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Understanding the diversity of Community Supported Agriculture: a transdisciplinary framework with empirical evidence from Germany

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Introduction: Community Supported Agriculture (CSA) is an emerging model within alternative food networks (AFNs). It shapes close relationships between food producers and consumers, thereby contributing to food sovereignty and agri-food system transformations. Despite rapid growth from about 10 to over 500 CSAs in just over a decade, the model in Germany still remains niche. We argue that further and faster scaling up requires better understanding of its diversity, yet a comprehensive conceptualization of CSA types is lacking, with insufficient differentiation in research and practice.

Methods: This study employs a transdisciplinary mixed-methods approach (literature, qualitative, and quantitative data) in cooperation with the German CSA Network. By integrating organizational perspectives, we found that CSAs are highly complex and diverse organizations. Therefore, we firstly aimed at identifying characteristics that we summarized in a CSA framework. In a second stage, we used this framework as guiding structure for co-developing a survey with the Network covering 70 participating CSAs.

Results: As the defining characteristic within the CSA framework, community financing (domain A) clarifies the uniqueness of the CSA model, thus enables delimitation from other AFN forms. Then differentiation characteristics (domain B) encompass the diversity of CSA configurations. CSA governance (domain B1), regarding the predominant characteristic of organizational governance, distinguish between Producer-led, Consumer-led, and Integrated (all-in-one) CSA types. Varying characteristics (domain B2) specify CSA configurations and enable additional distinction between CSAs. Based on the developed CSA framework, the survey results verify the applicability of governance types in particular, while confirming a high level of diversity of differentiating characteristics in general.

Discussion: This study can be used to reveal existing generalizations about CSAs, providing a starting point for more nuanced and critical views in research and practice. When seen against the background of AFN and food sovereignty discourses in particular, CSA is an alternative production-distribution model, but not every CSA is governed or structured in alternative ways. CSAs can simultaneously contain both more conventional, traditional elements, as well as more alternative elements. Moreover, the framework provides easy-to-access differentiation criteria for matching members with their most suitable CSAs and vice versa. Overall, this study illustrates that CSA cannot be considered as homogeneous AFN type but be rather marked as a diverse field of its own.

KEYWORDS

community supported agriculture (CSA), typology, CSA types, organizational governance, alternative food network, food sovereignty, transformation

1 Introduction

The current provision of food, systematically aligned with industrialization and growth, faces multiple interlinked crises such as climate change, environmental destruction, social inequalities, and threats to democracy around the world (e.g., Battilana et al., 2022; Mirzabaev et al., 2023). Against this backdrop, both socially and ecologically-sustainable food systems are being called for (e.g., Hinrichs, 2000; Mars, 2015; Campbell et al., 2017). Under the umbrella term Alternative Food Networks (AFNs), a diversity of approaches and involved actors are subsumed, whereby Community Supported Agriculture (CSA) is widely mentioned as an impactful model within the AFN movement (e.g., Mount et al., 2013; Chiffoleau et al., 2019; Ribeiro et al., 2021). The CSA model is described briefly as being a partnership between producers and a community of members which cover the cost of production of the farm, wherein the members receive a food share of the harvest throughout the season in return (Parot et al., 2023). According to this, the CSA model aims to "reshape dominant capitalist producer-consumer relations" (Plank et al., 2020, 51) and is ascribed as having significant potential in achieving food sovereignty, and also in contributing to the sustainable transformation of agri-food systems (e.g., McMichael, 2014; Galt et al., 2019; Plank et al., 2020).

Although various conceptions of CSAs have evolved internationally, given geographical and historical contexts (e.g., Whatmore et al., 2003; Goodman, 2004; Watts et al., 2005; Bashford et al., 2013; Si et al., 2015), most studies that consider CSAs as a homogenous phenomenon among others in AFN typologies tend to lump together different organizations that are using the CSA model (e.g., Si et al., 2015; Ribeiro et al., 2021). For instance, CSAs are often described in a generalized way as collectively managed by a community, although in practice CSAs are very often organized just by single farmers or farming families, that do not involve their members in decision-making processes (e.g., Adam, 2006; Bashford et al., 2013; European CSA Research Group, 2016; Hvitsand, 2016; Espelt, 2020; Plank et al., 2020; Grenzdörffer et al., 2022). It is therefore essential to define some terms related to the CSA terminology in this paper: (i) "CSA model" refers to a specific AFN form; (ii) "CSA organization" (hereinafter abbreviated as "CSA") relates to the entire organization of producers and members; (iii) "CSA farm" is an agricultural or horticultural farm that operates using the CSA model. These distinctions are essential, as among other things, several CSA farms can establish partnerships with other CSA farms to form so-called "multi-farm CSAs"[1] (e.g., Adam, 2006; Woods et al., 2017).

Due to the generalizations mentioned, studies often make neither sufficient distinctions between different CSA configurations nor state the multifarious effects or individual challenges they have [see Galt et al. (2019) for United States, Dong et al. (2019) for China]. For instance, good labor and employment practices may not be employed by each CSA, as there have been incidents of (self-) exploitation of producers (e.g., Hinrichs, 2000; Carlson and Bitsch, 2019; Galt et al., 2019; Ajates, 2020; Böhm et al. 2020; van Oers et al., 2023). This can be explained by the fact that CSAs are strongly embedded within their environments and socio-ecological and economic systems (Muñoz and Cohen, 2017). Another example is that, depending on the individual CSA configuration, they may often have different degrees of participation and may struggle with a lack of participation by its members or inadequately integrate low-income individuals (e.g., Pole and Gray, 2013; Watson, 2020; Pitts et al., 2022). In strong contrast to the mentioned generalizations and studies that lump CSAs together, some scholars do highlight that not all CSAs are the same and can take a wide diversity of organizational forms "as farmers and members shape it to their own needs and expectations" (Samoggia et al., 2019, 1). Yet, even though some studies see CSA as a highly complex, diverse, and multi-faceted phenomenon (e.g., Blättel-Mink et al., 2017; Baronov, 2018) with diverse configurations (e.g., Carlson and Bitsch, 2019; Espelt, 2020; Koretskaya and Feola, 2020) an overarching conceptualization of the diversity of CSAs is missing. One explanation for this could be that existing research on the CSA model is concentrated on the membership perspective, such as the motives of consumers for joining and participating in CSAs (e.g., Feagan and Henderson, 2009; Pole and Kumar, 2015; Blättel-Mink et al., 2017; Zoll et al., 2018; Gruber, 2020; Fomina et al., 2022). While this research and existing typologies offer valuable insights, they are limited in terms of research perspective and scientific disciplines, often sidelining the crucial viewpoint of CSAs as diverse organizations. This has meant there is a paucity of organizational perspectives in the CSA discourse. It is therefore helpful to adopt King et al.'s (2010) suggestion that organizational perspectives should focus on the unique features and practices of organizations. Accordingly, CSAs can be considered as complex arrangements wherein organizational perspectives are considered and combined in formal structures (e.g., as a legal entity) with various forms of organizational governance, as well as property and decision rights. Examples of these characteristics include different forms of contracts, coordination mechanisms, and the (non-) formalization of decision-making (see Ménard, 2013). A focus on the CSA organization itself through the inclusion of organizational perspectives also has the potential to address challenges of CSAs, again depending on their respective configuration.

For a better understanding of the diverse configurations of CSAs, the first aim of this paper is the development of a differentiating framework. The second aim is to use and apply the framework to show the diversity of CSAs in Germany. This study is based on a mixed method approach including literature, qualitative, and quantitative data and is conducted in a transdisciplinary research partnership based on knowledge

1 For details, see framework characteristic "single / multi-farm" in chapter 3.1.

co-production with the German CSA Network and its actors. The specific two research questions that guided our research are:

1 According to which characteristics discussed in literature and practice can CSAs be differentiated?
2 How is the diversity of CSAs manifested in Germany?

To answer these questions, we first introduce the research methodology and design of this mixed-methods study (chapter 2). Accordingly, we present our results (chapter 3) and discuss the potential and limitations, as well as the implications of our framework for practice and future research (chapter 4). A conclusion summarizes all results of our paper (chapter 5).

2 Methodology and transdisciplinary mixed-methods research design

This study was conducted by a transdisciplinary research partnership based on knowledge co-production (Jahn, et al., 2012; Lang et al., 2012; Weber et al., 2014; Schuttenberg and Guth, 2015; Schäpke et al., 2018; Hilger et al., 2021) with the German CSA Network[2] between January 2020 and December 2023, and was embedded in the research projects "nascent" and "SolaRegio".[3] We first describe this transdisciplinary research partnership (chapter 2.1), and then describe the used data material within the two-stage-process of knowledge co-production that contains the development of the CSA framework as well as the survey (chapter 2.2).

2.1 Research partnership with the German CSA Network

Knowledge co-production is defined as "an inclusive, iterative approach to creating new information; […] distinguished by its focus on facilitating interactions between stakeholders to develop an integrated or transformational understanding of a sustainability problem" (Schuttenberg and Guth, 2015, 1). Transparent research therefore requires awareness of the different roles combined with overcoming the researcher-practitioner dichotomy in the collaboration between researchers and non-scientific actors (see Hilger et al., 2021). As researchers with different disciplinary backgrounds, including alternative and critical organization, as well as social and sustainability science and sustainability economics perspectives, we combine research areas and are able to move across different fields and disciplines. The authors' preliminary work in the field being studied build necessary trust with the Network and eased the entry of the object of study. Involved actors in this study are people working and engaged in the Network, for instance, experts from their internal working groups (e.g., "Research," "Consulting," "Cooperatives"), practitioners such as individual CSAs, and various participants in events, workshops, and meetings of the Network. In this sense, the Network cannot be classified exclusively as a non-scientific actor. More specifically, a particular "Research Working Group" bundles and coordinates research and scientific work around the topic of CSA, collects practice-relevant questions, tries to avoid duplicate surveys, and is involved in several research projects. By being actively involved in such collaborative processes, research can be managed in order to meet the needs of the CSAs. The Network has formulated, for example, research ethics recommendations for good cooperation (German CSA Network, n.d.) that the authors of this study followed.

2.2 Two-stage knowledge co-production process and used data material

To answer the two research questions, the entangled nature of the used transdisciplinary mixed-methods design (Creswell and Plano Clark, 2018) unfolds in this study by combining three different data materials (literature research, qualitative data and quantitative survey, displayed in Table 1).

The knowledge co-production is divided into two stages. Stage I is the parallel development of the CSA framework and the survey using an iterative approach. Stage II is the framework application and survey conduction.

2.2.1 Stage (I) iterative development of framework and survey

The first stage is divided into the framework development (stage Ia) and the parallel survey development (stage Ib). The whole development of this paper is embedded in the process of planning, conducting, and then analyzing an extensive quantitative survey in 2022 as a joint project between research[4] and the Network. The survey development is therefore connected to the parallel framework development. For this development process, an iterative approach is applied which involves numerous steps through analyzing CSA literature (literature research) and by including discussions with the Network and its actors (qualitative research). These steps are described in the following in a chronological order.

This study was initiated by both a focus group meeting between the Network and researchers as well as a participatory observation at a Network's one-day conference (qualitative research). Both took place in January 2020 in order to specify research demands (for a chronological list of used qualitative data material and question categories, see Supplementary material). After this first step, we inaugurated a sample of CSA literature ($n = 35$ publications) to identify characteristics and types from the current discourse (literature research). Due to terminological heterogeneity, as well as the fact that characteristics for differentiation and CSA types are often only a by-product and are not explicitly mentioned in titles, abstracts, or keywords, we took an exploratory approach. For this, we started with recently published peer-reviewed articles from 2019 and 2020 to look at the current research discourse. We identified literature with the keyword "Community Supported Agriculture*" used to search the online catalog Web of Science (WoS) database. Furthermore, we added frequently cited scientific literature, as well as suitable articles based on our own knowledge. This included, for example, key publications by or in collaboration with CSA Network associations from different countries and the international CSA

2 Hereinafter abbreviated as "Network."

3 Website of "nascent" and "SolaRegio": www.nascent-transformativ.de

4 Besides the authors, Laura Carlson was involved.

TABLE 1 Combination of three different data materials during the two-stage knowledge co-production process (own illustration).

Type of data	Method	Data source	Sample size
Literature	Literature research	Scientific and gray literature	$n = 60$
Qualitative	Focus groups and Interviews	Researchers, experts, consultants, practitioners	4 focus groups with overall 25 participants; 6 interviews with 5 participants overall; Various feedback loops/discussions with 16 participants overall
	Participant observations	Non-scientific conferences with CSA experts, consultants, practitioners, policymakers, researchers	10 non-scientific conferences
Quantitative	Survey	Member-CSAs and CSA farms of the German CSA Network	$n = 70$ CSAs with 81 CSA farms

Network association, URGENCI. This starting literature sample intentionally included gray literature (e.g., not peer-reviewed book chapters, project reports, in-house publications of institutions and Networks) as they were cited several times in the identified peer-reviewed articles and often served as the starting points for these publications.

In the next step, we analyzed this literature sample with regard to their extent characteristics and types. We extracted the designations and terminologies of identified characteristics and types (e.g., forms, models, schemes), and, if available, also the descriptions, definitions, and distinguishing criteria (literature research). As part of the iterative approach, we discussed first drafts of identified characteristics and types with the Network and its actors (qualitative research). To include their practice-based knowledge, we conducted in total four focus groups with 25 participants overall, six individual interviews, and used participant observations (Kawulich, 2005) at 10 non-scientific Network conferences (e.g., biannual meetings of the Network). In addition, various discussions with 16 participants in total also comprise part of this iterative approach (for data details see Table 1 above). In doing so, we used audio recordings, as well as research diaries, and MAXQDA-Software for transcription, data management, and analysis. Many events and interviews were conducted online due to COVID-19 restrictions. The involved actors in qualitative data collection included people working and engaged in the Network as well as CSAs (see chapter 2.1). Furthermore, several persons of the Network brought in their knowledge and contacts as field experts and participated, partly with other researchers.

As part of the iterative approach, we discussed the prototypes of the framework and the survey as interim results several times with actors of the Network (qualitative research) leading to recommendations for additional characteristics as well as the modification of existing ones.

In the next step, we actively searched for these identified aspects in the literature sample. Wherever necessary, we also expanded the sample (literature research). To carry out the literature research, we followed a simplified snowball approach (Wohlin, 2014) including suitable articles. Our research for the framework development snowballed until saturation occurred so that no other or new CSA characteristic or type could be named or differentiated. Using this literature identification process, a further 25 publications were identified. In sum, 60 publications made up the final literature research data sample and were used for the iterative development of the final framework and final survey.

Regarding research question 1, we identify various characteristics for differentiation of CSAs in stage (Ia) (chapter 3.1). We provide therein a CSA definition of this study in the German context with the *defining characteristic* of the CSA model, which is *community financing* (framework domain A). We identified various *differentiation characteristics* (domain B), whereby organizational governance has been identified as the predominant one. This predominant nature of *CSA governance* (domain B1) could be confirmed by both literature and practitioners. According to this, we provide a CSA governance typology based on three *CSA governance types*. In accordance with Doty and Glick (1994), typologies provide a reduction in complexity by providing a set of identified types. In this context, we considered organizational governance literature. During the iterative development of the framework, we identify further *varying characteristics* (domain B2) that express even greater diversity of CSAs within these characteristics. The result of the final CSA framework is visualized in chapter 3.4.

2.2.2 Stage (II) framework application and survey conduction

In the second stage of this study, regarding research question 2, the finalized survey was conducted between the end of 2021 and the end of 2023. The survey is designed as an internal database of the Network, aimed at providing well-founded data over time. The Network intends to update the data at regular intervals (for details see Supplementary material). The survey follows a discursive methodological approach in which, for example, the CSAs were asked to assign themselves according to specific characteristics. The survey and the data collection process itself (e.g., invitation, mailing) was coordinated by the Network. The technical implementation was carried out by their "IT Working Group." At the time the survey was sent out, there were about 400 CSAs in Germany. As defined in the introduction, a distinction can be made between the entire CSA organization and the individual CSA farms (see chapter 1 and characteristic *Single/Multi-farm* in chapter 3.1). Consequently, some questions are answered at the level of the CSA organization and others at the level of the individual CSA farm. The Network contacted all CSAs who were official members within their association at that time (in total 164 CSA farms) via email and newsletter and send out several reminders. The survey was open to respondents from November 2021. This paper considers all records up to and including December 18, 2023. Until this date, a total of 81 out of 164 CSA farms (51% of the Network members at that time) responded to the questionnaire and generated quantitative results on

CSA in Germany (chapter 3.5). In total, 81 farms that are part of 70 CSA organizations responded to the survey. However, each question (relating to a specific framework characteristic) had a different respondent rate (i.e., not all participants answered every single question of the survey).

2.2.3 Visualization of the knowledge co-production process and used data material

Regarding the visualization of Figure 1, the methods and used data material are illustrated in blue (literature research, qualitative data, quantitative survey conduction. For details see Table 1). The interim results (prototypes and final survey) are presented in light green, and of the final results (CSA framework, quantitative survey results) in dark green.

3 Findings

This section is divided into two subchapters. Firstly, the framework development (chapter 3.1), and secondly, its application to the field of investigation in Germany using the survey (chapter 3.5).

3.1 CSA framework

Elaborating from research question 1, the characteristics of the CSA framework are explained in detail along two intertwined domains which build on each other. These domains relate to (A) *defining characteristic,* that can be found in every single CSA, and then (B) *differentiation characteristics*, that delineate the diversity of CSAs. Domain (A) *community financing* is the central *defining characteristic* and is mandatory to be considered a CSA. In this sense, domain (A) is mandatory, clarifies the uniqueness of the CSA model, and delimits it from other AFN forms. After this clarification and delimitation, then domain (B) encompasses the diversity of CSA configurations through *differentiation characteristics*. These characteristics can vary from one CSA to another. The key distinction lies in the mandatory presence of domain (A) for all CSAs, whereas domain (B) varies depending on the individual CSA configuration.

More specifically, *differentiation characteristics* (domain B) comprise two sub-domains. The individual configuration of CSAs depends upon the respective organizational governance as the CSA model can change the way organizations are governed. Domain (B1) proposes three *CSA governance types* as a *predominant characteristic* to differentiate CSAs as their governance approaches vary. Domain (B1) is intertwined with domain (A) since *CSA governance* specifies the how of *community financing* through a particular type of governance. These types can be specified by further *varying characteristics* (domain B2) to express even greater diversity of CSAs, and which enable an individual CSA configuration within these characteristics depending on the governance type.

The domains are intertwined as they build on each other. *Differentiation characteristics* (domain B) shed further light on the distinct expression of *community financing* (domain A), while *varying characteristics* (domain B2) specify CSA configurations, whereby the configuration depends on the respective *CSA governance type* (domain B1). In the following all domains are outlined in detail, summarized at the end, by the introduction of the framework-visualization (see chapter 3.4).

3.1.1 Framework domain A: defining characteristic community financing

We define the CSA model as a system of risk sharing and transparent co-financing by membership fees of the entire CSA operations in exchange for a food share for the CSA members. Thus, we wrap the uniqueness of the CSA model into the characteristic *community financing* which is mandatory to be considered a CSA (framework domain A). This *defining characteristic* is based on fee financing, cost coverage/full financing, risk sharing, transparency, and

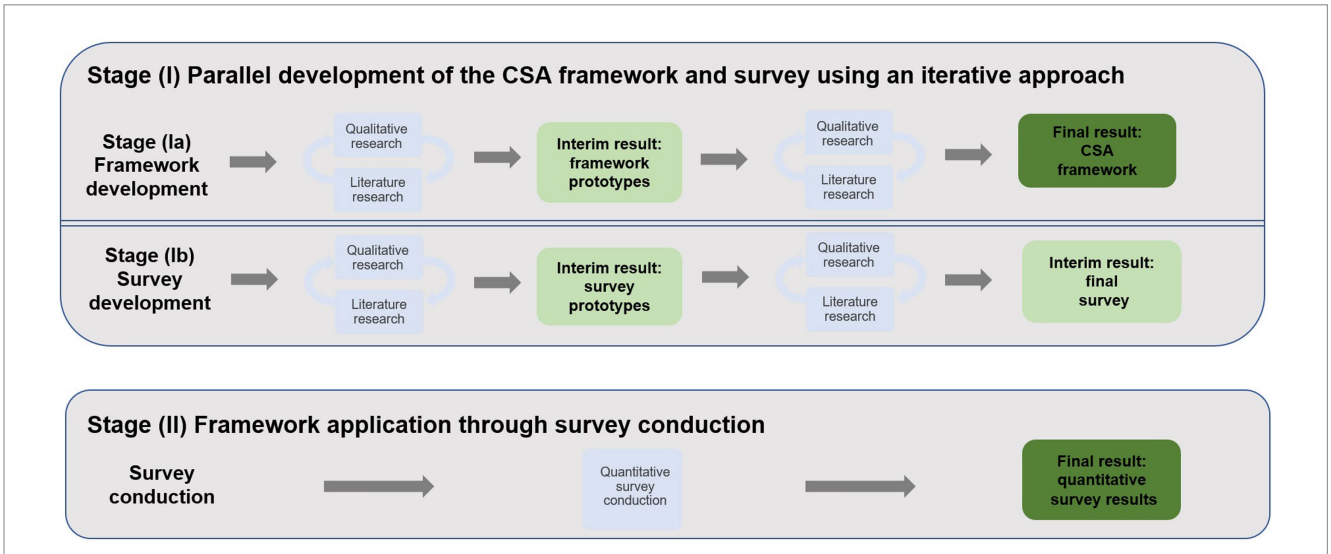

FIGURE 1
Two-stage knowledge co-production and used data material: (Stage I) Parallel development of the CSA framework (Stage Ia) and the survey (Stage Ib) using an iterative approach; (Stage II) Framework application and survey conduction (own illustration).

direct relations which can be shaped in different ways by CSAs (see description of the elements and their diversity in Table 2). *Community financing* describes the collaborative investment of the farm's operating costs that comprise fee financing, true cost coverage of the production, risk sharing, transparency, and direct relations between the food production and consumption side (e.g., Groh and McFadden, 2000; Ostrom, 2007; Cox et al., 2008; Bloemmen et al., 2015; Carlson and Bitsch, 2019; Fomina et al., 2022; Rommel et al., 2022). Consumers jointly become members of a CSA and help cover the farm's total budget over a particular growing season. This will have been done through regular, usually monthly, contributions (e.g., Haney et al., 2015; Galt et al., 2019). The members share the risks and benefits associated with weather dependent and seasonal farming and in return receive a proportional harvest share, typically on a weekly basis (e.g., O'Hara and Stagl, 2001; Brehm and Eisenhauer, 2008; Opitz et al., 2019).

3.1.2 Framework domain B: differentiation characteristics

The diversity of CSA becomes visible through *differentiation characteristics* (domain B). Literature research as well as our empirical results attribute *CSA governance* a *predominant characteristic* as the other var*ying characteristics* are often shaped and formed according to it. On this basis, three different *CSA governance types* can be distinguished (domain B1), whereby organizational governance affects and interacts with the *varying characteristics* (domain B2).

3.2 Domain B1: CSA governance as predominant characteristic

The aspect of how and by whom an individual CSA is governed, organized, and managed is ascribed a central and predominant characteristic in CSA and AFNs literature and by CSA practice (e.g., Krcilkova et al., 2019; Rosol and Barbosa, 2021; see also examples below). A CSA can be managed by an individual or a core group, which ranges between being solely led by the producer (i.e., single farm or farmer) to being led by a community with a corresponding decision-making process taking on most managerial responsibilities. The focus of this characteristic lies in the responsibility for higher level "management decisions" (Adam, 2006, 2), particularly the managerial "ownership of the operation" (Harmon, 2014, 2), which addresses who organizes and operates the CSA and who "makes most of the management decisions" (Adam, 2006, 2). An example from the CSA literature is the managerial decisions by the directors or growers that run the CSA. Mert-Cakal and Miele (2020, 11) distinguish between lower and higher decision-making levels, whereby the core question being addressed is, "Who makes the [(managerial)] "decisions" in CSA organizations?." The predominant characteristic of governance is also consistent with organizational governance literature. To understand the organization requires knowledge of its governance concerning direction and control (Cadbury, 1992). Organizational governance includes how decision-making processes and thus the distribution of power between the involved actors (e.g., managers, shareholders, employees, volunteers etc.) is attributed. Establishing and running an organization in general requires defined rules about who is in charge, who is involved in taking vital decisions, how potential profits are distributed, and who bears risk. Establishing the rules that shape organizational action creates the governance structure of an organization (e.g., Cadbury 1992; Klein et al., 2019). Thereby, governance is not static but also evolves from social norms and beliefs (Wiersema and Koo, 2022), which is why different governance types exist.

By reviewing the CSA literature, various typologies and a diversity of type-terminologies can be identified (for details, see Supplementary Table S5). What these identified typologies have in common is that they are neither literature- or theory-based, described in their development, defined in detail by CSA actors, nor differentiated in empirical studies. For example, the often cited report by Wilkinson (2001) uses a classification based on who organizes a CSA. The only sizable two-sided practical report distinguishes between four types: farmer managed, shareholder/subscriber, farmer

TABLE 2 Community financing as defining characteristic of the CSA model and its elements (own illustration).

Elements of community financing	Description of the community financing elements
Fee financing	Collaborative financing via fees by the individual CSA members (membership fees) which is financing the entire CSA operations for an annual membership (often for one particular growing season). In return, the members receive a proportional food/harvest share, typically on a weekly basis. Some CSAs take a break in winter or only provide a food share every 2 weeks. Members often pay the fees for their food/harvest shares monthly, although there are also annual advance payments.
Cost coverage / Full financing	Consumers who become members of a CSA, jointly cover the CSA budget of a particular growing season through regular, usually monthly, contributions. The membership fees cover all costs (full financing) of the CSA operations. This requires a cost calculation in advance by the CSA. The goal is to cover the true costs of production that includes the entire CSA operations.
Risk sharing	The members share via their membership fees the risks and benefits of the CSA operation with the food producers by adjusting their consumption to the farm produce available. The food/harvest share may be subject to seasonal and weather-related fluctuations (i.e., crop failures).
Transparency	CSA makes the cost structure and annual budget (costs of agricultural production, including wages, investments and savings), production standards and cultivation methods, as well as (if exists) the bidding rounds transparent for members.
Direct relations	Members receive the food/harvest share directly from the CSA farm(s). Direct connection between the food producers (those who grow food/work at the CSA) and the members (those who receive the food) without intermediaries, wholesalers or retailers in between. The model, therefore, seeks to reshape the nature of buying and selling agricultural goods.

cooperative and farmer-shareholder cooperative. Here, the type "farmer cooperative" correlates, for instance, with another differentiation characteristic which is multi-farm CSA (see below). In contrast, the often cited peer-reviewed case study by Ostrom (2007) summarized the management strategies of CSAs into three types: farmer-founded-and-driven-CSAs, CSAs initiated as a non-profit with a board of directors and supported by community financing, and a business-oriented and farmer-directed entrepreneurial approach, however, different characteristics, such as governance, management, foundation background, legal form and/or labor, are included and mixed together in these type-terminologies. Another example cited is the four distinct approaches to CSA by the CSA Network in the United Kingdom (UK) cited by Espelt (2020): producer-led, consumer-led, producer-community partnerships, and community-owned farms (see CSA Network UK, 2022). Even in this typology, there is no clearly recognizable distinguishing criterion. Governance, management, founding background, ownership and legal forms, as well as the aspect of labor, blur and partly overlap making difficult a clear distinguishing between the UK "consumer-led type" and "community-owned farm type."

Our literature research as well as qualitative data that take into account insights of key CSA-experts in Germany shows that it could be helpful to subsume CSAs into CSA governance types by asking how or by whom the CSA is governed (Krcilkova et al., 2019), (*self-*) *organized* (Bashford et al., 2013; Zoll et al., 2018 Opitz et al., 2019), *driven* (Adam, 2006; Bashford et al., 2013; European CSA Research Group, 2016; Hvitsand, 2016; Tang et al., 2019), *led* (European CSA Research Group, 2016; Espelt, 2020; Mert-Cakal and Miele, 2020), *run by* (Ostrom, 2007; Feagan and Henderson, 2009; Bashford et al., 2013; Hvitsand, 2016; Espelt, 2020; Mert-Cakal and Miele, 2020; Plank et al., 2020), *operated by* Adam (2006), Bashford et al. (2013), Ouahab and Maclouf (2019), and Koretskaya and Feola (2020), *or* (*self-*) *managed* (Wilkinson, 2001; Ostrom, 2007; European CSA Research Group, 2016; Krcilkova et al., 2019; Espelt, 2020; Mert-Cakal and Miele, 2020; Plank et al., 2020). The examples cited show that the aspect of governance is often used. As we have shown, no common use of terms satisfactorily distinguishes the identified various CSA types, used descriptions and terminologies. Using the predominant characteristic of organizational governance, three *CSA governance types* can be distinguished by asking how or by whom the CSA is governed: Producer-led CSA (Type 1), Consumer-led CSA (Type 2), Integrated (all-in-one) CSA (Type 3). For definitions, see Table 3.

According to a consultant from the German Network, the differentiation into these three CSA governance types within the framework is useful and has potential to remove uncertainty: In the same sense the consultant points out: "In the past I saw only two types, namely the producer-led CSAs [(type 1)] and the others. But especially in the development of the last years, I actually see type 2 and type 3 as independent groups."

3.3 Domain B2: varying characteristics

The individual configuration of CSAs depends upon the respective organizational governance. The *CSA governance types* unfold their specific nature through the interplay between various additional characteristics. These further *varying characteristics* express even greater diversity of CSAs within these characteristics and are presented in the following. The characteristics are summarized in the framework-visualization in chapter 3.4 (see also Supplementary Table S6).

Degree of co-decision by members/workers: It relates to both *workers* and/or *members* in terms of their integration within decision-making processes. Besides multifarious existing methods and approaches toward co-decision-making, it varies considerably in a spectrum from relatively low to medium to high (e.g., Koretskaya and Feola, 2020; Mert-Cakal and Miele, 2020). The lower level includes, for example, online polls or annual shareholder meeting. Daily decision-making belongs to the producers or a core group, whereby members have only informal participation. The medium level includes, for example, majority member decisions-making during the year in addition to the shareholder meeting or working groups possibly with voting rights. The higher level of co-decisions-making includes members' participation that is done, for example, by voting at the annual general meeting of the CSA (e.g., basic democratic

TABLE 3 CSA governance types (own illustration).

CSA governance type	Description of the CSA governance type
Producer-led CSA (Type 1)	The farm, farmer or farmers decide alone whether, how, and for how long the farm operation will be managed along the CSA model. The production of agricultural goods is carried out by one or several independent farm/farmer/farmers, whereby co-workers and volunteers can also be employed. The agricultural and/or horticultural farm is supported by consumers that are a format/informal community of members. Although the members have different opportunities to participate, most of the management decisions remain with the producer(s).
Consumer-led CSA (Type 2)	A group of consumers build a formal and legal organization (e.g., an association). This community organization has paid staff or is managed by volunteers. The production is carried out in a partnership with one or several existing partner farm/farmer/farmers, whereas the CSA organization is managed and led by the group of consumers. They decide with which farm(s) they want to partner. This also includes the aspect of whether the duration of the cooperation is to be continued after the end of the agreement, or whether a new farm/farmer/farmers are to be selected as partners for the CSA model. Likewise, the farm/farmer/farmers can also terminate the cooperation.
Integrated (all-in-one) CSA (Type 3)	People create a CSA organization as single legal entity which integrates and carries out (all-in-one) the production, management, administration, and ownership of the entire CSA farm. People are hired to manage, organize, farm and cultivate. All production and CSA-management related decisions are made by a board or delegated by general assemblies with workers and members. Type 3 differs from Types 1 and 2 (each with a partnership between producer and consumers - or vice versa) by its integrated approach as one organization.

decision-making structures, sociocratic form of organization, consensus, or consent decisions).

Founding impulse: Several studies differentiate CSAs by asking by whom the CSA was founded (e.g., Ostrom, 2007; Hvitsand, 2016; Carlson and Bitsch, 2019). recognized that every CSA is organized uniquely based on its history, geographical, and founding context. For example, Carlson and Bitsch (2019) do not distinguish between different CSA governance types, but on whether it was initiated and founded by producers (farmers) or consumers. Existing farms may be owned by farmers who are searching for a community in order to become CSA members, or a core community group may look out for one or several farms with which to cooperate and establish a new CSA model (see also *single or multi-farm* characteristic below). Another possibility is that a community may establish its own CSA which will include its own farm (Bashford et al., 2013). A combination of both, farm/farmers and consumers, is another possibility. In addition to this, researchers name a third-party founding impulse, such as a government or a restaurant [see Chinese CSA study by Tang et al. (2019)]. Vlasov et al. (2021) show that CSAs can be founded by people with non-agrarian backgrounds.

Establishing paths: There are several paths toward establishing a CSA. One path is a full or partial conversion of an existing agricultural farm to the CSA model (see also characteristic *scope of CSA operation*). In addition, a CSA can be founded by establishing a new agricultural start-up. Other establishing paths include the handover of an existing CSA, for example as part of a generational succession process (e.g., inheritance) as well as a spin-off from an existing CSA (e.g., Bashford et al., 2013; Carlson and Bitsch, 2019).

Legal form: CSAs are designed in a wide spectrum between individual and independent privately-run farms where the business is under sole proprietorship, to non-profit forms like a association, or CSAs legally registered as a cooperative. Others exist in mixed forms, such as the combination of non-profit and for-profit legal forms. Examples are non-profit associations registered as clubs and non-profit organizations organized as cooperatives where only the workers are stockholders (e.g., Cameron and Wright, 2014; Bloemmen et al., 2015; Carlson and Bitsch, 2019).

Ownership and property for land / operation: Some CSAs are existing farms that are owned by the producer or more precisely by the farmer(s) (Bashford et al., 2013). The commonly-known subscription CSA is initiated by the farmer, who maintains ownership of the operation (Harmon, 2014; Espelt, 2020). Other producer-led types may be joint owned by a couple of growers (Mert-Cakal and Miele, 2020), wherein both examples can lead to CSA governance type 1. Another possibility is that CSAs are "jointly owned by both producer and consumer members" (Bashford et al., 2013, 21) or even people starting a new CSA in the form of a legal cooperative, whereby the community of members owns the farm (Espelt, 2020) (can lead to type 3). *Ownership and property* are mentioned as important, but are rarely empirically investigated in CSA studies (e.g., Mert-Cakal and Miele, 2020). Few researchers, such as Koretskaya and Feola (2020, 306), ask questions like, "How is access to property structured?." *Ownership and property* is predominantly discussed with a focus on land or other resources, which are owned, rented or (temporarily) occupied by CSAs (European CSA Research Group, 2016). Thus, it seems important to also consider the ownership and property structure of the CSA itself. In the literature, it is touched upon in only a few cases and named as "collective property" (European CSA Research Group, 2016, 77), "shared ownership" (Bashford et al., 2013, 21), "co-operatively owned" and "non-farm owned" (Woods et al., 2017, 4) initiatives, where almost no distinction is made between land and CSA operation.

Labor and work: This characteristic includes diverse forms from paid to voluntary labor, full- or part-time work, as well as seasonal employment contracts, also including aspects of fair working conditions. Due to labor-intensive agricultural production, such as with vegetables, most CSAs have different forms of work. Examples are the individual self-employed farmer or gardener as well as employed or volunteer family members. Other CSAs hired full-time additional workers, seasonally or on an hourly basis. CSAs can also have trainees, interns or unpaid volunteers (e.g., Harmon, 2014; European CSA Research Group, 2016; Carlson and Bitsch, 2019; Krcilkova et al., 2019; Espelt, 2020; Koretskaya and Feola, 2020; Watson, 2020). Labor and work can be differentiated by quantification. For example, in relation to the number of workers (full-time and part-time) and the number of seasonal workers. A further differentiation can be made if CSA members work as volunteers in the CSA. Thus, the co-production by the CSA members can be of differing degrees: voluntary or mandatory, unpaid, serving as a discount on the share, or a paid position. Some CSAs limit the mandatory labor of their members to the main summer harvest season in order to provide support for peak workloads, such as during vegetable harvests, and by organizing 'working party days' (Watson, 2020). Other CSAs offer work-share memberships for its members. In this case, members can do work shifts to pay less for a share. Members can work a certain number of hours per week, month or season in the CSA (e.g., planting, harvest, sorting, and cleaning from the harvest, packing shares, or share distribution) and receive in return a partial or full discount on the share price (Cone and Kakaliouras, 1995; Goland, 2002; Cox et al., 2008; Shi et al., 2011; Watson, 2020).[5] There are also CSAs that limit volunteering by members to only a few work activities per year, since instructing and teaching new members in rotation is a time-consuming process for the employed team.

Farming method: Various methods can be identified depending on the country and are either conventional (not organic), organic (not certified) or organic (certified). The CSA movement is often closely linked to organic farming practices as the majority of CSAs seem to be certified organic or at least use organic practices without official certification (e.g., Bashford et al., 2013, European CSA Research Group, 2016; Carlson and Bitsch, 2019). In some regions, there are also Participatory Guarantee Systems (PGS) or third party (organic) certifications with more adaptive possibilities as specified by the CSAs (European CSA Research Group, 2016). Reasons not to seek official certification include a lack of credibility of the certification [for China, see Tang et al. (2019)], financial reasons due to the cost of certification, or the sufficiency of trust between producers and members that make certification unnecessary for some CSAs.

Single or multi-farm: CSAs can be established as a single farm CSA or in a partnership with multiple farms (e.g., Adam, 2006; Woods et al., 2017). In the latter, two or more producers cooperate in a formal partnership with each other and with one group of members. Through this cooperation, the CSA is able to offer a greater variety of products

5 In literature, there are also examples of members harvesting their own vegetables (Chen, 2013; Koretskaya and Feola, 2020). In these cases, however, we speak of self-harvesting projects.

and allow the specialization of individual farms, for example, in vegetable and fruit cultivation or in arable farming (Bashford et al., 2013). This CSA could then provide full supply cooperation for a broad range of food products (European CSA Research Group, 2016). The multi-farm approach can also permit risk sharing between involved farms (European CSA Research Group, 2016). Aside from this close formal partnership, more informal co-operations also exist. These benefits described are reduced competition between CSAs in the same region, which mean the "benefits could also include sharing marketing efforts, customer and delivery logistics, and the use of farm equipment" (Galt et al., 2019, 18).

Product variety: This relates to products offered by the CSA, ranging from CSAs which exclusively provide vegetables and fruit (Blättel-Mink et al., 2017), to full supply CSAs that integrate processed food, such as milk, yogurt, meat, bread, etc. Some CSAs offer animal products only as an additional option for their members (e.g., Bashford et al., 2013; European CSA Research Group, 2016).

Degree of self-production: The food share may not include goods produced only by the CSA farms but may also be enhanced by external purchases. Additional purchases can be market-based, based on cooperative structures such as binding contracts, or even be organized as a community-supported cooperation with corresponding risk sharing in which external farms are not paid for a guaranteed amount of products but for the farming of a specific and fixed cultivation area (Rommel et al., 2022). The respective degree (e.g., own production, additional purchases with or without risk sharing, marked-based purchase) can be indicated as a percentage and thus made more transparent.

Share distribution channels: The food share can be carried out and organized by the individual farmer, the CSA organization, or the members themselves. Home delivery, self pick-up by the members from the farm or at collection points (so-called depots) are share distribution channels according to which CSAs can be differentiated. Such depots are often established in cooperation with the members in their neighborhoods at restaurants, cafés, schools, workplaces, markets or in basements and garages of private households. This depends on the possibilities, the composition of the share (for example, because of perishable products and the necessity of cold chain logistics), and the creativity of the members. In addition, self-harvesting, although rare, is sometimes available, or can be provided in a supportive way as the need arises. If multiple CSAs are in the same region, they sometimes collaborate in the packing, grading, storing, cooling, and delivery with other CSAs, as well as AFN initiatives such as food hub concepts or food co-ops. Such cooperation in logistics or in operating a depot help in the sharing of infrastructure resources and thereby reduce costs (e.g., European CSA Research Group, 2016; Woods et al., 2017; Zoll et al., 2021).

Share distribution area: CSA members are more likely to be in urban, suburban, or peri-urban settings and tend to be rather educated, middle-class people who know about the concept and can afford the financial contributions as well as the additional effort required to engage, organize pick-ups, cook etc. (e.g., Goland, 2002; Bloemmen et al., 2015; Plank et al., 2020; Si et al., 2020). In contrast, CSA farms and the farmland are often located in rural or in the urban hinterland near to one or between several cities (Mert-Cakal and Miele, 2020).

Share payment options: The prices of the food share can be determined by CSA operators as a fixed amount. In most cases this is arranged in cooperation with members (Sanneh Njundu et al., 2001). With a diversity of different payment options (combination of fixed amount and a solidarity pot as well as graded contributions), CSAs aim to respond to differing economic conditions as well as to the needs of their (potential) members. Barriers related to financial access for membership are often reduced through so-called financing or bidding rounds (e.g., Carlson and Bitsch, 2019; Krcilkova et al., 2019). This special pricing mechanism encourages members to decide individually on the amount of their contribution and takes into consideration their own needs as well as their willingness and ability to pay (Blättel-Mink et al., 2017). Individuals or households with higher incomes are invited to ease the burden on financially-disadvantaged members by paying more.

Scope of CSA operation: Refers to whether the farm is fully or partially operated with the CSA model. For example, some farms still have traditional distribution channels in addition to the CSA. They use direct sales or other distribution approaches, such as farmers markets or self-harvest gardens, that are not part of the CSA (Chen, 2013; European CSA Research Group, 2016; Carlson and Bitsch, 2019). This allows an existing farm to continue with its other forms of distribution or for the entire farm to graduate step-by-step to the CSA model (see also *establishing paths*).

Size: It is possible to differentiate CSAs according to size, using number of members and households, number of food/harvest shares, as well as the productive land for CSA (e.g., in hectares), or the total revenue of the CSA (e.g., Bashford et al., 2013; Krcilkova et al., 2019; Paech et al., 2021).

3.4 CSA framework visualization

When the various characteristics are considered together, then a CSA framework is reached, which was the first result of this study. Visualized as a framework (Figure 2), it supports a more differentiated view of an individual CSA organization. In this, *community financing* is the *defining characteristic* of the CSA model and is mandatory to be considered a CSA (domain A). It comprises fee financing, cost coverage/full financing, risk sharing, transparency, and direct relations. Furthermore, various *differentiation characteristics* (domain B) illustrate the complexity and diversity of CSAs. By taking the *predominant characteristic* of organizational governance into account, *CSA governance types* (domain B1) enable the distinction according to the question, "who organizes and manages the CSA?." CSAs with different constellations of actors can be classified as Producer-led CSA (type 1), Consumer-led CSA (type 2), and Integrated (all-in-one) CSA (type 3). The typology contains a definition of each type (see Table 3). *CSA governance* affects the additional *varying characteristics* (domain B2), which are: *Degree of co-decision by members / workers; Founding impulse; Establishing paths; Legal form; Ownership and property for land / operation; Labor and work; Farming methods; Single- or multi-farm; Product* variety; *Degree of self-production; Share distribution channels; Share distribution area; Share payment options; Scope of CSA operation; Size* (see Figure 1). In sum, there are various differentiation options within each *differentiation characteristic*. For some characteristics, it is possible to choose one out of many options (e.g., one type of the *CSA governance types* at domain B1 or one of the *farming methods*

Community Supported Agriculture (CSA) framework

Framework Domain A — Defining characteristic (mandatory and found in every CSA)

Community financing	Fee financing	Cost coverage / Full financing	Risk sharing	Transparency	Direct relations

Domain B — Differentiation characteristics (shed further light on the CSA diversity)

Domain B1 — Predominant characteristic (every CSA can be assigned to a specific governance type)

CSA governance	Producer-led CSA (Type 1)	Consumer-led CSA (Type 2)	Integrated (all-in-one) CSA (Type 3)

Domain B2 — Varying characteristics (specify CSA configurations and vary from CSA to CSA)

Degree of co-decision by members/ workers	Relatively low (e.g., online polls, annual shareholder meeting)		Medium (e.g., majority member decisions during the year in addition to the shareholder meeting; working groups possibly with voting rights)		High (e.g., basic democratic decision-making structures, sociocratic form of organization, consensus or consent decisions)			
Founding impulse	Farm(ers)		Consumer(s)		Both		Through third party	
Establishing paths	(Partial) conversion of an existing farm to CSA		Establishment of a CSA with new agricultural start-up		Handover of an existing CSA		Spin-off from an existing CSA	
Legal form	Sole proprietorship (e.g., independent private-run farm)		Non-profit form (e.g., association)		Cooperative form		Mixed form (e.g., combination of non-profit and for-profit forms)	
Ownership and property for land / operation	Farm(ers)		Member shareholdings		Community (e.g., cooperative)		Other	
Labor and work	Number of workers full-time	Number of workers part-time	Number of seasonal workers	Members as volunteers	Degree of co-production/ co-work of members (low, medium, high)			
Farming methods	Conventional (not organic)		Organic (not certified)		Organic (certified)			
Single- or multi-farm	Single-farm CSA				Multi-farm CSA			
Product variety	Vegetables	Fruits	Dairy products	Meat products	Eggs	Honey	Processed products	Other
Degree of self-production	Own production (in %)		Binding additional purchases with risk sharing (in %)		Binding purchases without risk sharing (in %)		Marked-based purchase (in %)	
Share distribution channels	Home delivery		Farm self pick-up by members		Pick-up point (depot)		Self-harvest	
Share distribution area	CSA members in urban settings		CSA members in suburban settings		CSA members in peri-urban settings		CSA members in more rural settings	
Share payment options	Fixed amount		Fixed amount and solidarity pot		Graded contributions		Financing round / Bidding round	
Scope of CSA-operation	The entire farm is part of the CSA				A part of the farm is part of the CSA			
Size	Number of members (persons)		Number of food shares		Productive land for CSA (e.g., in hectares)		Revenue of the CSA (e.g., in EUR)	

FIGURE 2
CSA framework (own illustration).

at domain B2). For other characteristics, multiple options are possible (e.g., *product* var*iety* at domain B2) or a number could be specified to quantify the diversity [e.g., *Number of members (persons)* at domain B2]. This selection of options makes the framework usable for research and practice (see survey results in the next chapter as well as discussion in chapter 5).

3.5 Diversity of CSAs in Germany

Regarding the characteristics of the CSA framework, the results of the survey elucidate a diversity of CSA configurations in Germany. Beforehand, we need to point out that some survey questions were answered at the level of the CSA organization (CSA) and others at the level of the individual CSA farm (see definition in chapter 1 and differentiation characteristic *Single/Multi-farm* in chapter 3.1). Overall, 70 CSAs ($n = 70$ CSAs) and in total 81 individual CSA farms ($n = 81$ CSA farms) participated. However, each question (relating to a specific framework characteristic) had a different respondent rate.

The main result is that 55 out of 70 CSAs assigned themselves to one of the three *CSA governance types* (for the distribution of the types see Table 4). This validates our proposal of governance types with a broad distribution in the German context.

Moreover, the survey confirms the existence of diverse ways of *co-decision* in CSAs. 28 out of 41 CSAs integrates forms of consensus and consent, which could be a criterion for both employees and members to help choose a CSA that is right for them. This interrelates with the *founding impulse* of CSAs. For example, 20 out of 57 CSAs were founded by members. In 15 cases, an existing farm initiated the CSA, and in 7 cases, members searched for an existing farm for a partnership. A current German trend is the growth of horticultural farms with only vegetables and/or fruits being founded as new ventures (24 between 2016 and 2022) in relation to farms with livestock being converted (18) (see characteristic *product* var*iety*). In the German context, there is also a diversity of *legal forms* such as sole proprietorship (11 out of 43 CSA farms), non-profit forms like associations (18), and those legally registered as a cooperative (3). As each country has its own legal system with country-specific legal forms, naming and comparing such forms is difficult, however, it should be emphasized that hybrid forms of organizations can exist simultaneously as combinations of different non-profit and for-profit legal forms. Concerning *ownership and property forms*, Blättel-Mink et al. (2017) noted that only a few CSAs used collective ownership forms at the time of their study. Our empirical findings confirm this assumption, yet indicate a continuous growth of CSAs with communitized property (15 out of 39 CSAs between 2016 and 2022). Regarding *labor and work*, for example, only seven out of 70 CSAs have requirements for co-production by members using a certain daily or hourly contingent per year. Concerning the *farming methods* most CSA farms produce organically. 26 out of 41 CSA farms are certified and 15 are organic but not officially certified, thereby preventing access to government organic subsidies. Another interesting finding is that 13 out of 81 CSA farms are organized within *multi-farm CSAs* (i.e., CSAs with multiple farms). In terms of *product* var*iety*, the majority integrate vegetable products (67 out of 80 CSA farms) into their food share. A little less than half produce fruits (31) and animal products (36), some produce beverages (34), grain products such as flour, semolina, pasta (11), others bread and bakery products (7). Producing plant-based foods offers great potential to expand product range by the diversification of crop farming or food processing (e.g., European CSA Research Group 2016). Concerning the *degree of self-production* 14 out of 70 CSAs executed marked-based purchases, 8 CSAs went further and integrated binding trading relationships, and 6 CSAs went even further by incorporating risk sharing within their trading partnerships. Regarding *share payment options*, so-called financing or bidding rounds are possible ways to address low-income members in Germany. 39 of 51 CSAs indicate that they use this approach in order to determine share costs. 10 CSAs add the option of a so-called "solidarity pot" to organize their fixed-contribution scheme in a more inclusive way. In terms of *size* variations, the average share size is 141 shares (31 responding CSAs). The size of agricultural land (30 responding CSA farms) ranges from 1 to 58 hectares (mean 5.4), however, there are also farms of up to 200 hectares, although only a percentage of the entire farm is part of the CSA (see *scope of CSA operation*).

An additional empirical result of the survey is linked to various characteristics such as *CSA governance types*, *founding impulse* and *establishing paths* of CSAs. The survey shows that generational succession processes are not yet widely present in German CSAs. 29 out of 81 CSA farms answered in general to the answer options concerning whether or not the succession and handover processes of a CSA operation has been arranged. For example, for 19 CSA farms, succession processes are not yet an issue as most CSAs had only recently started. This could indicate that the question of succession will arise sooner or later, depending on the configuration of the CSA. A further additional result of the survey,

TABLE 4 Formulation in the survey of the German CSA Network with result for distinguishing CSA governance types (own illustration).

Type	Definition used in the survey for the CSAs	Total ($n = 55$)
Producer-led CSA (Type 1)	"In our case, the farm (or farms) takes over the management of the members, the communication to the members, and the recruitment of members. Acceptance is done through formal or informal individual contracts."	23
Consumer-led CSA (Type 2)	"We have a self-organized member community, which takes care of the administration of, communication to, and recruitment of member(s). The member community bears the acceptance risk through a cooperation agreement. The farm(s) undertake(s) mainly agricultural activities."	9
Integrated (all-in-one) CSA (Type 3)	"We are a formal organization in which consumers are shareholders. The organization operates the farm and is responsible for managing, communicating with, and recruiting member(s)."	23

without a direct reference to one of the framework characteristics, is that 53 out of 59 CSAs who took part in the survey advise other CSAs that exist or are in the process of being founded. We will discuss this and the other results in more detail in the following chapter.

4 Discussion

This study found that farms using the CSA model are complex organizations whose diversity can be differentiated with the help of the CSA framework. The results show both, a diversity of different characteristics, as well as the variety within each characteristic. This CSA diversity is synthesized and presented in a visualized framework and illustrated with empirical results from Germany. In the following we discuss the findings within the framework domains from both an organizational (chapter 4.1) as well as member (chapter 4.2) and AFN and food sovereignty discourse perspective (chapter 4.3). We conclude with some limitations and include implications for further research (chapter 4.4).

4.1 CSA organization perspective along the framework domains

Based on domain (A), by **clarifying the uniqueness of the CSA model**, CSAs can be **delimited through the *defining characteristic community financing*** from non-CSAs such as other AFNs, especially those that call themselves a "CSA" but do not realize its *defining characteristic*. This mandatory domain, therefore, has benefits for this discourse, since in practice and in literature, inaccuracies occur. For instance, the CSA definition from Si et al. (2020, 68) does "not include a requirement that the consumers (members) share the production risk (i.e., crop failures) with the farmer." Another example is, that in numerous "CSAs" in the United States, consumers can book and cancel food on a weekly basis without comprehensive risk sharing (*community financing*), that lies at the heart of the CSA model. These "CSAs" rather correspond to a box-subscription approach with month-to-month subscriptions [see Smith et al. (2019) for various examples]. Our presented definition of CSA in the German context likely goes much beyond the CSA reality in North America as indicated by Rosol and Barbosa (2021). We do see the necessity to define the core of the CSA model to prevent dilution, especially since similar developments are taking place in Germany, where for instance a so-called "solidarity subscription box" is officially promoted as a mixture of CSA along with a monthly cancelable subscription box. In the end these self-labeled "CSAs" do not follow the *defining characteristic community financing*. To prevent confusion and a dilution of the CSA model in Germany, the term "Solidarische Landwirtschaft" (literally translated "solidarity agriculture" or "solidarity farming") has been legally protected as a trademark.

Based on domain (B1), CSAs can be **classified into the CSA governance typology** and thereby **distinguished among each other through the three *CSA governance types*** by using the predominant aspect of organizational governance. This typification appears to make sense from both a practitioner and a research perspective and is proven to be useful and coherent even for complex CSAs, as our results show. For example, at a first glance it appears difficult to assign the Australian "Food Connect Brisbane CSA" into our typology. Cameron (2015) describes this organization as registered not-for-profit company that operates as a cooperative. A particular rather unusual detail, however, is that the cooperative shares are not held by the consumers (CSA members), but rather exclusively by the CSA workers. That means, that the workers – and in this understanding the employed producers, farmers, gardeners, and organizers of the CSA cooperative – are simultaneously the managerial decision-makers and responsible people in this organization. Asking the predominant organizational governance related question of our typology, by whom the CSA is governed, (self-)organized, and (self-)managed, leads us finally to classify this CSA as type 1. The Brisbane CSA seems to be a producer-led CSA, here in the sense of a worker-led CSA cooperative. In addition, this example illustrates the relevance of taking additionally *varying characteristics* into consideration when classifying CSAs into the typology (see also discussion domain (B2) below).

Based on domain (B2), CSAs can be differentiated **through *varying characteristics* and the diversity within them**. Even though our empirical survey covers just a sample of CSAs in Germany, the results are significant enough to confirm the diversity of CSAs, both, in terms of *CSA governance types* as well as various ways of configuring the further characteristics. For some *varying characteristics*, it is now possible to choose one out of multiple options. For other *varying characteristics*, a number could be specified to quantify the diversity (see chapter 3.1 with the CSA framework visualization). This selection of options can prevent binary understandings and generalizations and makes the framework usable for further research and practice. Based on the study results, we highlight that each CSA is a unique combination of different characteristics and that each can be positioned on a spectrum of different expressions and selection options. Hence, the framework has the potential to open up tensions within discourses inside the German Network, for example, between peasant farms (mostly type 1 producer-led CSA) and on the other hand a significantly larger type 3 CSA [for coexisting discourses within the Network see Guerrero et al. (2024)]. Our findings, moreover, show that the framework has, for example, the potential to support the matching of (potential) founders and workers toward finding their best fitting CSA configuration if based on the framework characteristics. In the meantime, our transdisciplinary research partnership with the Network has already encouraged thinking, talking, and working with different CSA types and their configurations in the context of the Network, and the presented types have been integrated in their consulting activities (see also result transfer by handbook publication in chapter 4.4). In this way, we argue that the framework can be useful for peer consulting among existing CSAs as well as with founding initiatives. This could potentially support organizational development and, as a result, help to maintain and stabilize CSAs over the long term. Thereby, establishing the perspective of CSA organizers as important. For Adam (2006, 3), the success of a CSA depends on the "highly-developed organizational and communication skills" of the organizers. In this context, training courses and the aspect of learning, for example, in managerial, communication, multicultural, leadership, and business running skills, are mentioned (Mert-Cakal and Miele, 2020).

More comprehensively, the framework can be used to avoid generalizations. Our findings show that, first and foremost, a CSA, in its narrowest sense, with its *defining characteristic community financing*, can be seen as an alternative production-distribution approach. By incorporating organizational perspectives, we show that CSA can be seen

also as an organizational approach. CSAs are complex organizations but not every CSA is also an alternative organization governed, managed, organized, and structured in alternative ways (see diverse expressions within these characteristics). For instance, Grenzdörffer et al. (2022, 79) reveal that a CSA "can be still owned and managed in a conventional, traditional way by a single individual not sharing any decision-making or property rights." This could indicate that family farms using the CSA model could correspond in particular with the type 1 producer-led CSA, even if they are otherwise organized and structured in traditional ways. In addition to this, it is possible that a family farm exists only to some extent as a CSA (see characteristic *scope of CSA operation*). In this case, the CSA model functions as an independent operation of the farm while there are also parallel farm operations, such as direct sales, that are not part of the CSA model. This may encourage existing (family) farms to change, establishing and expanding their CSA configuration step-by-step over time. In this regard, besides advancing and promoting "alternative" organizational forms, the CSA model proves to also have distinct potential for the preservation of (family) farms, that are organized in "traditional" structures. Interestingly, the CSA model opens up a development space in which both worlds mutually fertilize each other.

In connection with possible changes over time, our findings prove the possibility of dynamic development within CSAs as changeable organizations, especially in times of succession processes, where a window of opportunity can open up for CSAs to change their governance type. Of course, this is possible at any time, for example when a type 1 CSA decides to communitize their entire property in order to set in stone the ecological and social structures of the farm for future generations to come. This perspective is also confirmed by a consultant who states that these "type 1 CSAs most likely will not remain such, at the latest during the generation succession." He argues that "a high level of trust is necessary for a member-community, that had financed a privately inherited farm for decades in a process of handing it over to people who might not even want to continue this farm [as an CSA]." In these cases it seems possible that the CSA can be transformed into a type 3 by founding their own organization and entering into their own agricultural production [see, for example, Carlson and Bitsch (2019)]. This option is consistent with organization research by Wiersema and Koo (2022) which shows that organizational governance is not static. The dynamic development of and changes in characteristics is also confirmed by CSA studies, such as van Oers et al. (2023), that examine the aspect of unlearning in CSAs based on solidarity and, in particular, the CSA farm conversion process toward solidarity payments (see characteristic *share payment option*). The researchers demonstrate the added value of this unlearning approach to transitions in sustainability. Based on this cited study, we emphasize that, depending on the CSA configuration, the members of a CSA could, for example in producer-led CSAs (type 1), be the initiators of such an unlearning process for farmers and the designers of modified characteristics. This last example illustrates the interrelations between the perspectives of CSA organization and CSA members, which we will discuss next.

4.2 Members' perspective: more differentiation to choose their "suitable" CSA

Employing a broad understanding, it can be seen that CSA members can be both the holders of a food share as well as the co-owners of community-owned farms, founders and organizers of a CSA, or co-producers and volunteers in CSAs depending on the specific CSA configuration and governance type (e.g., Matzembacher and Meira, 2019; Rosol and Barbosa, 2021). In the following, we focus the narrow understanding of CSA members as co-financiers that exchange membership fees for a food share. Currently, it is hard for (potential) CSA members to distinguish between different CSAs in a low-threshold way, especially considering the individual needs and life circumstances of the members (e.g., time aspects related to wage and care work). Currently, joining a CSA is often a random occurrence due to a lack of choice. The reasons for this could be, for instance, that the respective CSA's pick-up location (see characteristic *share distribution channels*) is close to them, or recommended by a known person who is already a member, or simply because it is the only CSA where free membership shares are available. Based on the results of this study, we argue that public and an easy-to-access differentiation criteria for members could have the added benefit of enhanced commitment stay rates, which can positively impact the long-term stability of CSAs. The diversity within the characteristics of the framework suggests that some CSA configurations can enhance the exclusion of certain kinds of members, whereas others can be a better match. The requirements and unfulfilled expectations of the composition of the products (e.g., wrong or too much food; see characteristic *product variety*) or forms of co-decision-making (see *degree of co-decision*) can lead to dissatisfaction of the members. Other reasons for members leaving a CSA are time constraints and scheduling conflicts (e.g., additional time for picking up the products as well as for cooking food) (Ostrom, 2007; Zoll et al., 2021). These reasons can result in the cancelation of membership, or in the leaving of one CSA for another. It should be noted, however, that for some members, activities such as meetings, events, or educational activities and, in general, having a close connection to a farm are all important aspects of membership. Other members prefer that a CSA be not privately inherited, and that they can become co-owners of a CSA farm (see type 3 and characteristic *ownership and property*). In contrast, Cone and Kakaliouras (1995, 30) observed already in the 1990s that "from the average member's perspective, the demands of membership may begin and end with the bag of vegetables." To prevent any exclusion effects of CSAs, it seems especially necessary that members find a CSA configuration that most suits them. But the results of this study show that so far it is hardly possible for (potential) members to compare CSAs in detail. The presented framework characteristics with its diversity within the characteristics can help to make the diversity of CSAs more visible for members. The findings reported here suggest that in regions with many CSAs, there seems to be a great potential for a digital matching platform (e.g., website, app, quiz) with some selection questions that could support (potential) members to find a CSA that matches their needs, life realities, and values. This platform could indirectly increase the creation of new CSAs. In addition, if members do not find the best CSA configuration in a given region and the potential membership of the demand group reaches a certain number, the respective CSA Network association could support establishing a new CSA. The founding of new CSAs in this way could also be supported through institutional support by policymakers.

4.3 CSA in AFNs and food sovereignty discourses: more differentiation instead of overgeneralization

Besides these discussed CSA-related findings, this study has implications for a more differentiated view and analysis of other AFNs

in revealing generalizations. By including organizational perspectives, the results of our study confirm the impression that there are currently multiple ways to position CSA into existing AFN typologies. Overall, AFN research in general, and typologies in particular, are often based on a trimmed CSA definition that leads to an incomplete classification of this diverse phenomena. Ribeiro et al. (2021, 500), for instance, define CSAs in their AFN typology as a separate type (alongside five others) as "groups of people who have a joint commitment with a farmer, who is paid in advance (for a year or a season), for the produce" (Ribeiro et al., 2021 p. 500). This excludes, for example, the existence of type 3 CSAs (see definition in Table 3). In general, AFNs are associated with shorter distances between producers and consumers as well as small farm size and scale instead of large scale production (Jarosz, 2008). This often underlines a deterministic opposition between alternatives (such as good, small, local, embedded) on the one side, and conventional (such as bad, big, global, dis-embedded) on the other (e.g., Hinrichs 2000; Moragues-Faus 2017). Nevertheless, this binary conception is challenged because of the fluid relationship between alternative and conventional systems and its involved actors, such as AFNs. Alternatives, like CSAs, are embedded in existing economic systems, which can lead to multiple organizational challenges and has implications for the organization itself. The presented framework of this study offers opportunities for a more differentiated view and consideration of these challenges. It shows, for example, that within one CSA conventional, traditional elements are even preserved and deliberately strengthened, whereas at the same time alternative structures are developed showing that alternative and traditional elements may fruitfully complement each other. In addition, the framework enables more differentiation within AFNs. Watts et al. (2005) delimit AFNs based on the two pillars (alternative) food products and (alternative) distribution systems. Accordingly, alternative food can be described as production processes, such as sustainable, organic, or holistic farming and production methods can instead be considered industrial agribusiness (Jarosz, 2008; Forssell and Lankoski, 2015). These aspects can be gathered in our presented framework within var*ying characteristics* in domain (B2). According to the second pillar, alternative distribution systems are described as distribution networks that have a producer-consumer relationship within the food sector and a minimal number of intermediaries (Forssell and Lankoski, 2015). This pillar can be connected to the *defining characteristic community financing* in domain (A) of our framework. In favor of a complementing consideration of AFNs, Rosol (2020) argued it does not only include the two pillars of food products and distribution systems, but also their (alternative) economic practices. This third pillar includes (un-) paid work of members, equal pay for all employees regardless of rank, and different forms of economic organization under which cooperatives and collectives are subsumed. This pillar can be incorporated into var*ying characteristics* in domain (B2). In studying AFN and CSA discourses, it becomes evident that these are often focused on challenges in sustainable transformations of agri-food systems at the macro (i.e., system) level. In parallel, and in contrast with this level, researchers and food movements rarely integrate internal perspectives of organizations and challenges at the organizational level of AFNs like CSAs, as the additional pillar of Rosol (2020) illustrates. We conclude that a CSA should not be generalized and regarded as a homogeneous AFN type, but be rather marked as a diverse field of its own.

Finally, the findings of this study suggest that a more differentiated consideration of the diversity of CSA characteristics could also help in revealing existing generalizations about CSA, for example, in the food sovereignty discourse. CSA has been described multiple times, both by researchers as well as the CSA movement and the food sovereignty movement, as a practical example of being in line with food sovereignty (e.g., McMichael 2014; Duncan et al., 2019; Paul, 2019; Stapleton, 2019; Matacena and Corvo, 2020; Plank et al., 2020; Parot et al., 2023). Both, CSA and food sovereignty, therefore, are ascribed in the literature as engaged for just and sustainable agri-food system transformations in local and regional economies and the empowerment of people and actors involved in food production, distribution, and consumption. A high degree of participation or forms of collective property in organizations can also be often assessed in a generalized way as being "positive" for food sovereignty (Dekeyser et al., 2018), but our study shows that these aspects are not highly implemented in every CSA as the results regarding the diversity in Germany illustrates (see *degree of co-decision by members/workers* and *ownership and property*).

4.4 Limits and implications

In the following, we point out limitations, give implications for further research, and further development of the framework. We have deliberately chosen a narrow CSA definition, excluding other AFN forms like self-harvesting gardens, that could lead to confusion since these are subsumed under the umbrella term CSA (e.g., Chen, 2013). We are aware that our focus on German CSAs has limited significance and could be criticized, as some researchers have made the point that European and North American research perspectives are prioritized in the study of AFNs (Zollet, 2022) although we have included CSA literature with an international scope. A shortcoming regarding the survey is that the limited response rate of CSAs which meant that the responses (i.e., number *n*) varied, depending on the question and linked framework characteristic. We made this transparent and provided (n) for each question. In addition, some questions were queried at individual CSA farm level, others at CSA organization level in order to take account of their complexity. Moreover, keeping the effort for CSAs and farms within practicable range, the Network decided upon the final survey questions. For this reason, not all framework characteristics include empirical data. Overall, we want to highlight, that the framework and terminology of the *CSA governance types* already affects the international CSA discourse through active exchange, for example, through the adaptation of the typology by research and practice (e.g., URGENCI Network).[6] We emphasize, however, that CSA configurations can vary widely related to the existing diversity within the characteristics, particularly in other geographic, socioeconomic, and cultural contexts, and others may exist. The framework, therefore, needs to be further discussed and adjusted by both researchers and practitioners.

6 URGENCI conducted 2023–2024 a "Worldwide CSA census" (forthcoming). There, the results are presented along our typology. Simultaneously, a scientific publication is being prepared on this basis.

These limitations lead us to further research. Firstly, the framework could be used as a starting point to better understand CSAs worldwide. Research could conduct analyses that are more type-specific in order to avoid generalizations. In addition, there is room to explore the potential in other countries for further or new CSA types and configurations (both from a member and organization perspective). National and international surveys could query the proposed existence of yet unknown types and configurations based on further or differently-expressed characteristics. Secondly, another option to avoid generalizations in CSA and AFN discourses could be to study the individual transformative potential of specific CSA configurations, respectively regarding their social and ecological effects. Even though the aim of this study was not to develop a tool for evaluating such aspects, the framework provides starting points. For instance, it could be studied if CSAs using bidding rounds (see *share payment option*) contribute to the inclusivity of social groups (see matching potential above). Overall, the "differences in consumers' characteristics, preferences, and attitudes" (Pisarn et al., 2020, 15) should be taken more into account from the perspective of CSA organizers and managers in order to include broader social groups. Further research could, for example, analyze the potential of online tools for enhancing the inclusivity of CSA (see Bos and Owen, 2016). Thirdly, the framework could be adjusted and extended in order to be more context dependent, particularly in other geographical areas where CSA and AFN research is underrepresented, for example, when studying the diversity of food hubs by incorporating organizational perspectives (see Horst et al., 2011) as part of a study that includes various countries. This could involve analyzing drivers and barriers to increase organizational stability and sustain AFNs over the long term (e.g., generational succession). The integration of organizational perspectives and internal challenges, therefore, could enhance agri-food systems-related research.

Considering the previous remarks, the question of future institutional support by policymakers arises. A challenge in policymaking for rural development arises, when assuming that all AFNs or CSAs are equal. In this sense, Grashuis and Su (2019) argue that considering differences (like analyses that are more type-specific) helps to provide a better understanding of the factors that determine their performance, as well as their constraints, by making comparisons among such organizations and across locations. For example, a less-discussed aspect is that policy could promote CSAs that use or establish memberships for low-income people through so-called subsidized or "cost-offset" CSA (CO-CSA) (Pitts et al., 2022).

To consider differences rather than make generalizations corresponds to the aim of this study. The advantage of our framework is that it helps researchers, policymakers as well as practitioners to identify and in particular appreciate diversity and complexity of and within CSAs based on their various possible configurations. As this study was conducted in a transdisciplinary research partnership with the German CSA Network, the results have already been implemented by CSA practice, for example through integration of the framework characteristics and typology into a practical handbook of the German Network, into consulting activities of the Network, as well as currently into a worldwide CSA census by URGENCI, of which both publications are linked collaboratively with the authors of this study. This makes it more practical to use the results of this study, for example, in future CSA consulting activities.

5 Conclusion

This study contributes to the understanding of the diverse CSA phenomenon at the organizational level through the development and application of a CSA framework. Based on literature research and qualitative data, this transdisciplinary study found that CSAs can be differentiated by various characteristics. The framework provides a description of CSAs, considering various characteristics and the diversity of its possible configurations. The multiple selection options make the framework applicable both for research and practice. In this way, the framework contributes to clarifying the uniqueness of the CSA model based on the *defining characteristic* of *community financing* expressed by fee financing, cost coverage/full financing, risk sharing, transparency, and direct relations (see framework domain A). This *defining characteristic* enables the delimitation of the CSA model from non-CSAs such as other AFNs. Furthermore, the question of how an individual CSA is governed is ascribed as a *predominant characteristic* by literature and practice. Organizational governance is therefore highly suitable for classification and allows the identification of three *CSA governance types* (domain B1): Producer-led (type 1), Consumer-led (type 2), and Integrated (all-in-one) CSAs (type 3). This typology, in combination and interrelation with *varying characteristics* (domain B2), reveals a diverse landscape of CSA configurations, as evidenced by our quantitative survey with German CSAs. Our results prove that each CSA is unique, exists as a complex arrangement, and is even more multifaceted than previously considered (i.e., combination of different characteristics that each can be positioned in various ways with different expressions and selection options). We emphasize that every CSA configuration has its own legitimacy since the coexistence of different CSA types as well as various AFN forms is necessary to cover different needs, life realities, and the values of the people that support them.

Moreover, our findings suggest the potential for dynamic development within CSAs over time, indicating changes in characteristics and governance types. The framework can be used for the matching of (potential) members as well as founders and workers, providing guidance for organizational configurations based on the various characteristics. The implications of our framework therefore extend to supporting the organizational development of existing and new CSAs, contributing to their overall stability and long-term survival. Although CSA is still a niche in agri-food systems limited to a minority of people, our findings offer the potential to better address broader social groups. The framework enhances visibility into the diversity of CSAs, which could benefit scaling up and replicating them.

Finally, our results challenge prevailing overgeneralizations within the discourse on AFNs. We argue that the CSA model is an alternative production model, but not every CSA can be generally categorized as alternative organization, emphasizing the existence of CSAs across a spectrum of both alternative as well as conventional configuration options. Our results even prove that oftentimes elements which are described as rather conservative or traditional are preserved and deliberately strengthened in CSAs, while at the same time alternative forms and structures are developed showing that alternative elements and more traditional elements may fruitfully complement each other. This nuanced consideration of CSAs encourages a more informed dialog, for instance, within the food

sovereignty discourse, as well as with traditional farmers' associations that are often critical about CSA. In conclusion, the CSA framework has the potential to avoid generalizations within CSA, AFN and food sovereignty discourses and beyond.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author/s.

Author contributions

MM and MR designed the research project, structured the paper, collected and analyzed the data, and wrote the manuscript equally together. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsufs.2024.1205809/full#supplementary-material

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