



Research article

Sustainable public procurement and constrained agricultural entrepreneurship

Marcello De Rosa*, Annalisa Castelli, Luca Bartoli and Martina Francescone

Department of Economics and Law, University of Cassino and Southern Lazio, Via Folcara, 03043 Cassino (FR)—Italy

* **Correspondence:** Email: mderosa@unicas.it; Tel: +3907762993782.

Abstract: This paper analyzes the relevance of green public procurement (GPP) in boosting the transition to more sustainable and innovative regional and localized agrifood systems. Many scholars have emphasized the importance of the GPP in stimulating various positive effects and impacts on the sustainability of agrifood systems. Framed within the context of the sustainable competitiveness of localized agrifood systems, the GPP represents an excellent opportunity for a more sustainable farming sector. If well exploited, it may relaunch smallholder farms' competitiveness on a regional scale. Moreover, the GPP effectively addresses sustainability issues like fighting food insecurity and reducing food waste. The possibility of adhering to these localized modes of food provisioning engenders constrained rural entrepreneurship due to the regulatory system which mandates compliance by the farming sector. The paper provides an empirical analysis of the region Lazio of Italy to evidence the eventual propensity of regional farms and eventual entry barriers. The results of the analysis show, on the one side, high interest primarily within regional organic farms; on the other side, the results evidence that compliance with mandatory regulation and organizational and logistic assets represent the principal limit to exploit this opportunity fully. Consequently, reduced exploitation of this opportunity is translated into a rate of transition to more sustainable regional farming systems.

Keywords: green public procurement; environmental criteria; constrained entrepreneurship; sustainable farming systems; short food supply chain

1. Introduction

The public food sector procurement represents all food purchased by public actors in a cost-efficient and timely manner. In the last years, the objective of minimizing costs and maximizing efficiency brought about the prevalence of unsustainable food systems [1]. With the expression of green public procurement (GPP), environmental concerns are taken into account in procurement processes. GPP is defined as a public procedure of food provisioning aiming to minimize environmental impacts [2]. Sustainable public procurement (SPP) has recently addressed a broader perspective, where environmental, economic, and social issues are considered in public food provisioning [3]. SPP is gaining consensus in both developed and developing countries [4] as a means for addressing public policies where the economic, environmental, and social aspects of development are taken into account [3]. This is realized through dedicated procurement choices that contribute to many sustainability goals [1]. For instance, sustainable food procurement contributes to less food waste and reduces the meals' environmental footprint [5,6].

Since the beginning of the 2000s, procurement has been at the center of a renewed interest as an engine for promoting sustainable development through innovating modes of food provisioning and gearing toward more localized approaches. In this way, public procurement is identified as a process of building up a "nested market" [7,8] empowered and driven by the public sector. More precisely, the SPP policies act as game changers, with the purpose of boosting a functional repositioning of the agricultural activities within new relational configurations and through the setting up of localized agrifood systems [9]. These policies are directional and identified as "*transformative innovation policies, oriented toward social change that gives prominence to influential niche innovations and institutional reforms actuated in concrete places, spaces, and multiscalar institutional contexts*" [10]. Set against the background of agricultural entrepreneurship as an adaptation strategy [11], privileged policies are targeted toward promoting entrepreneurship by shaping social conditions for exploiting new opportunities. More precisely, these policies try to encourage an enterprise culture within the framework of public goals and the creation of dedicated markets where multifunctional agriculture is developed within localized modes of food provisioning [12]. This policy setting creates opportunity clusters [13,14] that, if well exploited, allow smallholder farms to escape the price-costs squeeze of the conventional farming paradigm [15]. That makes for agri-entrepreneurship approaches aiming to stimulate proactiveness and a set of strategies to modernize the farm [16]. When sustainable development goals are at stake in policy design, a "constrained institutional context" is identified [17], due the constraints framed within public procurement policies.

Consequently, how farmers respond to the so-called constrained institutional context is a recently debated issue in the literature. On the one side, scholars have widely explored innovative public procurement policies and initiatives [3,7,18], but less attention has been devoted to the role of SPP in boosting constrained agricultural entrepreneurship [17]. This paper fills this gap in the literature by positing that SPP frames constrained models of rural entrepreneurial ecosystems, aiming to address new societal instances.

We believe that this paper is important in that it contributes to the literature from two perspectives: the first one relates to developing the issue of constrained rural entrepreneurship, and the second one concerns the potential for strengthening localized modes of food provisioning through the building up of sustainable regional agrifood systems aimed to feed the circuits of the GPP.

Against this background, the paper aims to analyze the potential adherence to the GPP system by

farms located in localized agrifood systems of the region Lazio of Italy through the analysis of constrained agricultural entrepreneurship mechanisms. The research questions are as follows: How may the institutional context setup by the rules of GPP act as a barrier or an opportunity for agricultural entrepreneurship? How may a regional agrifood system exploit the opportunity to build up a regional and sustainable agrifood system based on a GPP supply chain system?

The study's results confirm that access to the GPP circuit may represent a chance for developing a more sustainable regional farming system, despite the significant obstacles that must be removed to exploit this opportunity fully.

1.1. Contextualizing agricultural entrepreneurship in the framework of the public sector food procurement

As posited by [19], entrepreneurial activity can take place in many different settings, which identify the "where context" that includes not only the spatial dimension but also the institutional and the business context [20]. In this paper, the "where context" concerns the green food public procurement, which paves the way to a distinctive category of the rural enterprise [18], whose purpose is to be part of alternative food channels aiming to satisfy a "dedicated demand", where the consumers' identity is taken into account [21]. More precisely, policies for SPP set up a constrained institutional context [17] which may act as a conducive environment for supporting rural entrepreneurship. The conducive environment identifies three policy dimensions involving food quality schemes, a short food supply chain, and sustainable food public procurement [22]:

- a. Food quality schemes are set up within a food-related configuration reconnecting consumers and producers within a "civic convention" where quality requirements are inspired by collective goals like safeguarding consumers' collectivity [23,24]. Consequently, new civic food networks emerge [25] (Renting et al., 2012), where citizens become the third leg of a virtuous triangle with the market and the state, and where consumer-citizens play an active role in reconstructing alternative systems of food provisioning [25]. Moreover, food quality schemes involve the identification of a regulatory framework including environmental minimum criteria (for instance, the minimum percentage of organic products to be secured) which sets up the scene for exploiting this entrepreneurial opportunity.
- b. Short food supply chains are encouraged, with the purpose of promoting localized food systems that are able to reorganize their supply chain, to feed broader segments of the population.
- c. Regarding SPP, the new system attributes relevance to the rural territory through place-based approaches, where localized modes of food provisioning are privileged [12]. This represents a great opportunity for smallholder farmers and family farm businesses [1]. In order to grant food safety in the public procurement schemes, strict institutional arrangements are required, aiming to identify minimum environmental criteria and quality standards to be satisfied by the potential producers.

The three dimensions identify the framework of action of small farms aiming to enter this alternative food circuit by pointing out the institutional context for accessing the food network. Therefore, the three pillars of the SPP system depict constrained models of rural entrepreneurship, as represented in Figure 1. In this context, we agree with [26], who pointed out that GPP implicates connecting public and private actors, embedding the public sector into the regional economy and intertwining school food with the quality of life, health, social inclusion, regional economy education and the environment. Therefore, state support through public procurement is a fundamental tool to

promote better market access for smallholder farmers and localized agrifood systems [27].

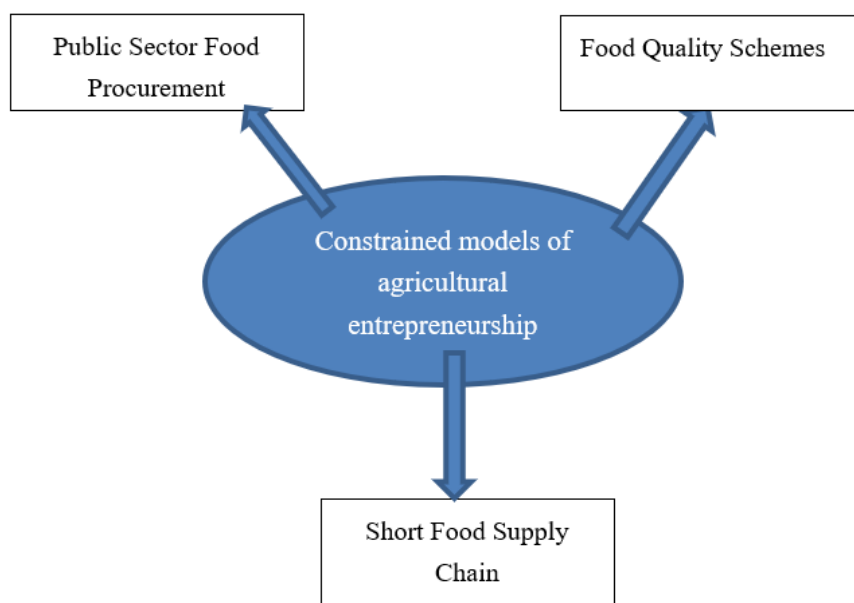


Figure 1. Constrained institutional context and agri-entrepreneurship.

Many public tenders address this purpose by encouraging higher access to public canteens for ZeroKM initiatives, organic products and geographical indications. Therefore, public tenders depict the scene for an entrepreneurial opportunity, which calls for agricultural entrepreneurship, namely, farmers' strategies in response to institutional changes [28]. As pointed out in the opportunity discovery theories [29], these chances are depicted regardless of the entrepreneur's awareness and can be exploited by alert entrepreneurs [30,31]. Even so, awareness does not automatically bring about the exploitation of the opportunity due to the regulatory framework, which may identify critical barriers to accessing the GPP channel. Therefore, despite the great potential, the "constrained institutional context" may represent a barrier impeding full access to the GPP. The term constrained institutional context identifies the main drivers/barriers which may foster and, simultaneously, limit access to the SPP food provisioning system by small-sized farms.

Some scholars stressed the key obstacles related, for instance, to scale (i.e., difficulty in reaching a critical mass of production for small farms to access GPP), food safety compliance and legal issues [26]. The main barriers are represented by the criteria to be respected by the companies to enter the food network. For instance, in the Italian GPP system, some minimum environmental criteria are set up, with the purpose of securing the sustainability of the food production processes. These criteria identify environmental requirements and specify the percentage of food from sustainable agricultural practices (like organic products or products obtained through integrated management practices, products with geographical indications, ZeroKM products, etc.). Consequently, they reconfigure the institutional framework for the farms willing to enter these civic food networks. This regulatory framework may act as either a determinant or a barrier to entrepreneurship, and it is particularly relevant for smallholder farmers [32].

In the following section, we conduct an empirical analysis to evaluate barriers to this new and

promising form of agricultural entrepreneurship, which may represent a new engine for sustainable endogenous models of rural development, but on the other side, could fail in the presence of inadequate entrepreneurial orientation by farmers.

2. Materials and methods

Starting from the hypothesis that decision-making is a complicated process articulated in various steps, (for instance, awareness, evaluation, decision), our empirical analysis was carried out via a methodological approach based on an awareness-constraints-attitude (ACA) sequence. The purpose of the sequence is to verify the following:

- the level of either awareness and alertness about the GPP;
- eventual constraints and barriers to accessing GPP;
- attitude toward GPP and to eventually attending a training course to become potential providers of the GPP channels.

To this end, we submitted a questionnaire to a random sample of farms enrolled in the register of Coldiretti, the most influential farmers' association in Italy, focusing on the farms enrolled in the region of Lazio. We first contacted all farms registered in the database and asked them to provide consensus to fill out the questionnaire. This approach allowed us to acquire sound information from farms interested in entering the GPP supply chain system.

Among the registered farms invited to the survey, 28 confirmed their willingness to participate. Every participant provided ethical approval and consent. The survey investigates the direct or indirect relationships between the interviewed companies and the public administration and its green tenders for food supplies for schools, universities, hospitals, military canteens, etc. Moreover, the questionnaire aims to help us understand the constraints that farms encounter in accessing the supply chains of the public administration ("green tenders").

Data were collected through the use of a computer-assisted web interview methodology and processed through descriptive analysis reporting of the main variables affecting the propensity to enter the GPP system. The ACA sequence was analyzed by considering the awareness of the GPP system potential for small farmers, the entrepreneurial constraints to adhere to the network and the attitude to enter and/or to gather training courses. All 28 questionnaires were considered helpful for further analysis. The followed methodology seems appropriate because it allowed us to excavate the dynamic process of entrepreneurial action, starting from the cognitive sphere (awareness), moving to the barrier sphere and, finally to the conative sphere (decision to adhere and to be trained).

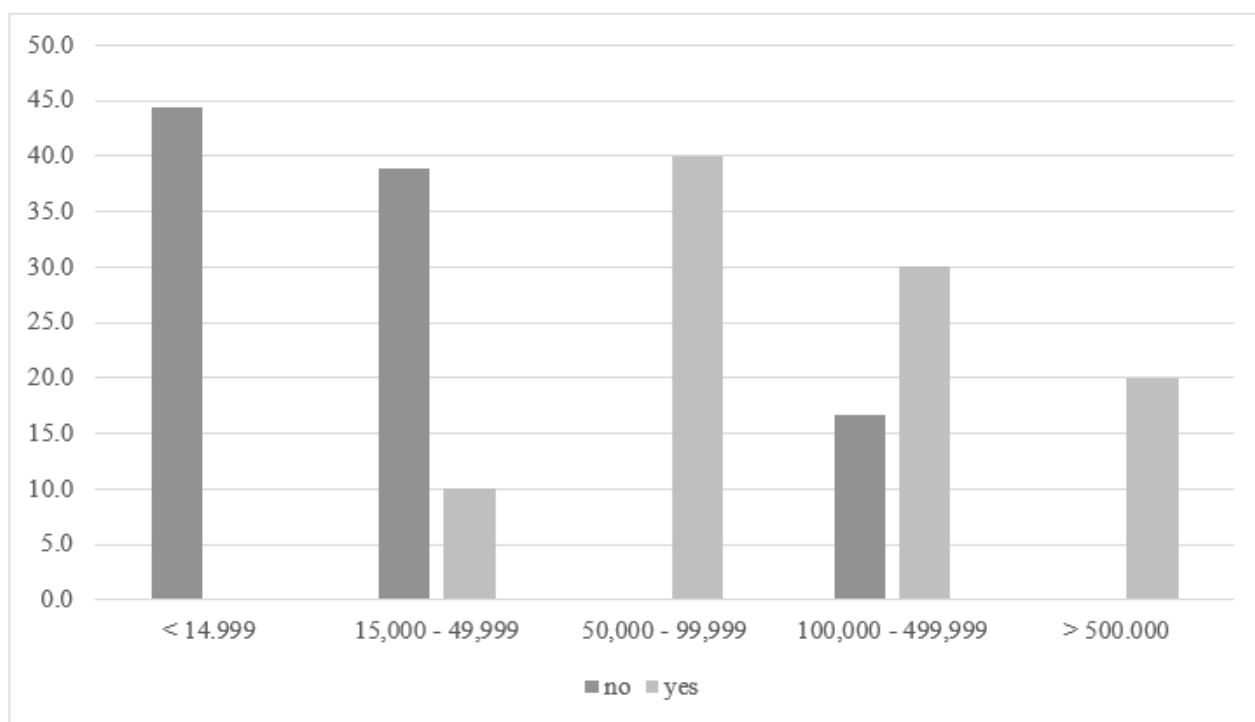
3. Results

The application of the ACA sequence provides useful insights for understanding the potential for supporting the regional food systems through the adherence to the GPP food network.

3.1. Awareness

The empirical analysis shows a relatively low awareness: out of the 28 companies interviewed, only 10 knew about the opportunity linked to green public tenders. The result is strictly correlated with the economic size of the farm (classified according to the EU FADN system). Figure 2 evidences how

none of the companies with an economic size of less than €14,999 (8) were aware of these tenders, while awareness tends to emerge for the economic dimension of €15,000–49,999. Nonetheless, the link between economic size and awareness is not linear. From the figure, it is possible to stress that in the middle economic dimension, i.e., €50,000–99,999, all farms reveal awareness about the GPP, as with the class of the largest economic size. Various sources of information provide awareness about the public procurement opportunity; the trade union association of reference or public sources or the media prevail, but also self-produced information is a relevant source.



(Legenda: yes= aware about the public tenders; no = not aware about the public tenders)

Figure 2. Awareness and farm economic dimension.

Regarding types of production, except for the wine sector, knowledge of green tenders was reported in all other companies, with a particular prevalence of those with a mixed system of farming and breeding. Regarding the production method, we analyzed the eventual differences between organic and non-organic farmers. The highest percentage of knowledge was recorded among non-organic companies (53% of these companies are already familiar with green public tenders). Out of the seven companies that have indicated the certified organic product as a type of production, only two were familiar with the green tenders (one participates directly as a supplier). Finally, none of the six companies that produce non-certified organic products were aware of the green tenders.

Based on the product's delivery or sale, nine out of 23 companies of fresh products were familiar with the tenders, and only one of the four that produce both fresh and prepared products was aware of them. The only company dealing exclusively with prepared products was unaware of the green tenders. Farms selling to modern distribution channels seem to be more aware of the opportunities of green tenders; as confirmation, the level of knowledge in companies that distribute to small retailers was found to remain very low (out of 13 of these, only one already knew about green tenders). The

awareness of GPP channels by companies already equipped to supply critical masses of products, such as those that sell to large-scale distributors or the Ho.Re.Ca (hotel, restaurant and catering) channel, or those that deliver to producer organizations, is much more evident. This aspect is also confirmed by observing the data on the geographical destination of the product (Figure 3). Seven of the 12 companies that distribute their products to a national or international market have declared that they are aware of the green tenders. On the other hand, most of the companies interviewed in the questionnaire operate in a local or regional market (57%). Among these, the percentage of companies aware of green tenders was relatively low (30%).

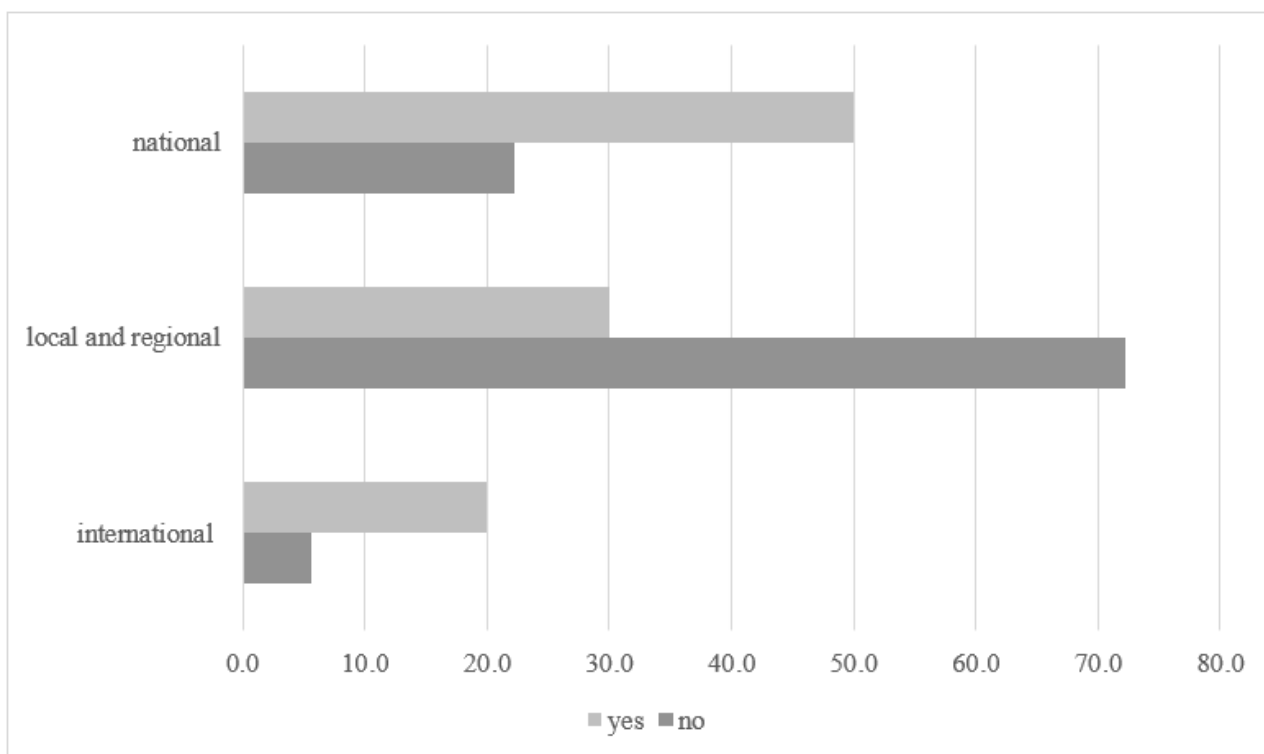


Figure 3. Awareness and geographical destination of the product.

Finally, familiarity with green tenders was also affected by the level of education, as shown by the data on the total absence of awareness in companies where the entrepreneur needs qualifications. Conversely, possessing a diploma or degree increased knowledge about tenders related to GPP. However, awareness does not always result in a strategy of penetration of this distribution channel. Out of the 28 companies in the sample, only two declared that they supply companies that have won green tenders from the public administration. Both denote a high level of education, have an economic size of more than €5,500,000 and supply fresh products; the two companies are opposed to each other in terms of the type of production, as they provide certified organic products and non-organic products, respectively. As for the sales or delivery channels, on the one hand, there is reliance on large-scale distribution, packagers or Ho.Re.Ca channels. Therefore, these companies have a certain "familiarity" with distribution channels in which large quantities of suitably certified products are required.

3.2. Constraints

Apart from awareness, the questionnaire also aimed to analyze barriers and constraints to accessing a "promising" distribution channel for regional farm enterprises, which requires appropriate certification standards and a solid and organized production structure. The constraints to the GPP market emerge from the responses:

- informational asymmetries, that is, a particular difficulty in accessing the necessary information about the presence of this opportunity and about the access requirements;
- technological barriers, that is, the difficulty, especially for small- and medium-sized farms, to manage technological solutions often required them to operate in a channel like this;
- closely connected to the previous point is the cost of accessing the GPP market, which is too often prohibitive for family farm businesses.

On the other hand, of lesser importance were the difficulties of a bureaucratic/administrative nature, those of a logistical nature and the difficulties connected with the quality and/or availability of products. If attention is focused on organic producers, the situation is slightly different. In particular, the companies producing certified organic products indicated the following main obstacles: limited and uncertain production, difficulties in accessing information (both problems shared by producers of fresh products), logistical challenges and also previous negative experiences and excessive uncertainty about the outcome or the fact of not being directly involved in green tenders as suppliers.

3.3. Attitude

The section of the questionnaire analyzes the extent to which the farmers are interested in participating in the GPP tenders or in being updated/trained about these tenders. We measured this attitude using a Likert scale (1 = very low to 7 = very high). A moderate interest emerged, with an average response value of 4.2. Farms with an economic size between €50,000 and €99,999 showed greater interest (with an average of 5.3), while the lowest average interest (equal to 3.5) was found among companies with a turnover between €100,000 and €499,999.

As far as the productive orientation of the participants is concerned, the highest average interest (5.7) was registered among companies specializing in a mixture of crops and livestock, which, as we had previously seen, were also those with the highest level of awareness. Farms with mixed cultivation orientation (5.5) and wine farms (5) also had high scores; an intermediate interest was indicated by the animal husbandry and olive growing sectors (with average values of 4 and 3, respectively), while fruit and vegetable companies showed the lowest interest, with an average value of 2.3. The sales method used by the participants seems to correlate with their responses; in fact, the companies that deal exclusively with prepared products showed high interest (with an average grade of 5), followed by companies that distribute both fresh and prepared products (4.8), and finally, companies that supply only fresh products had an average interest equal to 4.1.

Concerning the sales/delivery channels, the highest average value of interest (7) was indicated in the various categories, like large-scale distribution, small retailer/direct sales and associative/cooperative organization. On the other side, the lowest average degree of interest (2.5) came from two companies, which identify themselves with the following sales/delivery channel: 'small retailer /direct sales, transformer'. The result seems consistent with what was stated earlier in the previous two stages of the sequence.

Lastly, referring to the geographical destination of the product, the agrifood companies that distribute in the local/regional market seem to be most interested (with an average value of 4.9), followed by companies operating internationally (4.7). In contrast, the companies that distribute their products on the national market indicated a degree of interest, with an average value of 2.9. Furthermore, regarding the type of production, the agrifood companies most interested in participating in green tenders are organic farms. More precisely, those producing organic products but waiting for official recognition had the highest average value (5.3). A significant propensity was also indicated by companies that, on the other hand, officially certify their organic products (with an average value of 4.5), while the interest declared by companies with non-organic products was lower (3.6).

From the above analysis, organic farmers selling products on regional markets seem prone to enter these localized supply chains by adhering to public tenders. Nonetheless, in many cases, farms have revealed that a low propensity to be in the GPP circuits is motivated by the inadequate knowledge of these circuits and low familiarity with the relative mechanisms. To test this statement, we tried to understand companies' degree of interest in free refresher/training courses linked to green public tenders. Again, the degree of interest was indicated on a Likert scale (from 1 = very low to 7 = very high). In general, participants' average value of interest in free refresher/training courses on green tenders (4.3) was close to the average value of interest expressed in participation in green tenders in the previous question (4.2).

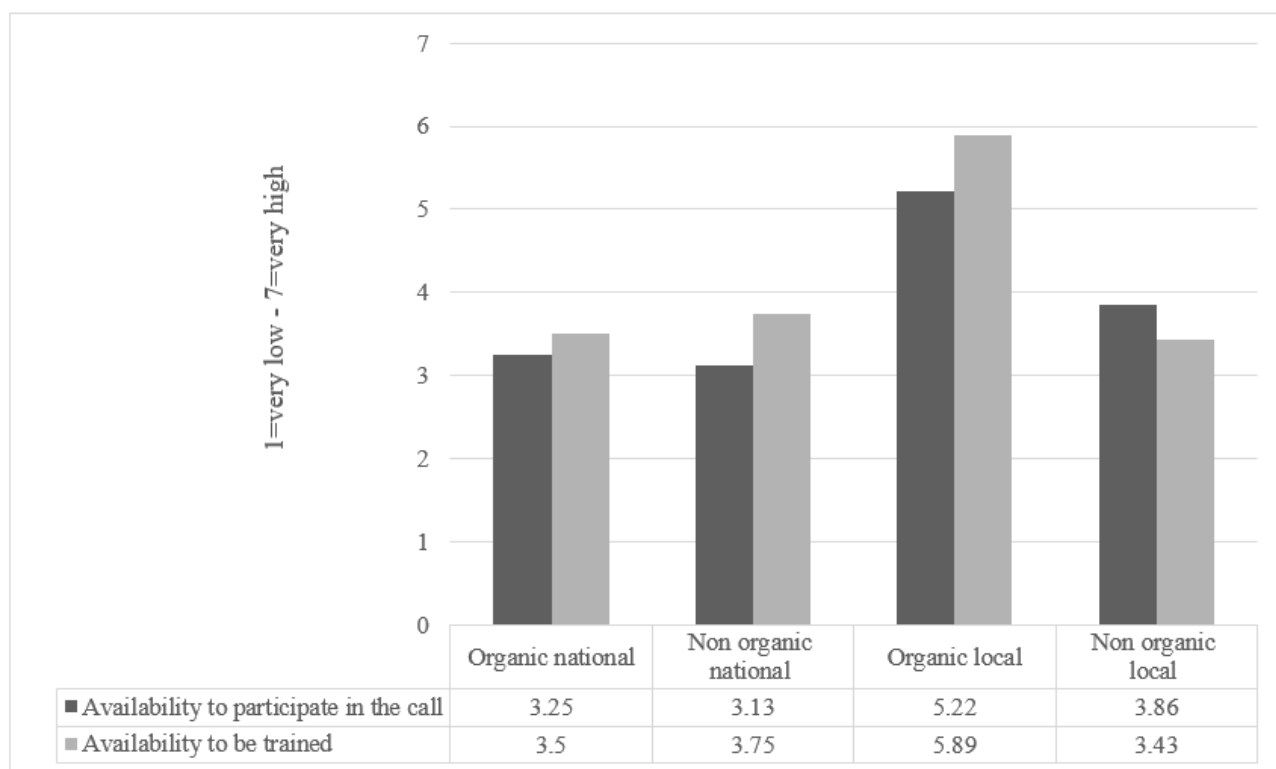


Figure 4. The farmer's availability to adhere the GPP circuit on the basis of type of activity (means of answers).

In Figure 4, we have tried to typify producers' attitudes concerning organic-oriented farmers and market outlets (local-regional / national-international). The figure shows how organic producers who

privilege local or regional markets are mostly oriented toward GPP food channels. What is interesting to stress and that has been evidenced in the awareness step of the sequence, is that they also needed to be made aware of this entrepreneurial opportunity. But, those who were conscious of it revealed a high propensity to invest in this activity and are likely to be trained on the GPP system.

This result is of paramount importance because it points out the potential for developing a sustainable localized agrifood system grounded in providing food within the GPP system.

4. Discussion and conclusions

Public food procurement is becoming a relevant entrepreneurial alternative for smallholder farmers. It can boost a functional repositioning of their business models on localized agrifood systems targeted towards public goals, like school meals programs. This alternative food network is grounded in reconnecting consumers and producers at a regional level. However, relevant constraints may be an obstacle to exploiting this opportunity successfully. This paper has analyzed this issue under a theoretical framework positing constrained models of agricultural entrepreneurship where the institutional context may limit the opportunity. The empirical analysis provided initial insight into barriers and obstacles to the GPP system in a region of Italy, evidencing some crucial issues that deserve broader attention in future research.

The study contributes to the literature on rural entrepreneurship by highlighting the issue of constrained agricultural entrepreneurship in the institutional context of the GPP system. The GPP systems establish agri-environmental criteria to be respected and require a critical mass of products that call for a reorganization of the regional farming systems. Moreover, it provides a contribution to the building up of a sustainable regional agrifood system. We believe that this analysis can be replicated in other contexts, not only in developed but also in developing countries, where SPP is gaining ground [4].

The paper presents some limits due to the small sample size, therefore, further studies are necessary to better understand the potential of the GPP for the regional farms.

Despite the limits of the analysis, due to the limited sample of regional farms that have adhered to our survey, some insights have emerged that call on Kirznerian and Schumpeterian perspectives on rural entrepreneurship [33]. From a Kirznerian point of view, the analysis has shown limited alertness by the potential farmers in this alternative food network. Most of the farms need to be made aware of the opportunity of the GPP system. The only two companies revealing higher awareness hold high entrepreneurial alertness and attitude to operate within a discovery perspective, which allows to either discover and exploit existing opportunities [34]. From a Schumpeterian point of view, exploiting this opportunity calls for innovation and requires recombining the farm's resources with new processes, organizational solutions, and products, which may represent relevant barriers.

The ACA sequence revealed a scenario where the barriers to this innovative form of agricultural entrepreneurship are high and may be challenging to overcome in the short run. Nonetheless, the analysis shows how organic producers selling products to prevalently regional and local markets are most interested in these localized modes of food provisioning. In many cases, new opportunities arising from the GPP regulation may boost these alternative forms of entrepreneurship. For instance, the region of Lazio, like many other regions in Italy, awards those farms producing organic products and/or have geographical indications and are working within the ZeroKM agrifood supply chain. This action may partially remove some obstacles and paves the way for some policy implications, addressing targeted measures to fill the gap in GPP for smallholder farmers. However, measures for rural

development provide farmers with a set of interventions that are well exploited and may relaunch rural entrepreneurship in the GPP framework with particular reference to the following:

- funding producers' organizations to create a critical mass of production that is able to enter the GPP system;
- covering quality certification costs may reduce the difficulty in adopting the minimum environmental criteria provided by the public food tenders.

Therefore, we think that the GPP system can be considered as an opportunity for agricultural entrepreneurship under conditions that deserve attention in future research. Firstly, future investigations should integrate this scenario by analyzing more in-depth entrepreneurial skills required for successful access to the GPP system. Second, new institutional arrangements are necessary among various public procurement supply chain stakeholders. The main concerns regard the farming sector, where organizational innovation must be adopted to stimulate collective action and the creation of a new institutional framework aiming to strengthen bottom-up approaches and networking through ambidexterity [35,36]. On the other side, a key role for public actors in reducing informational asymmetries and providing services for easier access to the GPP system emerge [37]. The greening of the common agricultural policy is addressing agronomically sound and competitive farming business models, with special attention to smallholder farmers. Set against this background, the road for connecting smallholder farmers and sustainable food procurement is still long, but indeed our analysis provides encouraging cues to facilitate the building up of a sound alternative for regional agrifood systems grounded in the multifunctional role of small farmers.

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Conflict of interest

The authors declare no conflict of interest.

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