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# Green public procurement of agrifood products: A business model view

Evagelos D. Lioutas, ORCID: 0000-0003-3784-9553
Department of Supply Chain Management, International Hellenic University, Katerini, Greece
Kanellopoulou 2, 60100, Katerini-Greece, evagelos@agro.auth.gr

Anastasios Michailidis, ORCID: 0000-0002-7560-4365
Department of Agricultural Economics, School of Agriculture, Aristotle University of Thessaloniki, Thessaloniki, Greece
University Campus, 54124, Thessaloniki-Greece, tassosm@auth.gr

Chrysanthi Charatsari, ORCID: 0000-0002-9160-3469
Department of Agricultural Economics, School of Agriculture, Aristotle University of Thessaloniki, Thessaloniki, Greece
University Campus, 54124, Thessaloniki-Greece, chcharat@agro.auth.gr

Dimitrios Aidonis, ORCID: 0000-0001-6981-4027
Department of Supply Chain Management, International Hellenic University, Katerini, Greece
Kanellopoulou 2, 60100, Katerini-Greece, daidonis@ihu.gr

Paolo Prosperi, ORCID: 0000-0002-8494-0344
1) CIHEAM-IAMM, UMR MoISA, F-34093, Montpellier, France

2) MoISA, Univ Montpellier, CIHEAM-IAMM, CIRAD, INRAE, Institut Agro, IRD, Montpellier, France

prosperi@iamm.fr

Reem El Khechen, ORCID: 0000-0002-9350-646X

1) CIHEAM-IAMM, UMR MoISA, F-34093, Montpellier, France

2) MoISA, Univ Montpellier, CIHEAM-IAMM, CIRAD, INRAE, Institut Agro, IRD, Montpellier, France

elkhechen@iamm.fr

Maria Partalidou, ORCID: 0000-0001-6712-2094

Department of Agricultural Economics, School of Agriculture, Aristotle University of Thessaloniki, Thessaloniki, Greece

University Campus, 54124, Thessaloniki-Greece, parmar@agro.auth.gr

Charisios Achillas, ORDID: 0000-0001-5503-1777

Department of Supply Chain Management, International Hellenic University, Katerini, Greece

Kanellopoulou 2, 60100, Katerini-Greece, c.achillas@ihu.edu.gr

Stefanos Nastis, ORCID: 0000-0002-3102-5505

Department of Agricultural Economics, School of Agriculture, Aristotle University of Thessaloniki, Thessaloniki, Greece

University Campus, 54124, Thessaloniki-Greece, snastis@gaaps.auth.gr

Luca Camanzi, ORCID: 0000-0003-0738-6279

Department of Agricultural and Food Sciences, Alma Mater Studiorum – Università di Bologna, Bologna, Italy

Viale Giuseppe Fanin, 50, 40127 Bologna-Italy, luca.camanzi@unibo.it

# Green public procurement of agrifood products: A business model view


## Abstract

Green public procurement (GPP) schemes emerged as environmentally responsible public procurement systems. However, despite the increasing interest in the topic, little is known about how these schemes create value and what types that value encompasses. In the present study, concentrating on the GPP of agrifood products in France, we aim to address this question. To do so, we first developed a business model portraying three facets of value (economic, environmental, social) and their essential components. Then, exploiting data from a sample of experts, we evaluated our model. The results uncovered a relatively low capacity of GPP schemes to produce environmental value, thus questioning their "green" nature. According to the analysis, the limited environmental efficiency of agrifood production compromises the ability of GPP supply chains to deliver on their environmental promises. Nevertheless, a notable finding was that GPP schemes have a considerable – yet improvable – ability to generate economic and social value.



**Keywords:** green public procurement, business models, environmental value, social value, economic value


## 1. Introduction

The realization of the significant role that the public sector plays as a buyer has led policymakers to sharpen their focus on the ways the products and services bought by public organizations are produced and distributed. The World Bank (2020) estimates that public procurement accounts for about 9.5 trillion US dollars annually, whereas in the European Union the percentage of GDP spent on public procurement is 14% (European Commission, 2020). The question of how to purchase products and services (including work) in such a manner that ensures that public money is prudently spent was always pivotal for the public sector. In the scholarly literature, some first concerns about the value of public expenditures in sectors like education (Briggs, 1947) or health (Abel-Smith and Titmuss, 1956) date back to the mid-20$^{th}$

century. Nevertheless, today, beyond economic feasibility, researchers put equal emphasis on the environmental and social impacts of public procurement.

Legislative frameworks, such as the European Procurement Directives, along with the growing sustainability awareness of citizens, led governments worldwide to integrate green practices in their procurement procedures (Brammer and Walker, 2011). Under the overarching label "green public procurement" (hereafter GPP) fall a series of environmental criteria that define an environmentally responsible procurement (Li and Geiser, 2005) and should be used in the process through which public authorities purchase products or services (Cheng et al., 2018). These criteria involve a broad range of technical specifications, eco-labels, standards, and performance clauses (e.g., related to energy waste and/or greenhouse gas pollution), which can frame the process of candidate suppliers' selection or exclusion (Halonen, 2021; Rainville, 2017; Diófási and Valkó, 2014). Although not centered on the social dimension of sustainability – like its kin term "sustainable public procurement" (Sönnichsen and Clement, 2020) – GPP aims to produce positive outcomes for society by promoting sustainable production and consumption (Pouikli, 2021) and fostering sustainability-related attitudes (Wang et al., 2021).

Although the relevant research shows enormous progress, the green procurement of agrifood products has not yet enjoyed considerable attention. Nevertheless, the public sector buys high quantities of such products to cover the needs of public schools and kindergartens, universities, elderly houses, hospitals, prisons, military bases, etc. Embracing the greening of food procurement can, thus, substantially contribute to the achievement of sustainability targets, also ensuring that public money is spent with an emphasis on the common good. Although there is a lack of financial data, Caldeira et al. (2017) confirm that in some European countries, the expenditure for covering the public sector's needs in food products is considerably high. For instance, in Finland and Ireland, the annual expenditures for meeting public food procurement amount to €395 and €195 million, respectively.

However, what is the value of GPP schemes, and how is it created? To answer this question, in the present study, we theoretically developed and empirically evaluated a business model for GPP schemes, focusing on three different facets of value: economic, environmental, and social. Using data from a sample of French experts in GPP schemes, we evaluated the dimensions of this model. France was selected because it represents a country with many good

practice examples in GPP, both at the policy/institutional (Vidal, 2010) and the practice level (EU-FPC, 2021).

## 2. Developing a business model for green public procurement schemes

### 2.1 A brief conceptualization of business models

A business model is a mechanism through which a unit of interest (organization, company, or supply chain system) produces value. It is, simultaneously, a set of strategies (Markides and Sosa, 2013), a "story" portraying the (potential) customers, their needs, and the most efficient ways to address them (Magretta, 2002), and a prototype showing how business is done (Baden-Fuller and Morgan, 2010). In the economic sense, a business model illustrates the value proposition offered to the consumers and the resources needed to create it (Morris et al., 2005).

Osterwalder, and Pigneur (2010), were the first to develop a business model canvas presenting the essential components of economic value creation. The central element of their business model is the value proposition (Figure 1), i.e., the benefits the unit of interest conveys to its customers. To transform their value propositions into real value, during the production phase, organizations exploit their resources, enact value-creating activities, and develop partnerships. However, it is equally important to use effective distribution strategies by targeting the proper consumers, developing functional relationships with their customers, and choosing efficient distribution channels. At the bottom of their model, they added the sum of costs and revenues that the application of the model can generate.

Joyce and Paquin (2016) took a step forward, incorporating the environmental and social value to their "Triple Layered Business Model Canvas" (TLBMC). In their view, organizations and companies produce (or not) through their action value in the form of environmental and social benefits. Hence, they developed two extra layers following the operationalization of Osterwalder and Pigneur (2010). The first layer refers to environmental value (or, in their words, "functional value"), which concerns the sum of functional units consumed in a given timeframe. Functional value depends on both core production activities (presented on the left side of the canvas), including the process of producing a product or service and the environmental footprint of the materials and supplies used during it, and the post-production management of the products (illustrated at the right side), referring to the distribution process, consumer use of the product,

and the positive or negative environmental outcomes of the end-of-life phase. Finally, environmental impacts and benefits are aggregated at the bottom of the layer.

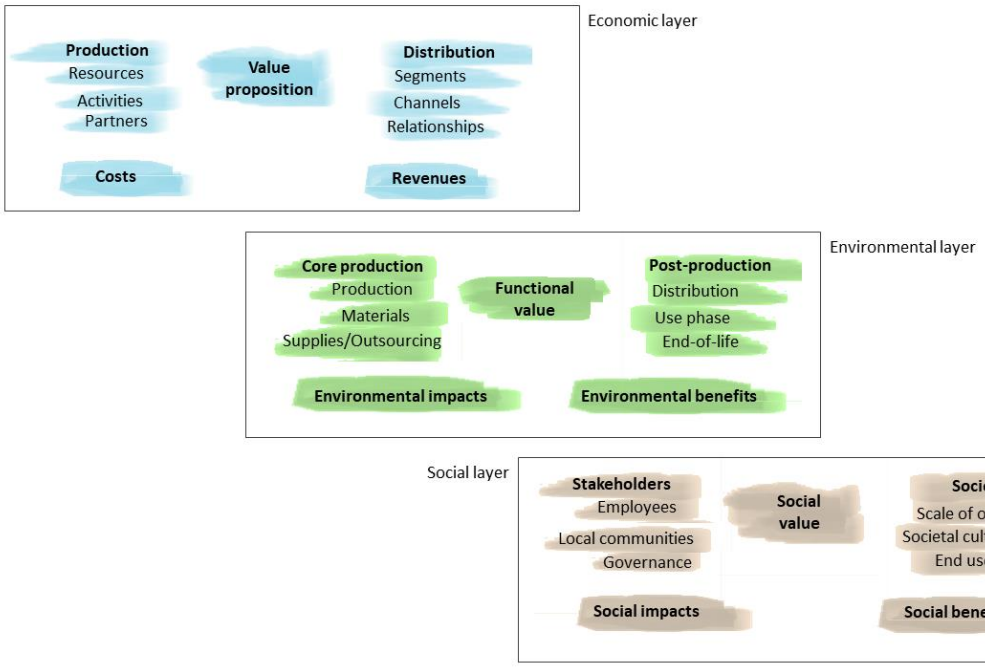


**Figure 1.** A triple layered business model canvas – based on Joyce and Paquin's (2016) TLBMC

In the same vein, the social layer focuses on social value, which defines the bundle of benefits that the unit under consideration creates for the community of stakeholders and the wider society. On the left and right sides of social value, the developers of the model entered two parts. The first one includes dimensions referring to stakeholders (like the employees and the local communities), their engagement with the unit, and the governance structures that define stakeholders and their level of involvement in value co-creation processes. The second refers to the social outcomes extending beyond the unit's cycle of activities, involving the "scale of outreach" element – which Joyce and Paquin (2016, p. 1180-1181) describe as "the depth and breadth of the relationships an organization builds with its stakeholders through its actions over time," the impacts of the society through influences on its societal culture, and the value absorbed by end-users of the products. The sum of social impacts and benefits is presented at the foot of the canvas.

## 2.2 Developing a triple layered business model canvas for green public procurement

In GPP systems, contracts signed between actors refer to the food production process and the compliance with environmentally sound behaviors, the products used during production, and may also involve the need for specific certifications (e.g., organic certification) (Lindström et al., 2020; Cerutti et al., 2016). In that sense, the buyer (the public sector) pays an amount of money to buy green – or greener than those produced and distributed through conventional practices – products, which are then consumed by the end users (e.g., students of public schools and universities).

Hence, GPP schemes emerged having as their central value proposition the supply of public organizations with high-quality products which are produced in an environmentally sound manner and meet specific environmental criteria. The main segments to which these supply systems are targeted are public authorities, municipalities, universities, and kindergartens/nurseries (Fuentes-Bargues et al., 2018; Neto and Caldas, 2018; Testa et al., 2016). To build relationships with these segments, the suppliers can offer complaint forms and traceability systems (Bucea-Manea-Țoniș et al., 2021). As Figure 2 highlights, the channel used is direct selling to public agencies. That is to say, GPP schemes connect individual producers or farmers' groups (e.g., cooperatives) to public organizations.

To meet their objectives, GPP systems use on-farm resources (land, labor, capital) combined with certification schemes (organic, ethical, or fair-trade certification) (Cerutti et al. 2018). Hence, for GPP, sustainable branding is another intangible resource contributing to their economic performance. The activities performed include the production of food products, logistics and transportation required to produce these products, and the quality costing since, in public procurement, the cost is always a critical factor for choosing among potential suppliers (Schotanus and Telgen, 2007). In such systems, farmers develop partnerships with suppliers of seeds, pesticides, and other agro-supplies. However, the creation of partnerships between farmers and brokers is also possible.

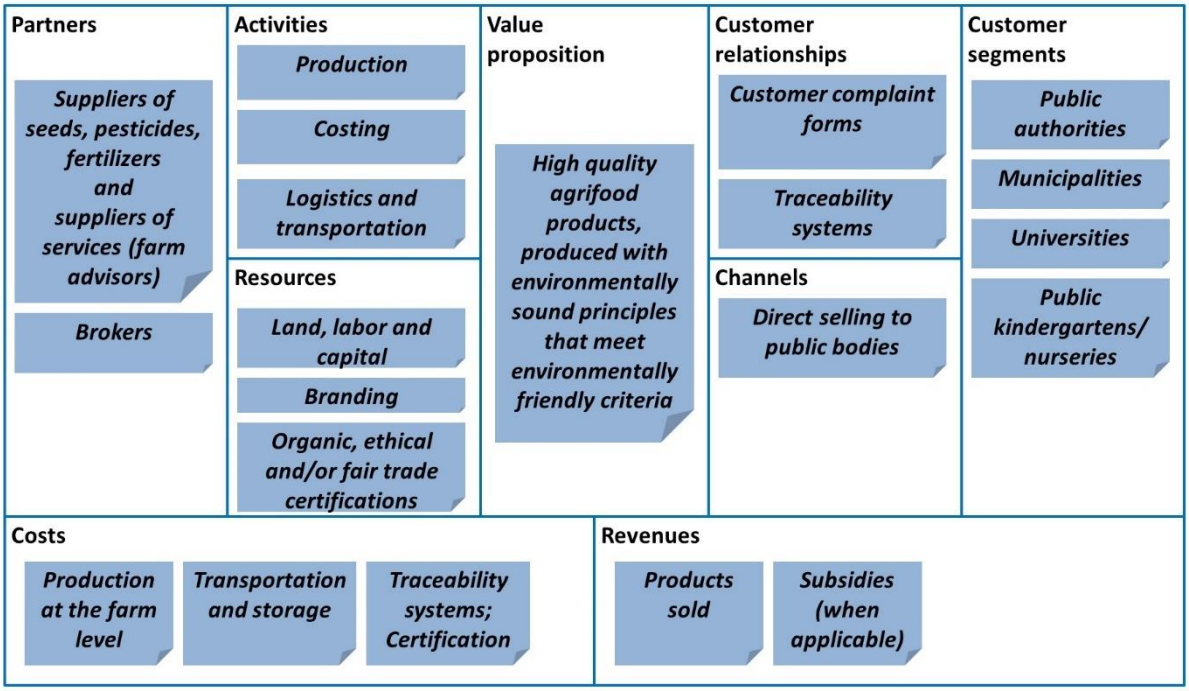


**Figure 2.** The economic layer of TLBMC

Farmers' revenues come from selling products to public sector organizations, while subsidies – when applicable – can also increase the economic performance of GPP schemes. The costs involve the budget for the production at the farm level, the transportation and storage expenses, the fees for certification, and the costs for the development and implementation of traceability systems.

The environmental layer of the TLBMC (Figure 3) has at its core the functional value of GPP, that is, the total amount of products purchased through these systems and consumed by public authorities over one year. Aside from the energy needed at the farm level, the production activities include logistics operations, which also have an environmental cost. The materials used include those integrated within agricultural production (agrochemicals, propagation material, farm equipment, irrigation water) and transportation vehicles. Beyond the core of the system, the energy used for transportation, the production of transportation vehicles and agricultural machinery, and the electricity needed also produce environmental externalities.

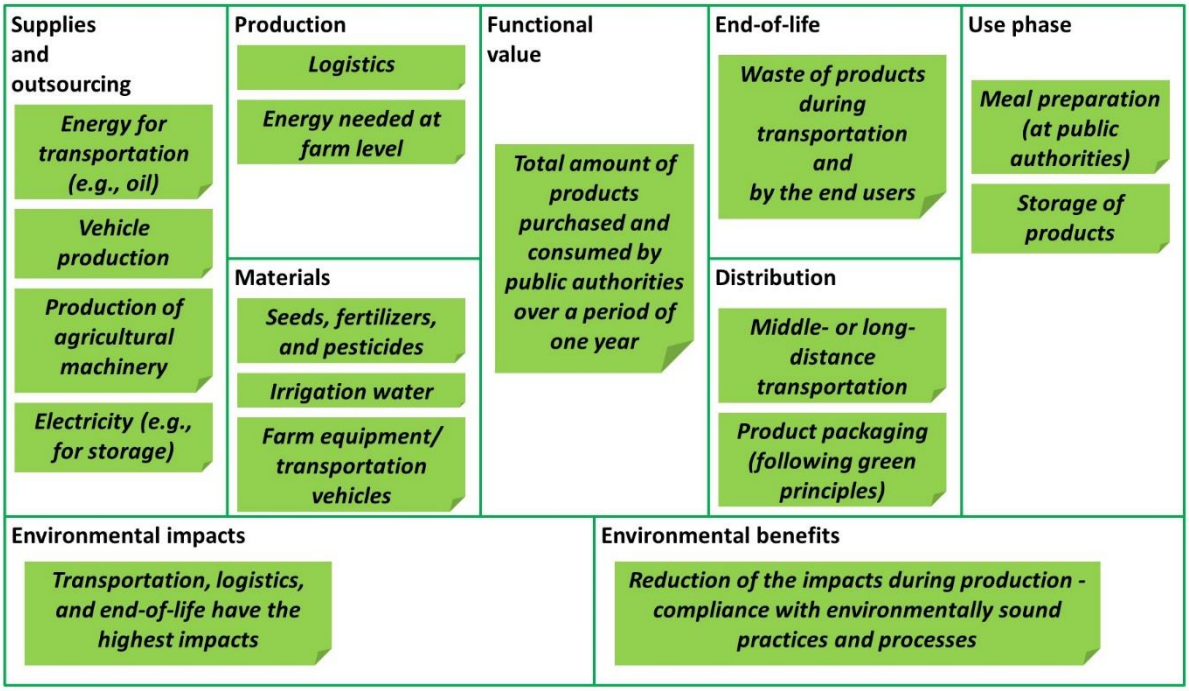


**Figure 3.** The environmental layer of TLBMC

When looking at the end-of-life component of the environmental layer, food waste by the end-users remains a pivotal issue. By nature, some public institutes – like schools (García-Herrero et al., 2019) or hospitals (Sonnino and McWilliam, 2011) – produce high quantities of food waste. Since products are transported, food waste during transportation can considerably affect the environmental performance of GPP supply chains. Besides, the distribution might involve middle or even long-distance transportation, also having environmental costs (Cerutti et al., 2016), whereas packaging is another source of environmental burden. However, since packaging in GPP is expected to comply with green practices (Lundberg and Marklund, 2018), its externalities are limited.

At the use phase, the preparation of meals (when the food is not ready-to-eat) and the storage of products contribute to the environmental footprint of the system. For instance, research on schools indicates that electricity and/or gas needed for preparing and serving meals is an issue that should be taken into account (Batlle-Bayer et al., 2021; García-Herrero et al., 2019).

Among sources of environmental footprint, the transportation and logistics activities and the end-of-life component seem to have notable negative impacts. Nevertheless, GPP systems are

based on operating mechanisms that conform to environmentally sound practices. The European Union has already developed a relevant legal framework (Mélon, 2020; Kunzlik, 2013) defining what criteria should be met by suppliers. Such a structure of guidelines and regulations helps to reduce the environmental impacts of GPP schemes.

Moving to the social layer of TLBMC (Figure 4), the system seems to have the potential to generate "green" communities when suppliers and purchasing organizations belong to the same community. Another essential impact of the system is the development of institutions between communities and public authorities. The governance mechanisms of GPP schemes are a priory defined by legislative regulations. The rules are clear, and the decision-making processes (e.g., while choosing a supplier) are pre-described, explicit, and accepted by all the involved actors.

That characteristic represents a pivotal difference from other types of agrifood supply chains, compatible with the fundamental social ambition of GPP: the creation of social value through the promotion of both green production and responsible consumption (Wang et al., 2021; Pacheco-Blanco and Bastante-Ceca, 2016). In pursuing these targets, the system under consideration infuses a societal culture of responsibility in production and consumption. Some scholars argue that applying green practices during public procurement can promote the transition towards sustainable production paradigms (Borsato et al., 2020; Lindström et al., 2020). Nevertheless, they can also promote an elitist culture since farmers who are not certified with organic, ethical, or fair-trade certifications might be excluded by GPP chains.

The social outcomes of GPP for end-users refer to the access to healthy food products that meet sustainability standards; the development of awareness on issues like environmental sustainability, ethical food production, and fair trade; and the information the public authorities can have on the food production standards. Finally, the exclusion of non-certified farmers from green public procurement chains and the potential transformation of green, sustainable production to a marketing mechanism that overemphasizes the market benefits and undervalues the real meaning of sustainable agrifood production represent significant negative social impacts of GPP schemes. On the other hand, the promotion of sustainable and responsible food production and consumption is a valuable social benefit. Hence, it can be argued that the depth of outreach is high, but the breadth – being limited to a regional or national level – is medium.

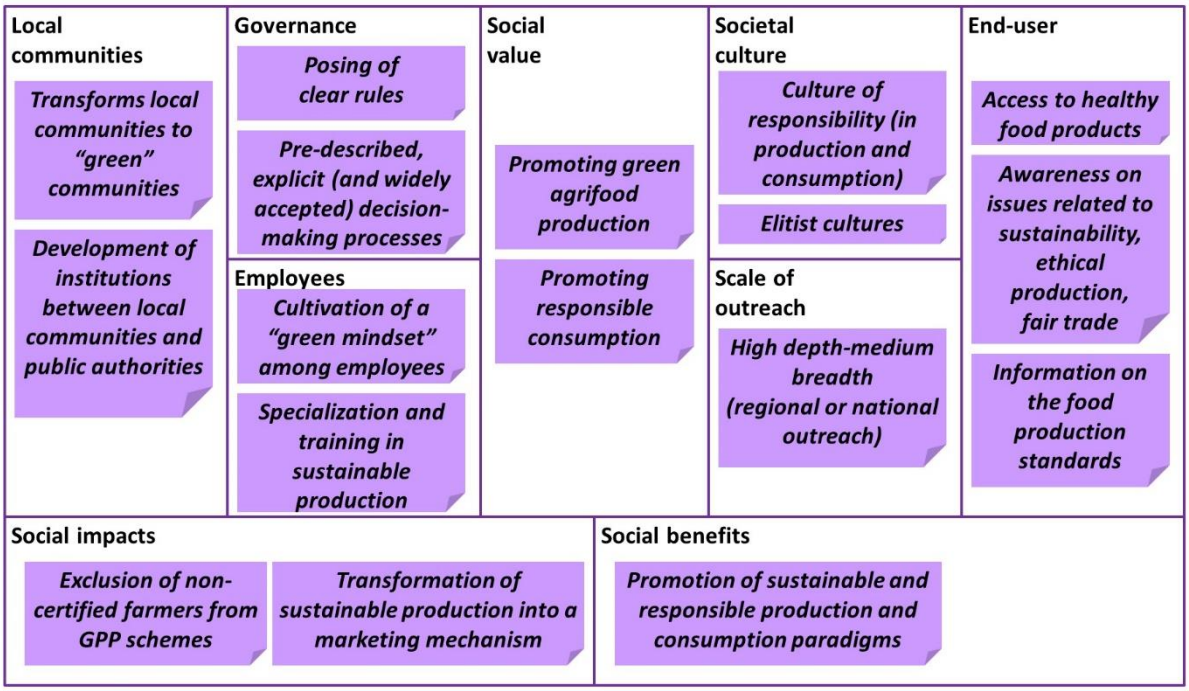


**Figure 4.** The social layer of TLBMC

## 3. Methods

### 3.1 Measures

To evaluate the developed business model, we constructed an instrument consisting of 72 items, referring to the sub-dimensions of each layer's components. To examine the content and face validity of the questionnaire, we conducted a preliminary analysis by inviting two experts with experience in the topics under study to assess the instrument's general quality, the complexity and wording of the items, and their matching with the relevant literature. After making some modifications suggested by the experts, the instrument took its final form. To measure items, we used a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire also included a section aiming at collecting socio-demographic data.

To confirm that the sets of developed items belonged to the theoretically expected dimensions of the TLBMC, we performed a series of principal axis factor analyses after recoding negatively worded items. In all cases, the process revealed unidimensional structures for each

component. Nevertheless, four items with loadings lower than 0.4 were eliminated. Hence, the final analysis included 68 items.

The variance explained by the new factors was quite high for all nine components. Eigenvalues were above 1 for all factors. Cronbach's alphas were sufficient in all cases, especially considering the small sample size. Alpha values ranged between 0.57 and 0.76 for the economic (Table 1), 0.50 to 0.91 for the environmental (Table 2), and 0.61 to 0.85 for the social layer (Table 3).

**Table 1.** Components of the economic layer, number of items, percentages of variance explained and Cronbach's alphas

| **Component** | **No of items** | **Example item** | **Explained variance (%)** | **α** |
|---|---|---|---|---|
| Value proposition | 2 | *are able to offer high quality agrifood products, produced with environmentally sound practices* | 76.71 | 0.69 |
| Activities | 3 | *are characterized by high production effectiveness* | 56.76 | 0.60 |
| Partners | 3 | *are based on functional collaborations between farmers and suppliers of seeds, pesticides, fertilizers* | 65.83 | 0.72 |
| Resources | 3 | *are based on the effective use of land, labor, and capital* | 68.30 | 0.76 |
| Customer relationships | 2 | *operate based on effective traceability systems* | 71.47 | 0.57 |
| Channels | 2 | *distribute effectively products through direct sales to local authorities* | 72.07 | 0.61 |
| Customer segments | 5 | *target effectively municipalities and municipal services* | 76.71 | 0.69 |
| Costs | 2 | *have low production cost at the farm level* | 56.76 | 0.60 |
| Revenues | 2 | *offer farmers an extra revenue due to the associated subsidies* | 65.83 | 0.72 |

*Note: Items endorse the statement "green public procurement schemes in my region…"*

**Table 2.** Components of the environmental layer, number of items, percentages of variance explained and Cronbach's alphas

| Component | No of items | Example item | Explained variance (%) | α |
|---|---|---|---|---|
| Functional value | 2 | *have a low environmental footprint per unit of product sold in public bodies* | 86.30 | 0.84 |
| Production | 2 | *are based on efficient energy use at the farm level* | 64.28 | 0.61 |
| Materials | 2 | *use agricultural supplies (seeds, fertilizers and pesticides) that do not harm the environment* | 66.53 | 0.50 |
| Suppliers/ outsourcing | 3 | *use farm machinery that requires high amounts of energy to be produced** | 65.97 | 0.70 |
| End-of-life | 2 | *produce waste of products during transportation** | 67.96 | 0.53 |
| Distribution | 3 | *are based on middle-distance transportation that does not harm the environment* | 68.26 | 0.53 |
| Use phase | 2 | *consume high amounts of energy during the storage of products (e.g., in public authorities' refrigerators)** | 91.91 | 0.91 |
| Impacts | 2 | *are based on energy-consuming procedures across the chain** | 65.09 | 0.46 |
| Benefits | 2 | *mitigate the environmental impacts due to the compliance with environmental practices and processes* | 84.41 | 0.82 |

*Notes: Items endorse the statement "green public procurement schemes in my region…" Negatively worded items are marked with an asterisk.*

### 3.2 Participants

For this study, we drew on data from a sample of 20 experts in GPP from France. Participants were farmers (20%), farmer cooperative members (65%), wholesalers involved in GPP (5%), and consumers buying products sold through these schemes (10%). Among respondents, 13 were men, whereas 75% of the sample were aged between 41-60 years, 20% belonged to the age group of 21-40 years, and 5% were above 60 years. Half of the participants (50%) had secondary education, 30% had completed post-secondary education, 15% graduated from a tertiary institute, and only one (5%) had only primary school education.

**Table 3.** Components of the social layer, number of items, percentages of variance explained and Cronbach's alphas

| Component | No of items | Example item | Explained variance (%) | α |
|---|---|---|---|---|
| Social value | 2 | *promote the idea of green agrifood production* | 77.21 | 0.70 |
| Local communities | 2 | *develop institutions between local communities and public authorities* | 83.10 | 0.80 |
| Governance | 2 | *decision-making processes are prespecified and widely accepted* | 86.67 | 0.85 |
| Employees | 3 | *offer employees opportunities for training in sustainable production* | 69.57 | 0.73 |
| Societal culture | 2 | *cultivate a culture of responsibility in production and consumption* | 72.04 | 0.61 |
| Scale of outreach | 3 | *offer benefits that extend beyond local communities* | 71.57 | 0.80 |
| End user | 3 | *offer consumers (employees in public authorities, public universities' students) access to healthy food products* | 58.77 | 0.63 |
| Social impacts | 2 | *transform sustainable food production into a marketing mechanism** | 73.98 | 0.65 |
| Social benefits | 2 | *promote sustainable and responsible consumption* | 81.14 | 0.75 |

*Notes: Items endorse the statement "green public procurement schemes in my region…" Negatively worded items are marked with an asterisk.*

### 3.3 Data analysis procedure

To present data, we used mean scores and standard deviations. Differences between components of the TLBMC were examined using paired samples t-tests. We also used Spearman's correlation coefficient to uncover significant associations between the components of TLBMC. In all cases, significance level was defined at $p<0.05$.

## 4. Results

According to the mean scores (Table 4), GPP schemes have an average to high value proposition (M=3.97) while they lead to moderately high revenues (M=3.10). The dimension "costs" received a relatively low mean score (M=2.57). Given the positive wording of the items belonging to the component, we can argue that the cost represents an issue for GPP schemes. Aside from this, there are many spaces for improvement since none of the remaining dimensions yielded a mean score higher than 3.38. As Table 4 highlights, the margins for improving the effective use of resources (M=3.08) and targeting customer segments (M=3.18) are broad. The same is true for the component referring to the weaving of functional customer relationships (M=3.22).

Testing for significant differences between the dimensions referring to the production process, we discovered that t values ranged from 0 to $|1.78|$ ($p>0.05$ in all cases). Following the same procedure for the dimensions associated with the distribution of products, we found no significant differences ($0.31 \leq t \leq 1.09$, $p>0.05$).

For the environmental layer, the mean scores revealed that, despite the fact that the environmental benefits of GPP received a relatively high mean score (M=3.65), there are aspects related to the environmental performance of those schemes that can be seriously improved. The production dimension yielded a mean score of 3.05, indicating that it represents a factor limiting the environmental performance of these schemes. The mean score for the dimension concerning suppliers and outsourcing (M=3.32) was also somewhat low. Nevertheless, the functional value of green public procurement is just above the reference line of 3.00 (M=3.27), suggesting that some aspects of GPP are not as "green" as hoped.

The production component had a significantly lower mean score compared with all the post-production dimensions. Paired samples t-tests revealed that these differences were significant at the 0.01 level for distribution ($t=-2.86$, $p=0.010$) and at the 0.05 level for end-of-life ($t=-2.83$, $p=0.011$) and use phase ($t=-2.22$, $p=0.039$). Moreover, we observed that environmental benefits correlate with dimensions belonging to core production – namely materials ($\rho=0.47$, $p=0.036$) and suppliers/outsourcing ($\rho=0.45$, $p=0.049$) – as well as with the post-production components of distribution ($\rho=0.59$, $p=0.006$) and use phase ($\rho=0.45$, $p=0.045$). On the contrary, the production process did not correlate with environmental benefits ($\rho=0.07$, $p=0.775$) and impacts ($\rho=0.28$, $p=0.224$).

**Table 4.** Mean scores and standard deviations for the components of the TLBMC

| **Economic layer** | | **Environmental layer** | | **Social layer** | |
|---|---|---|---|---|---|
| **Component** | **Mean score (S.D.)** | **Component** | **Mean score (S.D.)** | **Component** | **Mean score (S.D.)** |
| Value proposition | 3.97 (0.62) | Functional value | 3.27 (0.92) | Social value | 3.82 (0.61) |
| Activities | 3.38 (0.59) | Production | 3.05 (0.65) | Local communities | 3.37 (0.87) |
| Partners | 3.38 (1.02) | Materials | 3.65 (0.63) | Governance | 3.17 (0.75) |
| Resources | 3.08 (0.95) | Suppliers/ outsourcing | 3.32 (0.66) | Employees | 3.40 (0.65) |
| Customer relationships | 3.22 (0.68) | End-of-life | 3.70 (0.75) | Societal culture | 3.52 (0.70) |
| Channels | 3.37 (0.84) | Distribution | 3.72 (0.87) | Scale of outreach | 3.60 (0.70) |
| Customer segments | 3.18 (0.81) | Use phase | 3.57 (0.81) | End user | 3.65 (0.72) |
| Costs | 2.57 (1.07) | Impacts | 2.55 (0.60) | Impacts | 2.90 (0.87) |
| Revenues | 3.10 (1.01) | Benefits | 3.65 (0.74) | Benefits | 3.87 (0.82) |

Finally, the mean scores for the social layer confirmed that GPP schemes do have a relatively high ability to generate social value (M=3.82) and produce high social benefits (M=3.87). The mean score for social externalities (M=2.90) also showed that GPP perform relatively well in the social layer. Among the other aspects of the model, the highest means were observed for the dimensions referring to end users (M=3.65), the scale of outreach (M=3.60), and societal culture (M=3.52), which concern the broad social impacts of GPP operation. Interestingly, governance mechanisms had a somewhat low mean score (M=3.17), potentially

suggesting that adaptations to the current governance structures can lead to higher levels of social value.

Another notable finding was that the components pertaining to the social impacts that extend the boundaries of GPP had higher mean scores than those reflecting stakeholders' involvement in the social value creation process. However, paired samples t-tests uncovered that the only significant difference was that between the end user and governance components ($t=2.92$, $p=0.009$), while in all other cases, the differences were not significant. Notably, Spearman's correlations demonstrated that social value modestly but significantly correlated with all the dimensions that regard broad social impacts, i.e., societal culture ($\rho=0.55$, $p=0.013$), the scale of outreach ($\rho=0.49$, $p=0.029$), and end user ($\rho=0.48$, $p=0.033$). On the other hand, in the general category that includes stakeholders, the only significant correlation was noticed for local communities ($\rho=0.58$, $p=0.007$). Governance ($\rho=0.22$, $p=0.348$) and employees ($\rho=0.27$, $p=0.257$) did not correlate with social value.

The comparison of the three layers led to some interesting notes. The functional value of GPP schemes was found to be significantly lower than both economic value proposition ($t=-3.07$, $p=0.006$) and social value ($t=-3.24$, $p=0.004$) while no significant differences were detected between the latest two constructs ($t=1.20$, $p=0.249$). On the other hand, the revenues had a significantly lower mean score than both environmental and social benefits ($t=-2.57$, $p=0.019$ and $t=-2.79$, $p=0.012$, respectively), between which no significant difference was observed ($t=-1.06$, $p=0.304$). A final remarkable finding was that, although functional value positively correlated with social value ($\rho=0.62$, $p=0.003$), it did not show a significant correlation with the (economic) value proposition ($\rho=0.19$, $p=0.432$), pointing out that the capacity of a GPP scheme to produce environmental value is not associated with its ability to deliver value propositions.

## 5. Discussion and conclusions

Adding to the growing body of literature on GPP schemes, the current study developed a business model canvas illustrating the essential components that contribute to the production of economic, environmental, and social value through the operation of GPP supply chains in France. Our analysis uncovered an average to high value proposition for the schemes under consideration, showing a clear need to improve both the production and distribution processes, and increase revenues. On the other hand, when looking at the social layer of the TLBMC, some

silver linings emerge. GPP schemes seem capable of producing social value that extends beyond the boundaries of the buyer-seller dyad, thus confirming the contention of Bucea-Manea-Țoniș et al. (2021) that green procurement of agrifood products by the public sector serves social purposes.

However, quite unexpectedly, we observed that functional value was rather low and significantly lower than economic and social value. A plausible explanation for the limited capacity of GPP schemes to achieve high levels of functional value, therefore attesting to their "green" character, is the environmental inefficiency of the production component. Indeed, the results seem to support this conjecture. The production dimension was found to have a relatively low mean score, indicating the need to improve the environmental performance at the initial nodes of GPP supply chains. Of course, to meet that purpose, GPP policy frameworks require farmers to apply green practices (Lindström et al., 2022; 2020); nevertheless, even sustainability-oriented farm production systems have questionable environmental outcomes (McGee, 2015; Tuomisto et al., 2012).

Although our study offers some interesting insights, we are well aware that the small sample size reduces the power of the statistical analyses. Another potential limitation involved the fact that we did not focus on a specific GPP system (e.g., schemes supplying hospitals or public organizations' canteens). Diverse sectors – and even organizations within the same sector – apply different criteria when purchasing "green" food products (Neto and Gama Caldas, 2018), thus impacting the production process and, hence, the value-generating capacity of GPP supply chains.

In light of these limitations, our work should be viewed as a preliminary – and, to the best of our knowledge, the first – attempt to estimate GPP schemes' ability to create economic, environmental, and social value. Future researchers can lean upon our theoretical framework, using the TLBMC developed in the present study to conceptually depict and empirically evaluate how GPP schemes produce and deliver value and what impedes them from reaching their full value-creating potential. In addition, our findings raised an intriguing question: are GPP schemes really green? Our data did not provide a positive answer, revealing a relatively low functional value for French GPP of agrifood products. Is that the case in other countries and/or sectors? This question awaits further research.

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