



Challenges and Opportunities in Managing Peri-Urban Agriculture: A Case Study of L'Horta de València, Spain

Josep Lluís Miralles-García 

Dpt d'Urbanisme, Universitat Politècnica de València, València 46022, Spain

Corresponding Author Email: jlmirall@urb.upv.es

<https://doi.org/10.18280/ije.060301>

ABSTRACT

Received: 13 June 2023

Revised: 1 July 2023

Accepted: 14 July 2023

Available online: 27 September 2023

Keywords:

peri-urban agricultural management, agricultural heritage, regional planning, Horta de València, agricultural green infrastructure, food sovereignty, agriculture ecosystem services, ecological transition

Peri-urban agriculture potentially serves as an essential green infrastructure, facilitating sustainable transitions within cities by providing crucial local food ecosystem services to urban populations. This study centers on *L'Horta de València*, a historically significant agricultural area surrounding the city of Valencia, Spain, which has been operational for an extended period. Legislative protection for the area was established in 2018, followed by the approval of a management plan in 2019, both formulated to regulate land use and stimulate agricultural activities. While it remains premature to assess the outcomes of these measures, an evaluation of the ongoing positive and negative transformations is feasible. This paper presents research aimed at addressing this objective and poses the question: To what extent are the newly implemented tools rectifying the originally identified issues? The study employed a semi-structured survey, administered to key specialists who were directly involved in the formulation process of the approved plans and represent a diverse array of stakeholders. The survey concentrated on a SWOT analysis, with the results organized along the following themes: governance of the agricultural area, behavior of major powers, social agent behavior, agricultural profitability, agrarian policy, market knowledge, farmer-society communication, environmental concerns, technical innovation, new transport infrastructure and urban development, and cultural services.

1. INTRODUCTION

Peri-urban agriculture has an important role to play in processes to make cities sustainable. The general trend in urban areas all over the world is for their population increase [1, 2]. But at the same time, the increase of urban land or artificial land is much greater than the increase in the urban population. In addition, urban land increases by different kinds of urban sprawl meaning the forms of urban areas change from a compact area to a mosaic of urban-not urban uses. Here, there are agricultural areas between urban areas. These peri-urban areas have a very high potential to supply food directly to urban people living close by, that is, to provide a food ecosystem service. This service can be essential in specific situations of lack of food [3]. In other words, these areas are green infrastructures that are clearly important to generate sustainable cities. Urban areas are the biggest consumers of ecosystem services and producers of waste. A sustainable city can only exist if there is a balance between the ecosystem services produced (mainly in territories outside of the cities) and consumed (mainly in cities), and also an equilibrium between waste produced and waste recycled (in a natural or artificial way).

The lands suitable for agricultural production are only located in specific places with limited extensions. The location of these areas in the case of the Valencian Region was studied by Tomás [4] some 30 years ago. Mediterranean coasts have a specific hot and dry climate. So in places with water for irrigation, agricultural activities can be highly productive. However, in general, according to Rabelo et al. [5], in western

Mediterranean areas, agricultural land use is decreasing. These places are very vulnerable to urban development. Spain in particular saw a sharp increase in urban development for tourism along its Mediterranean coast between 1960 and 2008 [6]. This development changed land uses in coastal areas often destroying natural ecosystems and agricultural areas. Only in exceptional cases was urban development stopped such as in Saler's Devesa [7, 8]. These cases show that urban development processes are generally irreversible.

Green infrastructure includes land with uses that produce ecosystem services [9] for society and economic activities. Green infrastructure is Natural Capital, and agricultural areas are part of it [10]. Within this framework, the concept of agroecological food system [11] is a good tool to understand functions and analyze characteristics. Ecosystem services produced in cities or close to cities, and urban green infrastructures have been analysed by different authors like Van Teeffelen et al. [12], Jalkanen et al. [13] and Palliwoda et al. [14] among many others. Venter et al. [15] studied the possibilities of integrating urban and peri-urban green infrastructure into urban and regional planning, through green roofs. However, peri-urban agriculture is more suitable for Mediterranean coastal areas with water available. The possibilities of urban planning as a tool to protect and promote agricultural food systems have been studied by Wolfram [16] and Kassis et al. [17]. According to Wackernagle et al. [18], it is possible to decrease the ecological footprint of cities by improving ecosystem services produced for urban green infrastructure. In fact, one of the conclusions of the Living Planet Report 2020 [19] is that "land-use change due to where

and how we produce food, is one of the biggest threats humans pose to biodiversity”.

L'Horta de València is an historical agriculture area around the city of València in Spain. It is a big area irrigated by water from the River Túria. The land agriculture that is protected, including a buffer around strict historical area and all kind of uses inside the perimeter (infrastructures, urban land, etc.) covers 63,400 ha. Many authors have studied very different aspects of this special historical landscape because this area and agricultural activity are very interesting from many points of view. Among the latest publications, Romero and Francés [20] coordinated a multidisciplinary study which analyzed the causes that explain the progressive disappearance of this historical space. *L'Horta de València* is a specific historical landscape that the Valencian population perceives as part of their identity that was the object of a “Popular Legislative Initiative” [21] in 2000 to protect it. Rodríguez Romero et al. [22] studied the case of Madrid’s peri-urban areas from this point of view. In the case of Valencia, the dynamics of the landscape’s changes have been studied by Temes and Moya [23, 24], Temes Córdovez et al. [25] and Melo [26]. An important part of this peri-urban landscape is the cultural heritage that was studied by Maya and Pla [27]. Romero and Melo [28] studied the real possibilities of regional planning as a tool to govern uses and protect peri-urban agricultural areas, and Melo [29] studied the role of these kinds of peri-urban spaces inside the metropolitan area of València. Marzal Raga [30] directed a study about the regulation of uses in this kind of space, i.e. peri-urban agricultural areas. They have a legal framework based on regional law as a part of land classified like *non-developable land* (i.e., lands urban plans require to remain undeveloped). But obviously, to protect an agricultural area inside a metropolitan area, agricultural activity must be maintained, i.e., a pro-active politician is needed. It is not enough to stop new urban uses or urban development. Pérez et al. [31] studied the functionality of agriculture in this area.

Real changes in agricultural policy began in 2015. The municipality of València and the regional government started undertaking actions to protect agricultural areas more effectively. One major initiative was the transition to agri-food sustainability, an initiative studied by Sarabia et al. [32]. It is an major challenge for our global society which has been studied by different institutions like FABLE [33]. The societal transition to sustainability is an interesting research field focused on the stakeholders which play a role in the process [34, 35]. According to this approach, new pathways are needed for governing food system transformations like Mangnus et al. [36] explain. Tuscano et al. [37] point out, consumers are changing their behavior to become more responsible food consumption. 2017 MILAN URBAN FOOD POLICY PACT Annual Gathering and Mayor’s Summit took place in València, and it drew up the document Agri-food Strategy [38]. The next year, in March 2018, the *L'Horta law* (Llei de *L'Horta de València*, in Catalan) was published [39]. This law is the main tool to shift agricultural activity in this area to a sustainable agri-food system. The law establishes a complex system to manage the agricultural area, analyzed previously by the author [40], and focused on four issues:

- Promotion a regional plan called the “Territorial Action Plan to Regulate and Revitalize *L'Horta of Valencia*”. This is a regional plan to determine land uses and stop urban development in agricultural spaces.
- Legal identification of elements that make up this landscape to protect.

- Creation of the “*L'Horta Council*” a public-private organism with a budget to finance actions of common interest and/or public interest to agriculture activities.
- Promotion of an Agrarian Development Plan that is the main tool to program future strategies. The plan drawn up but has not yet been approved.

The Territorial Action Plan to Regulate and Revitalize *L'Horta de Valencia* [41] elaborated by the regional government was passed in December 2018. It establishes possible uses in protected agricultural area. Nevertheless, in Spain, regional planning approved by regional governments is not binding on public works promoted by the central administration. In consequence, even today the protected agricultural area is threatened by the construction of central state projects, especially those that are transportation related.

The Agrarian Development Plan [42] is a tool to improve agricultural activity and profitability. The first version of the plan was finished in 2020 but has still not been passed.

The last important document was drawn up in 2019. It is the report *Historical Irrigation System at the Horta of València* [43] which was carried out to register *L'Horta de València* as a Globally Important Agriculture Heritage Systems (GIAHS) by the UN Food and Agriculture Organization (FAO). It was designated a GIAHS on December 2 that the same year.

After the approval of *L'Horta Law*, the success or failure of designed actions should be evaluated. Not much time has elapsed since the approval, but the new situation can be assessed by means of a survey of experts who directly participate in drawing up the different tools: *L'Horta Law*, the regional plan and the agriculture development plan.

The process to transition to an agri-food sustainability system has been analyzed by different authors. The behavior of different stakeholders is important and a determining factor in the process’s succes. Ingram [44] showed the relevance of diversity to understand agricultural transitions. Wolfram et al. [45] studied in more detail the concept of urban transformative capacity to successfully undertake agri-ecological transitions. Geels [46] focused his studies on a multi-level perspective. And Singh et al. [47] focus his interest on package-based to agri-ecological transition. All these kind of analyses consider the stakeholders, and their behavior and perceptions, and consequently use surveys to analyze situation.

The author carried out a study whose results were published synthetically as a paper at the 2nd International Conference on Urban Agriculture and City Sustainability [48]. This article is an extension of that publication focused on the interpretation of the results.

2. MATERIALS AND METHODS

Both the plan and the law are being applied. The aim of this paper has been to identify the characteristics of the new situation of the *L'Horta de València* after applying the two new tools, and to identify the new challenges in this new situation. There is an ex-ante situation which was analyzed and diagnosed according to a literature review. New management tools were designed to solve the problems. Therefore, an ex-post analysis is necessary to discover the efficiency of the new management rules implemented. This analysis can be complex and a period of time is necessary to verify the changes. But a preliminary analysis is possible through a survey of key informants.

The study was done by a SWOT (strength, weaknesses,

opportunities, threats) analysis. It was produced as a synthesis of the results of a survey of key informants. The phases of methodology are the following:

- Design a semi-structured survey focused on a SWOT analysis.
- Establish criteria to select key informants.
- Pick key informants.
- Run all surveys individually (no interviewee knew at any time the responses of the other interviewees).
- Analyze and synthesize the answers.

The objective was to learn the characteristics of the new situation after implementing the new management resources (*L'Horta Law*, regional plan and agriculture development plan) through a SWOT analysis. The survey was semi-structured and personal. The interviewees were personally asked about SWOT issues, one by one, in the new situation according to their own experience. That is, each interviewee was orally asked their opinion on the strengths, weaknesses, threats, opportunities, of the current situation of agricultural activity in the area of *L'Horta de València*. For example: "The *L'Horta Law* and *L'Horta Plan* were approved two years ago approximately. What do you think about the strengths that currently are for agriculture activity in *L'Horta*". All surveys were recorded and notes were taken with the main ideas. The main objective of the survey was for each person to express themselves freely.

Each interview lasted 1–2 hours and were conducted in 2020. During the interview, the interviewer asked questions to clarify answers or about aspects of interest according to previous information. He also stepped in to direct the interviewee to SWOT questions. In no case, however, did he in any way offer an opinion or discuss his interventions. The conditions of the interview were explained before the start of the interview. No interviewee ever knew the answers of any other interviewee or other previous information. In this way, the results are objective vis-à-vis the opinions expressed. The survey was carried out in the first semester of 2020, partly before Spanish COVID-19 lockdown and partly afterward. The *L'Horta Council* started operations in 2021.

The criteria to select the key informants were:

- People with extensive knowledge about the conditions of agricultural activities in this area.
- People who directly participated in developing one or more of the new management tools.
- Representatives from different stakeholders with direct experience in their own field.

These people know the reasons for the new management regulations and know, after the first experiences, which of the new rules are efficient or not and why. The literature reviewed newspaper articles and personal contacts helped identify people who met these conditions. Note you that the *L'Horta Plan* and also the *L'Horta Law* followed a strategic environmental assessment process with public participation. Therefore, the specialists, professionals and technicians who participated in the process of preparing the proposals, and also the leaders of this process within the different stakeholders are known. Additionally, a previous SWOT analysis was carried out with the available information. Five people were selected from different stakeholders: a university specialist, a union representative of farmers that usually practices conventional agriculture, farmers interested in non-certificate organic agriculture, entrepreneurial organic farmers and an NGO that focused on environmental protection and food sovereignty.

Finally, the answers were structured by topics through a

direct qualitative analysis.

The method allows identifying the main problems and the success with a qualitative analysis but without any quantitative analysis. For example, this method not allows measuring how important is each topic. The results of analysis must be coherent and logical.

On the other hand, the surveys show the evaluations of people interviewed. It is important select people to survey that actually want improve objective conditions to maintain agriculture activity. This is a previous condition to be part of interviews. It is possible knowing the people with this condition during the public participation process to elaborate the plan and the law.

All these characteristics limit the possibilities of method to a first qualitative approach to real situation. A deeper analysis requires other types of methodologies.

3. RESULTS

3.1 Identifying main issues

The first analysis allows identifying the main concepts about the future by grouping each item/opinion of answers according to a concept, idea, representative name of the kind of action or problem identified by interviewees. This analysis allows structuring the answers according to the following topics:

1. Governance
2. Behavior of social agents
3. Environment and agricultural activity
4. Cultural issues
5. Agricultural profitability
6. Behavior of big economic powers like major companies
7. Agrarian policy
8. Knowledge needs about agricultural market
9. Public communications and information
10. Technical innovation in agricultural production
11. New transport infrastructures and urban development

The following sections show the results of the SWOT analysis topic by topic. Tables 1-6 show an overview of the results of SWOT survey by topic. Sometimes several interviewees expressed the same opinion about an idea. If two persons expressed the same idea, the idea is marked by an &, and when more than two interviewees said the same idea, this idea is marked by &&.

3.2 Results for the "Governance" topic

Governance is the topic with the highest number of opinions. Interviewees recognize the positive actions to tackle some main problems, particularly those undertaken by the *L'Horta Law*. As a strength they emphasize that the regional plan (Territorial Action Plan to Regulate and Revitalize *L'Horta de Valencia*) has stopped urban development on agricultural land that implies its destruction. About 50% of historical agricultural land today has been urbanized. However, some interviewees remember that this plan still allows for important urban development on agricultural land. In some cases, the law allows these urban developments because of the cost of money compensations for cancelling acquired rights if the administration annuls them. But in other cases, urban development is allowed to undertake municipal urban projects.

The protected area covers 44 municipal boundaries in very diverse situations.

In addition, interviewees highlight the idea of “Definition and identification of professional farmers (organic and conventional)” because that is the best way to focus assistance on farmers for whom agriculture is a way of life. They are identified through a register.

Table 1. SWOT analysis results about “Governance”

Governance
Strengths
-The <i>Horta Law</i> has allowed stopping the process of urban development on agricultural lands.
Weaknesses
-Public administration in general and <i>L’Horta’s Council</i> particularly does not have initiatives to promote the agricultural economy. && - <i>Horta Law</i> was a social pact to protect and promote <i>L’Horta</i> but there are still problems about several urban expansions. & -The <i>L’Horta Law</i> does not prevent the central administration from promoting the construction of large transport infrastructure (highways, high-speed train) in the protected agricultural space. -There is no coordination in the initiatives of the different public and private agents with common objectives of promoting agricultural activity. -Lack of collaboration between agrarian union, farmers and politicians. &
Opportunities
-GIAHS-FAO registration is an international award that can help to create a brand, promote rural and cultural tourism, create professional farmers, etc. -It is necessary a registration of professional farmers in organic and conventional agriculture. && - <i>L’Horta’s Council</i> can promote initiatives and planning actions because has the budget and ability. - <i>L’Horta’s Council</i> is an entity open to all sensibilities. -It is possible to achieve the objective of food sovereignty in the urban area of Valencia with agricultural products from <i>L’Horta</i> . & -It is necessary to make organic and conventional agriculture compatible. -The inspection teams must be a mix between technicians and farmers. -Now the collaborative economy in agriculture is an opportunity. -In any case it is necessary some type of a supra-individual organization. -EU Recovery Plan promoted because of COVID is an opportunity to transform peri-urban agriculture.

Source: Miralles i Garcia [48]

The idea of creating the *Horta’s Council* was evaluated very positively because it is open to all sensibilities and has the budget and ability to promote initiatives of a common interest, but several people were very critical with its delay starting up and the results of activity.

Several opinions were expressed regarding the need to coordinate actions and show its possibilities:

- Opportunities: promoting food sovereignty of the metropolitan area of València, making organic and conventional farming compatible, farmers’ participation in technical inspections, making groups of collaborative economy in agriculture, creating a supra-individual organization.

- Weaknesses: coordination between different social and public agents to achieve common objectives (e.g., local administration) and collaboration between agricultural workers’ union, farmers and politicians.

Some actions about coordination are currently in execution,

for example, agreements between farmers and municipalities. The municipality of València has an agreement to supply schools with organic vegetables for school cafeterias. This kind of farmer–consumer collaboration means direct services from local farmers who are guaranteed sales.

Some interesting opportunities that interviewees identified are the possibilities of GIAHS-FAO registration and the use of the EU Recovery Plan for an ecological transition. These two real possibilities can help to promote necessary changes, like creating a brand, promoting rural and cultural tourism, creating professional farmers, etc.

The interviewees identified two important ideas. They mentioned that *L’Horta Law* was a social pact to protect and promote *L’Horta*, but there are two major problems still pending. The first has to do with the risk of new urban expansions if regional planning criteria changes, and the second with the risk of new infrastructures such as motorways or railways promoted by the central administration in the protected area because this regional protection is not binding upon it.

3.3 Results for the “Behavior of Social Agents” topic

Social agents play an important role in Valencian society regarding the issue of *L’Horta*: there is a major social movement in favor of *L’Horta* remaining agricultural land, many local administrations share that movement’s objectives, and consumer preferences are shifting in favor of local demand and organic products. There is a small but growing group of enterprising young farmers that represents a new kind of farmer in a globalized economy. Valencian society holds the agricultural heritage of *L’Horta* in very high esteem.

Table 2. SWOT analysis results about the “Behavior of Social Agents”

Behavior of Social Agents
Strengths
-There is a strong very diverse very active social movement in favour of <i>L’Horta’s</i> agricultural land. It is a bottom-up entrepreneurship system. & -A significant part of the local administration shares this movement’s values. -Consumer attitudes are changing and organic products are increasing. -The number of young entrepreneurial farmers is small but growing progressively. -Very positive social assessment of the agricultural heritage of <i>L’Horta</i> . & -There is an effective and traditional water management community with a Water Court. -There is a collaborative and self-organizing tradition between farmers.
Weaknesses
-Lack of consensus among social agents in favor of agricultural activities about the way to act. -The representation of each agrarian union on <i>L’Horta Council</i> is small and not proportional. -Disappointment among conventional farming community: — Expectations have been created that have not been met.
Opportunities
-Change of mentality in favor of local products.

Source: Miralles i Garcia [48]

In addition, very importantly, there is a traditional attitude and culture amongst conventional farmers in favor of collaboration and self-organizing with ample experience in

water management and conflict management through the Water Court [49] based on keeping one’s word. The Water Court establishes sentences by word only, without writing anything, one that all farmers accept. In fact, historically, if a farmer did not keep his word, the others excluded him from their society due to lack of trust and do not work with him when he needs help. This system of social control is not currently applied in today’s global economy, but there is still the moral value of “keep one’s word” as a part of the culture of traditional farmers.

3.4 Results for the “Environment and Agricultural Activity” topic

The environmental topic refers both to the environmental variables that affect the agricultural activity, and also the environmental impact, positive and negative, that the agricultural activity has on *L’Horta*’s territory and its surroundings.

Table 3. SWOT analysis results about the “Environment and Agricultural Activity”

Environment and Agricultural Activity
Strengths
- <i>L’Horta</i> has been a sustainable agricultural system for more than 1,000 years.
-The traditional irrigation system help fight climate change, the “hot island” phenomenon and heat waves.
-Historically there was a <i>L’Horta</i> -swamp symbiosis that increased rainfall. This situation can be recovered.
-The ecosystem of <i>L’Horta</i> increases biodiversity.
Weaknesses
-The use of agrochemicals is contaminating soil and groundwater.
-Low quality of irrigation water.

Source: Miralles i Garcia [48]

According to interviewees, in addition of food services, that is an ecosystem service produced by the agricultural landscape, and other ecosystem services that this place provides society with such as moderating the weather and the urban heat island phenomenon from the nearby city of València, increasing rainfall in a Mediterranean area that is usually dry, and increasing biodiversity. These opinions come from those interviewed with a more environmentalist worldview. On the other hand, *L’Horta* suffers from negative environmental impacts such as irrigation water pollution and itself produces environmental negative impacts such as soil pollution from the use of agrochemicals in conventional agriculture. The interviewees with a direct interest in agricultural activity point out more specifically the negative impact on the quality of irrigation water while soil pollution is associated with the use of chemical products in agriculture.

3.5 Results for the “Cultural Issues” topic

L’Horta de València produces a significant cultural ecosystem service: It is a cultural landscape that defines Valencian society’s identity. This is recognized as a strength and, although it was only mentioned by one person, it is widely accepted.

3.6 Results for the “Agricultural Profitability” topic

In agricultural landscapes, profitability is essential to

maintain the activity. Agricultural landscapes are artificial and need the work of farmers to maintain them. Maintaining the work of farmers is only possible if the work is profitable enough to continue the economic activity. All interviewees spoke about this issue from different perspectives.

L’Horta is a smallholding landscape, and economic activity has the weaknesses of this kind of agricultural activity: dispersed and small fields, weak ability to negotiate sales prices, contradictory interests between farmers and traders, weak control over marketing and value chain, etc.

The interviewees also point out strengths such as easy possibility of diversifying crops, diversifying value chains, the versatility and diversification of commercial models, etc.

Table 4. SWOT analysis results about the “Agricultural Profitability”

Agricultural Profitability
Strengths
-Small-scale farming has drawbacks but also advantages.
Weaknesses
-Farmers typically farm small fields with different locations, which increases costs.
-The small farmers do not have ability to negotiate good prices with big buyers.
-Differences of interest and behavior between farmer and trader.
-Small farmers do not have the capacity to control the marketing process or the value chain.
-Territorial fragmentation and residual fields produced by transportation infrastructures mainly.
Opportunities
-Promoting more competitive farmers/rural companies by increasing farm size, making source-identified products, promoting proximity markets &, land grouping &...
-Promoting land stewardship to maintain agriculture and landscape. &
-Carrying out a study with a long-term horizon (e.g., 20 year) to analyze how to defend the <i>L’Horta</i> ’s heritage (visioning).
-COVID-19 has increased demand for local products and organic agriculture in València, Spain and Europe. &
-Make a direct distribution system from farmer to consumer.
-Last real estate crisis (before COVID-19) generated a limited return of workers to agriculture that increase interest to agriculture production.
-Possibilities of agricultural wholesale market (MERCAVALENCIA): management of ‘ <i>tira de comptar</i> ’ for direct sales, sales of prepared products, online sales and home deliveries, offering of certified organic products and traditional products (not certified organic products).
Threats
-Unfair competition from third countries with lower phytosanitary requirements.
-Agricultural crisis with prices below the cost of production (before COVID-19).
-Usually farmers do not have connections with foreign markets out of Spain which limit the possibilities to sale.
-Certified organic agriculture has rigorous controls that penalize farmers.
-The big stores can control prices and impose conditions.

Source: Miralles i Garcia [48]

Interviewees identify many opportunities to improve profitability but only some are in execution. The *tira de comptar* or *ecotira* (proper name in Catalan) is a sales point at the agricultural wholesale market of València (MERCAVALENCIA). This sales point has direct sales from farmers to third parties such as small grocery stores. Usually, farmers go to the fields very early, before 6 a.m., to harvest

vegetables and at 6 a.m. they start market activity. The traders usually go to market between 6–7 a.m. to buy product that they then sell in grocery markets. In this way, people can buy fresh local “km 0” products. It is a system to promote direct contact between farmers and consumers. This system can be extended to other ecological products or prepared products like canned food. This sales system was launched in 2021.

The COVID-19 pandemic situation was other opportunity to changing agriculture system. In fact, the pandemic was a major boost to demand for organic products both locally and from other European countries.

The main threats identified were unfair competition from countries outside of Europe with lower phytosanitary requirements that often penalize Valencian farmers and the weak position farmers are in to negotiate sales with the large stores. This situation is aggravated because farmers, in general, do not have contacts with foreign traders, especially from central Europe.

On the other hand, organic agriculture is difficult in a smallholder’s situation with a mix organic-conventional agriculture because of agrochemicals move from conventional agriculture plots to organic agriculture plots and, finally, organic farmers are penalized.

The largest stores can buy enormous quantities of product, and set prices and conditions. In this situation, sometimes farmers prefer to destroy production like in the case of onions last spring (2021), despite their high sales price in stores.

3.7 Results for the “Behavior of Big Powers” topic

In this subsection, as the term “Big Powers” refers to the main administrations or organizations with the ability to guide the administration's governmental action, or the action of other organizations like universities or major trade companies, towards objectives about food sovereignty, sustainability, etc.

Interviewees perceive the behavior of these big organizations as a weakness because of:

- Lack of commitment from organizations (administration, universities, large companies, etc.) with capacity and power to promote a new urban concept (that includes protecting areas which produce ecosystem services).
- Sometimes there are dogmatic positions of some politicians that can produce the loss of allies (e.g., housewife).
- Risk that *L’Horta’s Council* disappear if the political landscape were to shift in the future.

Interviewees perceive the need for agreement with different stakeholders to produce changes. The answers show two points of view: the priority of an ecological transition in agriculture; and the priority of the profitability of conventional agriculture. In this situation, the dogmatic position of some politician regarding ecological transition can produce loss of allies to promote changes, e.g., a radical agri-ecological position can increase the food sale prices and, consequently, the rejection of housewives. Probably, the way to explain objectives to change and the future scenario, especially when they imply major changes, can alienate a part of traditional farmers. The *L’Horta’s Council* is empowered to manage general changes, but for the time-being unsuccessfully. That is why an interviewee warns that it might disappear.

3.8 Results for the “Agrarian Policy” topic

The interviewees explain weaknesses and threats but not strengths or opportunities. They identify problems but not solutions.

The opinions about agricultural policy are focused on the Agrarian Development Plan, the dichotomy between organic and conventional agriculture, and traditional agricultural knowledge transfer.

Table 5. SWOT analysis results about “Agricultural Policy”

Agricultural Policy
Weaknesses
-Agrarian Development Plan too focused on organic agriculture.
-Agrarian Development Plan has not been approved.
- <i>L’Horta’s Council</i> budget too oriented towards security against crop theft and very little towards productive investments.
-Dichotomy between organic (small but growing production) and conventional agriculture (majority today but uncertain future).
-Dichotomy between ecological dogmatism and pragmatism in the face of reality.
-Conventional agriculture obsolete because of negative environmental impacts.
-Rules about agrochemical products are unclear and there is not a good control.
-Several fields are abandoned which often become garbage dumps.
-Generational farmer chain broken and active farmers aging.
Threats
-Traditional chain seed is breaking which produces an external dependence.
-The interest of the new generations in agricultural work is decreasing. The profitability is too down.
-Risk of going back in the process due to lack of results.

Source: Miralles i Garcia [48]

3.9 Results for the “Knowledge Needs about Agriculture Market” topic

As expected, the interviewees identify this topic as a weakness. They identified knowledge deficits in different areas:

- A detailed study should be carried out to better understand: production, stakeholders, land grouping, field structure, etc.
- There is an Observatory, but prices, distribution and the value chain are not well known.
- Educational need (crop management, online sales management, etc.). There is one farmer school but it is inefficient according to current needs.
- Lack of cultural synergy between university and traditional knowledge about agriculture.
- In general, society does not understand how *L’Horta’s* agriculture works. &

The training should be targeted towards crop management or new internet-based technologies (e-trade, international door-to-door trade, e-distribution, etc.). Currently, there is one farmer school but is deemed to be ineffective according to current needs. This topic is perceived as a weakness.

Better knowledge of production, stakeholders, field structure, etc. is also needed. There is an Observatory but not enough information is available.

Some interviewees identified the lack of synergies between university and traditional agriculture. In general, city dwellers do not understand how *L’Horta* works.

3.10 Results for the “Communication and Information to Society” topic

This topic is also perceived as a weakness. Some interviewees have the opinion that the regional public TV does not accurately report on the real situation of farming in *L’Horta* and a discussion needs to be opened between stakeholders on the topic. This opinion is important because society needs to understand the situation to accept the actions to solve the problems.

3.11 Results for the “Technical Innovation in Agricultural Production” topic

In a coherent way, interviewees perceived technical innovation as a threat but also as a opportunity.

Table 6. SWOT analysis results about “Technical Innovation in Agricultural Production”

Technical Innovation in Agricultural Production	
Opportunities	
-To take advantage of technological changes. They do that land factor not be so important.	
Threats	
-“Vertical farms” will probably be the immediate future of agriculture production with hydroponic and aeroponic crops, particularly “vertical urban farmer”.	

Source: Miralles i Garcia [48]

Interventions focused on the technological possibilities of so-called “vertical urban farms” based on hydroponic/aeroponic crops or other similar techniques. This technology allows producing organic vegetables with a controlled environment in industrial buildings. Today this technology is energy-expensive. Can make organic agriculture with absolute control over all parameters in buildings or warehouses possible. This technology allows producing organic vegetables with a controlled environment in industrial buildings. Today this technology is energy-expensive, but the cost of production will probably go down.

Conventional farmers think that this kind of agricultural is not a threat for this agricultural area where farmers can have three or four crops each year with a good climate and irrigation. However, some university specialists do not agree. They think that vertical urban farms can be a real alternative to conventional agriculture in the future with low-cost organic production.

Interviewees do not consider other types of urban agriculture like green rooftops, green facades or even urban gardens because they usually only produce very small quantities of vegetables for own consumption.

3.12 Results for the “New Transport Infrastructures and Urban Development” topic

As previously mentioned, transport infrastructures and urban development are perceived by interviewees as a threat:

- The central administration is planning to expand already-existing transport infrastructures (motorways) and to build new infrastructure (high speed railway).
- New transport infrastructures irreversibly transform agricultural lands, fragment territories, and produce residual unusable fields.
- Use of protected agricultural land to build new infrastructure or for urban development.

- Urban pressure to build on protected areas.

In fact, the central administration has built an extension of a motorway in the protected area and is planning a new 20 km-long infrastructure for high-speed rail inside the protected area. Transport infrastructures are barriers that generate isolated agricultural areas difficult to work.

4. DISCUSSION

The interpretation of different opinions has to be carried out within the framework of the economic and social reality that exists in València and *L’Horta*, particularly according to its own culture. The problems and solutions analyzed and proposed must be considered as a reference or experience but not always are generalizable to other territories or places. Valencian territory is, however, part of Spain and the European Union, and as a consequence, several problems are shared by Spain and the European Union.

From his study, one can observe that the analysis of problems, weaknesses and threats carried out by the interviewees is more extensive than the analysis of solutions, strengths and opportunities. This is considered to be normal because the specialists tend to experience the problems and deeply understand them. However, to propose solutions, and particularly solutions with guarantee success, is more difficult even for specialists when affronted by such complex problems. In this situation, different specialists or professionals can have different or even contradictory points of view about the same problem or possible solutions. In addition, some solutions or investment priorities require the maximum possible consensus, especially if they are associated with effort or sacrifice.

The results of survey analysis show that only a few ideas were expressed by more than two people. In these cases, it is understood that the idea is common among interviewees. In consequence, it is obvious that the sample of interviewees is very independent and represents different ways of perceiving the same situation, different priorities about problems and solutions, and even contradictories positions about the same issue. However, at the same time, this variety of opinions enriches the analysis and facilitates understanding the problems. The management process started is innovative and the success of different actions needs to be confirmed.

It is interesting to note that the interviewees dedicated a large part of their interventions to the topic of governance, focused on maintaining agricultural activity that implies protecting the area and actively promoting initiatives regarding profitability and innovation in agri-ecological production and distribution. This concern is logical amongst small farmers.

However, the main problem of administrative protection with a territorial plan is the possibility of protection being lifted if a new regional government decides to annul or change the plan, or increase the area available for urban development. This is a problem currently not solved about administrative protection and sustainability. If we want, or need, to protect agriculture areas to guarantee food sovereignty and produce local food really, we have to guarantee protection continuously independent of future governments. Currently, protected areas are an administrative condition. In consequence, it is reversible while urban developments are practically irreversible.

Perhaps the solution here is the need to redefine the concept of progress which is strongly tied to an increase in GDP.

According to this idea, economic progress will always be greater with urban development than farming. But it is also obvious that in the current situation, the progressive destruction of natural resources, like high quality agricultural land, will generate future poverty. In fact, COVID has shown the vulnerability of countries highly dependent on importing basic consumer goods like food. In this situation, the theory about the role of property that can be built on must be revised because this concept of property does not generate wealth for society. If we accept that the landowner is free to sell his or her property for any use, the landowner will always prefer to sell it for buildings rather than maintaining agricultural activities because the price of land for buildings is much higher than it is for farming. In consequence, this concept of property of land prevents the optimization of alternative uses of the territory like the location of the necessary natural resources to produce ecosystem services (food among them). According to Kassis et al [17] this new concept of progress is considered to be necessary in order to develop sustainable cities.

As mentioned above, the Agrarian Development Plan is one of the four essential tools to manage the area and also the tool in which many agrarian stakeholders have placed most of their trust, especially conventional farmers. The plan was drawn up but has not been approved. The agrarian union thinks that it is too focused on organic production.

The chain for transmitting historical knowledge about farming generation to generation is breaking down. In general, new generations prefer to not work the land and very few groups have an interest in farming. These groups are growing but little by little. This situation has as a consequence the progressive aging of active farmers, the abandonment of agricultural plots and the risk of going back due to lack of results.

The mix of organic and conventional agricultural production on a smallholding area presents problems that are hard to solve. The organic and conventional plots are often mixed together. In this situation it is very difficult to prevent chemical products from crossing over into neighboring plots. The system to certify organic production is also very rigorous and expensive. In consequence, it is hard for small farmers to produce certified organic vegetables. One alternative is organic production based on a relationship of trust between the consumer and the farmer. If the consumer knows the local farmer personally, the farmer becomes a person of trust and there is a personal guarantee backing organic production. In this case, there is no total security about the product's organic characteristics, but the consumer knows that the farmer will do his or her best to produce an organic product. In this situation, the possibility of legal direct sales farmer to consumer is essential to make this kind of market possible. *L'Horta Law* allows for direct sales.

In addition, the mix of agri-ecological and conventional agriculture generates two agents with different interests. Conventional agriculture, which is considered to be predominant cannot sideline agri-ecological agriculture which is here considered to be the future path of this sector. Generally, conventional agriculture specializes in mass production based on historical knowledge transmitted orally from one generation to the other. On the other hand, agri-ecological agriculture is practiced by a new kind of farmer whose education is based on a mix of modern technologies and communication. Obviously, the ideal would be to mix both types of agricultural systems but it is not easy, and in any case,

the process will be progressive. Thus, the behavior of social agents presents a weakness focused on processes to change from a traditional agriculture of local production to a new model of agriculture in line with a globalized economy. In a global and digitalized economy ICTs like the internet or apps must be used to maintain contact with consumers, computer tools to organize logistics, and international languages like English must be spoken (in order to connect with European consumers, for example). There is still no consensus between different social agents to identify objectives or define the new model to implement by the agricultural plan, and there is some disappointment among the conventional farming community. Coherently, the main agrarian union that represents the majority of conventional agriculture thinks that it does not have enough representation on the Council and does not feel there has been much improvement of the conditions of its agricultural activity. Finding an equilibrium between conventional and organic agriculture closer could be the most important challenge.

From a cultural point of view, the social and economic activities in this space have been the subject of many studies and cultural actions like paintings or novels, like '*La Barraca*' the novel by Blasco Ibañez. Valencian society feels the disappearance of the *L'Horta* spaces as a loss of existential identity. According to Sarabia et al. [32] this feeling is an important strength that can be used to speed up the ecological transition.

As expected, agricultural profitability is essential to maintain agricultural activity, but it is not clear among interviewees how this can be improved. There are some initiatives such as the *tira de comptar* or *ecotira*. Another opportunity is applying the land stewardship model to guarantee vegetables supply to consumers and maintain the land's zoning for farming. But at the moment this system, despite it being provided for by law, is not working.

In this sense, the interviewees that represent agricultural activity identify a lack of commitment on the part of different kinds of large organizations (administrations, universities, major companies, etc.) having the capacity and power to promote a new urban concept (that includes protecting areas which produce ecosystem services). This concept is deemed to be important because it is focused on the concept of social and economic progress. Urban areas are the places that concentrate economic and social activities. Changing the concept of economic progress to a new concept understood as increasing the sustainability of cities including maintaining land areas that produce the ecosystem services consumed by inhabitants of cities is a far-reaching change, one that aims to design a better future.

However, this perception and the failure of the initiatives of the *L'Horta Council* and the agricultural plan is breeding disappointment. The farmers hoped for the new management instruments to be useful in addressing and solving problems, but neither of them has fulfilled their objective to date. The Council's activity has been limited and the agricultural plan has not been approved because of differences between the stakeholders. It is a very strong contradiction.

5. CONCLUSIONS

In the Valencian country there is an innovative system to manage the large historical peri-urban agriculture area called *L'Horta de València*. The system is based on four essential tools that were implemented in 2018. While conventional

agriculture still dominates, an agri-ecological transition is underway. It is too early to evaluate results but through research based on a survey of experts with a multi-level perspective, this study has been able to identify through a SWOT analysis the goals achieved and the main challenges that now exist after the implementation of the new management system according to the key interviewees.

The significant results show a partial success regarding agricultural area management through the four tools designed. According to the study, the main successes and limitations of these four tools are the following.

The “Territorial Action Plan to Regulate and Revitalize *L’Horta of Valencia*” has been implemented, urban development has been stopped and uses are now regulated prioritizing agricultural activities. In consequence, despite the plan accept to urbanize some areas and there is an argument about this fact, this tool has made it possible to achieve the planned objectives. The main limitation is the risk that a future regional government will change or eliminate this plan to allow new urban expansions by removing more agricultural land.

In second place, the main elements which define the landscape of *L’Horta* have been identified and protected. Nevertheless, there is a limitation. The risk of building new infrastructures still exists because the regional plan is not binding on central administration interventions. In this sense, administrative protection is incomplete.

This study shows that the main unsuccessful tools are the *L’Horta Council* and the Agrarian Development Plan. The *L’Horta Council* was designed to revitalize farming and promote common political and actions to generally benefit of farmers, but according to its results all interviewees felt that the Council was not adequately fulfilling its intended purpose.

In fourth place, the Agrarian Development Plan was thought to improve agricultural activity and profitability, but differences between different stakeholders have created an inadequate situation for it passing. In consequence, the very important objective of guaranteeing agricultural profitability has not been achieved.

In consequence, there are two most important lines of research for the future: (1) to identify the structural reasons that explain why stakeholders cannot agree to roll out an agricultural plan that is of common interest; and (2) to discover why the Council is inefficient and how it is possible to redesign the management actions to be successful.

Both our local and global communities are experiencing a historic moment with decisive challenges. The new world of harmony between the natural (rural) and the artificial (urban) is yet to be discovered and created. Agroecological production in peri-urban areas, such as *L’Horta*, must be part of this new world with the help of science and scientists.

ACKNOWLEDGMENT

The author wants to acknowledge the experts and professionals that participated on a survey with the sincere interest of helping to improve the management of the precious territory of *L’Horta de València*.

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