns over resource management, land use controls, space allocations, and necessary legal procedures, planning offices will be hard-pressed to see the benefit of urban agriculture over the inconvenience of its establishment.

Other concerns for urban agriculture establishment come from local businesses and existing producers. Farming in an

urban space can have a disruptive influence in a local economy. Established businesses within the local market may be threatened by the urban agricultural production. These parties will utilize land use ordinances and regulations, public opinion, and any other holes in an urban farming production plan to reduce competition and limit their risks. Additionally, most new urban agriculture suffers from weak or non-existent distribution infrastructures in the beginning stages of production. Failure to establish positive relationships with local economic influences can cause city producers to be blocked-out of their target markets by poor local opinion. An urban farm may have been built, but it will not survive without a customer base. Market competitors that have already established themselves in the local economy will take advantage of any missteps by urban agriculture enterprises to benefit their own businesses.

Depending upon the local culture, urban agriculture may be seen as either a negative or a positive status symbol. There will be some people who do not want agricultural production in their communities for aesthetic or a myriad of other personal reasons. In 2015, the United States Department of Agriculture (USDA) submitted a report to Congress titled, "Trends in U.S. Local and Regional Food Systems" [15]. The report detailed studies conducted by the Economic Research Service (ERS) branch of the department on the growth and development of local food markets in the United States. The report stated that there was a 180% increase in local food producers from 2006 to 2014 and is displayed in figure 3.

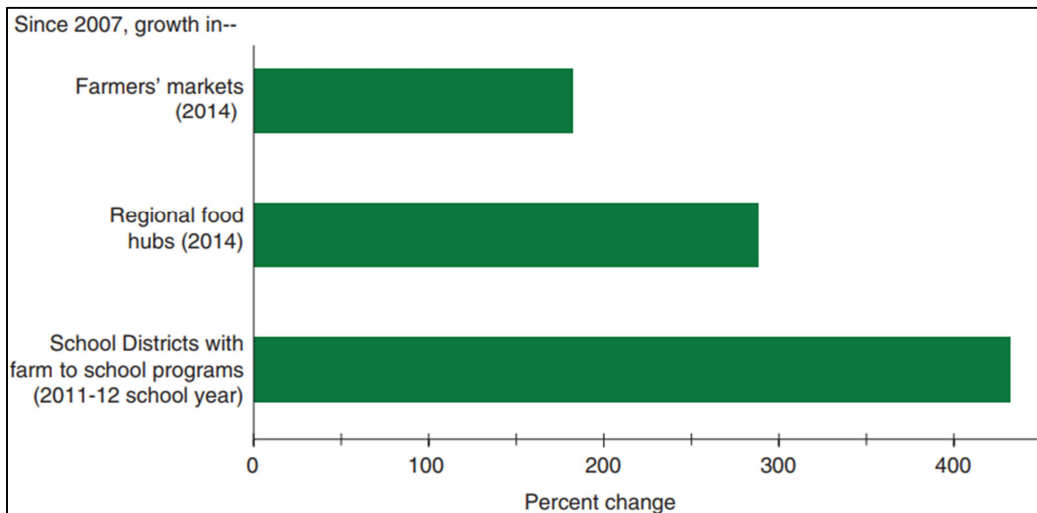


Figure 3. Increase in local & regional marketing channels [5].

This study indicated market growth within the field and increased consumer interest in local food products. Food hubs, direct sales to consumers, farm-to-school programs, and partnerships with restaurants and grocery stores were cited as major tools in the development of local food markets. These tools are particularly useful in urban spaces where community interest and support have larger impacts on business success. The 2015 report also concluded that locally sourced food markets have a larger economic benefit for the entire local

market as a whole. Within the study areas, the local dollar retention associated with these practices encouraged business growth and entrepreneurial development within the community. While the benefits of local source food production are widespread, the overall desires of the community must be taken into account from the initial planning stages for any urban agriculture efforts to be truly successful [16].

### 3. City Officials

If there is a local planning commission for the area, there is likely already a documented area plan established and in motion. Most of these plans will not have considerations for agricultural production within city limits [17, 18]. When area plans were first developed, the ideas on agricultural land uses were very different from the current trends in crop production. Industrialization pushed people into cities and away from their sources of food. As cities grew and the cost of transportation remained manageable, the sources of food for urban residents were pushed farther and farther away. This progression left no room for agriculture in the cityscape. The land use ordinances and regulations that were put in place to establish area plan documents by the planning commissions, often did not include stipulations for agricultural practices in the urban space [17, 18, 19, 20]. Today, there is growing support for agriculture within the urban planning field. However, many of the existing ordinances need to be amended or changed to allow for this new growth. Early communication with local planners and an understanding of the current local area land use regulations are vital for the development of any urban agricultural project. Legal precedence for these activities is developing in some regions, but every situation will be different. Fortunately, many planning offices will be open to assisting in the development of local food sources, and it is helpful to frame the discussion in this manner. The services provided by these efforts have many positive effects on urban development. When designing an urban agricultural enterprise, feedback from the area planning commission will help ensure that the construction and operation of the farm will fall within local rules.

The elected officials and public leaders who will determine whether or not an urban agriculture effort will be allowed to operate within the limits of a city, must take the concerns of their constituents into account. These representatives may be hesitant to adopt urban agriculture practices within their home areas. While there are many benefits to local source practices, these efforts may have the cultural connotation or image of big money moving-into the local area, and that will drain local

public support. In these cases, it is best to focus on how the organization will benefit the community and make those benefits apparent to the local decision makers. Design choices can be made within the project to appeal to the community leaders and influencers. The use of urban agriculture to rehabilitate brownfields and abandoned buildings is a common example of those choices. While these choices may not be ideal for the project, or as cost effective in the long run, they do go a long way to promote the adoption of the urban agriculture practice within an area. Without the cooperation of local officials in all stages of the development of an urban agriculture installation, the support needed to establish a healthy and productive enterprise may not be available [21, 22].

### 4. Designing with the Community in Mind

Designing for the local residents will do two things. It will gain local support for establishment of an urban agriculture farm, while creating positive connections within the local consumer base [23]. The residents of the local community must be the primary consumer market for urban agriculture to have its full impact. In 2015, the USDA report on the development of local food markets, the ERS studied the buying habits of individuals who purchased locally sourced products. This report referenced a study conducted in 2010 that identified the importance that consumers place on various factors when choosing to purchase fresh produce [24, 25]. As seen in figure 4, many of consumers assigned either a great or moderate importance to factors such as “supporting local economy” and “locally grown.” Those who purchased these products directly from producers felt a sense of pride in their choices and that they were “making a difference” in their community [25-27]. Early and continual involvement, along with feedback from the local, interested residents, will encourage produce sales from the farm, while providing necessary information for the integration of the farm into the community [28]. Sunlight, transparency, and local thoughtfulness will help make these projects successful.

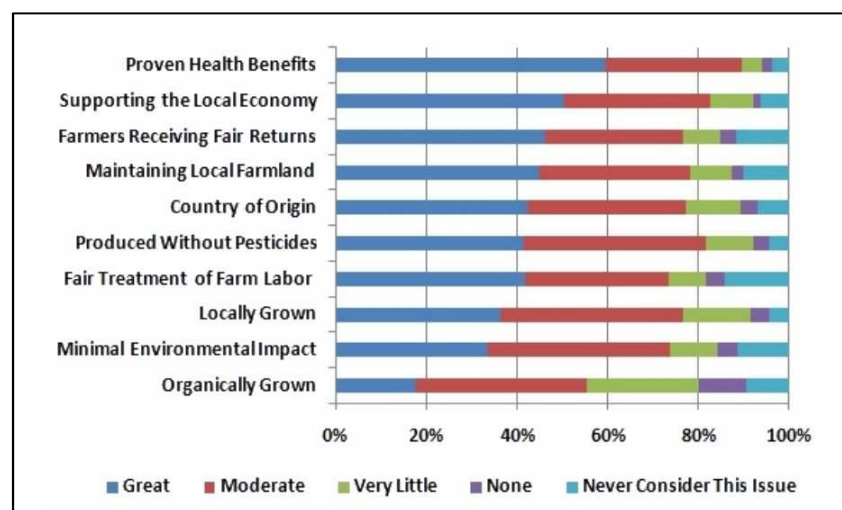


Figure 4. Importance of Factors When Choosing Fresh Produce [6].

## 5. Becoming Part of the Neighborhood

The operation of an urban farm creates many opportunities for the enterprise to provide services beyond produce production. As an example, free disposal of biodegradable waste products from restaurants and cafeterias can serve as a composting material source for the farm and provide a valuable cost cutting measure for the local food service providers. While these systems can be difficult to add to urban production operations retroactively, the inclusion of these practices in the initial stages of planning often cuts operational costs and helps to decrease negative opinions of these ventures. These activities may not be necessary for the operation of the farm, but the resulting social connections help to improve lines of communications between the local community and agricultural producers. Failure to establish these connections often leads to potential oversights and weakening of the social support infrastructure of the farm. Sustainable urban agriculture needs local, social support. These efforts are less necessary in rural settings, but the target market for an urban farm is greatly influenced by local community perceptions of the farm production [29]. An integrated farm that provides beneficial services to the community beyond produce will garner more social support than an effort that ignored its neighbors during the planning process.

Farms can also create partnerships within the community to distribute their product. If the local consumer has increased access to the farm's products, there is a higher chance that they will support the farm. Food charters are an example of these partnerships. These charters are legal agreements about the price, quality, and quantity of produce from the farm being sold to an interested party. They add stability to the process. Examples of interested parties are: area schools, restaurants, and hospitals. The utilization of agreements like food charters are an increasingly popular way to make sure all parties are represented in the production and distribution of local produce [24]. Similar agreements can also be made with food pantries and local homeless shelters to avoid food spoilage and give back to the local community.

## 6. Conclusions

The difficulties and undesirable effects of urban agriculture generally come from a lack of planning, thoughtful consideration, or local communication within the chosen community. It is the responsibility of pioneering urban farmers to take these nearby stakeholders into consideration and open the lines of communications between agriculture and the urban population more than has been seen since the beginning of the industrial revolution. If farms are going to be a part of neighborhoods and city centers, they need to be good neighbors. It will take time for the city ordinances and individual perceptions to adjust to this new food stream. Urban agriculture can be made into a normal way of life, if those establishing it have the patience to

seek-out community feedback and respond with meaningful integration into the community. The thoughtful design of these new urban farms will lead to smoother, more cost effective project establishments and operations. It just takes a little extra effort to add a farm to a city neighborhood, but the benefits can far outweigh the challenges.

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## References

- [1] Simon D., Adam-Bradford A. (2016) Archaeology and Contemporary Dynamics for More Sustainable, Resilient Cities in the Peri-Urban Interface. In: Maheshwari B., Singh V., Thoradeniya B. (eds) *Balanced Urban Development: Options and Strategies for Livable Cities*. *Water Science and Technology Library* (72), Springer.
- [2] Grebitus, C., Printezis, I., & Printezis, A., (2017). Relationship between Consumer Behavior and Success of Urban Agriculture. *Ecological Economics* 136, 189-200.
- [3] United States Department of Agriculture Economic Research Service. (2017). <https://www.ers.usda.gov/data-products/food-environment-atlas/go-to-the-atlas/>. Accessed July 8, 2019
- [4] Diekmann, L., Bennaton, R., Schweiger, J., & Smith, C. (2017). Involving Extension in Urban Food Systems: An Example from California. *Journal of Human Sciences and Extension* 5 (2), 70-90.
- [5] Ballard, R., Strohm, H., & Ogle, T. (2016). *2016 ILFS Morning Sessions Food Hubs and Food Businesses*. Session presented at the 2016 Indiana Local Food Summit, Indianapolis, IN.
- [6] Ward, S. (2016). *The Peaceful Path: Building Garden Cities and New Towns*.
- [7] Livesey, G. (2016). INNOVATION, THE AGRICULTURAL BELT, AND THE EARLY GARDEN CITY. *Berkeley Planning Journal* 28 (1), 148-163.
- [8] Howard, E. (1902). *To-morrow: a Peaceful Path to Real Reform*; reprinted as *The Garden Cities of To-morrow*.
- [9] Congress for the New Urbanism, [www.cnu.org](http://www.cnu.org). Accessed on July 12, 2019.
- [10] Foong, K. (2014). What's 'new' in new urbanism. *Multi - Housing News* 49 (4), 22-27.
- [11] Orbach, B. Y.; Sjoberg, F. R. (2011). Excessive speech, civility norms, and the clucking theorem. *Connecticut Law Review* 44 (1), 1-60.

- [12] Bouvier, J. (2014). Why urban agriculture can be controversial: Exploring the cultural association of urban agriculture with backwardness, race, gender, and poverty. *University of Detroit Mercy Law Review* 91 (3), 205-214.
- [13] Slade, C., Baldwin, C., & Budge, T. (2016). Urban planning roles in responding to food security needs. *Journal of Agriculture, Food Systems, and Community Development* 7 (1), 33-48.
- [14] Reid, N., Gattrell, J., Ross, P., & IGU Commission on the Dynamics of Economic Spaces. (2016). *Local Food Systems in Old Industrial Regions: Concepts, Spatial Context and Local Practices*.
- [15] Low, Sarah A., and United States. Department of Agriculture. Economic Research Service, Issuing Body. *Trends in U.S. Local and Regional Food Systems: Report to Congress*. 2015. Print. Administrative Publication (United States. Department of Agriculture. Economic Research Service); No. 068.
- [16] Armstrong H., Lopes A. M. (2016) Re-Ruralising the Urban Edge: Lessons from Europe, USA & the Global South. In: Maheshwari B., Singh V., Thoradeniya B. (eds) *Balanced Urban Development: Options and Strategies for Livable Cities. Water Science and Technology Library (72)*, Springer.
- [17] Butler, W. (2012). Welcoming animals back to the city: Navigating the tensions of urban livestock through municipal ordinances. *Journal of Agriculture, Food Systems, and Community Development* 22 (3), 193–215.
- [18] Huang, D., & Drescher, M. (2015). Urban crops and livestock: The experiences, challenges, and opportunities of planning for urban agriculture in two Canadian provinces. *Land Use Policy* 43 (2), 1–14.
- [19] Gordon, L. (2013). Legal battles over gardens are sprouting up across the country. Retrieved from [http://www.abajournal.com/magazine/article/legal\\_battles\\_ove\\_r\\_gardens are sprouting up across the country/](http://www.abajournal.com/magazine/article/legal_battles_over_gardens_are_sprouting_up_across_the_country/)
- [20] Keeling, B. (2011, March 30). City of Oakland shuts down Novella Carpenter's farmstand. Retrieved from the SFist website: [http://sfist.com/2011/03/30/city\\_of\\_oakland\\_shuts\\_down.php](http://sfist.com/2011/03/30/city_of_oakland_shuts_down.php)
- [21] Lester, R. (2006). "Urban Agriculture: Differing Phenomena in Differing Regions of the World." <http://community-wealth.org/pdfs/articles-publications/urban-ag/report-lesher.pdf>
- [22] Orsini, F., Dubbeling, M., De Zeeuw, H., & Gianquinto, G. (2017). *Rooftop Urban Agriculture*.
- [23] Specht K., Reynolds K., Sanyé-Mengual E. (2017) Community and Social Justice Aspects of Rooftop Agriculture. In: Orsini F., Dubbeling M., de Zeeuw H., Gianquinto G. (eds) *Rooftop Urban Agriculture*, Springer.
- [24] Hardman, M. & Larkman, P. (2014). *Informal Urban Agriculture: The Secrete Lives of Guerrilla*.
- [25] Onozaka, Y.; Nurse, G.; Thilmany, D. D. 2010, "Local Food Consumers: How Motivations and Perceptions Translate to Buying Behavior," *Choices* 25 (1).
- [26] Yue CY, Tong C (2009) Organic or local? investigating consumer preference for fresh produce using a choice experiment with real economic incentives. *HortScience* 44 (2), 366–371.
- [27] Nwosisi S., Nandwani D. (2018) Urban Horticulture: Overview of Recent Developments. In: Nandwani D. (eds) *Urban Horticulture. Sustainable Development and Biodiversity 18*, Springer.
- [28] Napawan, N. (2016). Complexity in urban agriculture: The role of landscape typologies in promoting urban agriculture's growth. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability* 9 (1), 19-38.
- [29] Miccoli, Finucci, & Murro. (2016). Feeding the Cities Through Urban Agriculture The Community Esteem Value. *Agriculture and Agricultural Science Procedia* 8 (C), 128-134.