

Article

Identifying the Policy Instrument Interactions to Enable the Public Procurement of Sustainable Food

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Abstract: A public food procurement policy has been identified as having significant potential to drive food consumption and production towards greater sustainability, delivering social, economic, environmental, and health benefits to multiple beneficiaries. However, empirical research reveals that the potential of public procurement of sustainable food (PPSF) is not currently being realised, with studies from a range of different countries identifying stubborn barriers. Situating PPSF within the complex multi-instrument setting of the broader policy system, and utilising the concept of policy interactions, can help to explain, articulate, and provide pathways to address barriers identified in empirical studies on PPSF. A desk survey of PPSF in different countries identified the range of instruments which interact with procurement policy. The findings detail PPSF instruments interacting with many other policy instruments, resulting in both positive reinforcing and negative undermining effects. Taken as a whole, these interactions suggest a ‘policy package’ of instruments which should be considered in PPSF policy design to maximise effectiveness and capitalise on its transformative potential.

Keywords: public food procurement; sustainable food; policy interactions; food systems; food policy



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1. Introduction

The public procurement of food has been identified as a means with significant potential to drive food consumption and production towards greater sustainability, delivering social, economic, environmental, and health benefits to multiple beneficiaries [1–6]. There are multiple examples at all levels of government of public procurement being directed towards health and sustainability goals, yet this variety serves to highlight the operational complexity of the policy environments that such public procurement initiatives face, e.g., see [2,7,8].

The public procurement of sustainable food (PPSF) operates within the ‘complex multi-instrument setting’ [9] of the broader policy system. The aim of this paper is to illustrate the importance of a conducive set of policy instruments which promote the transformative potential of more sustainable and healthy food reaching the plate in public restaurants and eating settings. This requires ‘a focus on the interactions and interdependencies between different policies as they affect the extent to which intended policy outcomes are achieved’ [10]. Increasingly, studies of the broader food system have identified the need to understand, identify, and at least co-ordinate, the connections and interdependencies of food system activities in order for policies to be effectively applied to improve health and sustainability impacts [11–16]. The need for more attention to be given to the co-ordination and interdependencies of public policies is not particular to food systems. A recent review by Capano and Howlett [17] laments the lack of evidence on whether and how policy instruments interact in different sectors and countries. This paper aims to contribute to the understanding of the empirical interactions between policy instruments through a case study of the public procurement of more sustainable food. In doing so it offers one tangible example of, and method for, operationalising a ‘food systems approach’ which goes beyond single instruments in policymaking practice.

Public procurement is a policy employed in many countries at considerable cost to governments; representing 13 to 20 per cent of gross domestic product in OECD countries (all goods and services) [4]. In the UK, £2.4 billion is spent annually on *food* procurement specifically, representing 5.5 per cent of total food sales [18]. Most governments have a procurement policy and many have specific policies on public food procurement. At the same time, empirical research has detailed how the potential of PPSF is not being realized, with reviews from a range of different countries identifying stubborn barriers. Canadian researchers concluded that ‘despite recommendations, healthy food procurement policies have not been broadly implemented in Canada’, noting issues and challenges hindering implementation including limited knowledge of potential positive impacts, logistical barriers (e.g., lack of cooks or kitchens in schools), financial issues (pressures to create revenue streams from food service and/or franchising), and inconsistent nutrition standards and policies [7]. In Finland, factors hampering the use of organic, and local, food and making responsible choices unduly difficult in public catering include: inadequate know-how on purchasing procedures; lack of education among the municipal procurers; economically stressed purchasing procedure focusing primarily on price; steadily increasing purchasing costs; uneven availability and low availability of appropriate processed products; plus poor co-operation along the organic food chain and other sectoral fragmentation [8]. The proposition of this paper is that the concepts of policy instruments and their interactions can help to explain, articulate, and provide pathways to address barriers identified in empirical studies on PPSF. The article examines case studies of PPSF policy innovation through the conceptual lens of policy instrument interactions as a test case for the applicability of these concepts in the field of food policy. As such, the aim of the paper is not to evaluate the effectiveness of the policies referenced or of the policy interactions identified. It does not address the most effective design of an individual PPSF policy instrument per se, but rather recommendations around an optimum PPSF policy package are offered in the discussion. In the conclusion, suggestions for future research to expand the evidence base further are offered.

2. Conceptual Framework and Methods

2.1. Theoretical and Conceptual Context

2.1.1. Sustainable Food and Public Food Procurement

The term sustainable food is often used as a summary or short hand term for food that is procured, delivered, and prepared for consumption in public sector settings, ranging from schools and universities to government departments, and from armed forces canteens to hospitals and care homes. There is no single accepted definition of sustainable food, and different conceptualisations offer different emphases, across sustainability’s established ecological, economic, social (including health), dimensions, and sometimes a cultural dimension [1,19]. As Morley notes, ‘the FAO have put forward five defining principles that encompass sustainable food and agriculture: 1. Improving efficiency in the use of resources; 2. conserving, protecting and enhancing natural ecosystems; 3. protecting and improving rural livelihoods and social well-being; 4. enhancing the resilience of people, communities and ecosystems; and 5. promoting good governance of both natural and human systems’ [1]. When defining the environmental dimension, the Eat Lancet Commission on healthy diets from sustainable food systems, utilised the planetary boundaries framework, encompassing GHG, cropland use, water use, nitrogen and phosphorus application, and extinction rate [20]. Morley highlights four types of sustainable food category with pertinence to PPSF: organic, local, welfare friendly, and fair trade [1].

As a result of this heterogeneity, interpretations of the sustainability characteristics that are ascribed to food and related meal offerings in public sector settings vary. One recent systematic review of studies of sustainability criteria for public procurement of food identified some main aspects [21]. In this review, environmental was identified heavily with organic food production, overlapping with health. Reduction of waste, climate impact reduction, and seasonality also featured as environmentally sustainable. Social was linked

to healthy food and the reduction of externalities in production (groundwater pollution, pesticide residue reduction), complementing organic food. Livelihoods was a key economic sustainability criterion notably for small and local farmers [21]. Often, individual studies of the public procurement of sustainable food have highlighted one particular benefit, such as providing a market for small and local-regional farmers e.g., [22], or lowering carbon emissions [23]. The range of studies for sustainable food public procurement was addressed as part of the literature search process described in Section 2.2 below.

2.1.2. Policy Instrument Interactions

The rationale for looking beyond individual policy instruments to the broader mix of policy instruments is well established in the policy studies literature. Smart policy design should recognise how instruments create interactive effects, which can be complimentary, supplementary, or counterproductive, and should aim to minimise counterproductive interactions and maximise synergies which may occur when multiple instruments are more effective than when deployed alone [17,24]. For proponents of ‘smart regulation’ such as Neil Gunningham, basic principles include (1) considering the full range of policy instruments available; and (2) employing a mix of policy instruments carefully chosen to create positive interactions with each other and to respond to particular, context-dependent features of the policy sector [7,25,26]. Drawing on policy studies conceptualisations, and our existing knowledge of food policy, this paper applies the following definitions of ‘instruments’, ‘interactions’, ‘policy mix’, and ‘packages’.

We adopt ‘instrument’ as the label for a particular action by government or non-government actors, while acknowledging the terms ‘policy’, ‘intervention’, ‘instrument’, ‘tool’, ‘measure’, or ‘lever’ are also used—often interchangeably—in the literature. The definition we employ also characterises policy instruments broadly and with recognition of their hybridity, and as targeting both policy outcomes and processes (as explained next).

Firstly, a broad, extended definition of a policy instrument is utilised, in recognition of the many types of instruments which exist and are applied to food systems, from laws to voluntary certification schemes. The literature on policy instruments tends to equate instruments with distinct, single policy interventions, though there is some discussion of more blurred ‘hybrid’ instruments [27]. The empirical realities of public procurement policy suggest a more flexible definition of instruments to be appropriate. Public food procurement can involve a ‘hybrid’ range of instruments, ranging from framework policies or plans, to more specific regulations, finance, and training [27]. These might represent the ‘parent’ procurement policy itself and several accompanying measures (for example a set of non-binding nutrition standards), which may be understood as ‘sub-instruments’ following [27–30]. It is not always empirically evident whether instruments which are described as part of a case’s ‘procurement policy’ are sub-instruments of a parent procurement policy, or independent from the procurement policy. Cognisant of this blurring, we include instruments specified in the procurement policy itself (for example, a requirement to buy from local or family farms) as well as distinct instruments such as health regulations. Both cases can result in positive or negative interactions with the core parent policy objective of sustainable food procurement. In the interests of parsimony, the term ‘instruments’ is used in the paper to also include ‘sub-instruments’.

Secondly, in defining policy instruments we make the distinction between ‘substantive’ instruments—those used to directly affect policy outcomes such as regulation or subsidies—and ‘procedural’ instruments (for example monitoring or evaluation of policies), which are used to affect policy processes and outcomes [31]. Procedural instruments, though relatively neglected compared to their substantive counterparts, indirectly but ‘significantly affect policy processes and outcomes’ [31]. Again, both substantive and procedural instruments interact with PPSF.

The relationships between instruments are labelled ‘interactions’, and—applying a simplified version of the complimentary, supplementary, or counterproductive typology—we propose that such interactions can be classified as undermining, or ‘negative’ where a policy, or absence of a particular policy undermines the effectiveness of PPSF. They can be

classified as complimentary, or ‘positive’, where a policy instrument—or a particular sub-instrument within an overarching PPSF policy—is suggested to increase the effectiveness of a PPSF policy. Interactions between these myriad types of policy instrument are positioned as resulting from the particular policy *mix*—the sum total of existing policies—which exists in a food system.

Policy design can capitalise on positive interactions through the creation of a purposeful ‘*package*’ of instruments designed to address one or more policy objectives, created in order to improve the effectiveness of the individual policy measures, and implemented while minimizing possible unintended effects’ [32], p. 3, in [33]. In an effort to avoid the conceptual ambiguity in the policy studies literature, the term ‘mix’ is used to label a set of existing instruments in a particular context, and ‘package’ to refer to a purposefully-designed set of instruments.

2.2. Methods

There are practical limits to assessing instrument mixes: the multitude of possible permutations of instrument and institutional interactions render the task of producing a general causal model of relationships between the multiple variables impractical (even without problems of context specificity) [26]. A pragmatic approach was therefore employed to understand the PPSF policy mix context. A desk-based survey was conducted on PPSF policy in a range of countries, to identify instruments most relevant to (interacting with) PPSF which might need to be factored into policy design to maximise transformative potential. This evidence on PPSF policies was identified through two routes. Firstly, a literature search was conducted for a date range of 2010 to the present—using a combination of search terms for ‘public procurement’ and ‘food’ and ‘sustainability’—on a number of databases, and relevant papers downloaded, results/abstracts screened and inclusion criteria applied: Business Source Complete (12); Google Scholar (117); JStor (4); Pubmed (16); Sage (11) and Scopus (82). Qualifying papers: addressed *public sector* food procurement (i.e., not food procurement per se); included references to food sustainability as an objective of food procurement; and featured an empirical case study data on a particular country or city-level procurement intervention. Papers were excluded where they were a generic discussion of sustainable food procurement without a specific empirical case, or where food procurement policy was one of several food policies under discussion, without a specific focus. Secondly, a grey literature search was conducted. This drew on an inventory of food-related policies—including PPSF policies—from around the world produced by the authors [34], along with two existing reviews of country approaches [18,35]. The review was conducted by the first author, and criteria cross-checked with the co-author.

Additional sources to those which resulted from the literature searches were identified from papers and reference lists. Inclusion criteria to select case studies were applied; there needed to be at more than one source available on the case study, and the sources needed to provide detail which would enable identification of interactions with procurement policy. In total, food public procurement policy case examples from nine countries met the inclusion criteria: Brazil, Denmark, Finland, Germany, Italy, Norway, Sweden, UK, and USA. In addition, examples of policy interdependencies from other countries (e.g., Austria; Latvia; Slovenia) were included where they contributed additional findings on policy interactions. In total, 41 papers and reports were used to extract the data for the case studies.

The country case studies were reviewed and coded for mentions of policy instruments (for example an agriculture programme in Denmark to provide organic supply for use in PPSF); enablers and constraints of PPSF which could be addressed by a policy instrument intervention (e.g., requirement for food producer training signified by failures to understand procurement rules); or other interactions with policies or activities not fitting the previous two categories. The data were then coded as either representing a positive or negative interaction. Instances where a policy instrument—or a particular sub-instrument within an overarching PPSF policy—was suggested to increase the effectiveness of a PPSF policy

were coded as ‘positive’. Instances where the effectiveness of a PPSF policy was suggested to be undermined by another instrument, or absence of it, were coded as ‘negative’.

3. Results

The results of the analysis are presented in Table 1. The Table documents PPSF policy interactions identified in the case studies, grouping these by broad category of policy instrument (e.g., Supply-related), and then by more detailed instrument (e.g., Agriculture Production Programme). Whether the identified interaction with PPSF was positive or negative is presented, alongside a short detail on the example. The discussion following the table provides more in-depth analysis of the findings.

The findings on food public procurement of sustainable food interventions illustrate its interactions with the broader policy mix. Its transformational potential towards sustainable food systems is amplified by positive interactions with complementary policy instruments, yet is dampened by a range of negative policy interactions, often resulting from the *absence* of particular supportive policy instruments, as outlined next under the headings of substantive and procedural.

3.1. Substantive Instruments

3.1.1. Instruments to Support Supply

Two interrelated considerations related to PPSF are how the policy mix influences what produce is available to procure (including both what is grown and what is processed), and which producers are in a position to supply it. The potential for procurement—in particular locally sourced sustainable food procurement—can be undermined by lack of the right kind of produce. Inclusivity of suppliers is connected to this, since smaller/local producers may face practical barriers to supplying their produce.

Agricultural production programmes, and interventions to facilitate local processing, are two PPSF-interacting instruments identified in the analysis. One of the key enablers of Denmark’s successful organic procurement policy has been an Organic Action Plan to double the area of organic agricultural production in Denmark [35]. An enabler in Sao Paulo, Brazil, has been an investment in a distribution centre to support local businesses to participate in supply [22]. Similarly, supply chain infrastructure that includes ‘mission driven centers of aggregation, processing, and distribution (food hubs) dedicated to the same vision and goals of the collaborative’ is identified as crucial in the USA case [41].

Conversely, an absence of supportive instruments which facilitate the storage, processing, and distribution of produce is a common theme across multiple country cases. In comparison to some of its neighbours, Finland has experienced slower progress on developing organics. This has been ascribed to lack of local infrastructure such as centralised processing capabilities [35]. A case study of one Finnish municipality highlights how the proportion of local and organic food items available in the region is high, and the municipality is located in a primary production area for milk and beef, but a major bottleneck occurs due to concentration of processing plants into few large units. Investment into local processing—and of pre-processing of organics—is needed to create shorter local supply chains [8]. Similar barriers are found in Germany and Brazil. In Berlin, Germany, for instance, lack of local pre-processing means caterers rely on specialized suppliers that operate nationwide, often supplying cheap, anonymous vegetables from spot markets [38]. These examples concur with earlier studies identifying dependency on pre-processed food as a barrier for local value chains in school catering [38]. Attempts to build direct relationships with local organic farms in Germany were unsuccessful due to requirements farmers could not meet, such as a continuous supply of certain quantities and qualities [38].

Table 1. Identified policy instrument interactions for public procurement of sustainable food.

	Policy Instrument Category	Case Study where Identified	Positive or Negative Interaction	Details
SUBSTANTIVE INSTRUMENTS	Agriculture Production Programme	Denmark	+	Organic Action Plan framework policy including goal to double organic agricultural area [35]
		Brazil	+	Law requiring 30 per cent of school meal budget to family farms [36] Simplified procedures for buying from family farms [36] Priority purchasing from marginalised communities (quilombolas-descendants of enslaved Africans and indigenous) [36]
	Mechanisms for Supplier Participation (including small/local/organic)	Copenhagen, Denmark	+	Contractual requirements targeting (bio) diverse fruit and vegetable produce supply favours small and medium-sized suppliers [37]
		Podravje region, Slovenia	+	Smaller contracts to encourage supply of local produce [18]
		UK (Bath and East Somerset council)	+	Flexible contracting via ‘Dynamic Purchasing System’ enables participation of mixture of different (including small) suppliers [18]
		Germany	–	Attempts to build direct relationships with local organic farms unsuccessful due to requirements farmers could not meet, such as a continuous supply of certain quantities and qualities. Wholesaler does not work with local organic vegetable farms since access to the farms is perceived as difficult [38]
		Norway	–	Supply chains for organic produce to schools poorly developed [39]
		Brazil	–	Ability of small-scale farmers on land reform settlements to engage in sales of value added, processed foods, including meat and dairy, is limited by health regulation standards [40]
Supply-related				

Table 1. Cont.

Policy Instrument Category		Case Study where Identified	Positive or Negative Interaction	Details	
SUBSTANTIVE INSTRUMENTS	Supply-related	Support for Processing/Distribution Facilities	Sao Paolo, Brazil	+	Distribution centre to support local businesses to participate in supply [22]
			Malmo, Sweden	+	Menu planning, food purchase and preparation centrally organised [18]
			USA	+	Supply chain infrastructure that includes mission driven centers of aggregation, processing, and distribution (food hubs), dedicated to the same vision and goals of the collaborative [41]
			Brazil	–	Lack of adequate facilities for reception and storage of provisions puts small farmers at competitive disadvantage [22] Poor capacity for production and processing, and storage and transport prevents institutional food buying from region's farmers [42]
			Brazil	–	Almost all products marketed through the program were (less profitable) fresh vegetable products, with no processing, due to lack of technical knowledge and organisation required re. animal origin food, processing and/or certified organic [43] Schools turned away deliveries of poor-quality produce due to poor product quality, including due to long distances travelled, on poor road conditions, and lack of infrastructure [40]
			Finland	–	Lack of centralised processing capabilities prevent purchase of more localised produce [35]
			Latvia	–	Lack of sufficient and high-quality space for vegetable storage until the next harvesting season as a barrier to small producers [44]
			Germany	–	Lack of local pre-processing means caterers rely on nationwide suppliers, often using cheap, anonymous vegetables from spot markets [38]

Table 1. Cont.

Policy Instrument Category		Case Study where Identified	Positive or Negative Interaction	Details	
SUBSTANTIVE INSTRUMENTS	Supply-related	Finance/ Investment	Denmark	+	Funding to underpin shift to organic: kitchen conversion (€11 mn); farmer conversion (€267 mn; Rural Development Programme); promotion (€3.3 mn) [18]
			Brazil	−	Problem of financial flows in public sector practices for payment to farmers [22]
			Canada	−	Financial supports required, including provision of transition funds, subsidies, incentives, plus funding to support innovation through pilot projects, implementation/evaluation research, and knowledge translation [7]
	Information/Awareness Raising	Labelling	Denmark	+	Label which rewards kitchens that reach certain percentage of organic food ('Organic Cuisine' label) [35]
			Vienna, Austria	+	Natürlich gut Teller (naturally good plate) label based on mandatory and target standards [4,45]
			UK	−	Loophole exempting out of home sector from labelling requirements undermines PPSF policy [46]
		Promotion/ Events	Sweden	+	Swedish Meal Day annual event attended by range of stakeholders. Presentation of initiatives on: improved eating habits; environmental impacts; sustainable food production [47]
			Norway	+	'Golden Meal Moments' awards, run by Ministry of Agriculture and Food, for healthy and well-presented dishes served by treatment centres and care homes [47]
			England (Northumberland County Council), UK	+	Increased (five-fold) participation by local suppliers, through intervention to increase awareness and encourage local SMEs [18]

Table 1. Cont.

	Policy Instrument Category	Case Study where Identified	Positive or Negative Interaction	Details
SUBSTANTIVE INSTRUMENTS	Training	Latvia	–	Progress on procurement hindered by lack of producer knowledge on how to sell to schools and other local authorities [44]
		Producers		Poor farmer understanding of purchasing system resulting in failed non-compliant supply [22]
		Brazil	–	Institutional market not used to support constitution or access to other markets beyond the program. Additional service to farmers, such as prospecting/construction of other markets, technical assistance, and joint purchases of inputs not offered [43] Farmers with advanced age, low education, and low per capita income, and those who sell directly to the consumer not well represented, due to lack of technical assistance [42]
		Caterers		
		Denmark	+	Public kitchens guided through organic transition process by dedicated conversion manager; bespoke classes tailored to kitchen budget and nutritional needs of recipients [48]
		Brazil	–	Implementation of direct purchase policies from farmers in the region requires training efforts and new institutional food services' work routines—including menus, food shopping lists—to reflect the available food supply [42]
		Vienna, Austria	–	Seasonality misunderstood and misinterpreted by kitchen managers; supervision and advice identified as necessary [45]
	Multiple			
		Sweden	+	Improved meal experiences and professional and policy know-how through creation of a Centre of Competence for Meals in Healthcare, Education and Social Services [47]
		Finland	–	Poor education and training for staff undermines effective implementation [35]

Table 1. Cont.

Policy Instrument Category	Case Study where Identified	Positive or Negative Interaction	Details	
PROCEDURAL INSTRUMENTS	Measuring/ Monitoring	Denmark	+	Targets support policy of increasing organic PPSF in kitchens and organic production [35]
		Sweden	+	Swedish Meal Model used to support meal planning and monitoring in healthcare, schools and care institutions [47]
		Brazil	+	Implementation monitored by municipal Food and Nutrition Security Councils or other municipal-level agencies such as Rural Development Councils or School Boards [40]
		UK	−	Poor monitoring of implementation [46]
		Scotland, UK	−	Failure to implement baseline assessments/set targets [35]
		Los Angeles County, USA	+	Public procurement bid specifications informed by Health Impact Assessments [49]
		Germany	+	Studies—including impact assessments—prepared by independent experts and academics useful in objectifying the decision-making process, for example providing evidence that adoption would not lead to higher prices for the poor [50]
		Germany	+	Comparison to/competition with other cities (policy learning through knowledge exchange) helped decision-makers legitimize ambitious policy targets [50]
		Brazil	+	Procurement guidelines underpinned by Food Guide for the Brazilian Population, and state that only unprocessed and minimally-processed food may be procured [49]
		Anchoring to existing policies	USA (State Level)	+
	Scotland, UK	+	Sustainable procurement duty on public bodies and requirement to: write procurement strategies and an annual report; give special attention to community benefits and SMEs when awarding contracts; and 'have regard' to highest animal welfare standards [35]	

Table 1. Cont.

Policy Instrument Category	Case Study where Identified	Positive or Negative Interaction	Details	
PROCEDURAL INSTRUMENTS		Brazil	+	At the federal level, a food procurement managing group is coordinated by the Ministry of Social Development and includes representatives from the Ministry of Planning, the Ministry of Agrarian Development, the Ministry of Agriculture, the Ministry of Finance and the Ministry of Education [40] At municipal level, governments play a coordinating role in product placement, and occasionally provide transportation and packing facilities to farmer associations [40]
	Cross-cutting Mechanisms	Vienna, Austria	+	Cross-departmental coordination through thematic working groups with members from local authorities, NGOs, municipal administrations and companies, plus public procurement practitioners from all parts of administration [4]
		USA	+	The well-staffed, local government supported Los Angeles Food Policy Council gave rise to the Good Food Purchasing Program as one of its many initiatives [41]
		Denmark	+	Organic procurement supported by overarching Organic Action Plan framework policy, consisting of complimentary policy instruments including: producer support for conversion and maintenance; market development; certification, regulation and inspection; processing support; R&D; training and education; information [51]
	Stakeholder Participation	Italy	+	‘Canteen Commissions’ involve parents in the governance of school meals [39,52]
		Denmark		Stakeholder engagement, including government, municipalities, NGO’s, catering staff, producers, consultants and enterprises and their cooperation, helped to maximize effect and decrease conflicts of interest [48]

Table 1. Cont.

Policy Instrument Category	Case Study where Identified	Positive or Negative Interaction	Details
PROCEDURAL INSTRUMENTS	Los Angeles, USA	+	Good Food Purchasing Programme framework developed through participation of more than 100 local, state, and national public, private, and non-profit organisations, backed by federal grant from Center for Disease Control [53]
	Finland	+	Use of Participatory Dialogues between caterers and suppliers [8]
	Brazil	+	Participation of urban food security councils, school boards and rural development councils in overseeing PAA and PNAE contracts in the municipalities was an important vehicle for communication in restructuring both production strategies on the part of the producers and the meal planning strategies on the part of local institutions [40] Engagement between school directors and nutritionists and producers helped purchasers better understand the reality of the local production system [40]

Source: Authors.

In Brazil, a lack of adequate facilities for reception and storage of provisions placed small farmers at a competitive disadvantage in relation to companies that traditionally operate in the supply chain [22], and there was a general lack of food production/storage/transport/processing capacity which made it challenging for institutional food services to buy food from farmers from certain regions [42]. Wittman and Blesch [40] describe how schools turned away deliveries of produce which was poor-quality, at least in part due to long distances travelled on poor road conditions, and a problematic lack of infrastructure [40]. One farmer participant commented that they lost several deliveries due to the 'produce turning to mush' on the bumpy roads [40]. Similar difficulties are raised in the Latvian case; a lack of sufficient and high-quality space for vegetable storage until the next harvesting season was a barrier to small producers [44]. In Sao Paolo, Brazil, this barrier has been addressed through creation of a distribution centre to support local businesses to participate in supply. São Paulo City Hall invested in implementing a logistical system: transforming an old idle shed belonging to the municipality into a distribution center; providing growing space to family agriculture organizations; and contracting a logistics company to move greens from family farmers to the distribution center or other intermediary sites and from these facilities to schools [22]. Malmo, Sweden facilitated supply using a centrally organised system for menu planning. In addition, 25 kitchens are used for food purchase and preparation. The food then goes for further preparation to be served by 60 kitchens [18].

The findings highlight the important influence which capability, and capacity, of buyers has on the success of procurement activities. In the German case, a wholesaler reported that it did not work with local organic vegetable farms since access to the farms was perceived as difficult [38]. In Brazil, it became clear through the implementation process that institutional actors needed to better understand, and be able to work with, the available food supply of a particular region, and may require changes to practices such as menus and shopping lists which take account of productive capacity and seasonality [42]. Complementary policy interventions can enable supplier involvement: a five-fold increase in local supplier expressions of interest resulted from the programme of awareness raising by Northumberland County Council in England. Time investment in administrative work was offset by a higher number and better quality of tenders [18]. There are overlaps with requirements for training of suppliers outlined below.

Policies to encourage the PPSF can be designed to target the participation of small and local suppliers. Brazil's multi-pronged approach includes a legislative requirement for 30 per cent of school meal budget to be spent with family farms, as well as simplified procedures for such farms [36], and priority purchasing from marginalised communities [36]. These measures enable the purchase of minimally-processed, perishable, food. However, the empirical examples of barriers illustrate the additional interdependencies which may need to be designed in to deliver on these objectives.

Contractual arrangements are an important instrument in the Slovenian and UK cases. One Slovenian region targets 20 per cent of supply from local producers through the use of small direct contracts and a focus on quality considerations and locally-available foods in menu planning [18]. A similar approach is taken in England's South-West region. Bath and East Somerset council applies a Dynamic Purchasing System which favours smaller suppliers by giving them the flexibility to move in and out of the system. The barriers to SME involvement associated with conventional framework contracts; stringent pre-qualification requirements (e.g., proven track record and minimum production capacity) and narrow time-windows for (re)tendering, are removed [18].

Finally, health regulations are identified as a potential negative interaction; in the Brazil case, small-scale farmers looking to engage in sales of value added, processed foods, including meat and dairy, faced barriers due to the prohibitive cost of upgrading facilities to meet new health regulation standards. For example, one cooperative stopped producing cheese and cassava flour when the health regulations were tightened, and a cooperative processing kitchen closed when the regulations for commercial kitchens were changed to disallow the use of copper pots, in favour of stainless steel. The replacement cost of the

kitchen equipment—estimated at US\$30,000—was far beyond its budget. Barriers around supply of meat and dairy to the school meal programme was also hindered by ‘lack of inspection capacity’ and the high cost of developing regulated processing facilities [40]. These barriers are linked to the need for complimentary finance instruments (discussed next).

3.1.2. Finance and Investment

Another category of supportive instruments is finance and investment, which encompasses direct funding of PPSF and related activities, and indirect support of financial needs of suppliers and other PPSF actors. Denmark’s organic food procurement policy has been supported by conversion funding—for both kitchens and farms—and other promotional campaign funding, and in the capital Copenhagen, additional investment made in knowledge, education, and counselling [18,37]. Conversely, lack of financial support negatively interacts with and dampens PPSF in the Brazilian and Canadian cases. In Brazil, a problem of financial flows has been identified in public sector practices for payment to farmers whose produce has historically been sold through more informal channels and where commercialisation was handled by intermediaries. Supply to local governments requires financial planning, working capital for the development of their business, and special lines of credit, due to the relatively high risk of payment being postponed or not being received at all [22]. In Canada, a wide-ranging review and ‘consensus conference’ with health and procurement experts concluded that financial supports should be introduced to support innovative funding models, including the provision of transition funds, subsidies, and incentives [7].

3.1.3. Information and Awareness Building

Two main intervention types feature under the umbrella of information/awareness building: labelling, and promotion. Labelling can be an important compliment to, or component of, a PPSF policy. Kitchens in Denmark can display a label when they reach a percentage of organic food [35]. Vienna, Austria, enhances procurement through a bespoke label—*Natürlich gut Teller* (naturally good plate)—based on mandatory and target standards [4,45]. Conversely, the UK’s weak labelling instrument represents a barrier to raising procurement standards, since catering is not subject to the same labelling system as retail. An absence of mandatory method of production labelling—except in the case of eggs—means foods produced to a lower standard can be imported and utilised in procurement; illustrating the interdependency of procurement policy with labelling policy and trade policy [54].

Promotion of PPSF benefits and best practice, through events, awards, or general awareness-building, can be employed to improve its effectiveness. Sweden’s National Food Agency introduced an annual ‘Swedish Meal Day’. These events gather together government and other stakeholders, with ‘social change-makers’ who present their initiatives to increase sustainable food [47]. In Norway a Golden Meal Moments competition rewards good practice around sustainable food in certain types of public institutions [47].

3.1.4. Training

Policy instruments which improve the skills and knowledge of actors in the food chain, through training, may target farmers and other producers, retailers, caterers, and other practitioners—for example nutritionists, or individual citizens. An absence of adequate skills in the farming sector dampens the effectiveness of PPSF in several case studies. In Brazil, poor farmer understanding of the São Paulo Mayoralty purchasing system—which maintains severe deadlines and absolute control over quality—resulted in significant levels of failures, with products not accepted since they were “non-compliant” with the quality standard or not delivered in time. Once suppliers became familiar with the system over time, the number of failures dropped significantly [22]. In Latvia, progress has been similarly hindered by ‘lack of knowledge on how to sell their products to schools and other local authorities’ [44]. A lack of training instruments may disproportionately impact particular

types of producers. In one of the Brazilian cases, farmers with advanced age, low education, and low per capita income, and those who sell directly to the consumer, were identified as not well represented in procurement activities due to a lack of technical assistance [42].

The same issues arise in relation to institutional staff such as caterers: random checks of PPSF menus under Vienna's Natürlich gut Teller label revealed seasonality to be misunderstood and misinterpreted by kitchen managers, with further supervision and advice required [45]. A barrier to effective implementation of procurement policies identified in the Finnish case is lack of staff education and training [35].

Conversely, other Nordic cases demonstrate how interventions to improve staff skills and knowledge can support PPSF. The integration of craftsmanship and learning in public catering kitchens is seen as a core element in Danish PPSF, and a route to inspiring and motivating staff. Public kitchens are guided through the organic transition process by a dedicated conversion manager. Bespoke classes are offered exclusively to kitchens adopting organic goals [45]. Swedish staff know-how—practitioners and policymakers—is improved via a Centre of Competence for Meals in Healthcare, Education and Social Services [47].

3.2. Procedural Policy Instruments

3.2.1. Measuring and Monitoring

PPSF measuring and monitoring is identified as an important interaction: in several cases poor monitoring undermines the effectiveness of PPSF. The UK is one example of where it has a dampening effect; a recent parliamentary inquiry uncovered poor evaluation of the Government's Plan for Public Procurement of Food policy, not audited during the six years it has been operating. Analysis of hospital compliance with standards conducted over ten years ago—the only available evidence on implementation of procurement policy—found 48 per cent of hospitals were failing to comply [46]. Problems around measurement dampening the potential impact of PPSF have also been reported in Scotland [35]. Positive interactions were identified in the Nordic cases. In the Danish city of Copenhagen, target setting has contributed to increasing organic PPSF in kitchens and organic production [35]. In Sweden, the Swedish Meal Model is used to support monitoring in healthcare, schools and care institutions [47]. In Brazil, an enabler of implementation has been monitoring by municipal Food and Nutrition Security Councils or other municipal-level agencies such as Rural Development Councils or School Boards [40].

Another monitoring approach is health impact assessments, which came up in several cases. Los Angeles County, USA, has employed these to inform public procurement bid specifications [49]. Likewise, in the German case, studies—including impact assessments—prepared by independent experts and academics were identified as enablers. They were useful in objectifying the decision-making process (for example, providing evidence that policy adoption would not lead to higher prices for the poor) [50].

3.2.2. Anchoring to Existing Policies

A tactic utilised in several cases is anchoring PPSF to other instruments within the broader mix. An example is underpinning PPSF with national dietary guidelines. Brazil's procurement guidelines are underpinned by its Food Guide for the Brazilian Population, and the PPSF policy requirement that only unprocessed and minimally-processed food may be procured mirrors the position on processed foods in the food guide [49]. Scotland's procurement policy is anchored to several policies, including a duty when awarding contracts to address sustainability, animal welfare, and community benefits and SMEs, along with reporting requirements [35].

3.2.3. Mechanisms to Support a Cross-Cutting Approach

Procedural policy instruments can also support PPSF through embedding a cross-cutting approach. One way of doing this is a structure connecting relevant government and non-government actors. In the Vienna, Austria, case there is cross-departmental coordination through thematic working groups with members from local authorities, NGOs,

municipal administrations and companies, and including public procurement practitioners from all parts of the administration [4]. At the federal level in Brazil, a food procurement managing group is coordinated by the Ministry of Social Development and includes representatives from the Ministry of Planning, the Ministry of Agrarian Development, the Ministry of Agriculture, the Ministry of Finance and the Ministry of Education. At municipal level, governments play a coordinating role in product placement, and occasionally provide transportation and packing facilities to farmer associations [40]. While at state level, in the US case, the ‘well-staffed, local government supported’ Los Angeles Food Policy Council was an important catalyst for the Good Food Purchasing Program [41]. An alternative to a specific organisational structure is a cross-cutting framework policy or plan, as in the Danish case, where an organic action plan encompasses a range of different policy instruments targeting an overarching goal [51].

3.2.4. Stakeholder Participation

Multiple case studies identify the participation of a wide range of PPSF-relevant stakeholders—during policy development or implementation/delivery—as contributing to effective PPSF policy. The Good Food Purchasing Programme of procurement standards was developed in Los Angeles, USA, through involvement of more than 100 organisations, with stakeholders from local, state, and national levels, and across the public, private, and non-profit spheres [53]. The Finnish case highlights the use of participatory dialogues between caterers and suppliers before tender calls are put out [8]. In Denmark, stakeholder engagement, including government, municipalities, NGO’s, catering staff, producers, consultants and enterprises, and their cooperation, has been identified as an important enabler of the procurement policy as it helped to maximize effect and decrease conflicts of interest [48]. In the Brazilian case, participation of urban food security councils, school boards and rural development councils, which oversee procurement contracts in the municipalities, was an important vehicle for communication in restructuring both production strategies on the part of the producers and the meal planning strategies on the part of local institutions [40]. Engagement between school directors and nutritionists and producers more generally helped purchasers better understand the reality of the local production system [40]. For example, one producer cooperative leader expressed frustration that, prior to engagement, the school nutritionist refused to make changes in the standardised lunch menus to accommodate seasonal availability of local produce. In response, producer associations met with school nutrition councils to learn about the ingredients for approved school menus, and engaged in production planning to meet those needs. They also engaged with school directors and nutritionists to help them better understand the reality of the local production system [40]. Another instrument for engagement, highlighted in the Italian case, is ‘canteen commissions’, which involve parents in the governance of school meals [52]. Although there is some suggestion that the involvement of parents in menu planning and so on is not always successful [55].

4. Discussion

Analysis of positive and negative interactions within the policy mix of the country case studies identifies a number of instruments likely to improve PPSF policy effectiveness. An important finding, which we have not seen addressed in the existing literature in any detail and which is worthy of further exploration, is how the *absence* of instruments in a given mix may undermine the effectiveness of a PPSF policy.

Mapping, understanding, and addressing these interactions, and identifying packages of complimentary instruments, is one method to operationalise the otherwise somewhat nebulous aims of improving policy coherence (within a policy mix), and taking a more comprehensive food systems approach to designing food policies.

The findings also provide insights into the ‘policy package’ of instruments (Table 2) which could be considered in PPSF policy design, to capitalise on its transformative potential.

Table 2. Policy package to optimise the transformative potential of food public procurement policy.

	Policy Instrument	Contribution to Effective PPSF Policy
SUBSTANTIVE	Agricultural Production Programme	Ensure available supply of produce required by (healthy and sustainable) procurement specifications
	Support for Storage/Distribution Facilities	Enable produce from a range of suppliers to reach procurers
	Support for Processing Facilities	Enable produce from a range of suppliers to reach procurers
	Requirements on volume of produce and type of supplier	Encourage/Incentivise diversity of supply from a range of suppliers, including small/local/indigenous
	Simplified procedures, including contracting arrangements, for certain suppliers	Encourage/Incentivise diversity of supply from a range of suppliers, including small/local/indigenous
	Direct funding for conversion to healthy and sustainable produce, and for pilot projects, implementation and evaluation research	Catalyse transition to healthy and sustainable procurement
	Support in access to finance for suppliers	Ensure available supply from a diverse range of suppliers
	PPSF Labelling Scheme	Inform customers and incentivise caterers on healthy and sustainable PPSF
	Promotional events and other activities	Inspire and inform all actors on healthy and sustainable PPSF benefits and best practice, and incentivise caterers and suppliers
	Training programme for PPSF actors on how to supply, how to transition	Ensure a diverse range of suppliers and catalyse successful transition to healthy and sustainable catering
PROCEDURAL	Monitoring and Measurement	Ensure PPSF is implemented effectively and ambitiously, and support policy lesson drawing
	Anchor PPSF to other health and sustainability policies	Increase policy coherence and ensure health and sustainability objectives embedded in PPSF
	Cross-government structures and plans	Ensure policy development and implementation involves all relevant actors, and utilises all possible policy instruments in a coordinated way
	Stakeholder participation programme	Ensure policy development and implementation involves all relevant actors to ensure buy-in and informed by on-the-ground experiences

Along with the policy interdependencies identified in the cases, several additional policy interdependencies proposed in the literature—but without specific examples of implementation—are worthy of further exploration. They include using building design/planning policy to prioritise the dining environment in design and resourcing of new public buildings where PPSF is located [56]; integrating healthy food procurement policies into standards for institutions subject to accreditation (e.g., daycare, care facilities) [7]; connecting PPSF to the health and educational professions with public institutions [57]; and the positive synergy between PPSF and women’s empowerment [58].

One final theme to highlight is not related directly to the policy instrument mix but does have important implications for understanding the transformative potential of public food procurement as a policy lever. That is, the potential for changes in public sector activities to catalyse change in the private sector. The case study data reveal examples of where this both has, and has not, taken place. For example, in the UK case, Morley [1] details several examples of where procurement requirements led to product and packaging innovations, stimulating changes across suppliers which impacted all supply relationships beyond just the institutional customers. Another example highlighted in the UK case is that of sustainable fish: suppliers increasing their supply of fish compliant with Government buying standards had a knock-on effect on the market availability of non-compliant fish [46]. Similar findings emerge in the US case, where the GPPSF affects 750,000 meals served daily by LAUSD and the city of Los Angeles. LAUSD’s participation in the GPPSF is having

ripple effects on the business practices of other supply chain partners [53]. Conversely, a failure to support producers to capitalise on supply to public institutions, to increase supply to private markets, was raised as a missed opportunity, including to improve resilience of supply, in the Brazilian case [59].

The findings from this analysis demonstrate potential for applying the concepts of policy interactions, policy mixes, and policy packaging to lesson drawing from a range of countries and to support a practical approach to more holistic, coherent, and effective policy design. Indeed, lesson drawing and policy learning between countries could be an important catalyst, as highlighted in the German case, where comparison to/competition with other cities (through knowledge exchange) helped decision-makers legitimize ambitious policy targets [50].

Echoing similar findings on the interplay between policy instruments around environmental public goods [27], the empirical data from public food procurement policies in action draws attention to the need to study policy instruments ‘in-use’ in order to understand their potential role in shifting food systems towards sustainable food.

Further testing and evolving of the approach taken in this paper will be required. This is likely to require that current gaps in the evidence be addressed. Further research will be needed to ascertain the complete policy mix present in a particular location (see [60] for an example of mapping food-related policies at country level); evaluate the development and delivery of PPSF policies more systematically; interrogate the identified negative and positive interactions in more detail; and understand the practical applicability of the policy packaging idea within government. One future research possibility which might extend the analysis undertaken for this paper, would be to address all instruments in a particular jurisdiction, to establish whether this provides additional—for example instruments with no or neutral interactions with PPSF—insight into the most transformative policy mix.

5. Conclusions

This paper presents the case for policy designers to move away from single instrument paradigms towards considering PPSF within a broader package of instruments as a way to improve effectiveness and meet multiple outcomes. It argues that procurement is likely to remain a ‘tale of untapped potential’ [61] if the interdependencies of this policy with other instruments remains unaddressed. The nine case study examples indicate that positive and negative policy interactions exist between PPSF and a range of other policy interventions, including substantive interventions to support supply of sustainable food; on labelling; on training of caterers and farmers; procedural interventions around monitoring, mechanisms to support a cross-cutting approach; and participation from the relevant stakeholders.

At the same time, the practical limitations to implementing policy packaging in reality must be understood and acknowledged. Designing a policy mix from scratch—a process known as ‘replacement’ where the old mix is replaced by a new set of interventions—is not common. It is unlikely that a government will be in a position to start from scratch and wipe out all existing instruments to create a fresh and more effective package, with policy designers’ freedom hemmed by existing mixes, which ‘often have accumulated varying degrees of political support from those who benefit from them, ruling out complete replacement’, and where key instruments in the mix may be defended by powerful ‘instrument constituencies’ [24]. As such, policy ‘patching’—which aims at patching up existing mixes in the same way as software designers issue ‘patches’ for their operating systems and programmes in order to correct flaws or allow them to adapt to changing circumstances’ [24]—rather than creating an entire package based on a blank slate may be a more realistic prospect [62]. Further analysis is needed to explore the practical implications for food policymaking of a packaging as opposed to a more incremental patching approach.

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