

Effects of consumer-producer interactions in alternative food networks on consumers' learning about food and agriculture

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Abstract

In the recent literature, Alternative Food Networks (AFN) are discussed as a promising approach, at the urban-rural interface, to meeting the challenges of the current agri-food system. Consumer-producer collaboration is seen as a characteristic feature in this context. What is lacking, however, are general concepts for describing the topics of consumer-producer interactions (CPI). The present study aims (1) to develop an analytical framework relying on six CPI domains and (2) to apply it to investigate CPI effects on consumers' learning about and appreciation of agriculture. We conducted 26 guided interviews with consumers and producers of the three most frequent AFN types in Germany: community-supported agriculture (CSA), food coops, and self-harvest gardens. The results show that AFN participation enhances consumers' learning about food (seasonality, cooking/nutrition, housekeeping aspects) and agricultural production (farmers' perspectives, cultivation). Our results show that consumer's learning is influenced by certain CPI domains, and each AFN type can be described by distinctive CPI domains. This led to the conclusion that specific AFN types open up specific learning channels and contents, with consumers learning from producers. AFNs at the urban-rural interface exploit knowledge of rurality.

Keywords: Analytical framework, community-supported agriculture (CSA), food coop, self-harvest garden, urban-rural, Germany

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1. Introduction

In the recent literature, Alternative Food Networks (AFN) are popularised as a promising approach to overcome some of the recent drawbacks of the current small-scale agri-food system (Forssell and Lankoski, 2015). Despite the overall aim to achieve changes in food quality, production, distribution and consumption, the AFN concept covers a broad variety of forms, such as on- and off-farm direct marketing (Allen et al., 2006; Brown and Miller, 2008), producer-producer networks (Marsden et al., 2008) or producer-consumer partnerships (Venn et al., 2006). Still, some commonalities are also discussed in the literature, for instance

1. spatial or organisational proximity of consumers and producers,
2. new modes of consumer-producer connectivity, and
3. shared values of actors within an AFN.

(see Forssell and Lankoski, 2015; Jarosz, 2008; Marsden et al., 2008; Sonnino and Marsden, 2006; Tregear, 2011; Venn et al., 2006; Wiskerke, 2009).

More specifically, modified relations between consumers and producers represent an important feature of AFN concepts, contrasting with conventional agri-food systems where they remain separate from each other (Schermer, 2015). Forssell and Lankoski (2015) describe consumer-producer relations as a strong bond characterised by trust and social embeddedness, and Jarosz (2008) sees food purchasing venues as a means to strengthen consumer-producer relations. Due to the diversity of AFN types as well as AFN actors, however, descriptions of consumer-producer relations remain vague in most AFN studies.

Alternatively, other aspects are drawn on to explain consumer-producer relations, e.g. spatial proximity or AFN members' shared values (Forssell and Lankoski, 2015). While urban agriculture is located in predominantly urban areas and influenced by urban conditions, AFNs are networks at the urban-rural interface, as a part of peri-urban agriculture (Opitz et al., 2016a; Zasada, 2011). This urban-rural context is not explored in detail in all studies, but as Wiskerke (2009) observes, AFNs are mostly

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networks that bring together urban dwellers and the food market (Doernberg et al., 2016). Jarosz (2008) emphasises current development trends such as rural restructuring as determinants for the emergence and diversity of AFNs. In addition to the physical proximity that is typical of regional networks, Forssell and Lankoski (2015) identify two other forms of distance between AFN consumers and producers: distance within the food value chain, and informational distance. Besides proximity, shared values are another determinant for explaining consumer-producer relations. In general, stakeholders in a network are committed to social, environmental or economic standards in agriculture (Jarosz, 2008) and share an understanding of food quality (Wiskerke, 2009).

General conceptualisations of consumer-producer relations in AFNs are rare. Venn et al. (2006) focus on functional relations among AFN actors to categorise AFNs. They distinguish between producers as consumers, producer-consumer partnerships, direct sell initiatives, and specialist retailers (Venn et al., 2006). For short food supply chains, Renting et al. (2003) conceptualise three categories of networks: networks that rely on face-to-face communication, proximate networks that are more complex, and extended networks. Rather lacking are approaches using the content of stakeholders' interactions to characterise AFNs. Only Holloway et al. (2007), who developed a methodological framework for exploring food production-consumption relationships, use content-related aspects to describe some of their categories.

Therefore, we propose an analytical framework of consumer-producer interactions (CPI) designed to specifically highlight the deliberate mutual interaction between consumers and producers in the domains of knowledge, labour, financing and contracting, produce, resources, or land, that sometimes even result in a reversal of roles. The analytical framework is described in section two.

Besides enhancing our understanding of AFN organisation and functioning, an approach, which is based on a characterisation of CPIs as a central AFN feature, allows us to investigate the specific benefits and consequences, especially for consumers, of AFN-based food supply. In

several studies, effects of AFN participation such as healthier diets or changes in nutrition (Andreatta et al., 2008; J. N. Cohen et al., 2012; Minaker et al., 2014; Wilkins et al., 2015) or effects on farm income (Galt, 2013; McIlvaine-Newsad et al., 2004; Oberholtzer, 2004; Tegtmeier and Duffy, 2005) have been investigated.

Other studies focus on the effects of consumers' learning and heightened awareness (Adler et al., 2003; Andreatta et al., 2008; Brunori et al., 2012; J. N. Cohen et al., 2012; Gorland, 2002; Hayden and Buck, 2012; Lamine, 2015; Lutz and Schachinger, 2013; Macias, 2008; Vogl et al., 2004). Often-described effects are learning about cooking, eating and meal planning, also to avoid food waste (Andreatta et al., 2008; J. N. Cohen et al., 2012; Gorland, 2002; Hayden and Buck, 2012; Lutz and Schachinger, 2013). In addition, we find only few other learning fields, e.g. about cultivation techniques in self-harvest gardens (Vogl et al., 2004) or production problems in a food coop (Brunori et al., 2012). Interestingly, some of the studies explain consumers' AFN-based learning by consumer-producer interactions. These explanations remain rather abstract (Adler et al., 2003; Macias, 2008), however, or rely on observations of a specific case and are therefore difficult to transfer to other cases.

Addressing the challenge presented by the lack of inductive transferability of case-specific evidence, the main objective of our study is to develop a structuring concept of CPIs in AFNs. We particularly focus on three different AFN types at the urban-rural interface, i.e. community-supported agriculture (CSA), food coops, and self-harvest gardens (see description in Section 3.1), and apply the approach to investigate the effects of CPIs on food production-related processes of learning about and appreciating agriculture.

2. Analytical Framework

In the present study, we propose a CPI-based approach using consumer-producer interactions in the domains of knowledge, labour, financing/contracting, produce, resources, and land to explain the specific effects on consumers' learning and appreciation (Fig. 1).

To this end, AFN are distinguished by the knowledge formats, e.g. annual meetings or Internet blogs, and the

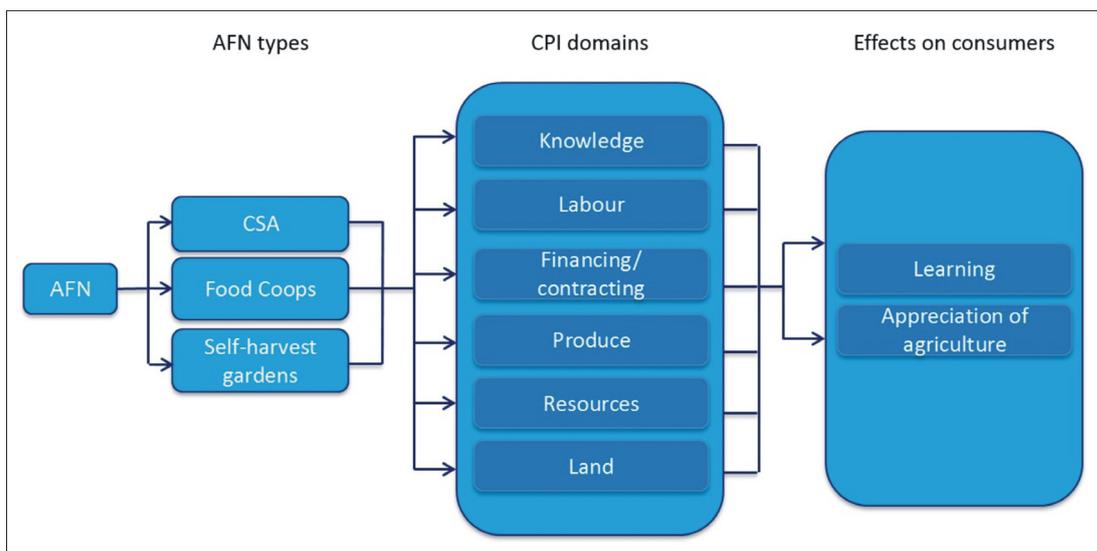


Fig. 1: Analytical framework, using six domains of consumer-producer interactions (CPI) to characterise types of alternative food networks (AFN) and explain AFN effects on consumers
Source: authors' conceptualisation

contents of knowledge exchange as well as by the amount and type of work done by consumers within the network, e.g. in distribution or production. Further domains are agreements on financing and the delivery of produce. AFNs are distinguished by how often, how reliably and at what price consumers receive produce from the farmers. CPIs are further characterised by the issues related to the exchange and sharing of resources, e.g. seeds or tools, or land ownership. AFNs, and in our case consumer-producer partnerships, can be described and distinguished with reference to the six domains of interaction. This analytical framework helps us to structure and explain AFN effects on consumers.

3. Data and methods

In order to deepen our understanding of consumer-producer interactions and their effects on learning and the perception of agriculture, we conducted and analysed 26 interviews with producers and consumers in three metropolitan areas in Germany.

3.1 Selection of AFN types and case study regions

In a first step, databases and websites were searched with a set of keywords to gain an overview of the incidence and spatial distribution of AFNs in Germany. As a first result, we found a concentration of cases in the three metropolitan areas of Berlin, Munich, and Hamburg (see Tab. 1). We then selected the three most frequent AFN types for further analysis:

- Community-supported agriculture (CSA), which represents partnerships between a group of consumers who pay up front for a share of the annual harvest and a farmer who supplies produce for the shareholders on a weekly basis (Hayden and Buck, 2012; Moellers and Birhala, 2014; Perez et al., 2003);

- Food Coops (also called Solidary Purchase Groups) – associations of consumers who jointly organise their food purchases and arrange for regular deliveries by regional farmers (Brunori et al., 2012; Zitcer, 2015); and
- Self-harvest gardens – plots for gardening and services provided by farmers to consumers (Vogl et al., 2004).

As Figure 2 shows, AFNs are located at the urban-rural interface. We therefore extended our case study areas to include a belt of about 25 km width around the three cities. This allowed us to include farmers operating in the peri-urban area and to do justice to the urban-rural character of AFNs.

3.2 Selection of interviewees, and interview conduction

For the selection of AFN interviewees, we conducted a sample of all AFNs in the three cities (see Tab. 1). In each of the metropolitan areas, one AFN initiative of each of the three types was randomly selected using an Internet application. During the selection process, ten food coops, five self-harvest gardens and one CSA were excluded from the study due to a lack of availability or

	Berlin	Munich	Hamburg
CSA farmers	5	3	2
CSA picking points	40	76	7
Food coops	10	1	13
Farmers directly related to food coops	4	4	1
Self-harvest gardens	7	51	8

Tab. 1: Number of AFNs in each metropolitan area per type, supplemented by number of associated places and farms. Source: authors' survey

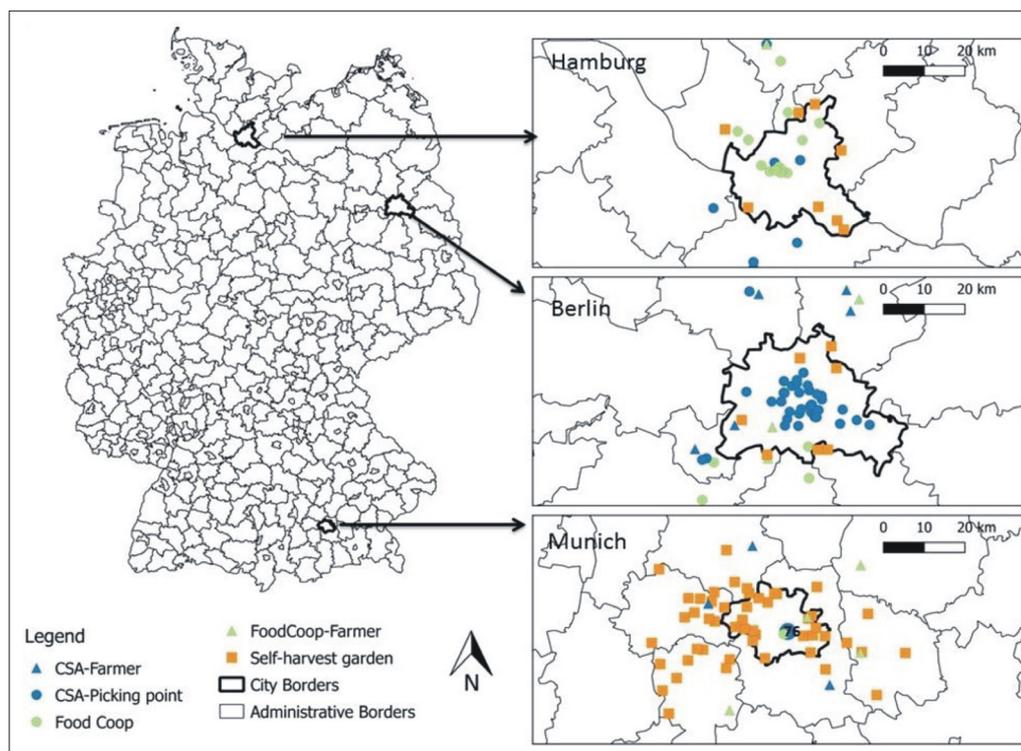


Fig. 2: Maps of Berlin, Munich, and Hamburg, with locations of the three AFN types investigated
Source: authors' elaboration

interest of the potential interview partner. In the case of self-harvest gardens and CSA networks, which are mostly operated by farmers, we contacted the producers and asked them to name two consumers they were connected with. In the case of food coops, we directly contacted the consumers group, selecting one producer who supplied the consumer's network. In one case, the selected producer in a CSA network is also the supplier to a food coop. In this case, we interviewed the producer only once. Except for two cases, the producers and the two consumers who were interviewed belonged to the same network.

Between February and May 2016, the 26 interviews were conducted in the three metropolitan areas as face-to-face (20) or telephone (6) interviews using an interview guideline. They took between 1 and 1.5 hours and followed a structured agenda. The main topics included information about CPIs, interviewees' motivation to participate in an AFN and views regarding potential effects in terms of societal change. In line with our research question, we asked consumers whether and how their perception of agriculture or rural areas had changed since they joined the AFN. We did not address the question of learning directly, respondents introduced the issue themselves.

3.3 Data analysis and interpretation

As a preliminary task, the interviews were recorded and transcribed. The analysis of the interviews was carried out in two steps: First, following the method of Kuckartz (2014), we conducted a content analysis using the MAXQDA software and iteratively generating a code system that was tested and applied. Starting with the question of changes in perception, we identified multiple aspects of consumers' learning and applied them in a general structure. The eight interviews conducted with AFN producers were mainly used to analyse CPIs and to demonstrate and complement the analytical framework. The 18 interviews with consumers were used to answer the question of consumers' perception of agriculture and learning fields. Second, we conducted a descriptive statistical analysis of the number of interviewees in each AFN type who referred to certain issues, supplemented by the number of references for each issue. This provided us with an estimate of the relevance of certain issues as compared to others.

4. Results

Based on our analytical framework, we will first describe AFN types by using the six CPI domains and the results from the interviews. Second, we will present the findings for consumers' learning about food and agriculture and appreciation of agriculture and relate them to the CPI domains.

4.1 Consumer-producer interactions

We investigated CPIs in six domains: knowledge, labour, financing/contracting, produce, resources and land.

4.1.1 Knowledge

CPIs in the domain of knowledge are constituted through the (i) different kinds of knowledge formats, (ii) frequency, and (iii) contents of knowledge transfer. Our findings show that direct knowledge transfer from producers to consumers (as well as among consumers) is a central element of the relationship between both AFN parties in all three investigated AFN types. Besides written formats such as newsletters or Internet blogs, meetings are a frequently

used format for knowledge and information exchange. In CSA initiatives, regular general meetings are held with all shareholders at least once a year. On these occasions, shareholders discuss farm development or share prices. In food coops, information exchange via telephone or online is mainly about organisational issues regarding offers and orders. In addition, participants of the food coops have access to the farms, from which they get their food. In self-harvest gardens, participants are offered workshops about specific cultivation techniques, or consulting hours.

4.1.2 Labour

Labour-related CPIs mainly address the way work is shared between consumers and producers, regarding the (i) field of labour, (ii) obligation, (iii) frequency, and (iv) responsibility. Interviews have shown that there is consumer-producer collaboration in all AFN types. Consumers contribute a certain amount of labour in cultivation, harvest and handling as well as distribution. In CSA initiatives, assistance work by consumers (e.g. harvest events, working days) is expected by producers, but not fixed by contract. The work load to be shared, however, is limited to particular tasks such as planting and harvesting. It is shown, that this is often linked to transaction costs, e.g. due to extensive supervision by the producer (# CSA producer 3). In food coops, participants are mainly taking over distributional tasks, such as organising orders and deliveries. They operate a storage room where all participants can pick up their food, coordinate the mode of orders, the distribution and the time of delivery with the farmer, organise the allocation and weighing of the produce, and decide on what to do with produce that was not collected. In one case, one or more participants are also involved in the transport of produce from the farm. In self-harvest gardens, cultivation work is shared between consumers and producers, with producers preparing the beds by tillage and sowing and committing the plots to consumers, and consumers caring for the plants and harvesting them. In one case, the producer offers additional watering services during the season.

4.1.3 Financing and contracting

CPIs in the domain of financing and contracting are covering aspects of (i) common agreements on pricing, (ii) contract duration and (iii) consumers' payment. Throughout all AFN types, variability in application can be observed. All AFN initiatives in our study rely on consumer-producer contracts. While in CSAs and self-harvest gardens, these are based on written contracts, food coops usually rely on oral agreements, with consumers committing themselves to regular orders with the farmer. In CSA contracts, consumers commit themselves to a monthly payment, a so-called share, while producers commit themselves to supply produce. A special feature of CSA contracts is that consumers and producers do not know how much the producer will harvest. The share is understood to constitute a payment for the farmers' labour rather than a price for the produce. In food coops, consumers pay for the food they have ordered, while in self-harvest gardens consumers pay for one season's use of the plot and the services provided by the producer or operator.

4.1.4 Produce

CPIs in the domain of produce are about the frequency of food supply and consumers' involvement in decision processes about what is grown on the farm. Interviews reveal that this CPI domain occurs in all three AFN types. In CSA initiatives, the harvest share is delivered to

participants on a weekly basis or, in winter, twice a month. Generally, consumers' freedom of choice regarding the type or the amount of the vegetables or fruit they will get is very limited. In one case, participants can choose whether to get their milk share in the form of milk, yoghurt, or cheese. But CSA participants can give farmers feedback on last year's vegetables and current preferences at the beginning of the season. In food coops, farmers mainly provide an assortment of the food crop they grow, and consumers choose from it. In self-harvest gardens, participants have the largest freedom of choice as they basically get what they harvest. Although farmers decide about the general setup, consumers can strongly influence the choice of crops to be cultivated and harvested.

4.1.5 Resources and land

The CPIs related to the sharing of resources are predominantly about what is provided by the farmers, i.e. tools and equipment for gardening or working clothes or inputs like seeds and water. This type of producer-consumer interaction is only relevant in those cases where consumers actually work in the fields, particularly in CSAs and self-harvest gardens. Usually, the inputs are provided by the farmer (mainly the case in CSAs) or are bought by the consumers who apply them in compliance with specific rules, e.g. for organic production (self-harvest gardens). In food coops, the consumers group or individual members of the group own or rent the needed resources, i.e. rental space and equipment. Land-related CPIs mainly occur in cases where consumers rent a plot from the farmer. This is only the case in self-harvest gardens where participants are required to rent a plot to cultivate.

4.2 Learning about food

Acquiring knowledge about and awareness of food and food handling to prevent food waste was found to be a major issue in all interviews, including topics of cooking and nutrition, seasonality, and housekeeping.

Cooking and nutrition as the primary aspect of learning about food is reported by almost all respondents. Consumers confirm that AFN membership has a positive effect on the frequency and regularity with which they prepare meals themselves. They learn to cook with as yet unknown and/or seasonally available vegetables using new recipes that are sometimes provided by the farmers or found in consumer-driven knowledge exchange formats or on the Internet. As one interviewee says:

“Because when I already had the process, I used to choose a recipe and then see what I had by way of produce. And here I first get the produce and then I have to go looking for recipes.” (# Self-harvest gardens consumer 2 Hamburg)

Especially CSA participants describe seasonal cooking as a great challenge. In winter, consumers only get storage produce and the few vegetables that grow in winter. Therefore, they need to learn to cook with a reduced array of produce, e.g. cabbage or celeriac. Some participants also learned more directly about processing and nutrition, including milk processing, pasteurisation and control standards. Others were advised in terms of dietary changes.

Considering the relation between learning about nutrition and cooking, interviewees relate them directly and indirectly with the CPI domains of knowledge and produce. As described above, AFN consumers and producers use various knowledge formats to share recipes or advice for processing. That is necessary as they often do

not know the products or they receive the same varieties of vegetables for a long period without much variation, e.g. during winter times. Frequency and delivery agreements regarding the produce influence the consumer learning process. Table 2 shows the related CPI domains of all the three identified learning fields of food.

Seasonality represents a second food-related issue but is reported less frequently. Respondents report learning about when crops are ripe and available. They also say that they have acquired specific knowledge about regional vegetables and traditional varieties they did not know before (as these are not available through retail trade) and are enhancing their understanding of regional cultivation options. AFN participants get their knowledge from workshops or newsletters provided by the farmers. But respondents also report learning about experiences while co-working and learning-by-doing or just having the seasonal produce in their basket. Therewith, learning about seasonality is related to the CPI domains knowledge, labour, produce and indirectly to the domain of financing/contracting (Tab. 2). Only long-term contracts allow insights in variability of varieties over the seasons.

The third aspect of learning about food concerns the practice of housekeeping. Especially with CSA participants, storage and handling on a household level, e.g. processing herbs and vegetables, is a frequently mentioned topic. Related to the prevention of food waste, we found learning processes about natural storage times of perishable food crops and about techniques to extend them. Gains in housekeeping knowledge also include learning about the time and the finances required for the various steps in food supply, e.g. distributional tasks in food coops and adaptation of shopping routines. Respondents directly relate learning about housekeeping with the CPI domain of produce (see Tab. 2).

4.3 Learning about agriculture

Besides the topic of food, participants learn about agriculture and the production process itself and, more specifically, about farmers' perspectives. This topic is frequently referred to in almost all cases. Cultivation practices play a secondary role but are relevant at least for CSAs and self-harvest gardens.

4.3.1 Farmers' perspectives

We observed learning processes with regard to farmers' perspectives on (i) economic requirements, (ii) workflows on the farm, (iii) distribution, and (iv) availability of land – in CSAs and food coops.

‘Economic requirements’ as the first of the four factors covers aspects of a farm's costs and calculation practices. Interviewees learn about agricultural costs and accounting through being involved in the process of calculating CSA share prices. In other cases, interviewees become aware of the question of farm succession or farm decision-making

Learning field	Related CPI domains
Cooking/nutrition	Knowledge, produce
Seasonality	Knowledge, produce, financing/contracting, labour
Housekeeping	Produce

Tab. 2: Consumer's learning about food in AFNs and the related CPI domains. Source: authors' elaboration

processes, e.g. concerning on-farm processing. Learning about ‘economic requirements’ is influenced by the configuration of the contracts and the financing agreements – that is why it is related to the CPI domain of financing/contracting. In Table 3 all influencing CPI domains for learning about agriculture are summarised.

‘Workflows on the farm’ covers timelines and events on the farm. Interviewees report gaining new insights into workflows on the farm or into special events, e.g. a butter flood or slaughtering schedules. One interviewee extensively describes the contents of a weekly newsletter:

“It’s all very detailed, you even get to know how many pigs were born or that they just finished setting up the new polytunnel for the new tomato greenhouse or whether or not there is a new apprentice on the farm or whether or not they bought a new tractor (...).” (# Food coop consumer 2 Hamburg)

In the quotation, the respondent refers directly to the CPI domain of knowledge.

The topic of ‘distribution’ covers all organisational, packaging and transport processes. In CSAs and food coops, consumers are involved in distributional tasks. From being involved in labour (CPI domain of labour), they therefore get specific insights into the efforts and requirements of distribution, e.g. the complexity and micro-management of small-scale packing and customer-specific delivery or consumer-producer differences over requirements. While consumers need to have one day in the week for delivery by all the farmers who supply produce for the food coop, farmers may find it difficult to coordinate different distribution pathways with the requirements of just one food coop. One interviewee states:

“That’s when we really got an idea why food coops are not that easy to work with for small-scale farmers, for instance.” (# Food coop consumer 2 Berlin)

The aspect of ‘availability of land’ covers the difficulties for farmers to rent additional land or continue farming on land especially in the urban fringe. This is reported by interviewees from all three AFN types. They learned that renting or buying arable land close to cities is difficult because availability is reduced and prices are comparatively high. One respondent associated these facts with land grabbing practices of the large-scale agro-business. Consumers become aware of the issue by newsletters or in the case of CSA by talking with the producers at the annual meeting or during the working events (CPI domain of knowledge).

4.3.2 Cultivation

Learning about cultivation is a major topic predominantly in self-harvest gardens. Respondents from CSA and food coops mention the issue less frequent and less variously. Consumers talk about aspects such as (i) dependency on external factors, (ii) cultivation planning, (iii) cultivation techniques, and (iv) yields.

The aspect ‘dependency on external factors’ covers the

Learning field	Related CPI domains
Farmers perspectives	Knowledge, labour, financing/contracting
Cultivation	Knowledge, labour

Tab. 3: Consumer’s learning about agriculture in AFNs and the related CPI domains. Source: authors’ elaboration

full range of weather and climate conditions, as well as seed quality, that influence the harvest and the yield. Participants describe how droughts or hailstorms may destroy the harvest or open the way for pests, and how farmers can adapt, e.g. by growing tomatoes in glasshouses. But they also report that adaptations like irrigation techniques or tabs are not always possible or too expensive to install, and why agricultural production in many cases depends on the rain and the sun, making cultivation and yields less predictable. Interviewees also report becoming aware of changing conditions over the years, i.e. of what they call ‘climate change’. A further issue besides the weather is seeds, e.g. the quality of organic seeds as compared to hybrid seeds. One interviewee reported learning that when seeds were cultivated outdoors, plants were more resilient to extreme weather conditions; another had learned about the advantage of having stones in the soil to slacken it. Learning about external factors is a process of realisation by doing. While AFN participants are doing cultivation work, they make experiences with climate effects. Learning about external factors is related to the CPI domain labour. Additionally, interviewees report about newsletters or workshops, explaining the relation between weather and harvest. Learning is related to the CPI domain of knowledge. An overview is given in Table 3.

The issue ‘cultivation planning’ primarily covers the techniques of crop rotation. Farmers instruct consumers about energy flows in integrated farming systems, or about the necessity of crop rotation as a provision for pest avoidance, or about fertilisation and how it works (CPI domain of knowledge). One interviewee reports:

“That’s why crop rotation is really important (...) because when you keep cultivating cabbage at the same place too many times in a row, some very nasty bacteria will come to live in the soil (...). And then it’s potentiating, it’s getting worse from year to year.” (# Self-harvest garden consumer 2 Berlin).

One respondent reports that cultivation planning may also involve a social perspective: to prevent harvests from being stolen, certain vegetables that are easy to harvest are not grown close to streets.

As a third topic, ‘cultivation techniques’ covers all the techniques of cultivation, such as sowing, planting, plant care, ripening process, harvesting, pest management, tillage and fertilisation, as well as the timing for each of these steps. In general, learning about cultivation techniques is related to the CPI of labour. Interviewees report learning about many practical aspects of gardening or cultivation, e.g. how to let seeds germinate in little pots and raise the seedlings on the windowsill before planting them out in the soil, or how to pinch tomato plants. In some cases, consumers are interested in the regulations of organic production. They therefore learn about how to use green manuring for organic fertilisation, how to use nets for pest avoidance or how to collect potato bugs and, more generally, about the efforts involved in growing organically.

As a last aspect, interviewees across all AFN types report insights into expected yields. They learn about how many eggs a hen can lay, or how much milk a cow can give, or how many potatoes can be harvested from a specific plot.

4.4 Appreciation of agriculture

Asking interviewees about the change of their perception of agriculture since they joined the AFN, we found broad awareness of and interest in food issues and appreciating

certain aspects of agriculture even prior to AFN participation. Especially access to good and fresh food represents an incentive for them to join an AFN initiative. Some of the respondents explain their early awareness by childhood links to rural areas or friends who shared their interest; others refer to a general interest in food and nutrition or to changes in lifestyle, e.g. having children, getting older. These groups are more conscious of the quality and the origin of the food they buy, e.g. only organic food, or less meat, or buying on farmers markets. Others seem to be driven by their rejection of the prevailing agro-food system.

Food quality is the first important issue referred to by a majority of the consumers we interviewed. Respondents particularly appreciate the freshness and tastiness of produce such as tomatoes, butter, bread, or potatoes and describe them as healthy. Another quality criterion is that produce is grown organically or that animals are fed with organic fodder. In addition, there is a specific quality value in terms of an emotional bonding to animals and plants. One participant in a self-harvest garden describes how watching a plant grow during the season intensifies this bond, and the pure joy of watching kids harvesting:

“(…) when you see (…) their eyes beaming with excitement, watch them lifting a carrot with their little knives.(…) How its value suddenly changes, the very carrot they may refuse to even touch at supper, and now they just won’t part with it.” (# Self-harvest garden consumer 2 Berlin)

Food quality is often described in contrast to the food available through regular retail trade. Respondents express their appreciation of AFN-supplied produce while rejecting supermarket vegetables as ‘mouldy’ (# Self-harvest garden consumer 1 Munich) or ‘overbred crap’ (# CSA consumer 2 Munich). Only one interviewee concedes that her self-grown vegetables are sometimes smaller or less tasty than vegetables bought in a bio-supermarket or at a farm shop (# self-harvest garden consumer 2 Hamburg).

A second aspect most frequently reported by self-harvest gardeners is their appreciation of farmers’ work efforts. Especially the laborious manual handling, e.g. pulling out weeds, that is typical of organic and/or small-scale cultivation of vegetables was repeatedly acknowledged. Interviewees reported getting a better feel for workloads, fair product prices and wages.

As a third and last aspect, consumers appreciate transparency regarding food origins and modes of production, which makes for an emotional component. In contrast to the anonymity of supermarkets and global value chains, interviewees describe their feelings with “trust” (e.g. # CSA consumer 2 Munich) and “transparency” (e.g. # Food coop consumer 1 Berlin, # CSA consumer 1 Berlin).

5. Discussion

From our perspective, the findings of our study allow for four distinct conclusions. First, four out of the six CPI domains are relevant for all the investigated AFN types, two of them are only relevant for single AFN types. In frequency of interaction, the AFN types do not differ very much, but taking qualitative descriptions, we can see that some CPI domains meet the core of the certain AFN types more than others. Second, AFN participation enhances consumers’ learning about food (seasonality, cooking/nutrition, housekeeping aspects) and agricultural production (farmers’ perspectives, cultivation). Third,

different CPI domains affect learning in different fields. Fourth, CPIs in AFNs at the urban-rural interface exploit knowledge of rurality. Opting for a specific AFN type opens up specific learning channels for consumers. In the following, we will discuss these conclusions with reference to the current state of research.

5.1 CPI domains characterise AFN types

Our analysis is based on a new analytical framework that we developed. We rely on six CPI domains – knowledge, labour, financing/contracting, produce, resources, and land – to describe the three AFN types we investigated. Our findings show that in all three types (CSA, food coop, and self-harvest garden) consumers and producers collaborate in four out of the six domains. Resource-based interactions are only relevant in those cases where consumers actually work in the fields, particularly CSA and self-harvest gardens. Land-based interactions seem to be specific to self-harvest gardens. Thus, considering the level of CPI domains, the AFN types show very little differentiation regarding the participation of consumers among the three investigated AFN types. Taking additionally the comparably small number of cases for each AFN type into consideration, we cannot derive significant differences regarding the frequency of participation. Hence, for explaining the results of the current study, the frequency of interactions on the six CPI domains is not helpful. Still, in a more descriptive way, CPI domains contribute to characterise AFN types.

Taking the scientific literature and our observations from the interviews into consideration, the relevance of single CPI domains differs in the three AFN types. In CSAs, financing/contracting (pre-payment for a year’s use of the share) and agreements on the supply of agricultural produce (all year round on a weekly basis) are very specific and elementary to the CSA concept in general. Describing the concept of CSA, both of these elements are often repeated (Hayden and Buck, 2012; Moellers and Birhala, 2014; Perez et al., 2003). Compared to the domains of financing/contracting and produce, for the CSA concept it is not constructing, whether the consumers do assistance work on the field or not (Janssen, 2010), or how the knowledge transfer is designed, or whether the consumers can use tools from the farmer. For food coops, interactions about labour (distributional work of the consumers group) and the supply of agricultural produce (ordered food) are at the core of the concept. In the few international published studies about food coops, both of these CPI domains are at the core of the descriptions and investigations, e.g. when Brunori et al., 2012 describe the consumers-producers-networks and subnetworks of a Solidary Purchase Group or Zitcer (2015) for food coops. In self-harvest gardens, in contrast, CPIs typically are about labour (sharing of work between the farmer who prepares the plot and the consumer who cultivates it), land (renting for one season) and produce (consumers get what they harvest) (Vogl et al., 2004).

Even if the way and frequency of knowledge transfer does not show characteristics for certain AFN types, CPI in the domain of knowledge is a key element of all AFN types (Brunori et al., 2012; Moellers and Birhala, 2014; Vogl et al., 2004). Communication and knowledge transfer can be seen as precondition for community building, motivation for participation (Brehm and Eisenhauer, 2008) or as one way of integration of members (Anschütz, 2015; Forssell and Lankoski, 2015; Moellers and Birhala, 2014). That is why in the different AFN types different contents of knowledge

are transferred and consumer's learning is stimulated differently in certain AFN types.

5.2 Consumers' learning in AFNs

Our findings confirm that during AFN participation, consumers learn about food (seasonality, cooking/nutrition, housekeeping aspects) and agricultural production (farmers' perspectives, cultivation). This is more or less in line with existing literature on AFNs, where knowledge acquisition in the domain of food, especially nutrition and behavioural changes regarding cooking and food consumption, is one of the most frequently explored issues. Studies on CSA primarily explore increased consumption of fruit and vegetables (J. N. Cohen et al., 2012; Minaker et al., 2014; Wilkins et al., 2015), changes in cooking practices or the frequency of eating out (Andreatta et al., 2008; Curtis et al., 2013), and learning about seasonal crops (Wilkins et al., 2015). Some studies were unable to confirm the hypothesis that CSA participation leads to healthier food consumption habits (Gorland, 2002; Quandt et al., 2013). No comparable studies exist, as far as we know, on food coops or self-harvest gardens. In this way, our empirical work provides new insights, confirming the significant and substantial importance of consumers' learning about various aspects of food, food processing, and food consumption regardless of AFN types. This multifaceted issue is referred to in all our interviews. Apart from verifying the broad scope of learning, it would be interesting to know more about the actual extent of the knowledge thus acquired or the depth of the effects, e.g. whether consumers affiliated with AFNs really engage in a healthier lifestyle than other members of the population. These issues are not specifically addressed by our research design.

Other novel insights of our study relate to learning about agricultural production, which is a relatively new object of investigation in the literature on AFNs. Vogl et al. (2004) report learning effects in self-harvest gardens due to mutual visits. The authors concluded that consumers' involvement in primary production may lead to a better understanding of the challenges and risks producers have to cope with. Our findings indeed confirm these observations by Vogl et al. (2004) for all our AFN types. Moreover, the differences described above in the specific nature of interactions, activities and learning contents along the whole production and distribution process, result in differences also in experienced complexity.

5.3 Specific CPIs affect specific fields of learning and appreciation

As shown in the results section, consumers' learning is influenced by CPIs in various ways. Even if we asked directly for the changes of perception during AFN participation, direct influences of CPIs on appreciation are not derivable from the interviews.

5.3.1 Consumers' learning

The interviews show that CPIs in four out of the six domains relate to specific fields of consumers' learning. We present an overview of this relation in Table 4.

CPIs about knowledge relate to nearly all of the learning fields. CPIs about labour relate to learning about production and seasonality, CPIs about financing/contracting relate to the learning field of farmers' perspectives, and CPIs about produce relate to learning about food. The interviews do not allow us to relate the CPI domains 'resources' and 'land' to one of the learning fields.

But even in cases where the three CPI domains of knowledge, labour, and produce enhance learning about seasonality, learning processes may differ in quality and intensity. Newsletters and workshops, as well as experiences of ripening processes through regular gardening work, may all lead to learning about the seasonality of food, but as learning means different things for different target groups, learning processes are certainly not fully comparable in terms of contents and feasibility.

5.3.2 Appreciation

In addition to learning effects, we analysed consumers' appreciation of agriculture. Three aspects are referred to in the interviews: appreciation of food, labour, and food origins.

Taking the current state of scientific literature, our results are in line with recent discussions. AFN participants report about their appreciation for food and its origins. As examined in other studies, the appreciation for food and certain food qualities is one central element of social identity in AFNs (Jarosz, 2008; Renting et al., 2003; Wiskerke, 2009). Therewith, appreciation for food and its origin is a precondition for consumers to participate in an AFN, as confirmed by the interviewees in our study. Furthermore, social identity, built on the belief in good food and their societal meaning, is a central element of AFNs, e.g. it contributes to the acceptance of higher prices (Forsell and Lankoski, 2015).

This might be a problem for the interpretation of empirical studies about AFNs, because respondents perceive themselves as 'good consumers' and may emphasise the positive effects of participating in an AFN. In our study, we attempted to reduce this issue while addressing the research question in the interviews indirectly.

Regarding the appreciation about labour, no comparable studies exist. Some studies investigate the conditions and mostly negative effects of increased workloads of farmers or AFN participants (Brunori et al., 2011; Oberholtzer, 2004; Simon Fernandez et al., 2012). An increased appreciation in terms of an increased value of farmer's labour is not examined so far. In Germany, there is a decreasing number

CPI domain	Learning fields
Knowledge	Cooking/nutrition
	Seasonality
	Farmer's perspectives
	Cultivation
Labour	Seasonality
	Farmer's perspectives
	Cultivation
Financing/contracting	Seasonality
	Farmer's perspectives
Produce	Cooking/nutrition
	Seasonality
	Housekeeping

Tab. 4: CPI domains of knowledge, labour, financing/contracting, and produce and related influences on consumers' learning

Source: authors' conceptualisation

of small and medium farm types. One reason among others is that older producers do not find successors motivated to continue the business. One reported reason is the missing appreciation of agricultural labour. Behind this backdrop, AFNs generate an interesting potential, which is hardly recognised so far.

Different to consumers' learning, from the interviews we cannot derive influences of CPIs on changed appreciation of food and its origin. We did not examine a quality or quantity of appreciation before and since participation in an AFN. Regarding the context of appreciation of labour, respondents report about their respect since they visited the farm or helped with cultivation in a CSA or a self-harvest garden. Certainly, also in this case, we cannot exclude from consideration that the participants had awareness of farmer's labour and working conditions before they entered the network.

5.4 Learning at the urban-rural interface

In addition to CPIs, we considered interactions within a consumers group and related them to the six learning fields. Interactions between consumers in a consumer group are related to learning about cooking/nutrition, and housekeeping, and in the case of self-harvest gardens to cultivation practices. In these cases, respondents report consumer-driven internet blogs or informal meetings on the plots in the cases of self-harvest-gardens, as knowledge exchange formats (Fig. 3). Considering the different learning fields (see sections 5.2 and 5.3), we concluded that in contrast to networks consisting only of consumers, CPIs in AFNs at the urban-rural interface widen the scope and intensity of consumers' learning, especially regarding topics of rurality, such as farmers' perspectives. Direct relations between producers from rural or peri-urban areas and consumers enable urban dwellers to access the farmer's knowledge resources. In all AFNs, and more particularly in CSAs and self-harvest initiatives, consumers' perception of farmers' perspectives has improved. Therefore it can be reasoned, that there is a major role of farmers in influencing perceptions and learning processes about the complex agri-food system.

From the insights discussed above, i.e. that each AFN type shows specific characteristics in the six CPI domains and that CPIs in each domain affects specific learning fields, we can assume that specific AFN types open up specific channels for urban consumers to learn from producers, as well as for producers to indirectly influence consumer's appreciation of their agricultural work.

Given these experiences and the findings of our study, and in analogy to the discourse about urban agriculture, perspectives on AFNs at the urban-rural interface should be more multifunctional. In the literature on urban agriculture, the latter is discussed as a vehicle for learning for innovation (Opitz et al., 2016b) or as a means of integrating the elderly (Cohen et al., 2012). Comparable multi-functional approaches to AFNs are conceivable, especially because the complex issue of food seems to be a highly workable gateway to access complex knowledge about agriculture, markets, and health issues that, in turn, will have consequences for individual behaviours. Furthermore, our study encourages counting on new and indirect farmer-driven ways to approach consumers by socially innovative means. In an active knowledge society consumers, or at least a certain number of them, can be assumed to positively respond to such offers of enhanced interaction.

6. Conclusions

In our study we analysed the effects of consumers' participation in alternative food networks (AFN) on their learning about and perception of agriculture. We investigated the three most frequent AFN types in Germany: community-supported agriculture (CSA), food coops, and self-harvest gardens. To account for the diversity of AFN types, we propose an analytical framework based on the domains addressed in consumer-producer interactions (CPI): knowledge, labour, financing/contracting, produce, resources, and land.

The findings of our study of AFNs in three German metropolitan areas show that participation in any of the three AFN types enhances consumers' learning about food (seasonality, cooking/nutrition, housekeeping aspects) and agricultural production (farmers' perspectives and

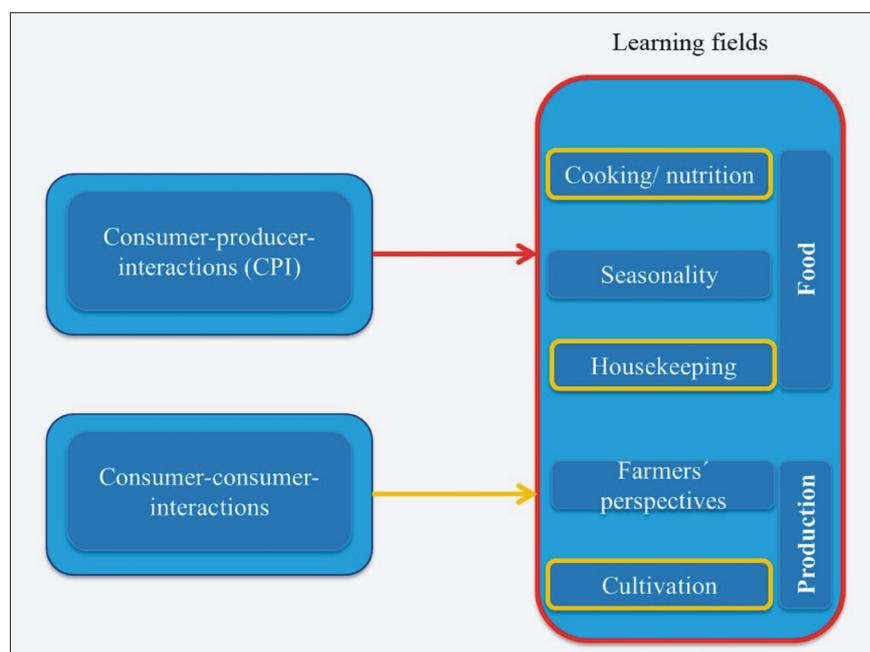


Fig. 3: Consumer-producer-interactions and consumer-consumer-interactions influence learning in different learning fields. Source: authors' conceptualisation

requirements, cultivation). In addition, consumers report appreciation of the quality and origin of the food they get, as well as a heightened appreciation of farmers' agricultural work.

The analytical framework we propose is well suited to describe and distinguish between the interactions and effects of various AFN types. CPI domains as a core element of our framework, are capable of explaining the effects of AFNs on consumers' learning about and allow us to relate these effects to specific learning fields. CPIs about produce are strongly related to the learning field 'food', while CPIs about labour, financing/contracting, and knowledge relate to the learning field 'agricultural production'. As a conclusion from these findings, i.e. that each AFN shows specifically using single CPI domains and that these domains are related to specific learning fields, we suggest that each AFN type opens up specific channels for consumers to learn from producers, as well as for producers to indirectly influence consumers' appreciation of their agricultural work.

In contrast to networks consisting only of consumers, consumer-producer networks exploit rural knowledge for urban dwellers. Thus, food seems to provide a workable gateway to access more complex knowledge about nutrition and production processes.

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