



# IFST – Discussion Paper

## IFST - Social Cohesion Indicator Guidelines

### A Starting Point for Measuring Social Cohesion in Food Systems

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## 1 Purpose and context of the IFST indicator guidelines

These indicator guidelines were developed in the research project “Social Cohesion, Food and Health - Inclusive Food System Transitions” (IFST) but can be also used by other researchers that wish to study the role of social cohesion in food systems. IFST aims to investigate the complex relations between food system transitions, innovations, social cohesion, and (food- and health-related) inclusiveness. More specifically, IFST focuses on two main research questions:

- How does (the lack of) social cohesion influence food system innovations and transitions?
- What is the impact of food innovations and transitions in food systems on social cohesion?

To understand how transition and innovation are interlinked with societal reconfiguration, it is key to pay close attention to the interplay of food and health related inclusiveness with social cohesion: on the one hand it is assumed that the inclusiveness of innovations can affect social cohesion of a particular social groups and on the other hand the level of social cohesion can also affect the inclusiveness of innovation processes and effects.

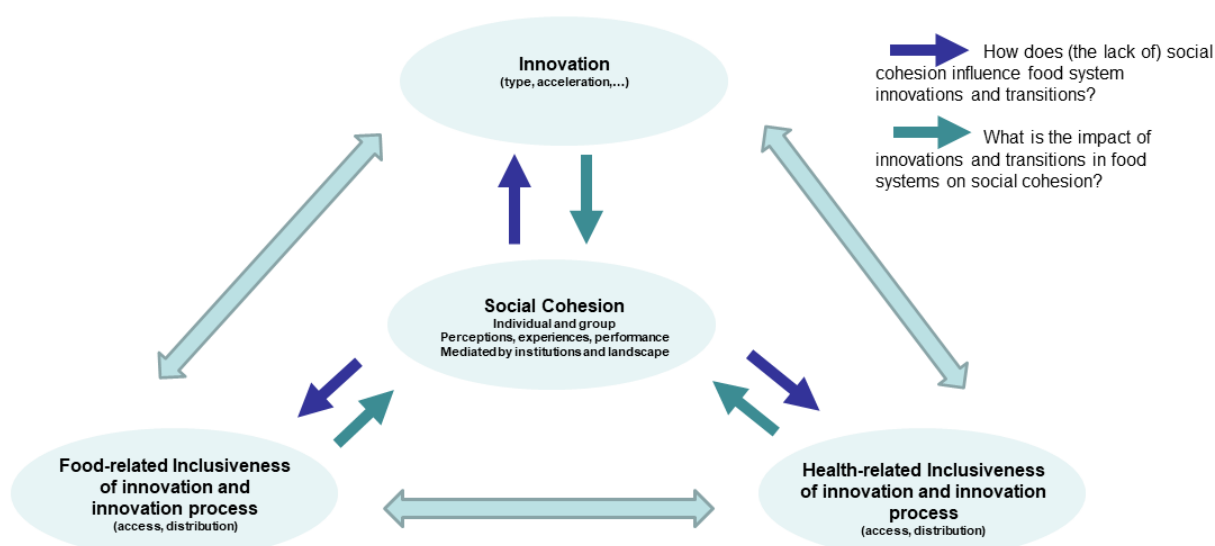


Figure 1 the social cohesion – food – health nexus; Source: case study guidance (Barnickel et al. 2023)

The relationship between social cohesion food, and health inclusiveness has already been theorized in depth in another working paper of the IFST project, which provides a solid framework for understanding the interplay between innovations and social cohesion in the context of the food system transitions (Barnickel et al. 2023). This IFST concept paper also provides the wider context for the development of these indicator guidelines, because it distinguishes the – often intertwined – concepts of social cohesion and inclusiveness and it also connects social cohesion to the multi-level-perspective-framework on system transitions. In particular social cohesion is conceptualized as a (i) multi-dimensional and a (ii) multilevel



framework. By doing so it is specified what type of dimensions are part of social cohesion (ideational and relational but not distributive dimensions see section 4) and social cohesion manifests itself on or is influenced by different levels of society (see Barnickel et al. 2023).

These indicator guidelines have been developed in the IFST project in order to provide orientation for the projects' highly diverse set of case studies on different food innovations. On the one hand, the guidelines should provide resources for assessing the various dimensions of social cohesion on different levels of society. On the other hand, the guidelines should support comparability across case studies in the project by providing a common pool of indicators based on a consistent conceptual framework.

However, the diversity of case studies in IFST does not make this an easy task. It does not seem appropriate to prescribe a rigid set of uniform indicators to measure social cohesion in multiple, diverse case studies characterized by very different contexts, data availability, and research objectives. Moreover, such a rigid approach hardly corresponds to the transdisciplinary research design of IFST. Therefore, we view the indicator guidelines as a flexible tool for assessing social cohesion that provides an analytical framework to further operationalize the broad conceptual categories of social cohesion. For each dimension of social cohesion, we propose a pool of indicators (both those used in the existing literature and those developed specifically for IFST) and ways to measure them. In this way we provide a toolbox that needs to be adapted by researchers for the specific IFST case studies. Researchers can also add indicators to the toolbox. Our indicator set will therefore grow through the exploratory work of the case studies and become an increasingly powerful tool for understanding and measuring social cohesion in different food-related contexts.

Although these guidelines were developed as part of the IFST project, they are also valuable to other researchers who wish to study the role of social cohesion in different food systems for several reasons: (i) they provide an overview and summary of the state of the art of indicators for measuring social cohesion; (ii) they provide a pool of indicators that can be used as a starting point for measuring different dimensions of social cohesion at different levels of food systems; (iii) finally, they provide guidance on how the general pool of indicators could be adapted for analyzing particular food systems in a specific context. We encourage discussion, critique, and use of these indicator guidelines because only by using and reflecting on them can this document become a starting point for a growing toolkit of indicators for studying social cohesion in food systems.

The document is structured as follows:

In the first part the term **indicator is defined, and different types of indicators are described**. Furthermore, it is briefly addressed in what contexts different types of indicators are normally used.

In the second part a brief **review of studies that have used indicators to examine the relationships between food and social cohesion** is presented. The results show that, to date, there is no exhaustive and specified set of indicators for analyzing social cohesion in the context



of food systems. Moreover, the results also show that – in contrast to the larger social cohesion studies in the next section – a broad variety of different types of indicators are used.

In the third part **a preliminary, IFST-specific pool of indicators for assessing social cohesion is created**. This task consists of two main steps. First, a number of important studies that have created, applied, and tested indicator sets for social cohesion are analyzed. The different approaches of these studies are harmonized and the addressed dimensions of social cohesion as well as the connected indicators are identified. The results are complemented by the findings of part two. In a second step, the existing indicators will be aligned with the IFST social cohesion framework and first IFST-specific indicators for all dimensions are proposed.

In the fourth part, **a guideline on how to adapt the basic indicator set for specific case studies** is presented. The guideline asks to specify the context of the case study as well as the main methodological approaches. Based on that, relevant dimensions and indicators can be selected and adapted. Following the guideline helps to ensure the comparability of the single case studies.

## 2 Different types of indicators for different purposes

More generally, an indicator can be defined as a sign that points to (or indicates) another phenomenon and describes its current state or its change over time. In research, indicators are used to describe a latent phenomenon that cannot be measured directly. For example, gross domestic product (GDP) is often used as an indicator to measure economic development, which is a complex construct that cannot be directly assessed. There are various types of indicators used in different research fields and scientific disciplines. In the context of IFST, the following distinctions are important:

**Quantitative and qualitative indicators:** Indicators are often associated with measurement and thus with quantitative research. However, there are both quantitative and qualitative indicators that serve their purpose in different areas of research. **Quantitative indicators** involve enumeration. This means that a concept is operationalized in a way that allows for measuring it in numbers. Again, the GDI is an example of a quantitative indicator. Quantitative indicators are reductionist in the sense that they abstract from the particular case and serve the aim of quantitative research to generalize across large sample sizes with the goal of (causal) explanation (Gläser & Laudel, 2010) In contrast, qualitative research aims at understanding relationships and mechanism and, therefore, rather analyses small numbers of cases in depth (ibid. ). **Qualitative indicators** are not represented in numbers but are described in words. They are a verbal description of the quality of a particular concept. For example, a farmer might verbally describe his or her livelihood and deductively or inductively generated qualitative categories can be used for analyzing and interpreting the verbal utterances of the farmer. Qualitative indicators are more capable of capturing nuances and complexity of a phenomenon and are useful for developing a deeper understanding of it.



**Single and composite indicators:** There are obvious problems in measuring complex phenomena with single, narrow quantitative indicators.<sup>1</sup> Composite indicators have been partly developed to avoid such problems. Composite indicators are indices that measure complex and multidimensional concepts that cannot be captured by a single indicator. They are based on a theoretical framework that allows the selection, weighting, combination, and measurement of variables that reflect the structure of the latent construct being measured (Nardo & Saisana, 2008). They are mathematical aggregations of sub-indicators (Saisana, 26-27th 2004). Prominent examples are the human development index,<sup>2</sup> which aims to measure the key dimensions of human development or also the environmental sustainability index (Esty, 2001). The advantage of combining variables into a single indicator (and number) is that it allows easier interpretation of complex phenomena and easier comparison of performance. The disadvantages of (poorly constructed) composite indicators are that they ignore important differences in individual dimensions, weight dimensions in problematic ways, and ultimately provide misleading information to decision makers that invites simplistic policy solutions (p. 13). Given these dangers, it may sometimes make more sense to use indicators only for the different dimensions of a complex phenomenon, rather than combining them into a single index.

**Perception-based and neutral-descriptive indicators:** Another important distinction in measuring social cohesion is between indicators based on respondents' answers (collected through surveys, questionnaires, interviews, etc.) and indicators based on "objective" data (e.g., statistics on income, crime rates, etc.). In the literature, the first category is sometimes referred to as "subjective" indicators and the second category as "objective" indicators. However, the use of the term "objective" can raise misleading hopes of objectivity and is therefore problematic. Therefore, we use here the terminology of perception-based and neutral-descriptive indicators (Dragolov et al., 2013). This distinction is important for IFST because social cohesion research also distinguishes between "objective" and perceived cohesion (introduced by Bollen & Hoyle, 1990). Objective cohesion refers to "objective" attributes of a social group such as cooperative behavior or participation (which are probably better assessed with neutral-descriptive indicators), while perceived cohesion refers to individuals' perceptions of certain aspects of social cohesion such as trust (and can be appropriately assessed with perception based indicators) (Bottoni, 2018).

**Direct and indirect indicators** A direct indicator is very closely related to the concept it is intended to measure. An indirect indicator, on the other hand, functions as a proxy for a concept that cannot be easily measured. For example, measuring crop productivity might be considered a direct indicator of crop productivity, but perhaps only an indirect indicator of farmer livelihoods (see FAO 1990). The danger in using indirect indicators is that you may not be measuring the concept you are interested in, but related concepts such as influencing factors or outcomes. For example, the number of smokers is not an indicator of the health of a

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<sup>1</sup> Again the use of the GDP as a way to assess economic development provides a good example for the problems related to the use of reductionist indicators (for a more detailed discussion of this example see Lepenies 2013)

<sup>2</sup> For a critical review on this index see Sagar and Najam (1998)



population, but a factor that influences health status. However, social cohesion is an abstract (and contested) concept which cannot be directly observed. Therefore, the theoretical and conceptual understanding of the concept and its dimensions need to be considered when proposing social cohesion indicators in order to avoid conflation with close but conceptually different terms (e.g. inclusiveness).

Different types of indicators are used in a variety of scientific disciplines to measure and evaluate different aspects of reality. Since social cohesion is a social phenomenon, its measurement often stands in the tradition of social indicator research. Social indicator research has its roots in the seventeenth and eighteenth centuries, when the collection of national demographic, economic, and social data began in Western societies (for a more detailed description see Land et al., 2011, 1ff). In the late 1950s the need to measure social well-being of societies was growing and academics and administrators aimed for a “*comprehensive and integrated series of indices for evaluating and studying the social state of the nation and changes that were occurring*” (Smith, 1981, p. 739). This led to an increased interest of governments, public agencies, and academia<sup>3</sup> to develop and use so called social indicators, that can be defined as a specific type of social measurement “*that inform us about current conditions and emerging trends with respect to those aspects that relate to human well-being or to major areas of social concern*” (Johnston & Carley, 1981, p. 237). In the context of social indicator research - which is often characterized by large scale, quantitative research on the national level – specific types of indicators, namely narrow quantitative indicators and composite indicators are in use. Indeed, most of the larger social cohesion indicator studies discussed in section – which stand in the tradition of social indicator research - use such kind of indicators. Qualitative indicators play in this type of studies no relevant role. However, the IFST case studies heavily differ from classical social indicator research. Therefore, it is necessary to explore the research on the social cohesion food nexus to see if and how other types of indicators are used.

### 3 Existing indicators to investigate the food-social cohesion nexus

#### 3.1 Methods

To obtain an overview of the use of indicators in research on food and social cohesion, an exploratory literature review of relevant articles was carried out. To this end, a keyword search of the Web of Science database was conducted.<sup>4</sup> We searched for all articles that included the words “social cohesion”, “food” and “indicators” in either the title, keywords or abstract. The search term we used was quite restrictive as the aim was to really identify only articles that focus on the use of indicators while researching the food-social cohesion nexus.<sup>5</sup>

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<sup>3</sup> Social indicator research is now a firmly established scientific research field. For example, the specialized academic Journal “Social Indicator Research” has been already founded in 1974

<sup>4</sup> <https://login.webofknowledge.com/>

<sup>5</sup> A larger review about general research about the food-social cohesion nexus was already conducted in the concept paper. There are only very few overlaps between those two reviews.





The search resulted in 16 articles. The articles were reviewed, and it was assessed for each article how social cohesion was conceptualized, what types of indicators were used and how they were measured. Furthermore, it was assessed what food system innovation or what aspect of food systems was studied and whether and how relations between food and social cohesion were in the focus of the study.

## 3.2 Findings

The results of the review show a wide variety of research topics, research scopes, and methodological approaches.

Two of the articles examined were reviews themselves. Badland et al. (2014) conducted a survey to identify appropriate indicators to measure urban quality of life in Australia. The indicators had to be quantifiable and measurable on relevant scales. Social cohesion was defined as an aspect of urban quality of life, and five appropriate indicators were identified to measure this aspect. Two of them were neutral-descriptive in nature (membership in community organizations, volunteering in the community), and three were perception-based (opportunities to contribute to important issues, feeling part of the community, social support). Access to local food was cited as another indicator of urban quality of life.<sup>6</sup> However, no associations between social cohesion and food were discussed. Artmann and Sartison (2018) conducted a review to understand the impact of urban and peri-urban agriculture on the challenges of urbanization. Maintaining social cohesion was identified as one of these challenges. The authors do not provide a detailed conceptualization of social cohesion or indicators to measure it. They only conclude that urban and peri-urban agriculture has the potential to promote social cohesion.

Three articles presented spatial modeling or participatory approaches to assess the potential of urban or peri-urban agriculture. Langemeyer et al. (2020) created different scenarios for the establishment of green roofs in the city of Barcelona based on the spatial distribution of variables that represented environmental and social conditions. Social cohesion was one of these variables. Two quantitative, neutral-descriptive proxy indicators were used to assess the spatial distribution of social cohesion in the city: income inequality and ethnic heterogeneity. Also in the city of Barcelona, Toboso-Chavero et al. (2021) tested a participatory framework for green roof implementation. Social cohesion was not conceptualized or measured. It was only mentioned that a lack of social cohesion is a barrier to green roof implementation. Social cohesion was also not conceptualized or measured in the work of Nigussie et al. (2021). In their article, they examined the potential of improving peri-urban agriculture in Ethiopia and only mentioned in passing that this type of agriculture could be beneficial to social cohesion.

Three articles conducted smaller, in-depth comparative case studies of rural communities in Canada, South Africa, and five countries in the Global South. Mundler and Laughrea (2016) examined the impact of the establishment of short food supply chains (SFSCs) on the economy,

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<sup>6</sup> In our understanding access to food would rather be an indicator of food-related inclusiveness, not an indicator for measuring social cohesion (see section 4).



environment, and social life (including social cohesion) in three rural areas in Quebec. Hossain (2009) examined how rising food prices in the wake of the 2008 financial crisis affected crime and social cohesion in ten different communities in five countries in the global South. Owen and Goldin (2015) went in the other direction, examining how youth skills (including social cohesion) affect youth food security in two South African villages. All three studies used qualitative approaches (participatory research, focus groups, interviews, etc.) to assess social cohesion. Only Owen and Goldin (2015) also asked quantifiable survey questions. Based on different conceptualizations of social cohesion, the three studies identified different dimensions of social cohesion. These dimensions functioned as qualitative indicators. Hossain (2009) defined relationships between groups and communities, charity, and the functioning of the credit system as indicators of social cohesion. His results show that rising food prices often lead to tensions between ethnic and religious groups, and that credit systems and informal charity play an important role in coping with rising food prices. Crime - which he did not consider an indicator of social cohesion - was also affected by rising food prices, as many households were pushed to the brink of legality. Mundler and Laughrea (2016) conceptualized social cohesion in the context of SFSC as the harmonious coexistence of farmers and new residents and did not identify any other dimensions. Based on their results, they conclude that the establishment of SFSC had little impact on social cohesion. Owen and Goldin (2015) took a narrower approach to conceptualizing social cohesion. They defined it as one component of youth skills. Other components included trust, collective action, and sociability, all of which could also be considered components of social cohesion if a broader conceptualization approach had been used. However, in their study, social cohesion consisted of only one dimension: sense of belonging. According to their results, social cohesion was high in both communities, but affected food security in only one of them.

The largest number of articles studied the relationship between various social and physical neighborhood environments and different health aspects. Access to healthy food was part of the physical neighborhood environment, and social cohesion was part of the social neighborhood environment. With the exception of Echeverria et al. (2004)<sup>7</sup> all studies were based on large-scale, quantitative research and often medical trials. Hoenink et al. (2019) examined the impact on obesity in several European countries (5199 participants); Hicken et al. (2019) examined kidney function in the United States (6814 participants); LeBrón et al. (2019) examined the impact on cumulative biological risks in Detroit, USA; and Christine et al. (2015) examined the impact on diabetes in the USA (5124 participants). Only Rodrigues et al. (2021) did not use data from medical studies but examined the effects of the environment on self-reported health.

Social cohesion was conceptualized and measured in different detail in the individual studies. All indicators were quantitative in nature and measured via survey items. Christine et al. (2015) used only one survey item to measure overall trust within the community. All other studies considered social cohesion as a multidimensional concept. Echeverria et al. (2004) and Hicken

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<sup>7</sup> Echeverria et al. (2006) conducted 48 interviews with members of Afro-American and Latino community in New York in order to assess the reliability of self-reporting on neighborhood factors influencing cardiovascular disease.



et al. (2019) identified the same components of social cohesion: close knit neighborhood, dislikes, solidarity, trust, and shared values. Each component was assessed using a survey question and a composite indicator for social cohesion was created, by calculating the overall mean score. Hoenink et al. (2019) identified trust and harmony as components of social cohesion and distinguished the concept from social networks and crime that were measured separately. LeBrón et al. (2019) identified membership, influence, integration, and emotional attachment to community as components of social cohesion and distinguished social cohesion from social support, neighborhood satisfaction, and participation. Both authors created a composite indicator of social cohesion based on the values of each component measured with survey items. Finally, Rodrigues et al. (2021) identified trust, solidarity, and a sense of belonging as dimensions of social cohesion. These components were measured using different survey items, and a composite indicator of social cohesion was created using factor analysis. None of the studies examined the relationship between access to food and social cohesion, only how both factors affect specific aspects of health. The results were mixed. Only Hoenink et al. (2019) found significant associations between social cohesion and obesity (see also Table x).

Finally, two articles do not belong to any of the above categories. Valli et al. (2019) analyze the impact of World Food Program food aid on social cohesion among Colombian refugees and their Ecuadorian host communities. It is the only major quantitative study (2,122 participants) that examines the relationships between food and social cohesion in more detail. Food aid consisted of food donations, cash, food vouchers, and nutrition education. Components of social cohesion identified were trust in individuals, social connectedness, personal agency, acceptance of diversity, freedom from discrimination, trust in institutions, and social participation. Each component was measured through multiple survey items, and an aggregate indicator was calculated for each of the six components. Most questions captured participants' perceptions, but some also captured more objective data (membership in specific religious groups, etc.). Results show that food assistance had a positive impact on the social cohesion of refugees, but not on that of host communities. Dudek (2014) analyzed the convergence of the share of expenditure on food in different EU Member States over time as a proxy to understand whether economic and social convergence has taken place in the EU. Only the distributive dimension of social cohesion is examined<sup>8</sup> (see Schiefer & van der Noll, 2017 and section 5), as social cohesion is only mentioned in the context of economic and social convergence.

Annex 2 provides a detailed overview of the content of all 16 articles. In summary the review has shown that social cohesion is conceptualized and measured in very different ways and that in contrast to classical social indicator research, qualitative indicators also play a role.

As far as the conceptualization of social cohesion is concerned, all but two authors consider it to be a multidimensional concept. However, social cohesion is often defined quite narrowly. Especially when compared to the larger studies that explicitly focus on the study of social

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<sup>8</sup> It is important to note that – in line with the majority of literature – we do not conceptualize distributive questions as indicators of social cohesion (see section 4).



cohesion (see section 4). Dimensions such as social relationships or social support are often considered separate concepts rather than part of social cohesion.

With regard to the indicators used, it can be seen that qualitative indicators play an important role for smaller, in-depth case studies. Here, the indicator stands for a dimension of social cohesion that is described in detail using methods from qualitative social science. Qualitative indicators can provide a comprehensive description of the individual components of social cohesion. They can help to explore a field or to better understand results from quantitative methods. Most quantitative indicators were perception-based, but neutral-descriptive data also played a role. Many of the studies reviewed constructed composite indicators for further calculations.

**Two important conclusions** for the IFST indicator guidelines can be drawn from the results. First, different types of indicators might be useful for different types of case studies. For in-depth case studies with a small sample size and a focus on understanding complex relationships between social cohesion and food innovation, qualitative indicators (i.e., broad descriptions of dimensions of social cohesion) may be appropriate. For other case studies, quantitative indicators or, of course, a combination of both may be appropriate.

Second, we must note that none of the studies reviewed developed a specific set of indicators that would be sufficient for analyzing the relationship between food systems and social cohesion in the IFST case studies. Social cohesion is often narrowly defined and the relationships between food and social cohesion are not really explored. Therefore, there is still a need to create a new indicator set for IFST.

## 4 Creating an indicator set for cohesive food system transitions

Because the initial review provided limited insights and did not provide a complete indicator framework for measuring social cohesion in the context of food systems, additional studies on social cohesion were reviewed to close this gap.

### 4.1 Methods

The first step in creating the indicator set was to review a number of key studies that develop, apply, and test indicator sets for social cohesion.

The starting point for the study was the work of the Bertelsmann Stiftung, which launched and operates the "Kohäsionsradar" one of the largest and best-known projects for conceptualizing and measuring social cohesion. Several studies related to the "Kohäsionsradar" regularly examine social cohesion in Germany (see e.g., (Arant, Dragolov, & Boehnke, 2017; Brand et al., 2020; Schiefer et al., 2012). Furthermore, there are other related studies that assess social cohesion at the regional and international levels (Arant, Dragolov, & Boehnke, 2017; Arant, Larsen, & Boehnke, 2017; Dragolov et al., 2013). In addition to the Kohäsionsradar, the



specialized academic journal “Social Indicator Research”<sup>9</sup> was searched for other relevant studies. After an initial screening of journal content, six additional articles were selected because of their relevance for particular the case studies. After reviewing these articles, three additional studies were included because they played an important role in one of the six other articles. Thus, a total of ten studies formed the basis for our indicator framework.<sup>10</sup>

The first step was to identify all dimensions of social cohesion measured in the various studies. This involved harmonizing the terminology and hierarchical structures in the different conceptualizations of social cohesion and eliminating overlaps.

In a second step, all indicators used to measure each of the dimensions were identified, as well as the associated measurements and data sets.

Both identified dimensions and indicators were cross-checked with the results from section 4 to determine if any relevant dimensions or indicators were missing.

Then, the identified dimensions and indicators were aligned with the IFST framework for social cohesion. On this basis, IFST-specific indicators for all dimensions were also proposed, based on the specific context of food systems. The result is a comprehensive pool of indicators that can be used to measure the different dimensions of social cohesion that have been defined in the IFST concept paper.

## Sampling

The following studies were considered in the development of the indicator set:

- Kohäsionsradar is the most prominent study on social cohesion in Germany and perhaps the most comprehensive study measuring and comparing social cohesion across OECD and EU member states. First an indicator framework that is based on secondary data was developed and applied (Dragolov et al., 2013; Schiefer et al., 2012). Later the indicator framework got adapted and indicators were measured through the collection of own primary data (Arant, Dragolov, & Boehnke, 2017; Arant, Larsen, & Boehnke, 2017; Brand et al., 2020). Still the indicator sets are very similar.
- Avery et al. (2021) find differences in social cohesion between rural and urban areas in Minnesota. They were initially included because they provide a thorough overview of the drivers and outcomes of social cohesion.
- Berger-Schmitt (2000) presents a set of normative indicators for measuring social cohesion in Europe. Some indicators are only suggested, and concrete measurements are not presented. Furthermore, as Berger-Schmitt defines social cohesion as having “two societal goal dimensions” (Berger-Schmitt 2000: 4) the approach has been

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<sup>9</sup> Since social cohesion indicator research is a vast research field (see section 2), we followed a pragmatic approach and conducted our first search only in this specialized journal.

<sup>10</sup> Although this does not represent a complete review of the whole literature, we got the impression that we reached a kind of saturation, since there are already huge overlaps between the single studies.



criticized for not actually measuring cohesion but rather other societal goals that are associated with social cohesion (Chan et al. 2006, Bottoni 2018, cf. Barnickel et al. 2023: Concept Paper).

- The study of Botterman et al. (2012) was included because, unlike the other studies, the focus is on objective rather than perception-based indicators.
- Bottoni (2018) provides an empirical study to test and validate social cohesion indicators in 29 countries.
- Dickes and Valentova (2013) and Dickes et al. (2010) present a theoretically grounded, multidimensional set of indicators that can be used to measure social cohesion across a wide range of European countries and regions.
- Goubin (2018) analyzes the relationships between different types of economic inequality and social cohesion and provides a useful starting point for discussing the relationship between inclusiveness and social cohesion.
- Janmaat (2011) explores whether social cohesion is generally conditioned by socioeconomic development or whether it is more likely determined by durable regional regimes that resist modernization.
- Langer et al. (2015) developed a perception-based index of social cohesion for African countries and by doing so brings a perspective from the global south into the research field.
- Based on the concept of social integration Vergolini (2011) creates a composite indicator for social cohesion.

## 4.2 Dimensions of social cohesion covered in previous research

All of the studies mentioned above consider social cohesion to be a multidimensional concept. However, the individual authors take different approaches to conceptualizing social cohesion, resulting in different dimensions or sub-dimensions being measured. A detailed overview of the different approaches to defining and conceptualizing social cohesion is provided in the IFST concept paper (Barnickel et al. 2023). The purpose here is to provide an overview of the dimensions of social cohesion for which indicators have been created or selected. The task is complicated by the fact that the various authors use different terminology to describe the conceptual categories of social cohesion. Also please note that some of the authors refer to the “distributive” dimensions of social cohesion (such as exclusion, inequalities and regional disparities). According to the IFST framework - and in line with main parts of the scientific literature - those dimensions are not included in our conceptualization of social cohesion. However, in the following overview they are listed, because the aim was to show what dimension have been addressed in previous research. This issue will be clarified in the following sections.

Avery et al. (2021) refer to the components of social cohesion identified by Sampson et al. (1997), which have also been widely used in studies of neighborhood influences on health (see



section 4): close knit neighborhood; helpfulness/solidarity, interpersonal trust, conflict, shared values.

Berger-Schmitt (2000) takes a normative approach and identifies two goals related to social cohesion: strengthening social capital and reducing inequalities, inequity and exclusion. For each of these goals, she then identifies related goal dimensions that should be measured. The existence of social relationships, social and political engagement, the quality of social relationships, and the quality of institutions are part of the goal of strengthening social capital. Reducing regional disparities, inequalities between different groups, and social inclusion are part of the goal of reducing disparities, inequalities, and exclusion. In addition, for each of the target dimensions, corresponding measurement dimensions, sub-dimensions and finally indicators are identified.

Botterman et al. (2012) follows Kearns and Forrest (2000) conceptualization and analyses five different dimensions of social cohesion: shared social norms and values, social order and control, absence of social exclusion and inequalities, social capital, and identification with a particular geographic unit.

Bottoni (2018) based her work on three main assumptions from previous research on social cohesion. First, that social cohesion is constituted at a micro, meso, and macro level (Whelan & Maître, 2005). Second, that it is based on social interactions as well as attitudes and norms (Chan et al., 2006). Third, that it can be analyzed from a subjective and objective perspective (Bollen & Hoyle, 1990). Based on these assumptions, she identified seven dimensions of social cohesion: interpersonal trust (sub./micro); social support (sub./micro); openness (sub./meso); institutional trust (sub./macro); density of social relations (obj./micro); participation (obj./mesa); and legitimacy of institutions (obj./macro).

Dickes and Valentova (2013) work draws on Bernard (1999) conceptualization of social cohesion and distinguishes between different social spheres (economic, political, and sociocultural) and attitudinal and behavioral aspects of relationships. In line with Chan et al. (2006), they excluded the economic dimension from their study and identified political and socio-cultural participation as well as trust in institutions and solidarity as relevant dimensions of social cohesion.

Goubin (2018) draws on the earlier research of Vergolini (2011), who identified six dimensions of social cohesion belonging to two different domains. Willingness to participate, participation in associations, and feelings of isolation belong to the network density domain. Interpersonal trust, institutional trust, and the quality of public services belong to the domain of civic integration.

Janmaat (2011) uses Moody and White (2003) distinction between ideational and relational dimensions of social cohesion and reviews several conceptualizations of macro-level social cohesion to finally identify six of its "components": common values, shared sense of belonging, social trust, tolerance, institutional trust, civic participation, political engagement, social order, and equality.



All studies of the “Kohäsionsradar” follow the same conceptual framework first presented in (Dragolov et al., 2013; Schiefer et al., 2012). Three so-called domains of social cohesion are identified. Each of these domains consists of three dimensions. The social relations domain includes the dimensions social networks, trust and acceptance of diversity. The domain belonging includes the dimensions identification with a group, trust in institutions, perception of fairness. Solidarity, acceptance of social norms and rules and social and political participation belong to the domain of orientation towards the common good.

(Langer et al., 2015) identify interpersonal and institutional trust as well as inequality and identity as dimensions of social cohesion. Furthermore, the authors emphasize that social cohesion in the African context must take into account relations between different ethnic groups.

As mentioned earlier, there is no consistent approach to the conceptualization of social cohesion in the various studies. First, the authors use different terminologies to name their conceptual categories. For example, the "components" of social cohesion mentioned by (Janmaat, 2011) refer to the same conceptual category as the dimensions mentioned by (Dragolov et al., 2013).

Second authors created different hierarchical systems to break down social cohesion. Berger-Schmitt (2000), for example, distinguishes five hierarchical levels: Goal, Target Dimension, Measurement Dimension, Subdimension, and Indicator, while Dragolov et al. (2013) distinguishes three levels (Domain, Dimension, and Indicator) and Avery et al. (2021) distinguishes only two levels (Dimension and Indicator).

These existing approaches were harmonized, by distinguishing between four analytical categories: core-dimension, dimensions, indicator, and measurement. The analytical category "dimensions" forms the backbone for the IFST indicator framework.

- Core-dimensions are comprehensive super-categories to which the individual dimensions belong. Following the extensive literature review by Schiefer and Noll (2017), three main core dimensions are considered: a relational, an ideational, and a distributive core dimension. As aforementioned Schiefer and Noll themselves argue that the distributive core dimension should not be considered as part of social cohesion, and we follow this argumentation (see next sections).
- Dimensions belong to different core-dimensions. However, the distinctions are often blurred, and there is overlap. Therefore, a dimension can be considered as part of more than one core-dimension (Schiefer et al., 2012).
- Indicators measure different aspects of a dimension of social cohesion.
- Finally, measurements describe how and with which data the measurement of an indicator is carried out.

To harmonize the hierarchical systems, it was sometimes necessary to split one dimension used in one study into two separate dimensions or to combine two dimensions into one. In addition to using differing hierarchical systems, authors use different terminology to name and describe





each dimension. Often, different terms are used to describe essentially the same dimensions (e.g., "social support" by Bottoni (2018) and solidarity by Dragolov et al. (2016), both capture solidarity). The use of different terminology can be confusing. We looked at the actual indicators assigned to each dimension by the different authors, to make a final decision how to harmonize the various terminologies. On this basis, we standardized the names of the dimensions. In summary the following changes were made<sup>11</sup>:

Avery et al. (2021): renaming "close knit neighborhood" into "identification", renaming "shared values" into "common values";

Berger-Schmitt (2000): renaming "equal opportunities" to "equality"; renaming "reduction of disparities" into "disparities"; renaming "quality of social relations" into "social networks"; renaming "quality of societal institutions" in "legitimacy"; renaming "civic engagement in public realms" into "civic engagement/participation";

Botterman et al. (2012): renaming "shared values" into "common values"; splitting "social capital" in "political engagement/participation" and "civic engagement/participation"; renaming "wealth disparities" in "disparities"; renaming "identity" into "identification"

Bottoni (2018): splitting the dimension "participation" in "political engagement/participation" and "civic engagement/participation"; renaming "openness" into "tolerance"; renaming "legitimacy/illegitimacy" in "institutional trust"; renaming "belonging/isolation" in "identification"; renaming "social support" in "solidarity".

Dickes and Valentova (2013): renaming "acceptance/rejection" in "solidarity"; splitting "participation/passivity" in "political engagement/participation" in "civic engagement/participation"

Janmaat (2011): renaming "shared sense of belonging" in "identification"; renaming "social trust" in "interpersonal trust"; renaming "social order" in "acceptance of social norms and rules"

"Kohäsionsradar" (Dragolov et al., 2013; Schiefer et al., 2012): splitting the dimension "societal participation" in "political engagement/participation" and "civic engagement/participation"; renaming "acceptance of diversity" in "tolerance".

Langer et al. (2015): renaming "inequality" into "equality"; renaming "identity" into "identification"

Vergolini (2011) and Goubin (2018): combining "participation in association" and "willingness to participate" into "political engagement/participation"; renaming "perceived quality of public services" in "legitimacy of institutions"; renaming "isolation" into "social networks"

After all these changes a list of 16 dimensions was created: acceptance of social rules and norms; civic engagement/participation; common values; harmony; identification; institutional trust; interpersonal trust; legitimacy of institutions; perception of fairness; political

<sup>11</sup> The reader can cross check and evaluate our standardization by looking at the list of indicators in section 4.6.



engagement/participation; social networks; solidarity; tolerance; disparities; equality; exclusion. Three of these dimensions are distributive dimensions and are therefore not considered as part of social cohesion.

### **Cross-referencing with existing research on social cohesion and food innovation.**

To assess whether the list of identified dimensions is exhaustive enough to cover the full range of the social cohesion-food nexus, we looked at the review in section 4 as well as the larger review of Barnickel et al 2023 and assessed whether all dimensions addressed there are covered by the newly derived list of dimensions.

The new list covers all dimensions and indicators mentioned in the review of section 4x except for "ethnic heterogeneity" in the study of Langemeyer et al. (2020). However, the notion of ethnic hetero/homogeneity as a proxy indicator for social cohesion is highly controversial and problematic. Therefore, this indicator and a related dimension was not included.

The larger review by Barnickel et al. 2022 showed the importance of the concept of social capital for understanding the relationship between social cohesion and food systems. On the one hand, bonding social capital describes the support that people (or groups) can receive through more or less closed networks (see Bernhard, 1999, Putnam (see Bernard, 1999; Putnam, 1995). On the other hand, bridging social capital describes the cross-group connections, i.e., the establishment and maintenance of members' contacts between different social groups. These cross-group connections can build trust, promote overall social cohesion, and also lead to support among network members (Hewstone, 2015; Putnam, 1995). Several studies show the reciprocal effects of food system innovations and bonding and bridging social capital. For example, Saint Ville et al. (2017), Rivera et al. (2021) or Boody et al. (2005) showed the lack of especially bridging social capital (intergroup links) can hinder cooperation, innovation and the transition of (local) food systems such as Caribbean reef fisheries. King (2017) demonstrated the importance of bonding social capital in a study of disadvantaged mothers in the U.S. by showing that social support from neighborhood networks (people who help with a financial loan, provide housing, or help with child care) reduces the risk of food insecurity (for a discussion of the example cf. Barnickel et al. 2023: Concept paper).

With the exception of Botterman et al. 2012<sup>12</sup> and Berger-Schmitt (2000), social capital is not explicitly prominent in the studies from which the list of dimensions was derived. However, it can be assumed that many aspects of social capital can be subsumed under the dimension of social relations. A look at the indicators that are part of this dimension (see next section) shows that here mainly aspects of bonding social capital are considered. Therefore, additional indicators to measure "intra-group linkages" (i.e., bridging social capital) were introduced into the dimensions of social networks (see next section). Since modern food systems are often characterized by long and highly concentrated food value chains (Howard, 2019), direct contact between different groups along these chains is limited and intra-group linkages might be of

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<sup>12</sup> However, Botterman et al. 2012 seem to use a broad definition of social capital and to assess rather political and civic engagement



particular importance. Table 1 provides a final overview of the identified dimensions and shows which study addresses them.

*Table 1 overview on dimensions identified in social cohesion indicator studies*

| Dimensions of social cohesion  | Studies addressing the single dimensions |                 |                 |                  |                  |                |                |                |                |                  |
|--|--|-----------------|-----------------|------------------|------------------|----------------|----------------|----------------|----------------|------------------|
|  | A <sup>1</sup>                           | BS <sup>2</sup> | BO <sup>3</sup> | BOT <sup>4</sup> | D,V <sup>5</sup> | G <sup>6</sup> | J <sup>7</sup> | K <sup>8</sup> | L <sup>9</sup> | VE <sup>10</sup> |
| <b>acceptance of social rules and norms</b>  |  |                 | X               |                  |                  |                | X              | X              |                |                  |
| <b>civic engagement/participation</b>  |  | X               | X               | X                | X                |                | X              | X              |                |                  |
| <b>common values</b>   | X  |                 | X               |                  |                  |                | X              |                |                |                  |
| <b>harmony</b>   | X  | X               |                 |                  |                  |                |                |                |                |                  |
| <b>identification</b>  |  |                 |                 |                  |                  |                |                | X              | X              |                  |
| <b>institutional trust</b>   |  | X               |                 | X                | X                | X              | X              | X              | X              | X                |
| <b>interpersonal trust</b>   | X  |                 |                 | X                |                  | X              | X              | X              | X              | X                |
| <b>legitimacy of institutions</b>  |  | X               |                 | X                | X                | X              |                |                |                | X                |
| <b>perception of fairness</b>  |  |                 |                 |                  |                  |                |                | X              |                |                  |
| <b>political engagement/participation</b>  |  | X               | X               | X                | X                |                | X              | X              |                | X                |
| <b>social networks</b>   |  |                 | X               | X                |                  | X              |                | X              |                | X                |
| <b>solidarity</b>  | X  | X               |                 |                  | X                |                |                | X              |                |                  |
| <b>tolerance</b>   |  |                 |                 | X                |                  |                | X              | X              |                |                  |
| <b>Distributive dimensions (according to IFST framework not part of social cohesion)</b> |  |                 |                 |                  |                  |                |                |                |                |                  |
| <b>disparities</b>   |  | X               | X               |                  |                  |                |                |                |                |                  |
| <b>equality</b>  |  | X               |                 |                  |                  |                | X              |                | X              |                  |
| <b>exclusion</b>   |  | X               |                 |                  |                  |                |                |                |                |                  |

<sup>1</sup>Avery et al 2021; <sup>2</sup>Berger-Schmidt 2003; <sup>3</sup>Botterman et al. 2012; <sup>4</sup>Bottoni 2018; <sup>5</sup>Dickens and Valentova 2012; <sup>6</sup>Goubin 2018; <sup>7</sup>Janmaat 2011; <sup>8</sup>Kohäsionsradar studies; <sup>9</sup>Langer et al. 2019; <sup>10</sup>Vergolini 2011

### Remarks regarding the dimensions and the conceptualization of social cohesion

It was not the goal of this work to create a new conceptualization of social cohesion. I.e., to define of what dimension social cohesion consists of and how the single dimensions are related to each other, or what dimension is more important than another one. We simply collected and show what dimensions of social cohesion have been addressed in the reviewed literature. What dimensions are relevant and how they are interconnected in a specific context have to be defined by researchers for their specific research problems.<sup>13</sup> The indicator guidance only provides a foundation for this task. However, we still follow the core conceptualizations of the IFST framework in this guidance: (i) In line with most of the literature. We do not consider the distributive aspects part as a dimension of social cohesion. Questions related to disparities, exclusion and equality are rather related to “inclusiveness” and should, therefore, not be used for measuring social cohesion. (ii) We differentiate between a multi-level definition of and a multi-level perspective on social cohesion, which requires us to consider indicators for the

<sup>13</sup> Similarly, we are also aware that some of the dimensions are of a normative character and therefore questioned and criticized. For example, the dimensions turn social cohesion into a concept to assess how well citizens are/feel integrated in a nation state such as “trust in institutions” or “acceptance of rules” are sometimes viewed as problematic.



individual, group and institutional level. These two major specifications will be addressed in section 4.4.

### 4.3 Available social cohesion indicators

In the various studies, a total of 277 indicators were used or proposed to measure social cohesion. As with the dimensions, there was some confusion about terminology and hierarchies. First, of course similar indicators were used in different studies. Second, some similar indicators were named differently. Third, some authors distinguished between an indicator and measurement (i.e. the survey item or existing statistical data used to measure the indicator) (Dragolov et al., 2013). For other authors, the measurement itself equaled the indicator (e.g., Dickes & Valentova, 2013).

The indicators were again harmonized by distinguishing between indicator and measurement. Furthermore, duplicates were sorted out. The result is a list of indicators and related measurements. A detailed description of each indicator is provided in the next section. As mentioned above, the indicators used in the various cohesion radar studies are very similar. However, they rely on different data sources. Therefore, the indicators used in the different studies are mentioned. Those that rely on secondary data are labeled “K”, and those that rely on their own primary data are labeled “BMZM”<sup>14</sup>.

All indicators are of a quantitative nature. In addition, most indicators are perception-based. That is, they are based on survey data and thus on participants' self-reports. Only four studies also included other statistical data. Berger-Schmitt (2000) suggested the use of various national statistics. Botterman et al. (2012) relied entirely on descriptive data such as crime rates or baptism rates from regional or national Belgian statistics. Janmaat (2011) used statistical data from the World Bank (Gini coefficient) and the United Nations (homicide rate). The first “Kohäsionsradar” study (Dragolov et al., 2013) uses expert estimates of the extent of shadow work and statistics on voting behavior and turnout from the Democracy Measure database.

It is striking that except of the later “Kohäsionsradar” studies (Arant, Dragolov, & Boehnke, 2017; Arant, Larsen, & Boehnke, 2017; Brand et al., 2020) none of the studies collected their own primary data, but relied on available data from large, often international surveys:

- Avery et al. (2021) uses data from the Missouri Crime Victimization Survey (MCVS).
- Dickes and Valentova (2013) used data from the fourth wave of the European Values Survey (EVS) from 2008
- Vergolini (2011) used data from the first round of the European Social Survey (ESS).
- Bottoni (2018) used data from the 6<sup>th</sup> wave of the ESS from 2012
- Langer et al. (2015) used three rounds of the Afrobarometer survey (2005 – 2012)

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<sup>14</sup> Abbreviation created from the title and the publisher of the studies.



- Janmaat (2011) uses in addition to statistical data also the findings from the World Value Survey (WVS) from 1999
- Berger-Schmitt (2000) uses data from the three WVS (1981, 1990, 1996) as well as the data from the Eurobarometer (EB) and from the European Survey on Working Conditions (ESWC) from 1996
- Finally, the first studies of the “Kohäsionsradar” aim to compare not only the EU but also a number of European and non-European industrialized countries and therefore combine a larger number of different surveys: EWS, ESS, WVS, EB, European Quality of Life Survey (EQLS), Gallup World Poll (GWP), International Social Survey Program (ISSP), International Country Risk Guide (ICRG), International Crime Victims Survey (ICVS), International Social Justice Report (ISJR). Data was gathered within three different time periods between 1996 and 2003.

These data sets are a valuable source for measuring social cohesion and also for comparing case study results with national averages.

#### 4.4 Matching available indicators with the IFST conceptual framework

The IFST concept paper provides a robust and state-of-the-art conceptualization of social cohesion that is applicable in the context of inclusive food system transitions. In order to create a suitable set of indicators, the previously identified dimensions and indicators of social cohesion were aligned with the analytical categories of the IFST framework. The IFST framework defines social cohesion as a multidimensional and multilevel concept. Therefore, "dimensions" and "levels" can be considered as the core analytical categories. The task is to identify which indicators are appropriate to measure which dimensions at which level. The result is a pool of indicators that could theoretically be used to measure or assess the different parts of the IFST definition of social cohesion. The fact that the pool consists of already used indicators also increases the comparability of the case study results with existing research.

##### 4.4.1 Dimensions

The IFST framework built in part on the findings of the broader literature review by Schiefer and van der Noll (2017), who identified three basic core-dimensions of social cohesion: the relational, the ideational, and a distributive core-dimension. The ideational core dimension consists of affective and cognitive components of social cohesion such as perceived values, trust, etc. The relational core-dimension stands for interactions and networks between actors and groups. Finally, the distributive core-dimension stands for equal or unequal distribution of resources, benefits and burdens, and social inclusion or exclusion. The understanding of social cohesion proposed in the IFST project does not include the distributive dimension. All of the dimensions of social cohesion identified in the previous section are part of one or two of these core dimensions. It is not possible to assign 100% of each dimension to a core dimension (Schiefer & van der Noll, 2017), but the following list represents an initial assessment. The final decision must then be made for each indicator individually.



- Ideational core-dimension: acceptance of social rules and norms; common values; identification; institutional trust; interpersonal trust; legitimacy of institutions; perception of fairness; solidarity; tolerance
- Relational core-dimension: civic engagement/participation; political engagement/participation; social networks; (performed) solidarity; (performed) tolerance
- Distributive core-dimension: equality, disparities; exclusion

In line with Chan et al. (2006) and Schiefer and van der Noll (2017), the IFST framework excludes the distributive dimensions from the definition of social cohesion to avoid overlap with other concepts and confusing the components of social cohesion with its drivers or outcomes. The consequence for the indicator set is that all indicators that belong to a distributive dimension must be excluded from the set of indicators that measure social cohesion. The remaining indicators are suitable to assess different aspects of social cohesion in the IFST project. However, the excluded distributive dimensions can still play a role at the level of structural influences on social cohesion (see next section).

#### 4.4.2 Levels

Levels is the second important analytical category of the IFST framework that is often overlooked in other research on social cohesion Friedkin (2004). In short, the IFST framework argues *“that social cohesion is enabled or constrained through macro-level developments, mediated through social structures and institutions, performed through the interactions at the meso-level of groups and communities, and perceived and experienced at the individual level.”* (Barnickel et al 2023)

Social cohesion can therefore be studied at the level of individuals (through people's perceptions and experiences) and at the level of groups and communities (through people's interactions and performances). In contrast, structures or institutions cannot be socially cohesive, they can only influence the social cohesion of groups and networks (see concept paper for a more detailed discussion). Consequently, we need indicators to measure social cohesion at the individual and group level. At the structural level, we can only map how certain institutions or structures affect social cohesion. This can, of course, be done using indicators that measure certain structural aspects that might have an impact on different components of social cohesion. Indicators that measure the importance of different direct marketing channels, for example, could tell us about the possibilities of direct contact between consumers and producers and thus about the possibility of establishing links between groups.

At first glance, it seems that the relational dimensions of social cohesion are more related to the group level and the ideational dimensions are more related to the individual level of social cohesion. However, we have to bear in mind that interactions at the group level are made up of individuals that e.g. perceive and experience the quality of interactions. Similarly, how (individual) senses of belonging or trust in others are perceived and experienced is related to how people experience social relations. Therefore, there are indicators that can be issued for inferences on multiple levels. Also, there is the issue of data that has been collected and



aggregated to identify characteristics of larger social groups. For example, if data about people's perception of shared values is aggregated to identify the homogeneity or heterogeneity of values in larger societies. In our opinion that aggregated data informs about the structural conditions that affect social cohesion. It should be not confused with measuring actual social cohesion on the group level, because the performance of social cohesion on this level is constituted only by interactions. Structural conditions influence these interactions.

Therefore, it is necessary to clarify for each indicator what value it has for the individual, group or structural level. The result of this clarification is a structured pool of indicators that can be used to measure the different analytical categories of the IFST framework. Finally, we argued before that those indicators related to the distributive dimensions should be excluded from a framework that aims to measure social cohesion. However, those indicators still have their place in this IFST indicator set. Although indicators of those dimensions do in our opinion not measure social cohesion, they can be still used to measure certain structural features that influence social cohesion. Their place is therefore on the structural level of the IFST framework.

## 4.5 Adaptation of existing indicators for the context of food systems

Aligning the existing indicators with the analytical categories of the IFST framework already provides a pool of suitable indicators for assessing social cohesion. However, none of the indicators have been developed specifically for measuring social cohesion in the context of food systems or food system innovations.

The core of IFST's empirical work consists of six in-depth case studies in different food systems. It would be useful to have specified indicator sets that consider the specific context of the case studies to get a better idea of how food system innovation is affected by, but also influences, social cohesion. Unfortunately, neither the review in section 3 nor the larger review by Barnickel et al 2023 in the concept paper provided us with such a specific indicator framework. Therefore, the task is to adapt the indicators previously used to specify them for the measurement of social cohesion in food system networks or even smaller food system innovation networks.

Food systems can be defined as all activities (and actors) linked to food value chains (i.e., the different steps of production, processing, distribution, and consumption of food) as well as the outcomes of these activities in terms of food availability, access, utilization, and associated social and environmental well-being. These activities are shaped by a complex web of rules, institutions, and structures. Food systems are influenced by environmental and socioeconomic drivers that are simultaneously affected by food systems activities and outcomes (Ericksen 2008; Ingram 2011). In line with the IFST framework, food systems can be described as sociotechnical systems composed of technical (e.g., infrastructure, production processes) and social elements (e.g., formal and informal rules, values) (Gaitán-Cremaschi et al., 2019; Levidow et al., 2014; Schrode Alexander et al.).



With this definition in mind, existing indicators were specified where appropriate and new indicators were added where there were obvious gaps. A number of relevant new data sets were also identified in this way.

On some occasion on the structural level we refer to indicators that measure inclusiveness. Those are indicators that measure that have been further developed from certain distributive dimensions and measure the degree of economic, political, social, educational, environmental and health exclusion that can lead to further inequalities and disparities. Those inclusiveness indicators are not described here, but in a separate indicator guideline (see inclusiveness indicator guidelines 2022).

## 4.6 An indicator set for inclusive food system transitions.

This section presents an initial proposal for the IFST indicator set for assessing social cohesion in the context of food systems. First Table 2 provides an overview of all the relevant indicators identified in previous studies as well as the specified IFST indicators (green).

Furthermore, all indicators for one dimension of social cohesion are described in detail in separate subsections. For each relevant dimension, all available indicators are first presented, and it is shown which of the indicators can be used to assess social cohesion at the individual or group level, or whether the indicator can provide relevant information about the structural level. Also, for each indicator the measurement (i.e., the survey item or data used to measure the indicators) are described. If a publicly available larger data set was used to measure the indicator, it is also mentioned.<sup>15</sup> Relevant data sets were:

- Afrobarometer (AB)
- Eurobarometer (EB)
- European Social Survey (ESS).
- European Survey on Working Conditions (ESWC) from 1996
- European Quality of Life Survey (EQLS),
- European Values Survey (EVS) from 2008
- Gallup World Poll (GWP)
- International Social Survey Program (ISSP),
- International Country Risk Guide (ICRG), International Crime Victims Survey (ICVS)
- International Social Justice Report (ISJR)
- Missouri Crime Victimization Survey (MCVS).
- World Value Survey (WVS)
- The later studies of the “Kohäsionsradar” do not rely on existing secondary data, but conduct their own surveys. However, their work could be also interesting for the

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<sup>15</sup> Some of the indicators from Berger-Schmidt 2002 were not used in the studies, but only proposed. This is also indicated in the table.





comparison of case study findings with aspects of social cohesion on the national level (BMZM<sup>16</sup>)

At this point, we have not selected the one most appropriate measurement for each indicator. Instead various options for measuring the indicators are presented and the case studies can use the most appropriate one. However, it could also be beneficial for the project to discuss the different types of measurement and select always the most suitable one in order to increase the comparability of the case studies. After presenting the available indicators, possible IFST indicators for the food system or food system innovation network are presented for each level. Again, these IFST indicators are a first suggestion. There are certainly more possible indicators, especially for the specific case studies. The idea is that the case studies researchers also suggest relevant indicators or measurements in their context.

During the adaptation of the indicator set, three new publicly available datasets were identified as useful for measuring specific indicators or comparing the case studies to the average national situation in the countries where they are located.

- The Special Eurobarometer 505 -Making our food fit for the future – Citizens expectations (EBFF)  
<https://europa.eu/eurobarometer/surveys/detail/2241>
- The Special Eurobarometer EB91.3 -Food safety in the EU (EBSF)
- The “Overview of community supported agriculture in Europe” from the European CSA Research group (Urgenci)  
<https://urgenci.net/wp-content/uploads/2016/05/Overview-of-Community-Supported-Agriculture-in-Europe.pdf>

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<sup>16</sup> We use this abbreviation to indicate the results presented in the latest study related to the Kohäsionsradar Brand et al. (2020)



Table 2 potential indicators for assessing different dimensions and levels of social cohesion in the context of food systems

| Dimensions of social cohesion   | Levels of social cohesion   |  |   |
|---------------------------------|---|--|---|
|                                 | Individual level  | Group level  | Structural level  |
| Acceptance of rules and norms   | IA1 perceived extent to which people are following traffic rules*<br>IA2 perceived safety in the environment<br>IA3 perceived severity of committing a traffic offense<br>IFST_IA1 perceived extent to which fraud is committed in the respective food value chain<br>IFST_IA3 perceived severity of food fraud | IFST_GA1 fraudulent behavior in a specific food value chain or networks  | SA1 share of shadow economy<br>SA2 rate of theft<br>SA3 rate of vandalism<br>SA4 rate of violence<br>IFST_SA1 rate of fraudulent behavior in the food value chain   |
| Civic engagement/ participation |   | GC1 membership in a civic organization<br>GC2 membership in a religious organization<br>GC3 membership in a worker organization<br>GC4 participation in a civic organization<br>GC5 participation in a religious organization<br>IFST_GC1 membership in food organizations or network<br>IFST_GC2 participation in food organizations or network | SC4: number of employees represented by a workers' council (p)***<br>SC2 share of companies with a workers' council (p)<br>IFST_SC1: number of employees in the food and agriculture sector represented by a workers' council<br>IFST_SC2 share of companies in the food and agriculture sector with a workers' council<br>IFST_SC3 market share of participatory food value chains |
| Common values                   | ICV1 perceived degree of common values<br>IFST_CV1: perception of shared food values  |  | GCV1 Consensus on democracy as preferred system<br>SCV2 Consensus on gender equality<br>SCV3 Consensus on survival-self-expression values<br>SCV4 Consensus on traditional-secular values<br>SCV5 Baptism ratio<br>SCV6 Church attendance Christmas ratio<br>SCV7 Funeral ratio   |



|                     |   |  |  |
|---------------------|---|--|--|
|                     |   |  | SCV8 Marriage ratio<br>IFST_-SCV1: consensus on food philosophies/lifestyles |
| Perceived harmony   | IPH1 perceived harmony between neighbors<br>IPH2 perceived conflicts between generations<br>IFST_IPH1 perceived conflicts between members of different food value chains<br>IFST_IPH2 perceived harmony between members of the food regime and niches actors  |  | IFST_SPH1 media prominence of actual conflicts in food systems               |
| Identification      | I11 level of national identity<br>I12 level of national pride<br>I13 identification with a certain geographical unit<br>I14 desire to emigrate<br>I15 level of neighborhood identity<br>I16 level of regional identity<br>I17 level of federal identity<br>I18 perception of close knit neighborhood<br>IFST_I11 identification with a certain geographical unit of the food system<br>IFST_I12 identification with certain food philosophies/lifestyle<br>IFST_I13 perceived discrepancy between own food values and the food values of the majority                           |  | IFST_SI1 prominence of regional food production and consumption              |
| Institutional trust | IIT1 confidence in legislative/political institutions<br>IIT2 confidence in executive institutions<br>IIT3 confidence in judiciary I institutions<br>IIT4 confidence in education system<br>IIT5 confidence in church /religious organizations<br>IIT6 confidence in civil service<br>IIT7 confidence in labor organizations<br>IIT8 confidence in market/economic institutions<br>IIT9 confidence in military<br>IIT10 confidence in press and media<br>IIT11 confidence in social security system<br>IIT12 confidence in the health system<br>IIT13 confidence in charity (p) |  | IFST_SL1_ aggregated data of IIT1 – IIT6 (trustworthiness of institutions)   |



|                            |  |  |  |
|----------------------------|--|--|--|
|                            | <p>IFST_IIT2 confidence in organizations along the food value chain</p> <p>IFST_IIT3 confidence in food regulations and rules</p> <p>IFST_IIT4 confidence in organizations directly involved in daily food practices</p> <p>IFST_IIT5 awareness of food safety issues</p> <p>IFST_IIT6 concern about food safety</p>   |  |  |
| Interpersonal trust        | <p>IPT1 perceived fairness of other people</p> <p>IPT2 perceived helpfulness of other people</p> <p>IPT3 perceived trust in other people</p> <p>IFST_IPT1 perceived trust in other actors in the food value chain</p>  |  |  |
| Legitimacy of institutions | <p>ILI1 perceived state of education</p> <p>ILI2 perceived state of health system</p> <p>ILI3 satisfaction with democracy</p> <p>ILI4 satisfaction with economy</p> <p>ILI5 satisfaction with government</p> <p>ILI6 satisfaction with labor offices (p)</p> <p>IFST_ILI1 satisfaction with organizations along the food value chain</p> <p>IFST_ILI2 satisfaction with food regulations and rules</p> <p>IFST_ILI4 satisfaction with the role of public authorities in the sustainable transformation of food systems</p> |  | <p>IFST_SL1_ aggregated data of ILI1 – IFST_ILI4 (performance of institutions)</p> <p>IFST_ILI3 satisfaction with the role of public authorities in the sustainable transformation of food systems</p> |
| perception of fairness     | <p>IPF1 perceived corruption</p> <p>IPF2 perceived need to tackle wealth gap</p> <p>IPF3 perceived tensions between rich and poor</p> <p>IPF4 perception of fair income</p> <p>IPF5 perception of social inequalities</p> <p>IPF6: perception of economic fairness</p> <p>IFST_IPF1 perceived fairness of working conditions in the food value chain</p> <p>IFST_IPF2 perceived fairness of prices the food value chain</p>  |  | <p>SPF1 expert judgement on the level of corruption in a system</p>  |



|                                     |  |   |  |
|-------------------------------------|--|---|--|
| political engagement/ participation | IPP1 interest in politics<br>IFST_IPP1 Interest in food politics   | GPP1 membership political organization<br>GPP2 participation/ work in a political organization<br>GPP3 political activism<br>IFST_GPP1 political food activism  | SPP1: expert assessment on voter turnout   |
| Social networks                     | ISN1 importance of family and friends<br>ISN2 perceived loneliness   | GSN1: density of social network<br>GSN2: quality of social networks<br>GSN3: support from social networks<br>IFST_GSN1 food related inter-group links (bridging social capital)<br>IFST_GSN2 food related density of networks<br>IFST_GSN3 support from food related networks | SSN1 structural conditions for intergroup links along the value chain  |
| Solidarity                          | IS1 concern about other people<br>IS2 willingness to help others<br>IS3 perceived importance of governmental social support<br>IS4 perception of community solidarity<br>IFST_IS1 concern about other people in the food value chain<br>IFST_IS2 approval of support for other people in the food value chain  | GS1 self-reported acts of solidarity<br>GS2 received acts of solidarity<br>IFST_GS1 food related acts of solidarity)<br>IFST_GS2 food related received acts of solidarity   | IFST_SS1 agricultural subsidies<br>IFST_SS2 food charity<br>IFST_SS3 IFST_SS3 share of people participating in food aid programs   |
| Tolerance                           | IT1 acceptance of ethnic minorities<br>IT2 acceptance of homosexuality<br>IT3 acceptance of immigrants/foreigners<br>IT4 perceived benefits from immigration<br>IT5 perceived societal aversities against ethnic minorities<br>IT6 perceived societal aversities against homosexuals<br>IT7 acceptance of other religions<br>IT8 acceptance of other lifestyles<br>IFST_T1 acceptance of different food philosophies/lifestyles<br>IFST_T2 acceptance of different farming philosophies<br>IFST_T3 tolerance of other people in the value chain<br>IFST_T4 tolerance for diverse food cultures | s   | ST1 Expert judgement regarding ethnical tensions in a certain group or society<br>ST2 Expert judgement regarding religious tensions in a certain group or society<br>IFST_ST3_ aggregated data of IT1 – IFST_T4 (level of tolerance in network, society) |

\* already existing indicators (in black) \*\*new indicators specified for the IFST project (in green) \*\*\*indicator was not actually used in the respective study, but only proposed



## 4.6.1 Acceptance of social rules and values

### Individual level

| Indicator  | Measurement (item; data)  | data type | Data set | Study |
|--|---|-----------|----------|-------|
| <b>Indicators in use</b>   |   |           |          |       |
| IA1 perceived extent to which people are following traffic rules                         | To what extent do people follow the traffic rules?  | survey    | EQLS     | K     |
| IA2 perceived safety in the environment  | Do you feel safe alone in the city/environment?   | survey    | GW P     | K     |
|  | Do you feel safe on the streets at night?   | survey    | ICV S    | K     |
| IA3 perceived severity of committing a traffic offense                                   | How bad is it to commit a traffic offense?  | survey    | ESS      | K     |
| <b>Proposed new IFST specific indicators</b>   |   |           |          |       |
| IFST_IA1 perceived extent to which fraud is committed in the respective food value chain | How prominent is fraudulent behavior in () agriculture; () food industry () retail () when buying or consuming food | survey    | ?        | ?     |
| IFST_IA2 perceived severity of food fraud  | How bad is fraudulent behavior in () agriculture; () food industry () retail () when buying or consuming food       | survey    | ?        | ?     |

### Indicators for group level

| Indicator  | Measurement (item; data)   | data type   | Data set | Study |
|--|--|-------------|----------|-------|
| <b>Proposed new IFST specific indicators</b>             |  |             |          |       |
| IFST_GA1 fraudulent behavior in a specific food networks | Number and severity of actual fraudulent behavior in a specific food network | observation |          |       |

### Structural level

Statistical, national or regional data on crime and violence are seen as indicators of social structures that go beyond the case study networks. Only if data on crime or violence could be collected in the actual network under study would they be an indicator of group level.

| Indicator                   | Measurement (item; data)   | data type  | Data set                  | Study   |
|-----------------------------|--|------------|---------------------------|---------|
| <b>Indicators in use</b>    |  |            |                           |         |
| SA1 share of shadow economy | percentage of shadow economy on total GDP estimated by experts   | Statistics | S&A                       | BO      |
| SA1 rate of theft           | Number of reported burglaries per 1000 inhabitants   | Stat.      | Federal Police of Belgium | BO      |
| SA2 rate of vandalism       | Number of reported crimes related to destruction and damage per 1000 inhabitants   | Stat.      | Federal Police of Belgium | BO      |
|                             | Gibt es in Ihrer Nachbarschaft Probleme mit ... (Anteil Ja-Antworten): Hundekot auf der Straße, falsch oder behindernd parkenden Autos, beschädigten Spielplätzen, Graffiti, Müll in den | survey     | BMZM*                     | B,F,U** |



|   |  |        |                |       |
|---|--|--------|----------------|-------|
|   | Straßen oder rüanlagen, Ruhestörungen, herumlungernden Betrunkenen, Belästigung oder Beschimpfung*   |        |                |       |
| SA4 rate of violence                            | 100 minus number of homicides per 100.000 inhabitants  | Stat.  | United Nations | BO    |
|   | Gibt es in Ihrer Nachbarschaft Probleme mit ... (Anteil Ja-Antworten): Hundekot auf der Straße, falsch oder behindernd parkenden Autos, beschädigten Spielplätzen, Graffiti, Müll in den Straßen oder Grünanlagen, Ruhestörungen, herumlungernden Betrunkenen, Belästigung oder Beschimpfung | survey | BMZM           | B,F,U |
| <b>Proposed new IFST specific indicators</b>    |  |        |                |       |
| IFST_SA1 fraudulent behavior in the value chain | Documented cases of food fraud in the last 5 years   | Stat.  | ?              | ?     |

\*If an item was taken from a German study, it was not translated.

\*\*B,F,U represent the initials of the author names from the most recent study from the Kohäsionsradar that used that indicator: Brand et al. (2020)

## 4.6.2 Civic participation

### Individual level

All existing indicators in this dimension primarily describe the group level, because they measure group activities or membership in groups. However, it would be of course also possible to use those indicators to describe individual behavior of single members within network.

### Group level

| Indicator                                  | Measurement (item; data)   | data type | Data set | Study |
|--|--|-----------|----------|-------|
| <b>Indicators in use</b>                   |  |           |          |       |
| GC1 membership in a civic organization     | Do you belong to ( ) a welfare organization, ( ) local community group, ( ) cultural association, women's group, ( ) youth work, ( ) sports/ recreation association;         | survey    | EVS      | D,V   |
|  | Number of different organizations respondent belongs to (mean)   | survey    | WVS      | JA    |
|  | Do you belong to charitable organization   | survey    | proposed | BS    |
|  | sind sie Mitglied in einem gemeinnützigen Verein oder einer gemeinnützigen Organisaition? (Nein, Ja)   | Survey    | BMZM     | B,F,U |
| GC2 membership in a religious organization | Do you belong to a religious organization  | survey    | EVS      | D,V   |
|  | do you belong to church/ religious organizations;  | survey    | proposed | BS    |
| GC3 membership in a worker organization    | Do you belong to: ( ) trade unions, ( ) professional associations  | survey    | EVS      | D,V   |
|  | Do you belong to: ( ) trade unions, ( ) professional associations  | survey    | proposed | BS    |
| GC4 participation in a civic organization  | Do you work unpaid for a: ( ) a welfare organization, ( ) local community group, ( ) cultural association, women's group, ( ) youth work, ( ) sports/ recreation association | survey    | EVS      | D,V   |



|   |   |        |          |       |
|---|---|--------|----------|-------|
|   | level of participation in: ( ) cultural organizations, ( ) sport organizations, ( ) humanitarian organization, ( ) environmental organization, ( ) scientific organization                                  | survey | ESS      | VE; G |
| GC5 participation in a religious organization           | did volunteered for a none-profit organization  | survey | EQLS     | K     |
|   | did volunteered for an organization   | survey | GWP      | K     |
|   | worked for an organization or association   | survey | ESS      | K     |
|   | Do you work unpaid for: a religious organization  | survey | EVS      | D,V   |
|   | do you regularly attend church?   | survey | proposed | BS    |
| <b>Proposed new IFST specific indicators</b>            |   |        |          |       |
| IFST_GC1 membership in food organizations or network    | Do you belong to ( ) food coops, ( ) food councils, ( ) food interest groups, ( ) cooking groups, ( ) food related welfare groups, ( ) CSA, ( ) other food related civic organizations/communities          | survey |          |       |
| IFST_GC2 participation in food organizations or network | Level of participation in ( ) food coops, ( ) food councils, ( ) food interest groups, ( ) cooking groups, ( ) food related welfare groups, ( ) CSA, ( ) other food related civic organizations/communities | survey |          |       |

### Structural level

Statistical, national or regional data on worker's representation, and community agriculture are seen as indicators of social structures that go beyond the case study networks. Only if data on crime or violence could be collected in the actual network under study would they be an indicator of group level.

| Indicator  | Measurement (item; data)                           | data type | Data set | Study |
|--|--|-----------|----------|-------|
| <b>Indicators in use</b>   |  |           |          |       |
| SC1: number of employees represented by a workers' council (p)                                     | share of companies with a workers council          | Stat.     | proposed | BS    |
| SC2 share of companies with a workers' council (p)   | share of workers with rights of co-determination   | Stat.     | proposed | BS    |
| <b>Proposed new IFST specific indicators</b>   |  |           |          |       |
| IFST_SC1: number of employees in the food and agriculture sector represented by a workers' council | share of relevant companies with a workers council | Stat.     | proposed |       |
| IFST_SC2 share of companies in the food and agriculture sector with a workers' council             | share of workers with rights of co-determination   | Stat.     | proposed |       |
| IFST_SC3 market share of participatory food value chains   | CSA members per 100.000 inhabitants                | Stat.     | Urgenci  |       |
|  | Food-Coop members per 100.000 inhabitants          | Stat.     | ?        |       |





### 4.6.3 Common values

#### Individual level

| Indicator                                    | Measurement (item; data)   | data type | Data set | Study |
|--|--|-----------|----------|-------|
| <b>Indicators in use</b>                     |  |           |          |       |
| ICV1 perceived degree of common values       | Agreement: shared values (disagree; disagree; neither; agree; strongly agree)      | survey    | MCVS     | A     |
| <b>Proposed new IFST specific indicators</b> |  |           |          |       |
| IFST_ CV1: perception of shared food values  | Agreement: shared food values (disagree; disagree; neither; agree; strongly agree) | survey    |          |       |

#### Group level

No relevant indicators found.

#### Structural level

Statistical, national or regional data on religious practices are seen as indicators of social structures that go beyond the case study networks. Only if data on crime or violence could be collected in the actual network under study would they be an indicator of group level.

| Indicator  | Measurement (item; data)  | data type | Data set                   | Study |
|--|---|-----------|----------------------------|-------|
| <b>Indicators in use</b>                         |   |           |                            |       |
| SCV1 Consensus on democracy as preferred system  | Aggregated data for the following item: For each one of the following political systems, how good a way would you say it is of governing this country?<br>- Having a democratic political system (very good; fairly good; fairly bad; very bad) | survey    | WVS                        | JA    |
| SCV2 Consensus on gender equality                | Aggregated data for the following item: When jobs are scarce, men should have more right to a job than women?   | survey    | WVS                        | JA    |
| SCV3 Consensus on survival-selfexpression values | Aggregated data for the following item: Composite dimension called 'Survself' in WVS database;  | survey    | WVS                        | JA    |
| SCV4 Consensus on traditional-secular values     | Aggregated data for the following item: Composite dimension called 'Tradrat5' in WVS database;  | survey    | WVS                        | JA    |
| SCV5 Baptism ratio                               | Number of Catholic baptisms/number of births*100  | Stat.     | Catholic Church of Belgium | BO    |
| SCV6 Church attendance Christmas ratio           | Number of attendees at Christmas masses/ number of inhabitants between 5 and 69 year*100  | Stat.     | Catholic Church of Belgium | BO    |
| SCV7 Funeral ratio                               | Number of Catholic funerals/number of deaths*100  | Stat.     | Catholic Church of Belgium | BO    |
| SCV8 Marriage ratio                              | Number of Catholic marriages/number of official marriages*100   | Stat.     | Catholic Church of Belgium | BO    |
| <b>Proposed new IFST specific indicators</b>     |   |           |                            |       |



|   |   |             |       |  |
|---|---|-------------|-------|--|
| GFST_SCV1: consensus on food philosophies | Would you say you follow a: () vegetarian; () vegan, () flexitarian, () carnivore, () omnivore, () other eating style   | calculation |       |  |
|   | When you buy food which of the following are the most important to you: ()taste, ()food safety, ()cost; ()geographical origin; ()nutrients, ()shelf-life; () how much processed; ()ethical reasons; convenience, ()other) | calculation | EBFF* |  |
|   | When you are producing food, do you follow a certain production philosophy such as () organic farming, ()IPM, ()permaculture, ()agroecology, ()other  |             |       |  |

#### 4.6.4 Perceived harmony

##### Individual level

| Indicator  | Measurement (item; data)  | data type | Data set      | Study |
|--|---|-----------|---------------|-------|
| <b>Indicators in use</b>   |   |           |               |       |
| IPH1 perceived harmony between neighbors   | Do you agree with the following statement: The people in my neighborhood get good along with each other?                          | Survey    | MCVS          | A     |
| IPH2 perceived conflicts between generations                                     | ?   | survey    | Only proposed | BS    |
| <b>Proposed new IFST specific indicators</b>                                     |   |           |               |       |
| IFST_IPH1 perceived conflicts between members of different food value chains     | Do you agree with the following statement: The people in the network/niche get good along with each other?                        | Survey    |               |       |
| IFST_IPH2 perceived harmony between members of the food regime and niches actors | Do you agree with the following statement: There are many conflicts between our network/niche and other actors of the food system | survey    |               |       |

##### Group level

No relevant indicators found.

##### Structural level

| Indicator   | Measurement (item; data)  | data type      | Data set | Study |
|---|---|----------------|----------|-------|
| <b>Proposed new IFST specific indicators</b>            |   |                |          |       |
| IFST_SPH1 media prominence of conflicts in food systems | Prominence of conflict between different actors in the food system covered in media | Media coverage | ?        |       |



## 4.6.5 Identification

### Individual level

| Indicator  | Measurement (item; data)  | data type | Data set | Study  |
|--|---|-----------|----------|--------|
| <b>Indicators in use</b>   |   |           |          |        |
| II1 level of national identity   | How strong are you feeling connected to your country?   | survey    | EB       | K      |
|  | “Let us suppose that you had to choose between being a [Ghanaian/Kenyan/etc.] and being a [Respondent’s Ethnic Group]. Which of the following best expresses your feelings? | survey    | AB       | L      |
| II2 level of national pride  | How proud are you to have citizenship of your country   | survey    | WEVS     | K      |
|  | How proud are you to be a [COUNTRY] citizen? (mean)   | survey    | WVS      | JA     |
| II3 identification with a certain geographical unit  | Which of these geographical groups would you say you belong to first of all? (mean)   | survey    | WVS      | JA     |
| II4 desire to emigrate   | Would you want to move to another country permanently   | Survey    | GWP      | K      |
| II5 level of neighborhood identity   | Wie stark fühlen sie sich mit Ihrem Wohnort verbunden? (überhaupt nicht, nicht sehr, teils-teils, ziemlich, sehr)   | survey    | BMZM     | B,F, U |
| II6 level of regional identity   | Wie stark fühlen sie sich mit Ihrem Region verbunden? (überhaupt nicht, nicht sehr, teils-teils, ziemlich, sehr)  | survey    | BMZM     | B,F, U |
| II7 level of federal identity  | Wie stark fühlen sie sich mit Ihrem Bundesland verbunden? (überhaupt nicht, nicht sehr, teils-teils, ziemlich, sehr)  | survey    | BMZM     | B,F, U |
| II8 perception of close knit neighborhood  | Agreement: this is a close knit neighborhood (disagree; disagree; neither; agree; strongly agree)   | survey    | MCVS     | A      |
| <b>Proposed new IFST specific indicators</b>   |   |           |          |        |
| IFST_II1 identification with a certain geographical unit of the food system                | How important is ( ) typical local food, ( ) typical regional food, ( ) traditional food of your country, ( ) exotic, ( ) international food for you                        | survey    |          |        |
| IFST_II2 identification with certain food philosophies/lifestyle                           | How important is being [answer IFST_CV1 (eating philosophy)] for your personal life   | Survey    |          |        |
| IFST_II3 perceived discrepancy between own food values and the food values of the majority | Agreement: Are your personal food values differ from the majority (disagree; disagree; neither; agree; strongly agree)  | Survey    |          |        |

### Group level

No relevant indicators found



## Structural level

| Indicator   | Measurement (item; data)   | data type  | Data set | Study |
|---|--|------------|----------|-------|
| <b>Proposed new IFST specific indicators</b>                    |  |            |          |       |
| IFST_SI1 prominence of regional food production and consumption | Existence of national marketing campaigns for national & regional food | review     | ?        |       |
|   | Prominence of regional food labels                                     | statistics | ?        |       |
|   | Prominence of regional brands  | statistics | ?        |       |
|   | Importance of regionality as a motive for buying food                  | survey     | EBFF     |       |

## 4.6.6 Institutional trust

## Individual level

| Indicator   | Measurement (item; data)  | data type | Data set      | Study         |
|---|---|-----------|---------------|---------------|
| <b>Indicators in use</b>                              |   |           |               |               |
| IIT1 confidence in legislative/political institutions | Confidence in () parliament; () political parties, () government  | survey    | EQS, ESS, WVS | K; D,V; VR; G |
|   | Trust in () countries parliament; () politicians; () political parties  | survey    | ESS, WVS      | BOT; JA       |
|   | How much do you trust each of the following, or haven't you heard enough about them to say: 1. The President 2. Parliament 3. Police 4. Courts of law | survey    | AB            | L             |
|   | opinion about the correctness of elections  | survey    | GWP           | K             |
|   | Wie groß ist das Vertrauen, das Sie den politische Parteien entgegenbringen? (überhaupt keines, geringes, teils-teils, große, sehr groß)              | survey    | BMZM          | B,F,U         |
|   | Wie groß ist das Vertrauen, das Sie der Bundesregierung entgegenbringen? (überhaupt keines, geringes, teils-teils, große, sehr groß)                  | survey    | BMZM          | B,F,U         |
|   | Wie groß ist das Vertrauen, das Sie dem Bundestag entgegenbringen? (überhaupt keines, geringes, teils-teils, große, sehr groß)                        | survey    | BMZM          | B,F,U         |
| IIT2 confidence in executive institutions             | Confidence in the police  | survey    | GWP; EVS; ESS | K; D,V; VR; G |
|   | How much do you trust each of the following, or haven't you heard enough about them to say: 1. The President 3. Police                                | survey    | AB            | L             |
|   | Wie groß ist das Vertrauen, das Sie der Polizei entgegenbringen? (überhaupt keines, geringes, teils-teils, große, sehr groß)                          | survey    | BMZM          | B,F,U         |
| IIT3 confidence in judiciary I institutions           | Confidence in the justice system  | survey    | GWP; EVS; ESS | K; D,V; VR; G |
|   | How much do you trust each of the following, or haven't you heard enough about them to say: Courts of law   | survey    | AB            | L             |



|   |  |        |               |         |
|---|--|--------|---------------|---------|
|   | Wie groß ist das Vertrauen, das Sie Gerichten entgegenbringen? (überhaupt keines, geringes, teils-teils, große, sehr groß)                           | survey | BMZM          | B,F,U   |
| IIT4 confidence in education system   | Confidence in: education system  | survey | EVS           | D,V     |
| IIT5 confidence in church /religious organizations                              | Confidence in: church  | survey | EVS, proposed | D,V; BS |
| IIT6 confidence in civil service; charity                                       | Confidence in: civil service   | survey | EVS, proposed | D,V; BS |
| IIT7 confidence in labor organizations  | Confidence in () trade unions; ()labor courts; ()  | survey | EVS, proposed | D,V; BS |
| IIT8 confidence in market/economic institutions                                 | confidence in financial institutions   | survey | GWP           | K       |
| IIT9 confidence in military   | Confidence in: armed forces  | survey | EVS           | D.V     |
| IIT10 confidence in press and media   | Confidence in: the press   | survey | EVS           | D.V     |
| IIT11 confidence in social security system                                      | Confidence in: social security system  | survey | EVS           | D.V     |
| IIT12 confidence in the health system   | Confidence in: health care system  | survey | EVS; GWP      | D.V;K   |
| <b>Proposed new IFST specific indicators</b>                                    |  |        |               |         |
| IFST_IIT1 confidence in organizations along the food value chain                | Confidence in: () input industry; () farmers; () agricultural production; () food industry; () different types of retailers; () consumers            | survey |               |         |
| IFST_IIT2 confidence in food regulations and rules                              | Confidence in () different labels and certification schemes  | survey |               |         |
| IFST_IIT3 confidence in organizations directly involved in daily food practices | confidence in organizations directly involved in daily food practices  | survey |               |         |
| IFST_IIT4 awareness of food safety issues                                       | QD3R: Index level of awareness of food safety issues (list of 15 different issues)   | survey | EBFS 2019     |         |
| IFST_IIT5 concern about food safety   | Item QD2: Focusing now on food safety (e.g., if eating certain foods poses a risk), please tell me which of the following is closest to your opinion | survey | EBFS 2019     |         |

## Group level

No relevant indicators found

## Structural level

For this particular dimension we argue that the aggregation of individual indicators can provide useful information about the structural level. If people distrust institutions those institutions are not trustworthy, and this degree of trustworthiness impacts the perception and performance of social cohesion.



| Indicator   | Measurement (item; data)   | data type   | Data set | Study |
|---|--|-------------|----------|-------|
| <b>Proposed new IFST specific indicators</b>                                    |  |             |          |       |
| IFST_SL1_ aggregated data of ILI1 – IFST_ILI4 (trustworthiness of institutions) | Aggregation of the relevant individual indicators of this dimension. | calculation |          |       |

## 4.6.7 Interpersonal trust

### Individual level

| Indicator   | Measurement (item; data)   | data type | Data set | Study         |
|---|--|-----------|----------|---------------|
| <b>Indicators in use</b>  |  |           |          |               |
| IPT1 perceived fairness of other people                           | Most people try to take advantage of you. or try to be fair; scale 0 (low) to 10 (high fairness)   | survey    | ESS      | VE; G; K; BOT |
| IPT2 perceived helpfulness of other people                        | Most of the time people helpful. or mostly looking out for themselves; scale 0 (low) to 10 (high helpfulness)  | survey    | ESS      | VE; G; K; BOT |
| IPT3 perceived trust in other people                              | Most people can be trusted. or you can't be too careful; scale 0 (low) to 10 (high trust)  | survey    | ESS; WVS | VE; G; K; BOT |
|   | neighbors can be trusted   | survey    | MCVS     | A             |
|   | How much do you trust each of the following types of people?* 1. Your relatives 2. Other people you know 3. Other [Ghanaians/Kenyans/ etc.]  | survey    | AB       | L             |
|   | Wie sehr vertrauen sie Menschen, denen Sie zum ersten Mal begegnen? ( gar nicht, wenig, teils-teils, ziemlich, völlig)   | survey    | BMZM     | B,F,U         |
|   | Ich bin davon überzeugt, dass die meisten Menschen gute Absichten haben ( gar nicht, wenig, teils-teils, ziemlich, völlig)   | survey    | BMZM     | B,F,U         |
|   | Heutzutage kann man sich auf niemanden verlassen ( gar nicht, wenig, teils-teils, ziemlich, völlig)  | survey    | BMZM     | B,F,U         |
| <b>Proposed new IFST specific indicators</b>                      |  |           |          |               |
| IFST_IPT1 perceived trust in other actors in the food value chain | Most people involved in ( ) input industry; ( ) farmers; ( ) agricultural production; ( ) food industry; ( ) different types of retailers; ( ) consumers can be trusted. or you can't be too careful; scale 0 (low) to 10 (high trust) | survey    |          |               |

### Group level

No relevant indicators found.

### Structural level

No relevant indicators found.

## 4.6.8 Legitimacy of institutions

### Individual level



| Indicator  | Measurement (item; data)  | data type | Data set | Study      |
|--|---|-----------|----------|------------|
| <b>Indicators in use</b>   |   |           |          |            |
| ILI1 perceived state of education  | State of education in country nowadays; scale from 0 (extremely dissatisfied) to 10 (extremely satisfied).  | Survey    | ESS      | BOT; VE; G |
| ILI2 perceived state of health system  | State of health services in country nowadays.; scale from 0 (extremely dissatisfied) to 10 (extremely satisfied).   | Survey    | ESS      | BOT; VE; G |
| ILI3 satisfaction with democracy   | How satisfied with the way democracy works in country; scale from 0 (extremely dissatisfied) to 10 (extremely satisfied).   | Survey    | ESS      | VE; G; BOT |
|  | How satisfied are you with democracy  | Survey    | EVS      | D,V        |
| ILI4 satisfaction with economy   | How satisfied with present state of economy in country; scale from 0 (extremely dissatisfied) to 10 (extremely satisfied).  | Survey    | ESS      | VE; G      |
| ILI5 satisfaction with government  | How satisfied with the national government; scale from 0 (extremely dissatisfied) to 10 (extremely satisfied).  | Survey    | ESS      | VE; G; BOT |
|  | View on government: very bad-very good (4 categories)   | Survey    | EVS      | D,V        |
| <b>Proposed new IFST specific indicators</b>   |   |           |          |            |
| IFST_ILI1 satisfaction with organizations along the food value chain   | How satisfied are you with: () input industry; () farmers; () agricultural production; () food industry; () different types of retailers; () consumers              | survey    |          |            |
| IFST_ILI2 satisfaction with food regulations and rules   | How satisfied are you with () different labels and certification schemes  | survey    |          |            |
| IFST_ILI3 satisfaction with the role of public authorities in the sustainable transformation of food systems | QB8.5: Public authorities are doing enough to encourage and promote food sustainability (campaigns, food labelling and other standards, taxes and other incentives) | survey    | EBFF     |            |

## Group level

No relevant indicators found

## Structural level

For this particular dimension we argue that the aggregation of individual indicators can provide useful information about the structural level. If people are the are the opinion that the institutions perform badly or are not function, this points to characteristics at the structural level that impacts social cohesion. It this impact is caused by actually low performance of institutions or if its only because of their bad reputation is only of secondary importance.

| Indicator                                     | Measurement (item; data)   | data type   | Data set | Study |
|---|--|-------------|----------|-------|
| <b>Proposed new IFST specific indicators</b>  |  |             |          |       |
| IFST_SL1_ aggregated data of ILI1 – IFST_ILI4 | Aggregation of the relevant individual indicators of this dimension. | calculation |          |       |



|                               |  |  |  |  |
|-------------------------------|--|--|--|--|
| (performance of institutions) |  |  |  |  |
|-------------------------------|--|--|--|--|

## 4.6.9 Perception of fairness

### Individual level

| Indicator  | Measurement (item; data)  | data type | Data set | Study |
|--|---|-----------|----------|-------|
| <b>Indicators in use</b>   |   |           |          |       |
| IPF1 perceived corruption  | Corruption in economy   | survey    | GWP      | K     |
|  | Agreement: to move up in my country you have to be corrupt  | survey    | ISSP     | K     |
|  | Agreement: If you want to be successful in our times your have to do things that are not ok   | survey    | EQLS     | K     |
| IPF2 perceived need to tackle wealth gap                                   | Agreement: The state should take measures to reduce income disparities  | survey    | ESS      | K     |
| IPF3 perceived tensions between rich and poor                              | Agreement: There are tensions between the rich and poor   | survey    | EQLS     | K     |
| IPF4 perception of fair income   | Agreement: My salary is fair  | survey    | ISSP     | K     |
|  | Agreement: My salary is in line with my performance   | survey    | ISSP     | K     |
|  | Man wir in Deutschland entsprechend seiner Leistung vergütet (gar nicht, wenig, teils-teils, ziemlich, völlig)  | survey    | BMZM     | B,F,U |
| IPF5 perception of social inequalities                                     | Ich finde die sozialen Unterschiede in unserem Land im Großen und Ganzem gerecht (gar nicht, wenig, teils-teils, ziemlich, völlig)  | survey    | BMZM     | B,F,U |
|  | Die Rangunterschiede zwischen den Menschen sind akzeptabel, weil sie im Wesentlichen ausdrücken, was man aus seinen Chancen gemacht hat (gar nicht, wenig, teils-teils, ziemlich, völlig) | survey    | BMZM     | B,F,U |
| IPF6 perception of economic fairness                                       | Die wirtschaftlichen Gewinne werden heute in Deutschland im Großen und Ganzen gerecht verteilt (gar nicht, wenig, teils-teils, ziemlich, völlig)  | survey    | BMZM     | B,F,U |
| <b>Proposed new IFST specific indicators</b>                               |   |           |          |       |
| IFST_IPF1 perceived fairness of working conditions in the food value chain | Agreement are there fair working conditions in: () input industry; () farmers; () agricultural production; () food industry; () different types of retailers;                             | survey    |          |       |
| IFST_IPF2 perceived fairness of prices the food value chain                | Are the prices () farmers have to buy for their input; () the food industry and retailers pay farmers, () consumers have to pay fair??  | survey    |          |       |

### Group level

No relevant indicators found.

### Structural level





Statistical, national or regional data on corruption are seen as indicators of social structures that go beyond the case study networks. Indicators that measure the level of economic exclusion (see IFST inclusiveness indicator guidelines) can be used to measure structural impacts on economic exclusion and resulting unfair inequalities.

| Indicator   | Measurement (item; data)  | data type         | Data set | Study |
|---|---|-------------------|----------|-------|
| <b>Indicators in use</b>                                      |   |                   |          |       |
| SPF1 expert judgement on corruption                           | Expert judgement on corruption  | Expert assessment | ICRG     | K     |
| IFST_SPF1 food related indicators for political inclusiveness | Indicators described separately in the IFST guidelines for inclusiveness indicators |                   |          |       |

#### 4.6.10 Political engagement and participation

##### Individual level

| Indicator                                    | Measurement (item; data)   | data type | Data set | Study      |
|--|--|-----------|----------|------------|
| <b>Indicators in use</b>                     |  |           |          |            |
| IPP1 interest in politics                    | How important is politics in your life?  | Survey    | WEVS     | K          |
|  | Are you interested in politics?  | Survey    | ESS      | K          |
|  | Frequency of discussing politics with friends  | Survey    | EVS, WVS | D,V;<br>JA |
|  | Frequency of following politics in the media   | Survey    | EVS      | D,V        |
|  | Wie stark interessieren Sie sich für Politik (überhaupt nicht, wenig, mittel, stark, sehr stark) | Survey    | BMZM     | B,F,U      |
| <b>Proposed new IFST specific indicators</b> |  |           |          |            |
| IFST_IPP1 Interest in food politics?         | How interested are you in food politics  | survey    |          |            |
|  | What of these political issues is of high interest for you?                                      | survey    |          |            |
|  | Frequency of discussing food politics with friends   | survey    |          |            |
|  | Frequency of following food politics in the media  | survey    |          |            |
|  |  | survey    |          |            |

##### Group level

| Indicator  | Measurement (item; data)   | data type | Data set | Study     |
|--|--|-----------|----------|-----------|
| <b>Indicators in use</b>                             |  |           |          |           |
| GPP1 membership political organization               | Do you belong to: a political parties/groups   | Survey    | EVS      | D,V       |
| GPP2 participation/ work in a political organization | Worked in political party or action group last 12 months   | Survey    | ESS      | BOT;<br>G |
|  | Do you work unpaid for: political parties/groups   | Survey    | EVS      | D,V       |
|  | Wenn die nächsten Wahlen anstehen, für die Sie wahlberechtigt sind, wie wahrscheinlich ist es, dass Sie tatsächlich zur Wahl gehen? (sehr unwahrscheinlich, eher unwahrscheinlich, eher w., sehr w.) | Survey    | BMZM     | B,F,U     |
| GPP3 political activism                              | Did you ever wear a badge of a political campaign?   | survey    | ESS      | K         |
|  | participated in a collection of signatures   | survey    | EQLS     | K         |



|  |   |        |          |                 |
|--|---|--------|----------|-----------------|
|  | Contacted a politician or civil servant in the public sector  | survey | EQLS     | K               |
|  | Representing one's own opinion in front of a state official   | survey | GWP      | K               |
|  | Signed petition last 12 months  | survey | ESS; EVS | BOT; D,V; VE; G |
|  | Boycotted certain products last 12 months   | survey | EVS; ESS | D,V; VE; G      |
|  | Attending lawful demonstrations   | survey | EVS; ESS | D,V; VE; G      |
|  | Joining unofficial strikes  | survey | EVS      | D,V             |
|  | Occupying buildings/factories   | survey | EVS      | D,V             |
|  | ever bought product for political reason  | survey | ESS      | VE; G           |
|  | Es gibt verschiedene Möglichkeiten, sich für etwas einzusetzen. Haben Sie in den letzten 12 Monaten ... (Ja-Antworten): an einer Demonstration teilgenommen; an einer Unterschriftensammlung teilgenommen; ein politisches Amt übernommen; an einer Bürgerinitiative teilgenommen; an einer Bürgerversammlung teilgenommen; einen Politiker oder Beamten kontaktiert; in sozialen Medien politisch Stellung bezogen; im Internet Presseartikel kommentiert; an einer Online-Petition teilgenommen | Survey | BMZM     | B,F,U           |
|  | Wenn die nächsten Wahlen anstehen, für die Sie wahlberechtigt sind, wie wahrscheinlich ist es, dass Sie tatsächlich zur Wahl gehen? (sehr unwahrscheinlich, eher unwahrscheinlich, eher w., sehr w.)  | Survey | BMZM     | B,F,U           |
| <b>Proposed new IFST specific indicators</b> |   |        |          |                 |
| IFST_GPP1 political food activism            | participated in a collection of signatures for food related petition  | survey |          |                 |
|  | Signed a food related petition last 12 months   | survey |          |                 |
|  | Boycotted certain food products last 12 months  | survey |          |                 |
|  | Attending lawful food related demonstrations  | survey |          |                 |
|  | ever bought product for political reason  | survey |          |                 |
|  | Joining unofficial strikes in the food value chain  | survey |          |                 |
|  | Occupying buildings/factories in the food value chain   | survey |          |                 |
|  | Contacted a politician or civil servant in the public sector to discuss food related issues   | survey |          |                 |

## Structural level

Statistical, national or regional data on voter turnout and behavior are seen as indicators of social structures that go beyond the case study networks. Indicators that measure the level of political exclusion (see IFST inclusiveness indicator guidelines) can be used to measure structural impacts on political engagement.



| Indicator   | Measurement (item; data)  | data type         | Data set | Study |
|---|---|-------------------|----------|-------|
| <b>Indicators in use</b>                                      |   |                   |          |       |
| SPP1 expert judgement on corruption                           | SPP1: expert assessment on voter turnout  | Expert assessment | VAN      | K     |
| IFST_SPP1 food related indicators for political inclusiveness | Indicators described separately in the IFST guidelines for inclusiveness indicators |                   |          |       |

## 4.6.11 Social networks

### Individual level

| Indicator                             | Measurement (item; data)            | data type | Data set | Study |
|---------------------------------------|-------------------------------------|-----------|----------|-------|
| <b>Indicators in use</b>              |                                     |           |          |       |
| ISN1 importance of family and friends | Importance of friends and families? | survey    | WEVS     | K     |
| ISN2 perceived loneliness             | How often do you feel lonely?       | survey    | EQLS     | K     |

### Group level

| Indicator   | Measurement (item; data)  | data type | Data set | Study         |
|---|---|-----------|----------|---------------|
| <b>Indicators in use</b>                            |   |           |          |               |
| GSN1: density of social network                     | how often do you meet with friends, family or privately with working colleagues   | survey    | ESS      | K; BOT; VE; G |
|   | How often take you part in social activities in compared to others in same age?   | survey    | ESS      | BOT; VE; G    |
|   | Existence of close relatives or friend?   | survey    | Proposed | BS            |
|   | Weekly contacts to close relatives or friends?  | survey    | proposed | BS            |
|   | Wie groß ist ihr Freundes und Bekanntenkreis (sehr klein, eher klein, mittel, eher groß, sehr groß)                                       | survey    | BMZM     | B,F,U         |
|   | Wie oft treffen sie sich mit freunden, Bekannte oder privat mit Arbeitskollegen (sehr selten, eher selten, manchmal, häufig, sehr häufig) | survey    | BMZM     | B,F,U         |
| GSN2: quality of social networks                    | Good relations to () neighbors, () colleagues   | survey    | Proposed | BS            |
| GSN3: support from social networks (social capital) | Support and advice for serious personal or family related problems  | survey    | EQLS     | K             |
|   | are there friends or family that can support you in difficult times   | survey    | GWP      | K             |
|   | How many people with whom you can discuss intimate and personal matters   | survey    | ESS      | BOT           |
|   | Available support in case of () financial distress; () household jobs; () feeling depressed   | survey    | Proposes | BS            |
|   | Wenn sie Schwierigkeiten hätten: Haben sie Freunde auf deren Hilfe sie jederzeit zählen können? (Nein, Ja)                                | survey    | BMZM     | B,F,U         |



|  |  |        |      |       |
|--|--|--------|------|-------|
|  | Haben sie Freunde oder Bekannte außerhalb ihrer Familie, die ihnen im dringenden Notfall 1.000 € leihen würden? (Ja, Nein)   | survey | BMZM | B,F,U |
| <b>Proposed new IFST specific indicators</b>                       |  |        |      |       |
| IFST_GSN1 food related inter-group links (bridging social capital) | How often do you have contacts with the following groups when purchasing/selling food products () farmers, () agricultural workers, () food industry employees, () food manufacturer; () whole sellers; () supermarkets; () small shops; () food coops; () charity organizations | survey |      |       |
| IFST_GSN2 food related density of networks                         | Agreement: I often eat alone   | survey |      |       |
|  | Agreement: daily meals are important to see and exchange with my () family, () friends () colleagues   | survey |      |       |
|  | Agreement: the food production activities I am involved in are important for me to see and exchange with my () family, () friends () colleagues  | survey |      |       |
| IFST_GSN3 support from food related networks                       | Agreement The people that I interact when () I produce food or when I buy, prepare and consume my food, would support me in chance of distress   | survey |      |       |

## Structural level

Indicators that measure the level of social exclusion (see IFST inclusiveness indicator guidelines) can be used to measure structural impacts on political engagement.

| Indicator   | Measurement (item; data)  | data type  | Data set | Study |
|---|---|------------|----------|-------|
| <b>Indicators in use</b>  |   |            |          |       |
| SSN1 structural conditions for intergroup links along the value chain | Share of direct marketing sales   | statistics |          |       |
|   | Degree of market concentration in different sectors of the food value chain         | statistics |          |       |
|   | CSA members per 100.000 inhabitants   | statistics | Urgenci* |       |
| IFST_SSN1 food related indicators for social inclusiveness            | Indicators described separately in the IFST guidelines for inclusiveness indicators |            |          |       |

## 4.6.12 Solidarity

### Individual level

| Indicator                      | Measurement (item; data)  | data type | Data set | Study |
|--------------------------------|---|-----------|----------|-------|
| <b>Indicators in use</b>       |   |           |          |       |
| IS1 concern about other people | Concerned with () people in the neighborhood, () in the region, () fellow countrymen, () elderly people, () unemployed people, () immigrants, () sick and disabled people, () poor children | survey    | EVS      | D,V   |
| IS2 willingness to help others | Willingness to help neighbors   | survey    | MCVS     | A     |
| IS3 perceived importance of    | The state should take more responsibility for ensuring that every citizen is covered.   | survey    | WEVS     | K     |



|   |  |        |      |       |
|---|--|--------|------|-------|
| governmental social support   |  |        |      |       |
| IS4 perception of community solidarity (?)                            | Feel people in local area help one another   | survey | ESS  | BOT   |
|   | Feel appreciated by people you are close to you  | survey | ESS  | BOT   |
|   | Die meisten Leute kümmern sich in Wirklichkeit nicht darum, was mit ihren Mitmenschen geschieht (stimmt gar nicht, wenig, teils-teils, ziemlich, völlig) | survey | BMZM | B,F,U |
| <b>Proposed new IFST specific indicators</b>                          |  |        |      |       |
| IFST_IS1 concern about other people in the food value chain           | Are you concerned with people working in ( ) Input industry; agricultural production, ( ) food industry, ( ) retail, ( ) waste management                | survey |      |       |
| IFST_IS2 approval of support for other people in the food value chain | Approval for subsidies for farmers   | survey |      |       |

### Group level

| Indicator   | Measurement (item; data)   | data type | Data set | Study |
|---|--|-----------|----------|-------|
| <b>Indicators in use</b>                          |  |           |          |       |
| GS1 self-reported acts of solidarity              | In the last 12 months, how often have you helped other people (other than family, at work or in clubs/associations/organizations)?                     | survey    | ESS      | K     |
|   | Community or social work (e.g., helping the elderly or disabled).  | survey    | EQLS     | K     |
|   | Donated money for common good last month   | survey    | GWP      | K     |
|   | Helped a stranger last month   | survey    | GWP      | K     |
|   | Manche Menschen spenden ab und an Geld für soziale oder gemeinnützige Zwecke. Haben Sie in den letzten 12 Monaten solche Spenden geleistet? (ja, Nein) | survey    | BMZM     | B,F,U |
|   | Wie oft sind sie in Ihrer Freizeit ehrenamtlich tätig, um anderen Menschen zu helfen? (nie, einmal im Monat oder seltener, einmal die Woche, täglich)  | survey    | BMZM     | B,F,U |
| GS2 received acts of solidarity                   | receive help and support from people you are close to you  | survey    | ESS      | BOT   |
| <b>Proposed new IFST specific indicators</b>      |  |           |          |       |
| IFST_GS1 food related acts of solidarity          | I donated food or money for food   | survey    |          |       |
| IFST_GS2 food related received acts of solidarity | I received governmental support for food production  | survey    |          |       |
|   | I received support and help from charity organizes to buy or get food  | survey    |          |       |

### Structural Level

| Indicator | Measurement (item; data) | data type | Data set | Study |
|-----------|--------------------------|-----------|----------|-------|
|-----------|--------------------------|-----------|----------|-------|



| Proposed new IFST specific indicators                       |  |            |   |  |
|---|--|------------|---|--|
| IFST_SS1 agricultural subsidies                             | Percentage of state subsidies of farmer income     | statistics | ? |  |
| IFST_SS2 food charity                                       | Density of food related charity organizations      | statistics | ? |  |
| IFST_SS3 share of people participating in food aid programs | Share of people participating in food aid programs | statistics | ? |  |

## 4.6.13 Tolerance

### Individual level

| Indicator   | Measurement (item; data)  | data type | Data set  | Study  |
|---|---|-----------|-----------|--------|
| <b>Indicators in use</b>  |   |           |           |        |
| IT1 acceptance of ethnic minorities                             | I would not like to have a people of different color as my neighbor   | survey    | WEVS      | K      |
| IT2 acceptance of homosexuality                                 | Which people would you not like to have as neighbors? -Homosexuals (mentioned; not mentioned)   | survey    | WEVS      | K; JA  |
|   | Hätten sie Homosexuelle ungern als Nachbarn? (ungern, nicht ungern)   | Survey    | BMZM      | B,F,U  |
| IT3 acceptance of immigrants/foreigners                         | Which people would you not like to have as neighbors? -foreign workers  | survey    | WEVS      | K; JA  |
|   | Hätten sie Ausländer/Migranten ungern als Nachbarn? (ungern, nicht ungern)  | Survey    | BMZM      | B,F,U  |
| IT4 perceived benefits from immigration                         | Country's cultural life undermined or enriched by immigrants  | survey    | ESS; EQLS | K; BOT |
|   | Immigrants make country worse or better place to live   | survey    | ESS       | BOT    |
|   | Immigration bad or good for country's economy   | survey    | ESS       | BOT    |
| IT5 perceived societal aversities against ethnic minorities (?) | city/region is a good place for ethnic minorities   | survey    | GWP       | K      |
| IT6 perceived societal aversities against homosexuals (?)       | city/region is a good place for homosexuals   | survey    | GWP       | K      |
| IT7 acceptance of other religions                               | Hätten sie Menschen anderer Religion ungern als Nachbarn? (ungern, nicht ungern)  | Survey    | BMZM      | B,F,U  |
| IT8 acceptance of other lifestyles                              | Hätten sie Menschen mit ganz anderem Lebensstil ungern als Nachbarn? (ungern, nicht ungern)   | Survey    | BMZM      | B,F,U  |
| <b>Proposed new IFST specific indicators</b>                    |   |           |           |        |
| IFST_T1 acceptance of different food philosophies/lifestyles    | I would not mind to share a household with a ( ) vegan, ( ) vegetarian, ( ) flexitarian, ( ) omnivore, ( ) carnivore  | survey    |           |        |
| IFST_T2 acceptance of different farming philosophies            | I would not mind live next to a conventioal ( ) organic, ( ) biodynamic, ( ) farm   | survey    |           |        |
| IFST_T3 tolerance of other people in the value chain            | Agreement: People working in ( ) Input industry; agricultural production, ( ) food industry, ( ) retail, ( ) waste management should be allowed to pursue their interests | survey    |           |        |



|   |   |        |  |  |
|---|---|--------|--|--|
| IFST_T4 tolerance for diverse food cultures | Agreement: International cuisine is threatening the typical food heritage of () my region () my country | survey |  |  |
|---|---|--------|--|--|

### Group level

No relevant indicators found

### Structural level

For this particular dimension we argue that the aggregation of individual indicators can provide useful information about the structural level. The dominant attitudes of people regarding the tolerance of different lifestyles or social groups also impacts the interactions of people and therefore the performance of social cohesion.

| Indicator   | Measurement (item; data)                                       | data type        | Data set | Study |
|---|--|------------------|----------|-------|
| <b>Indicators in use</b>  |  |                  |          |       |
| ST1 Expert judgement regarding ethnical tensions in a certain group or society          | Expert judgement regarding ethnical tensions                   | Expert judgement | ICRG     | K     |
| ST2 Expert judgement regarding religious tensions in a certain group or society         | Expert judgement regarding religious tensions                  | Expert judgement | ICRG     | K     |
| ST6 IFST_ST3_ aggregated data of IT1 – IFST_T4 (level of tolerance in network, society) | aggregated data of relevant indicators on the individual level | calculation      | GWP      | K     |



## 5 Guidance for the use of the indicator set

As aforementioned the preliminary indicator set presented here cannot provide a rigid and universal recipe neither for measuring social cohesion in all types of food system contexts, nor for comparing social cohesion across all six case studies of the IFST project. The case studies are too diverse for that, the available data are too varied, and such an approach would also not be consistent with the idea of transdisciplinary research, that guides IFST. Furthermore, the existing set of indicators is most likely too extensive to be fully covered in each case study. Moreover, on the one hand, the indicators will be too narrow for some case studies, while on the other hand, more specific, contextual indicators will be needed for other case studies. Those issues of course also apply for other, future case studies outside the framework of the IFST project.<sup>17</sup> Therefore, within the IFST project, but also for research on social cohesion in food systems in general, the set of indicators presented here functions as a starting point for measuring social cohesion and needs to be adapted to each specific context. The task is to find a compromise between indicators that are specific enough to be useful for the individual case studies and ensuring some degree of comparability for the results. For both the existing indicator set provides a suitable starting point, because:

- It offers a pool of indicators from which researchers can select appropriate measurements to analyze different dimensions and levels of social cohesion in the context of food systems and food systems innovation networks.
- It offers a framework (combination of dimensions and levels) to compare the results of the different case studies on social cohesion in food systems and also to guide the search for new indicators.

In the IFST project a guidance was developed to support case study researchers to adapt the preliminary indicator set for the single case studies in a comprehensible way. This adaptation process consists of two major – interconnected steps: The system description and the method specification. In general also other researchers who wish to study social cohesion in various food system context can follow this adaptation process.

### 5.1 System description

Social cohesion is always measured for/within a particular system. This system provides the context for assessing social cohesion. First, the system of interest determines which indicators of social cohesion are important and which of these can be adequately addressed. For example, in the context of school lunch, it may be more appropriate to assess students' participation in school activities than their overall level of political participation. Consequently, for each system, different dimensions of social cohesion might be more or less important and should be assessed

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<sup>17</sup> This guidance can be also useful for further research outside the IFST project, since it seems unrealistic to provide universal indicator set for measuring social cohesion in different types of food systems situated in particular contexts using different methods. Further research on food systems and social cohesion can use the preliminary indicator toolbox presented here and adapt them for their own purposes.





with different indicators. The following table gives some possible examples of how relevant aspects could be described.

*Table 3 Examples for identification of relevant aspects of social cohesion*

| Dimensions of social cohesion | Relevant aspects on individual or group level                    |  |
|-------------------------------|--|--|
|                               | Individual level   | Group level  |
| Perceived harmony             | Not relevant or measurable                                       | Not relevant or measurable   |
| Trust in institutions         | Confidence of pupils in the institutions that provide their food | Differences between social groups regarding confidence in school meal provisioners |
| Social networks               | Not relevant or measurable                                       | Social networks created through school food practices                              |
| ...*                          | ...  | ...  |

\* the table only shows possible examples. Not all dimensions are included

Second, certain structural elements of the system will affect social cohesion. For example, the structure of a particular value chain may hinder or encourage the formation of links between groups and thus the bridging of social capital. These effects should be considered at the "structural level" of social cohesion, which mediates how social cohesion is perceived and practiced by individuals or groups. Most important structures should be identified. The description of structures should be used to formulate the key hypothesis of how specific structural features of the system affect the group or individual level dimension of social cohesion. Of course, system structures can theoretically influence social cohesion in an almost infinite number of ways. For the research, only the most important influences should be addressed. Table 4 provides possible examples of hypotheses.

*Table 4 examples for possible key hypothesis about structural influences on social cohesion dimensions*

| Structural elements | Affected SC dimensions                 | Key hypothesis  |
|---------------------|--|---|
| value chain         | Social networks (inter-group linkages) | A high market concentration in the retail sector hinders the direct contacts between food producers and consumers |
|                     | Trust in institutions                  | The prominence of food fraud will negatively affect the trust in institutions along the value chain               |
| Support structures  | Civic engagement                       |   |
| ....                | ...                                    | ...   |

The systems description therefore provides the basis for identifying indicators for relevant dimensions of social cohesion and for formulating hypotheses about how context-specific structures might affect particular dimensions of social cohesion. Consequently it functions as



a starting point for the selection of suitable indicators. However, the selection of suitable indicators also depends strongly on the methods used in the case studies.<sup>18</sup>

## 5.2 Method specifications

We have already discussed that different scientific methods require different types of indicators. In short, the larger the sample, the more specific indicators can and usually are used. In contrast, qualitative research approaches that focus on a small number of cases typically require broader, less specific indicators.

The methods used in the case studies will determine which indicators are selected from the preliminary indicator pool to assess the relevant dimensions of social cohesion. Therefore, the methods used for each case study need to be described. Then, for each of the previously identified dimensions, appropriate indicators for each method can be selected. Given the diversity of possible case studies, it is likely that quantitative and qualitative research approaches will be used in different contexts. Since these two research paradigms differ greatly in terms of objectives, methods, and results, it is necessary to provide some specific "instructions" for the use of the indicator set in both paradigms.

### Indicator selection/use in qualitative research

Currently the preliminary indicator set is of a quantitative nature and can be used immediately for quantitative research. The set of indicators presented can also serve as a guide for qualitative research on the social cohesion-food nexus, but because of the differences between quantitative and qualitative research approaches, it has to be used in a different way. In contrast to quantitative social science, qualitative social research does not aim to identify measurable characteristics of larger populations, but to create a deeper understanding of a smaller number of cases. To this end, qualitative methods are used for data collection (such as qualitative interviews, focus groups, or observations) and analysis. The results are rich and qualitative descriptions of various aspects of social life (see Lamnek, 2005).

The narrowly defined indicators in the indicator set are not directly suitable for qualitative research. Qualitative indicators are usually more broadly defined to allow for a comprehensive description of complex situations. They function more like deductive analytic categories (i.e., categories derived from a theoretical framework) that guide the process of data collection and analysis (see Bortz & Döring, 2013). In terms of the indicator set, we suggest that the identified dimensions of social cohesion (e.g., tolerance or social networks) could function as appropriate deductive analytic categories to guide qualitative approaches in individual case studies and thus act as qualitative indicators. For example, some relevant dimensions could be used to create guiding questions in qualitative interviews and focus groups or serve as the main structure for observation protocols. The individual indicators for the relevant dimensions could be used to

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<sup>18</sup> Of course, if multiple case studies use a similar methodology to examine similar dimensions of social cohesion, it also makes sense to use comparable indicators and measurements so that the results are comparable across cases and, ideally, with other existing research. The guidelines provide the necessary resources for this as well.



create follow-up questions to ensure that the entire dimension of social cohesion is captured. Similarly, the dimensions can be used as deductive analytic categories to guide different types of qualitative content analysis (see Kuckartz, 2018; Mayring, 2020).<sup>19</sup> Should specific qualitative methods require more concrete items, of course also the narrower indicators can be used.

### **Indicator selection/use in quantitative research**

The indicators presented are quantitative in nature and can therefore be used directly in quantitative research. However, the analysis in section 3 and 4 have shown that also quantitative indicators can be used in various ways:

For example, Christine et al. (2015) used only a single item on a questionnaire to collect data for one quantitative indicator. Based on that data, the mean value was calculated to measure social cohesion. Other studies took a similar approach, but at least collected data for several dimensions of social cohesion. Other researchers already followed a more complex approach and multiple dimensions of social cohesion were measured with several indicators. The indicators were normalized, and mean values were calculated for the individual dimensions. Sometimes, a single (mean) value for overall social cohesion was calculated in a second step (see section three for an overview). The most complex approaches have been employed in large-scale social cohesion studies comparing different countries or regions. For example, various forms of multilevel structural equation modeling have been used to calculate the different values for the dimensions as well as for overall social cohesion. Exploratory factor analysis was used to test the unidimensionality of the indicators and to select those indicators that best measured each dimension (Botterman et al., 2012; Dragolov et al., 2013). Confirmatory factor analysis is used to build and test the multilevel models themselves (Bottoni, 2018; Dickes & Valentova, 2013). The degree of complexity required depends on the research question and the scope of the research. In addition, the degree of complexity is limited by the available data. Again, it is not appropriate to require all case studies to use a particular methodological approach, as the right method depends on the context.

### **Use of composite indicators**

Quantitative studies often attempt to create a composite indicator that combines different dimensions to measure social cohesion. The potential advantages of using a single figure to measure social cohesion are tempting. It would allow for easy comparison across countries or communities-and for our project case studies-and would also be an easily visualized measure for monitoring developments over time. For example, the (Dragolov et al., 2013)(Avery et al.; Bottoni; Dickes et al.; 2013) all ultimately provides one single number that allows the social cohesion in different countries.

Despite the attractiveness of a single composite indicator of social cohesion, many authors argue against it (Bottoni, 2018) (Botterman et al., 2012; 2018; Dickes et al., 2010), in the words

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<sup>19</sup> Of course, the different levels of social cohesion also had to be taken into account in the qualitative research. Here, the indicators of the framework provide clues as to which aspect of which dimension is of interest for the individual or the group level.



of Dickes and Valentova (2013, p. 836): “It also needs to be noted here that, despite the correlation between two second-order factors, is not possible to identify a general factor of social cohesion. Measuring social cohesion with one single composite indicator is not possible, confirming the truly multi-dimensional nature of the concept.” The authors of the “Kohäsionsradar” are also aware of the problems associated with creating composite indicators of social cohesion (Schiefer & van der Noll, 2017). Therefore, a common solution to avoid simplification risks - which should be applied in IFST - is to always include measurements of the individual dimensions and to think critically about possible misinformation caused by a single figure for measuring social cohesion.

### 5.3 Indicator selection and creation

To complete the adaptation of the preliminary set of indicators, two steps are required. First, it should be determined which methods will be used to capture which relevant dimension of social cohesion and at which level. On this basis, it can be decided which indicators will be selected (or newly created) to measure social cohesion (see Table 5 for examples).

*Table 5 example for selection of indicators to measure relevant dimensions of social cohesion based on method specification*

| Dimension/Level of social cohesion     | Applied methods        | Indicators  |
|--|------------------------|---|
| Institutional trust (individual level) | Qualitative interviews | Individual trust in institutions*   |
| Social networks (group level)          | Quantitative survey    | IFST_GSN1 food related intergroup links (bridging social capital)<br>IFST_GSN2 food related density of networks<br>IFST_GSN3 support from food related networks |
| ...                                    | ...                    | ...   |

\* The dimensions itself functions as a guideline for qualitative data collection/analysis

Second, it should be determined which methods will be used to explore/test key hypotheses about the impact of structural conditions on social cohesion. Based on this, relevant indicators at the structural levels should be defined to capture important structural features that could be defined.

*Table 6 example for selection of indicators to explore key hypothesis based on method specification*

| Key hypotheses about structural effects                                   | Methods to | Indicators to capture structural features                                   |
|---|------------|---|
| Concentration in the value chain hinders the creation of intergroup links | statistics | Market concentration in relevant value chains;<br>Share of direct marketing |
| ...   | ...        | ...   |



## 6 Summary and Conclusion

Our research showed that currently there is not a specific indicator framework to measure social cohesion in the context of food system transformation. To close this gap, we conducted a review to identify indicators already used to measure different aspects of social cohesion. Indeed, we found a large number of indicators that measured in total 13 different dimensions of social cohesion and 3 distributive dimensions that are not part of social cohesion but influence it.

Although a large number of indicators were found, our findings also show that the indicators used in earlier research are not usable to assess social cohesion in food systems without further adaptation and translation, because they are often used to measure social cohesion of larger geographical units and not food networks or value chains. Furthermore, the existing indicators are narrowly defined and often do not capture food specific aspects of social cohesion. To overcome this drawback, we matched the existing indicators with the IFST conceptual framework of social cohesion. This allowed us to identify which dimension of social cohesion can be assessed on what level with which existing indicators. This matching already made the existing indicators more useful to assess social cohesion in the context of food system transformations. Furthermore, it provided a starting point for a “translation” of existing indicators into more food specific indicators and we provided a first suggestion for such indicators.

However, food systems and therefore also the context they provide for analyzing social cohesion heavily vary and it would not be possible to provide here a complete list of indicators for all different types of food systems. We rather see the preliminary indicator set presented in this working paper as a resource and starting point for researchers that want to develop their own specific indicator set to research social cohesion in a particular food context. To this end we also provided a guidance how this adaptation could be done in comprehensible way.

We encourage discussion, critique, and use of these indicator guidelines, because only then, this document can function as a starting point for growing toolbox for studying social cohesion in food systems. Researchers can use the preliminary indicators, adapt them for particular research questions, and add their adapted indicators again. By doing so, knowledge how to measure and understand social cohesion in the context of food systems can be accumulated and the research field can be pushed forward.



## 7 Annex 1: Glossary

Table 7: Key terms and definitions

| Term                                    | Definition   |
|---|--|
| Landscape                               | Refers to the (relatively stable / only slowly changing) environment of food systems. The landscape encompasses aspects such as: economic context and crises, environmental problems, large-scale ecological developments, societal norms, other systems / changes in other systems (transport, health, energy,...), legal frameworks, and political coalitions. Landscape pressure can drive (niche and regime) innovations.  |
| Regime & incumbent (food) system        | <p>We use the terms regime and incumbent system interchangeably. They refer to the existing/established/dominant food system including its structures, groups and communities, and individuals (see below, levels).</p> <p>The (incumbent) food system, therefore, consists of all activities and processes from (pre-)production to consumption and waste (Gaitán-Cremaschi et al., 2019; Schrode et al., 2019, p. 15). Food systems are nested and encompass different layers in terms of geography (e.g. international, CAP, national and regional) and sectors (e.g. different products and established practices of harvesting). Therefore, there are/might be different subsystems in e.g. a country (Gaitán-Cremaschi et al., 2019).</p> <p>General patterns/features are: international trade, large firms business/oligopolies along the value chain, conventional large-scale production of standardized food (productivist paradigm) (Gaitán-Cremaschi et al., 2019).</p> <p>(Perceived) malfunctioning of the incumbent food system can drive innovations.</p> |
| Niche, emergent and accelerating system | <p>We use the terms niche and emergent/accelerating system interchangeably to refer to the new/arising system of which the innovation is part.</p> <p>Niches consist of structures, groups and communities, and individuals (see below, levels).</p> <p>In contrast to the regime/incumbent system, structures, communities, and individuals are less stable and more fluid. The distinction between emergent and accelerating refers to time and scope (e.g. market share, dissemination). Emergent niches are rather new, small and still in formation. In case of “success” they might grow and become more stable (acceleration) (cf. Roberts &amp; Geels, 2019).</p>  |
| Structural level                        | Structures are taken for granted rules and features of regime and niche that appear to actors as (more or less) “objectively given”. They encompass norms, routines, infrastructures, technologies, formal and informal institutions, markets, products, laws, regulations, policies, etc. (Schrode et al., 2019, 22, 72). The level of institutionalization, that is the degree to which they appear as objectively given, is higher in regimes than in niches. Structures in niches are, therefore, more fluid/less stable (Geels, 2010, 2011).  |



|                    |   |
|--------------------|---|
| Group level        | <p>The group level of regimes and niches refers to the interactions and relations of actors. Non-human entities, such as a product, a technology, can be part of relations.</p> <p>The relations of actors (and other entities) can be understood as networks. Networks assemble different types of actors and connect them. Through which types of relation actors are related varies. Relations can be e.g. cognitive and attitudinal (e.g. trust, reputation, friendship, knowing each other...), exchange (e.g. of information, goods, knowledge, help) or collaboration/cooperation/co-presence in meetings etc.</p>   |
| Individual level   | <p>The individual level of regime and niches refers to (individual) actors and their perceptions, experiences, attitudes and behavior.</p>  |
| Innovation         | <p>Innovations occur in both, in niches and in regimes.</p> <p>There are several ways to distinguish innovations (cf. section <b>Fehler! Verweisquelle konnte nicht gefunden werden.</b>). Among the most important are:</p> <ul style="list-style-type: none"> <li>- innovation objects: service innovation, process innovation, organizational innovation, market/position innovation, social innovation, technological innovation</li> <li>- innovation subject: objective (new to the world) vs. subjective innovations (new to a certain group, region, sector,...)</li> <li>- degree of novelty: incremental (often within the incumbent system) and radical (often within the niche).</li> <li>- targeted food system activity: production, processing &amp; packaging, distribution, consumption, waste</li> </ul>        |
| Innovation process | <p>An innovation process describes the process from the first idea to the launch and diffusion of the innovation (see above: TIS-phases). An innovation process can occur within a single organization or bind together different actors and organization. In the latter case, similar single processes might occur within a single organization.</p> <p>Innovation processes fulfill seven functions (so called “sub-processes”):</p> <ol style="list-style-type: none"> <li>1. entrepreneurial experimentation</li> <li>2. knowledge development</li> <li>3. knowledge exchange</li> <li>4. guidance of the search</li> <li>5. formation of markets</li> <li>6. mobilization of resources</li> <li>7. creation of legitimacy</li> </ol> <p>Please note that the innovation process is not the same as a process innovation.</p> |
| Social cohesion    | <p>Social cohesion refers to how people relate to each other. The concept of SC can be studied at:</p> <ul style="list-style-type: none"> <li>- The level of individuals: perceptions and experiences</li> </ul>  |



|                                     |  |
|-------------------------------------|--|
|                                     | <ul style="list-style-type: none"> <li>- The level of group/communities: interactions and performances</li> </ul> <p>Our multi-level perspective on social cohesion implies that social cohesion is:</p> <ul style="list-style-type: none"> <li>- mediated by structures (structures shape individual and group level and are in turn shaped by them)</li> <li>- enabled and constrained by landscape developments</li> </ul> <p>(Enhancing) social cohesion can be a motivation of innovation actors and also a goal.</p>   |
| <p>Food-related inclusiveness</p>   | <p>Food-related inclusiveness addresses questions of access and distribution in food production and consumption, including processes:</p> <p>It can be studied at:</p> <ul style="list-style-type: none"> <li>- The level of perceived and experienced individual access to food and food-related aspects, such as production, consumption, gains/benefits/losses</li> <li>- The level of groups/communities (disparities in access, benefits,...)</li> </ul> <p>Again, we take on a multi-level perspective and assume that inclusiveness is</p> <ul style="list-style-type: none"> <li>- mediated by structures. Structures, therefore, can be in- or exclusive and they additionally influence the inclusiveness at “lower” levels.</li> <li>- enabled and constrained by landscape developments</li> </ul> <p>(Enhancing) food-related inclusiveness can be a motivation of innovation actors and also a goal.</p> |
| <p>Health-related inclusiveness</p> | <p>Health-related inclusiveness addresses questions of access and distribution to/of health in relation to food:</p> <p>It can be studied at:</p> <ul style="list-style-type: none"> <li>- The level of perceived and experienced individual access to health-aspects related to food (production, consumption, benefits/gains/losses)</li> <li>- The level of groups/communities (disparities in access, benefits,...)</li> </ul> <p>Again, we take on a multi-level perspective and assume that inclusiveness is</p> <ul style="list-style-type: none"> <li>- mediated by structures. Structures, therefore, can be in- or exclusive and they additionally influence the inclusiveness at “lower” levels.</li> <li>- enabled and constrained by landscape developments</li> </ul> <p>(Enhancing) food-related inclusiveness can be a motivation of innovation actors and also a goal.</p>                            |

Source: Barnickel et al. 2023.

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