

Supplementary Material

Structure by type of data (in detail):

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1 Duration of project period

October 2020 - Dezember 2023

2 Overview of the data material used

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

* Table 1 is part of the original document.

3 Literature sample: List of the 60 CSA publications for Chapter 3.1 (in alphabetical order)

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- 5.) Cameron, Jenny; Wright, Sarah (2014): Researching diverse food initiatives: from backyard and community gardens to international markets. In *Local Environment* 19 (1), pp. 1–9. DOI: 10.1080/13549839.2013.835096.
- 6.) Carlson, Laura A.; Bitsch, Vera (2019): Applicability of Transaction Cost Economics to Understanding Organizational Structures in Solidarity-Based Food Systems in Germany. In *Sustainability* 11 (4), p. 1095. DOI: 10.3390/su11041095.
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- 13.) Diekmann, Marie; Theuvsen, Ludwig (2019): Value structures determining community supported agriculture: insights from Germany. In *Agric Hum Values* 36 (4), pp. 733–746. DOI: 10.1007/s10460-019-09950-1.
- 14.) Dong, Huan; Campbell, Benjamin; Rabinowitz, Adam N. (2019): Factors impacting producer marketing through community supported agriculture. In *PloS one* 14 (7), e0219498. DOI: 10.1371/journal.pone.0219498.
- 15.) Espelt, Ricard (2020): Agroecology presumption: The role of CSA networks. In *Journal of Rural Studies* 79 (1), pp. 269–275. DOI: 10.1016/j.jrurstud.2020.08.032.
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- 17.) Feagan, Robert; Henderson, Amanda (2009): Devon Acres CSA: local struggles in a global food system. In *Agric Hum Values* 26 (3), pp. 203–217. DOI: 10.1007/s10460-008-9154-9.
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- 23.) Heintz, Veikko (2018): *Betriebsgründung, Rechtsformen und Organisationsstrukturen in der Solidarischen Landwirtschaft.* 2nd ed. Hamm: ABL-Verlag.
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- 28.) Matzembacher, Daniele Eckert; Meira, Fábio Bittencourt (2019): Sustainability as business strategy in community supported agriculture. In *BFJ* 121 (2), pp. 616–632. DOI: 10.1108/BFJ-03-2018-0207.
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4 Qualitative data (overview)

a) Focus groups and interviews:

Participants: Researchers, experts, consultants, practitioners

Focus groups:

- 1.) January 2020: 5 participants
- 2.) April 2020: 12 participants
- 3.) August 2020: 6 participants
- 4.) September 2020: 2 participants

Interviews:

- 1.) April 2020
- 2.) April 2020
- 3.) June 2020
- 4.) August 2020
- 5.) August 2020
- 6.) December 2020

Feedback loops:

In addition, 16 participants were contacted for feedback, discussions, and queries during the iterative process.

Examples for question dimensions in the qualitative data concerning:

- Examination of the research goal and research questions (RQs).
- Presentation of preliminary results from CSA research as a basis for discussion and feedback.

Questions (selection):

What characterizes CSA?

Which elements are mandatory, and which are optional for the CSA model?

How does the CSA model differ from other economic forms?

- Presentation of a first “CSA framework” draft (prototype) with characteristics (defining characteristic, differentiation characteristics including first draft (prototype) of CSA governance types)

a) Feedback with respect to characteristics and identification of further characteristics (including aspects that constitute the spectrum of each characteristic).

b) Feedback with respect to the CSA governance types for a specification of the types.

Questions (selection):

From a German perspective, can all existing CSAs (CSA operations) be assigned to the presented CSA governance types?

Please give 3-5 examples of each type of the CSAs that you can relate to.

Are the CSA governance types plausible and beneficial?

Where do confusions?

What problems/challenges do you see regarding these CSA governance types?

Which other classification approaches do you find generally useful?

What suggestions do you have for further developing of the CSA framework?

b) Participant observations at non-scientific conferences with dates:

Participants: CSA experts, consultants, practitioners, policymakers, researchers

- 1.) January 2020: One-day conference (in presence) on CSA where research questions and content were presented and discussed.
- 2.) February 2020: Three-day-conference (in presence) on CSA hosting and participating in several other workshops focusing on aspects such as multi-farm concepts.
- 3.) February 2020: Two-day-conference (in presence) on CSA hosting a presentation and participant observation of several other workshops.
- 4.) March 2020: Two-day-conference (online) on enterprises using the community supported approach of the CSA model; in general with participant observation of several workshops.
- 5.) November 2020: Three-day-conference (online) on CSA with own workshops and participant observation of several other workshops focusing on the understanding of the diversity of CSA.
- 6.) February 2021: Three-day-conference (online) on CSA with participant observation of several workshops focusing among others on cooperative structures and multi-farm concepts.
- 7.) September 2021: Two-day-conference (in presence) on CSA with CSA consultants discussing the structures and needs of different CSAs.
- 8.) November 2021: Three-day-conference (online) on CSA with participant observation of several workshops focusing among others the key principles and characteristics of CSA.
- 9.) January 2023: One-day-conference (in presence) on CSA and the development of sustainable agri-food systems.
- 10.) February 2023: Three-day-conference (in presence) on CSA (online) with participant observation of several workshops focusing, among others, on the (further) stability of CSAs.

5 Literature: CSA governance types developed during knowledge-co-production with related names and descriptions identified in the literature with references

TABLE S5 CSA governance types developed during knowledge-co-production process with related names and descriptions identified from the literature with references (own illustration).

CSA governance types	Related names and descriptions identified in the literature	Related literature references
Producer-led CSA (Type 1)	Farmer-based, farmers-driven, Farmer managed, producer-driven, producer-led, farmers-led CSA initiative. CSA farms in which the farmer makes all the decisions.	European CSA Research Group (2016); Wilkinson (2001). Sanneh, Moffitt, and Lass (2001).
	Producer-driven farms initiated by the farmers. Traditional CSA model; traditional single farm model CSA; A one-farm CSA as traditional, normal farm business; traditional single farm model CSA; traditional CSA model with a farmer and a group of committed consumers which create a local food supply network. Family farms essentially family managed	Hvitsand (2016). Woods, Ernst, and Tropp (2017); Pisarn, Kim, and Yang (2020); Bashford et al. (2013); Diekmann and Theuvsen (2019); Sitaker et al. (2020).
	Standard model. Single contract CSA. A farm and a group of members.	Cicia et al. (2011). J. T. McGuirt et al. (2018). Rüter (2015); Heintz (2018). European CSA Research Group (2016).
	Subscription CSA (farmer-driven); Subscription CSAs, initiated by the farmer who maintains ownership of the operation. Agricultural enterprises owned by farmers.	Adam (2006); Harmon (2014); Espelt (2020).
	Farmer-driven and producer run CSA organized by the farmer of an already existing farm that is owned by the producer.	European CSA Research Group (2016). Bashford et al. (2013).
Consumer-led CSA (Type 2)	Consumer-driven initiatives.	European CSA Research Group (2016); Chiffolleau and Dourian (2020).
	Consumer-driven farm; consumer-driven initiative; shareholder CSA which is consumer-driven.	Hvitsand (2016); European CSA Research Group (2016); Adam (2006); European CSA Research Group (2016); Espelt (2020).
	Community-led; community shared farms; community subscriber group as a group of consumers committing to an existing farm. Consumer-led CSA where consumers establish a long-term agreement with a farm or group of farms; CSAs as organized consumers. Shareholder/subscriber.	European CSA Research Group (2016). European CSA Research Group (2016). Wilkinson (2001).
	By independent volunteer members.	Ouahab and Maclouf (2019).
Integrated (all-in-one) CSA (Type 3)	Shareholder CSA formed by a core group of members who make administrative decisions and collectively hire a farmer. A community rents a piece of land and hires a farmer. Organized as a cooperative; established a cooperative; cooperatives mode; Farmer-shareholder cooperative.	Harmon (2014); Espelt (2020). Poças Ribeiro et al. (2021). Blättel-Mink et al. (2017); Zoll et al. (2018); Pisarn, Kim, and Yang (2020); Tang, Liu, and Huang (2019); Wilkinson (2001). Espelt (2020); Bashford et al. (2013); European CSA Research Group (2016); Blättel-Mink et al. (2017); Woods, Ernst, and Tropp (2017).
	Community-owned farms; collective property; collective ownership; non-farm owned respectively co-operatively.	Harmon (2014); Tang, Liu, and Huang (2019); Espelt (2020); Pisarn, Kim, and Yang (2020).
	CSA as non-profit organization (NPO) or non-governmental organization (NGO) where decisions are made by a board of directors in collaboration with paid or volunteer staff.	

* Table 5 is an additional illustration in this document.

6 Literature and qualitative data: Differentiation characteristics identified during knowledge-co-production through literature research and qualitative data with used literature

TABLE S6 Differentiation characteristics identified during the knowledge-co-production through literature research and qualitative data (own illustration).

Differentiation characteristics	Expressions with examples	Used literature references in the discourse
CSA governance types	Responsibility for the (most) management decision-making along the question, "Who organizes and manages the CSA?"; Spectrum in which hands the CSA governance lies (individual, distributed among several people, distributed among different actors (producers, growers, organizers, managers, workers, members, co-owners etc.). CSA governance types: Producer-led CSA (Type 1), Consumer-led CSA (Type 2), Integrated (all-in-one) CSA (Type 3)	e.g., Wilkinson (2001); Adam (2006); Ostrom (2007); Feagan and Henderson (2009); Bashford et al. (2013); Harmon (2014); European CSA Research Group (2016); Hvitsand (2016); Wellner (2018); Zoll et al. (2018); Krcilkova et al. (2019); Opitz et al. (2019); Ouahab and Maclof (2019); Tang, Liu, and Huang (2019); Espelt (2020); Koretskaya and Feola (2020); Mert-Cakal and Miele (2020); Plank, Hafner, and Stotten (2020).
Degree of co-decision by members / workers	Differentiation in participation in decision-making according to members and workers from relatively low (e.g., online polls, annual shareholder meeting), to medium (e.g., majority member decisions during the year in addition to the shareholder meeting; Working groups possibly with voting rights), to high (e.g., basic democratic decision-making structures, sociocratic form of organization, consensus or consent decisions)	e.g., Groh and McFadden (2000); C.Clare Hinrichs (2000); Adam (2006); Venn et al. (2006); Ostrom (2007); European CSA Research Group (2016); Hvitsand (2016); Blättel-Mink et al. (2017); Carlson and Bitsch (2019); Krcilkova et al. (2019); Espelt (2020); Koretskaya and Feola (2020); Mert-Cakal and Miele (2020); Plank, Hafner, and Stotten (2020); Paech, Sperling, and Rommel (2021); Zoll, Specht, and Siebert (2021).
Founding impulse	Fonding impuls by farm(ers); consumer(s); both (farm(ers) and consumer(s); through third party	e.g., Ostrom (2007); Bashford et al. (2013); Harmon (2014); Si, Schumilas, and Scott (2015); European CSA Research Group (2016); Hvitsand (2016); Krcilkova et al. (2019); Stapleton (2019); Carlson and Bitsch (2019); Tang, Liu, and Huang (2019); Espelt (2020); Koretskaya and Feola (2020); Mert-Cakal and Miele (2020); Plank, Hafner, and Stotten (2020); Vlasov, Heikkurinen, and Bonnedahl (2021).
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	e.g., ; Bashford et al. (2013); Carlson and Bitsch (2019); Krcilkova et al. (2019); Espelt (2020); Vlasov, Heikkurinen, and Bonnedahl (2021).
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)	e.g., Bloemmen et al. (2015); Cameron and Wright (2014); European CSA Research Group (2016); Carlson and Bitsch (2019); Krcilkova et al. (2019); Espelt (2020); Koretskaya and Feola (2020); Plank, Hafner, and Stotten (2020); Paech, Sperling, and Rommel (2021).
Ownership and property for land / operation	Differentiation according to the CSA organization/operation and land with ownership/property rights by farm(er), member shareholdings, community (e.g., cooperative), other forms	e.g., Bashford et al. (2013); Harmon (2014); Bloemmen et al. (2015); European CSA Research Group (2016); Blättel-Mink et al. (2017); Woods, Ernst, and Tropp (2017); Zoll et al. (2018); Carlson and Bitsch (2019); Dong, Benjamin Campbell, and Rabinowitz (2019); Krcilkova et al. (2019); Espelt (2020); Koretskaya and Feola (2020); Mert-Cakal and Miele (2020); Plank, Hafner, and Stotten (2020).
Labor and work	Number of workers full-time; Number of workers part-time; Number of seasonal workers; Members engagement as volunteers; Degree of co-production/co-work of members from relatively low (e.g., occasional field actions), to medium (e.g., regular, institutionalized co-production actions), to high (co-production as a significant operating factor))	e.g., Cone and Kakaliouras (1995); Goland (2002); Adam (2006); Cox et al. (2008); Shi et al. (2011); Bashford et al. (2013); Harmon (2014); European CSA Research Group (2016); Woods, Ernst, and Tropp (2017); Carlson and Bitsch (2019); Krcilkova et al. (2019); Espelt (2020); Koretskaya and Feola (2020); Watson (2020); Rosol and Barbosa (2021).
Farming methods	Conventional (not organic), organic (not certified), or certified organic agriculture	e.g., Ostrom (2007); Bashford et al. (2013); European CSA Research Group (2016); Carlson and Bitsch (2019); Samoggia et al. (2019); Smith et al. (2019); Tang, Liu, and Huang (2019).
Single- or multi-farm	Single farm CSA or multi-Farm CSA	e.g., Wilkinson (2001); Adam (2006); Bashford et al. (2013); Harmon (2014); European CSA Research Group (2016); Woods, Ernst, and Tropp (2017); R. E. Galt et al. (2019).
Product variety	Vegetables, fruits, dairy products, meat products, eggs, honey, other; processed products	e.g., Adam (2006); Ostrom (2007); Bashford et al. (2013); European CSA Research Group (2016); Blättel-Mink et al. (2017); Woods, Ernst, and Tropp (2017); E. R. Galt et al. (2012); J. McGuirt et al. (2019); Paul (2019); Samoggia et al. (2019).
Degree of self-production	Own production (in %); Binding additional purchases with risk sharing (in %); Binding purchases without risk sharing (in %); Marked-based purchase (in %)	e.g., Rommel et al. (2022).
Share distribution channels	Home delivery, Farm self-pick up by members, pickup point (depot), or self-harvest	e.g., Feagan and Henderson (2009); Harmon (2014); European CSA Research Group (2016); Woods, Ernst, and Tropp (2017); Carlson and Bitsch (2019); Matzembacher and Meira (2019); Stapleton (2019) Zoll, Specht, and Siebert (2021).
Share distribution area	CSA members in urban, suburban, peri-urban, or more rural settings	e.g., ; Goland (2002); Bloemmen et al. (2015); Mert-Cakal and Miele (2020); Plank, Hafner, and Stotten (2020); Si et al. (2020).
Share payment options	Fixed amount, fixed amount and solidarity pot, graded contributions, financing/bidding round	e.g., Sanneh, Moffitt, and Lass (2001); Adam (2006); Blättel-Mink et al. (2017); Carlson and Bitsch (2019); Krcilkova et al. (2019).
Scope of CSA-operation	The entire farm is part of the CSA or a part of the farm is part of the CSA model	e.g., Chen 2013; European CSA Research Group 2016; Carlson and Bitsch 2019).
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)	e.g., Bashford et al. (2013); European CSA Research Group (2016); Woods, Ernst, and Tropp (2017); Carlson and Bitsch (2019); Krcilkova et al. (2019); Paech, Sperling, and Rommel (2021); Zoll et al. (2022).

* Table 6 is an additional illustration in this document.

7 Quantitative data (overview)

Survey development and conduction

This study follows a transdisciplinary mixed-methods approach in cooperation with the German CSA Network. The whole development of this paper is embedded in a collaborative process of planning, conducting, and analyzing an extensive quantitative survey from 2022 as a joint project between the researchers of this study and the German CSA Network. The survey development process is therefore connected to the iterative framework development process (see Chapter 2 as well as Chapter 3.1). Thereby, the survey is designed as an internal database of the Network, aimed at providing well-founded data over time. The cooperation with the German CSA Network has resulted in the identification of various synergies. In addition, multiple surveying of CSAs has been prevented (see Chapter 2.1).

Survey questions and variables:

The survey contains a total of 80 possible response variables relating to the individual CSA divided into the following three subchapters:

a) General: 8 possible response variables

Examples: governance type, founding background, founding year

b) Member community: 23 possible response variables

Examples: work and labor related questions

c) Operating data of the CSA farm: 49 possible response variables

Examples: legal form, ownership and property related questions, share and production related questions

Use of survey results

The survey is following a discursive methodological approach. For example, the CSAs were asked to assign themselves according to the identified characteristics and CSA governance types. However, not all variables of the survey were included in this study, as many questions are broader than the focus of this study. As defined in the introduction (chapter 1), a distinction can be made between the entire CSA organization and the individual CSA farms (see chapter 1 and also 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 3.2). 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). This is highlighted in chapter 3.2. Overall, 70 CSAs (n = 70 CSAs) and in total 81 individual CSA farms (n = 81 CSA farms) participated. In Table 7 we present more detailed information of the survey.

TABLE 7 Detailed Information of the Survey.

Domain	Explanation
Object of study	All 400 CSAs in Germany (which existed in 2022; today there are around 500 CSAs in Germany)
Sample	All 160 CSAs within the German CSA-Network (which were officially member of the association in 2022)
Response Rate	n = 70 CSAs with overall 81 CSA farms (51% of the CSA organizations that were officially Network members at the time of the survey)
Time period	This paper considers all records of the survey since November 2021 up to and including December, 18, 2023.

* Table 7 is an additional illustration in this document.