



Social and Technological Transformation of Farming Systems: Diverging and Converging Pathways

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Workshop 5.6: Food governance for metropolitan and local food systems – connecting urban and rural

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This workshop discussed examples and visions of food governance for metropolitan and local food systems. Contributions were requested that included examples from the Global North and South, urban or rural settings, but where the focus was on food governance and the connection between nutrition (urban/rural diets) and the production potential in the urban, metropolitan, or rural region connected to the food consumption. Governance examples could be at the level of state, regional or city but also self-governance in rural or urban communities, and involvement of non-governmental organisations and other civil society actors, taking into account the different economic, social, political, historical, and environmental structures and conditions. A focus was on the one hand on the role of institutions, and on the other hand on the perceptions and level of participation of various actors and stakeholders within these different governance levels, and how they can interact (tensions, challenges, opportunities, successes) to achieve a deeper connection between food, nutrition and production potential in a shared food culture. Empirical research and case studies reflecting opportunities and challenges of various examples of food governance and local/metropolitan agro-food systems were particularly welcome. The workshop was in an open format allowing plenty of time for discussion and sharing of knowledge.

Urban food governance in German cities: actors and steering instruments

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Abstract: Although in Germany food is increasingly an emerging topic on the municipal policy and planning agenda, a structured investigation of activities and political processes is lacking. This paper aims to identify existing municipal strategies and plans related to food as well as the application of specific policy and planning instruments. We analyse relevant actors and policy fields at the local level and gain new insights into the origin of initiatives for policy action. We studied the situation in ten large German cities and employed different data gathering methods such as reviewing municipal documents and conducting guided interviews with experts and decision makers in city administrations. Our findings show that integrated urban food policies and their implementation in the form of urban food plans or strategies are still in their early stages. Municipality administrations and other regional actors follow sectorial approaches and use a wide array of steering instruments, i.e. informational instruments and public procurement policies. The potential of the food topic affecting multiple sectors is still under-exploited due to the absence of comprehensive horizontal urban governance. Food-related policy and planning action is driven by individuals in administration and civil society initiatives, but often lacks financial and staffing resources as well as continuity. More integrated urban food policies are needed to overcome sectorial thinking and acknowledge the cross-cutting nature of food policy.

Keywords: Food policy, food planning, policy instruments, city regions, governance

Introduction

Cities bring food policy back onto the municipal agenda. For decades the topic has been seen as a steering subject of higher governance levels and national and supranational institutions like the WTO (World Trade Organisation) or CAP (Common Agricultural Policy) (Barling et al., 2002; Sonnino, 2009). New drivers, challenges and engagement however address the municipal level, which seems to be an adequate level for steering food topics aside from federal, national and supranational sectorial policies (e.g. agriculture, health and environment) and achieving goals like food security or re-linking urban and rural spaces. Here national and global policies have partially failed (Barling et al., 2002; Sonnino, 2009).

Problems of the modern globalised food system are becoming visible or are being caused on the local scale and regard e.g. food security and safety, malnutrition, food waste and long transportation distances (Koç, 1999; Wiskerke, 2009, Morgan et al., 2006; Stierand, 2012). Increasingly urban consumers scrutinise the conventional globalised food system and formulate new urban food needs regarding confidence, sustainability, health and fairness, which go beyond sufficient food supply (Stierand, 2012). Urban communities and civil society organisations take on a more active role in the urban food system and initiate in many cases

approaches for urban food policies, with municipalities creating governance structures for the implementation of these policies (Cohen & Ilieva, 2015; Stierand, 2014).

The topic 'food' constitutes an unexploited potential for sustainable urban development by touching on issues such as transport, health and economic development (Sonnino, 2009; Stierand, 2014). Many cities and towns all over the world have started to govern food topics more actively and develop urban food strategies or plans, for example by establishing Food Policy Councils, either applying top-down or bottom-up processes. They define objectives and measures and apply instruments which address specific challenges and fit to the local context (Dubbeling, 2013; Moragues et al., 2013; Morgan, 2009; Pothukuchi, 2009). In contrast to food strategies on other levels of government which focus on single issues (like agriculture, food safety etc.): *"a municipal food strategy is an official plan or road map that helps city governments integrate a full spectrum of urban food topics within a single policy framework that includes food production [...], food processing, food distribution, food access and food waste management"* (Mansfield & Mendes, 2013 p.38). Therefore *"municipal food strategies tend to be unique because of their location within local governments, and the attempt to treat food system issues holistically"* (Mansfield & Mendes, 2013 p.38).

According to Koc & Dahlberg (1999) three major options for introducing food into urban planning exist: creating a city department for food; creating food policy councils; and integrating food into city planning.

Food policy councils and food strategies seem to be the most popular approaches for governing food issues at the local level (Derkzen & Morgan, 2012; Scherb et al., 2012). Dating back to the 1980s cross-sectorial Food Policy Councils as governmental or non-governmental organisations developed first in the United States and Canada (Morgan, 2009; Schiff, 2008). Areas of interventions addressed structural failures in the food system like food insecurity and malnutrition in urban areas, and were mainly related to access to food (food for school children and low-income people, people living in food deserts): urban agriculture and public procurement (Morgan, 2009; Scherb et al., 2012). Subsequently more and more cities worldwide followed the examples of San Francisco (1997); New York (2007) or Toronto (1991) and established food policy councils and formulated food strategies. In Europe the cases of London (2004) and Amsterdam (2006) are most prominent, but also "smaller" cities like Bristol (2011) or Malmö (2010) are pioneers in the field of urban food policy and planning (Morgan, 2009).

In the German context, urban food governance activities started late and have a limited visibility in the international community of scientists and practitioners, despite the urban gardening phenomenon. Due to the novelty of the topic and the limited information and scientific knowledge base regarding local food systems in Germany as well as municipal food policy and planning activities, we decided on an explorative research approach of national case study. In this paper we present experiences from ten large German cities (>500,000 inhabitants) and address the following research questions: (i) What role does food policy and planning play in German cities? (ii) Who are relevant actors within the local food planning and policy activities? (iii) How do they shape the food system, more specifically, which instruments and measures do they apply and which resources do they have at their disposal?

Material and Methods

Our exploratory approach consisted of three main elements: (i) analysis of websites and planning and policy documents; (ii) interviews with city officials in ten selected cities; and (iii) analysis of best practice examples.

Based on a screening of websites and planning and policy documents (preliminary research) among the fourteen largest cities in Germany (> 500,000 inhabitants): we identified ten cities applying “a basic approach” of urban food policy (Table 1). These ten cities were selected for the in-depth case study for which we conducted interviews with one expert per city in the city administrations (total number of interviews n=10). We identified as experts, persons which have relevant knowledge about the food topic and/or are involved in relevant governance processes and/or were seen as representative for the organisation (Lamnek, 2010). With these persons (five male, five female): we conducted semi-structured telephone interviews between December 2013 and February 2014. The interviews took about 30-110 minutes, were recorded and transcribed. The interview guideline with the working definition (see below) of a local food strategy was sent to the interview partners in advance, containing 25 questions regarding the following three major aspects: (i) Initiation of municipal food strategies and projects; (ii) actors and resources; and (iii) implementation of a food strategy (instruments and measures).

Based on the works of Morgan (2009): DVRPC (2010): Mansfield & Mendes (2013): Raja et al. (2008) and Stierand (2014): we developed a working definition of “local food strategy”, which integrates food issues topics (of or) into other urban policies like agriculture, nutrition, health, education, economy, social or climate protection at local level. The strategy defines objectives, commitments, promotional programmes and policies as well as related measures and tools on a municipality level. Examples for concrete measures are the promotion of urban gardening and of distribution channels for direct marketing like farmers’ markets or market halls, as well as changes in public procurement policies in order to give preference to regional or organic food provision or land zoning for agricultural land preservation.

Interview transcripts were analysed with the MAX QDA software package (version 12 of VERBI Software GmbH) according to the principles of qualitative content analysis as described by (Kuckartz, 2014).

For the analysis of best practice examples we used the interviews and municipal documents.

Table 1. Preliminary research: overview of the ten studied cities and affiliations of identified experts

	City	Population (in 1,000)*	Integrated local food strategy or planning	Single food related policy activities	Affiliation of the identified experts
1	Berlin	3,422	no	yes	Dept. for Environment and Nature
2	Munich	1,408	partly	yes	Dept. for Health and Environment
3	Hanover City Region	1,120	no	yes	Dept. for Environment and Green Space Planning
4	Cologne	1,034	no	yes	Local Agenda 21 office and Agency for Environmental and Consumer Protection
5	Frankfurt (Main)	701	no	yes	Dept. for Environment and Health
6	Stuttgart	604	no	yes	Dept. of Health
7	Düsseldorf	599	no	yes	Local Agenda 21 office at the Environmental Agency
8	Bremen	549	no	yes	Networking Agency for School Catering
9	Leipzig	532	no	yes	Dept. for Environment, Public Order and Sport
10	Nuremberg**	499	partly	yes	Dept. for Environment and Health

Source: own investigations (screening of official websites, inquiries at municipality administrations).

*German Statistical Office (Statistisches Bundesamt): reference date 31-12-2013.

**We included Nuremberg, which has less than 500,000 inhabitants, but possesses a well communicated approach in the field of organic food.

Results

Initiation of municipal food strategies and projects

According to the in-depth interviews, in the majority of eight cases a comprehensive food strategy as defined in the interview guideline was reported. Only the cities of Munich and Nuremberg show at least initial approaches to more comprehensive strategic food planning and policy. These cases are further elaborated in the results section. However, despite the frequent absence of overarching strategies, all cities have on-going, but rather individual and non-integrated food related policy activities and projects related with food and agriculture.

In principle those activities and projects are driven by either internal, local initiatives or external drivers and support systems. Internally, a wide array of actors and decision-makers from administration, local legislation (e.g. city council): civil society (e.g. transition town movement) or local businesses (e.g. organic food producers) can be found as being initiators and driving forces behind the food policy and planning activities. Especially Local Agenda 21 processes and the related action programmes at local level play a relevant role for the initiation of food projects in the studied cities. For example the farmers' markets in Cologne and Dusseldorf were established with the involvement of the Agenda offices and other local actors.

Due to the limited room for manoeuvre of the municipalities, policy actions, activities and projects often rely on external triggers and funding sources, such as national and international programmes and promotional institutions (e.g. WHO Healthy Cities, School Fruit Scheme of

the European Commission, Federal Organic Farming Programme). The cooperation with universities and research centres with the implementation of innovative and pilot projects, e.g. in the field of urban agriculture, was also mentioned as another external driver of food-related activities.

Besides these programmes many of the studied cities are part of city alliances and networks working on special topics like climate, energy, health or organic food. Some cities gained momentum for common action from aiming at common targets, such as in candidature for nominations (e.g. “Fairtrade town”) or in competitions (“European Green Capital Award”). In addition, the interviews have revealed that municipal actors are quite well-informed about food related activities in other cities; particularly, Munich, Nuremberg, Hanover and Berlin, but also other smaller cities have been named as being best practice examples in the field of urban food governance.

Actors and Resources

Aiming at identifying relevant actors in local food planning and policy activities, we found in total 164 actors named in the interviews. To distinguish between their roles, we categorised these identified actors into three groups, including: (1) general actors, for example identified as relevant for the urban food system; (2) project partners, that are involved in realised projects; and (3) strategic partners that joined decision making processes, strategic planning in the form of working groups, round tables etc.(Table 2).

Table 2. Actors and their roles in the food system and projects

Ranking of relevant actors	General actors in the local urban food system	Actors as project partners	Actors as strategic partners	Total in actor groups
1	Administration (27)	Economy (23)	Civil Society (10)	Administration (49)
2	Civil Society (20)	Administration (18)	Economy (8)	Economy (47)
3	Economy (16)	Civil Society (10)	Administration (4)	Civil Society (40)
4	Other (15)	Other (7)	Other (2)	Other (24)
5	Policy (1)	Policy (2)	Policy (1)	Policy (4)

Source: own compilation based on interviews (frequency of references in the interviews, including double mentions).

General actors identified by the interviewed persons as “relevant” players in the local urban food system are based in administration, civil society (e.g. foundations and associations in environmental and nature protection) and economy (mainly food producers and distributors). Public caterers (i.e. schools, hospitals, and enterprises): one-world-initiatives, consumer advice centres, churches and academia we subsumed under the category “Other”. Economic actors represent the most important partners in implemented projects, followed by administration and civil society. Civil society plays an important role in the planning and institutionalisation of cooperation structures such as thematic working groups and round tables. Hence, the interviewed persons seem to be quite aware of other actors in the food system and cooperate mainly with economy and civil society in concrete projects, respectively strategic working groups at local level (Table 2).

The interviewed persons who are involved in most of the identified urban food projects and processes are mainly located in the departments for environment and health or are linked with Local Agenda 21 offices (Figure 1).

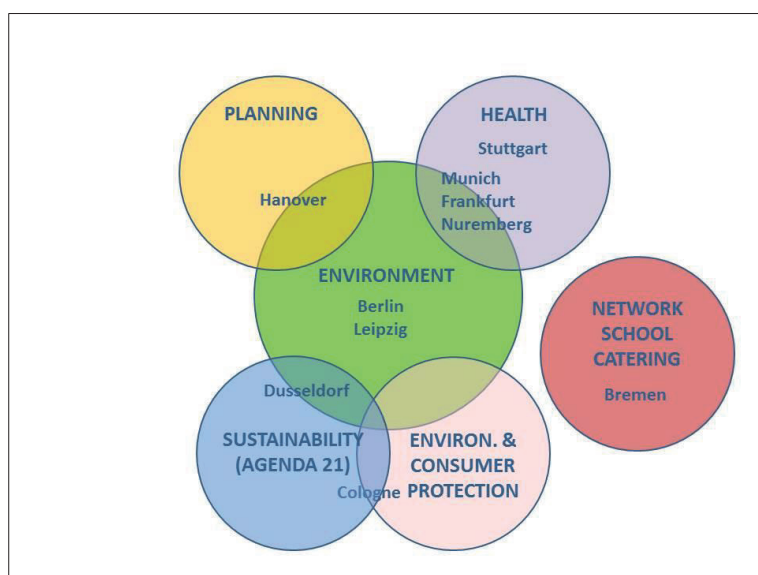


Figure 1. Sectorial responsibility of the identified food projects. (Source: own illustration inspired by Hatfield (2012 p.16))

Furthermore, a large range of other departments is actually involved in the implementation of different food projects as well as steering processes, or will be in the future. The interviewees named up to six other departments dealing with food issues on the municipal level (Figure 2). A high number of involved departments can be found, if cities either conduct a lot of different projects (e.g. Dusseldorf) or follow an more integrated approach like Nuremberg (see Results).

All in all, we identified ten different departments in the cities, illustrating the wide range of food system actors even in the field of administration. Here the departments for health, environment, social affairs (including schools) are the most relevant actor groups in administration (Figure 2). Departments dealing with use of the urban space (city, green areas and landscape planning, market office, real estate authority) were mentioned in fewer cities. This might indicate that the urban food topic is mainly perceived as an issue of health or environment and less of spatial planning.

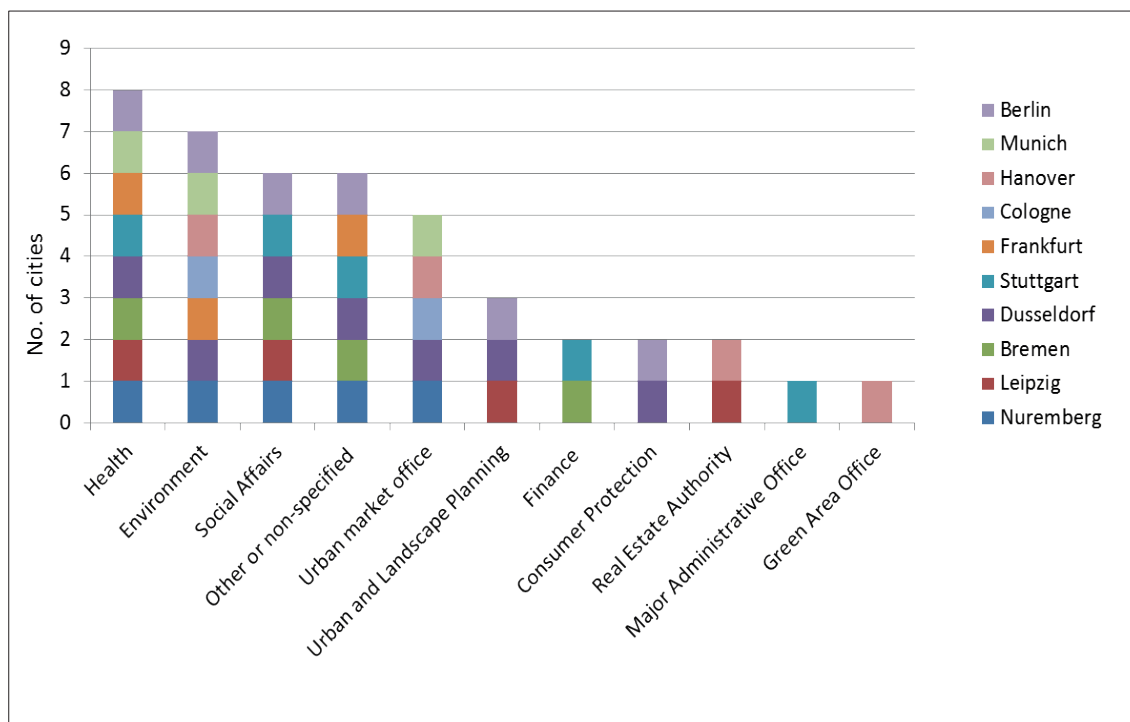


Figure 2. Range of city departments in urban food projects. (Source: Own compilation based on interviews).

Internal and external resources are used by actors in administration for shaping food issues at local level. External resources include European (three cases) and Federal funds (six cases). Otherwise, large environmental foundations (e.g. Deutsche Bundesstiftung Umwelt): private sponsoring or penalty fees are providing financial support for project implementation.

The interviewees often had problems estimating which financial and staffing resources the cities invest for food topics. Resources coming from public funding at local level are quite limited and the city administrations have mainly staffing resources at their disposal. In most of the cases people in existing positions deal with food topics, where they cover as a major or minor part of their daily work. Only three cities created additional positions. Basically one to five persons deal per city with food or agriculture in full-time or part-time roles. Two quotations from an interview summarise the situation in the following way: *“There are no specialist units or additional human resources, which are dealing with a sustainable food strategy in particular”* (verbatim translation of citation interview 8). *“My work was basically what the city invested in this issue”* (verbatim translation of citation in interview 5).

Three cities mentioned that they do not have (additional) financial resources for food topics. Financial resources from the city are sometimes available for the implementation of existing concepts or programmes (climate protection, Local Agenda 21 etc.). Here actors have a budget e.g. to finance events, material for public relations, coordinate work or external advisory (Frankfurt, Dusseldorf, Munich, Bremen). Measures were also paid from the current budget of different departments or funds that cities have at their disposal. Other sources were used by chance within large singular projects like the EXPO 2000 in Hanover, where a lot of additional money came in: *“This is special project, which would have never been taken place, if it was not EXPO, where a lot of additional funding came in from different participants”* (verbatim translation of citation in interview 5).

As their contribution to the steering of food topics interviewees named also the participation or coordination of boards and cooperation with different local actors that initiated projects without funding from the city.

Implementation of urban food projects: instruments and measures

All studied cities use a wide array of instruments for steering food topics at local level. Dominating are instruments aimed at the information and education of different target groups like children, adult consumers or canteens (Figure 3).

Informational instruments

Responsible persons apply different measures like events (e.g. meat-free days): offer information in the form of press reports, websites, films or printed materials, organise exhibitions, public lectures or workshops. In some cases professional public relation offices work in this field. In the group of informational instruments we also summarised measures like advisory services, professional qualification in the field of housekeeping and school gardens. Administrative actors stated that they perform a lot of informal networking and information transfer. Beside this they establish more institutionalised fora for information and knowledge transfer like boards, round tables and working groups.

Economic instruments

Apart from these soft informational instruments, city administrations strongly influence the urban food system by using their market power and formulate requirements for the purchasing in public canteens (schools, administrations, hospitals) or lease city owned land exclusively to organic farmers. In cooperation with private sector actors (enterprises, farming or marketing associations) they support regional marketing and also establish farmers' markets and market halls within the city. In some cases cities fund projects and initiatives from their budget.

Regulative instruments

Regulative and planning instruments were used rarely. They consider the preservation of agricultural land and water catchment areas or the compliance with certain requirements (e.g. organic farming) on land which is rented by the cities. We identified two cities that have an informal planning for the agricultural land in their city region. This kind of planning aims at the preservation and greening of agriculture (Hanover): and the preservation of agricultural land and economic development in the case of Leipzig. Here the cities conduct monitoring of the agricultural area as well as of the number of farms and influence land use through the formulation of requirements like environmentally friendly farming methods. The agricultural programme of Hanover goes beyond existing landscape or rural development planning and measures, strengthening the urban-rural linkages through shaping free space for recreation, providing fresh food for the urban citizens and creating income possibilities e.g. through the promotion of regional value chains etc.

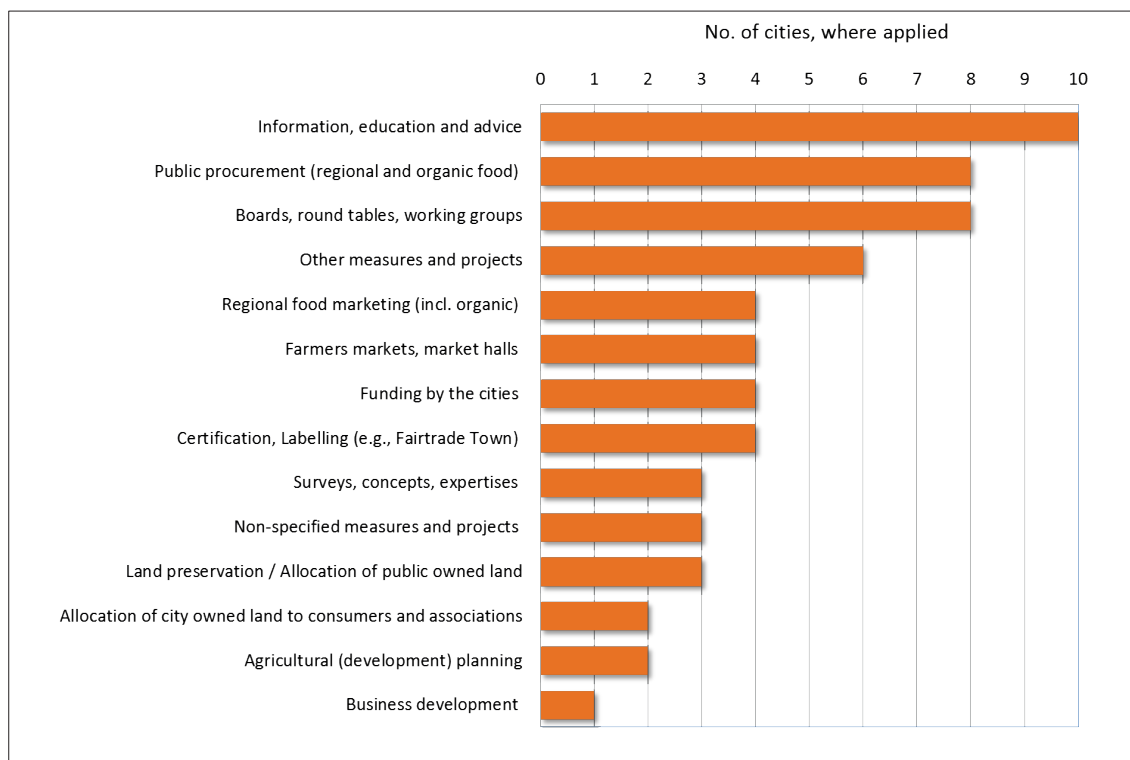


Figure 3. Application of instruments and measures in the studied cities. (Source: Own compilation based on interviews).

In order to identify good examples, we evaluated the identified instruments and measures more systematically by applying the differentiation into problem-oriented and opportunity-oriented projects, introduced by Stierand (2012 p.12). On the one side, problem-oriented projects address one specific problem in connection with the urban food system and accordingly focus on a single target. On the other side, opportunity-oriented projects take the complexity and interconnectedness of issues related to the food system into consideration. Therefore they use a more strategic approach for the solution and consider the food system as potential for urban development.

The projects and related measures can exist on different spatial scales ranging from a plot to the city region. They can touch specific policy fields like health or climate protection or integrate different fields into a more systemic, holistic approach (Figure 4). If we structure the projects and measures according to this scheme, it becomes obvious that most of the approaches applied by cities are problem-oriented rather than opportunity-oriented. They can be located on different scales, but rarely have a cross-sectorial approach. The organic food projects of Munich and Nuremberg (BioCity and BioMetropolis) constitute an exception to this pattern. We localise boards and working groups between problem- and opportunity-oriented approaches, because of their role as intermediaries or procedural instruments for a transformation towards more opportunity-oriented approaches.

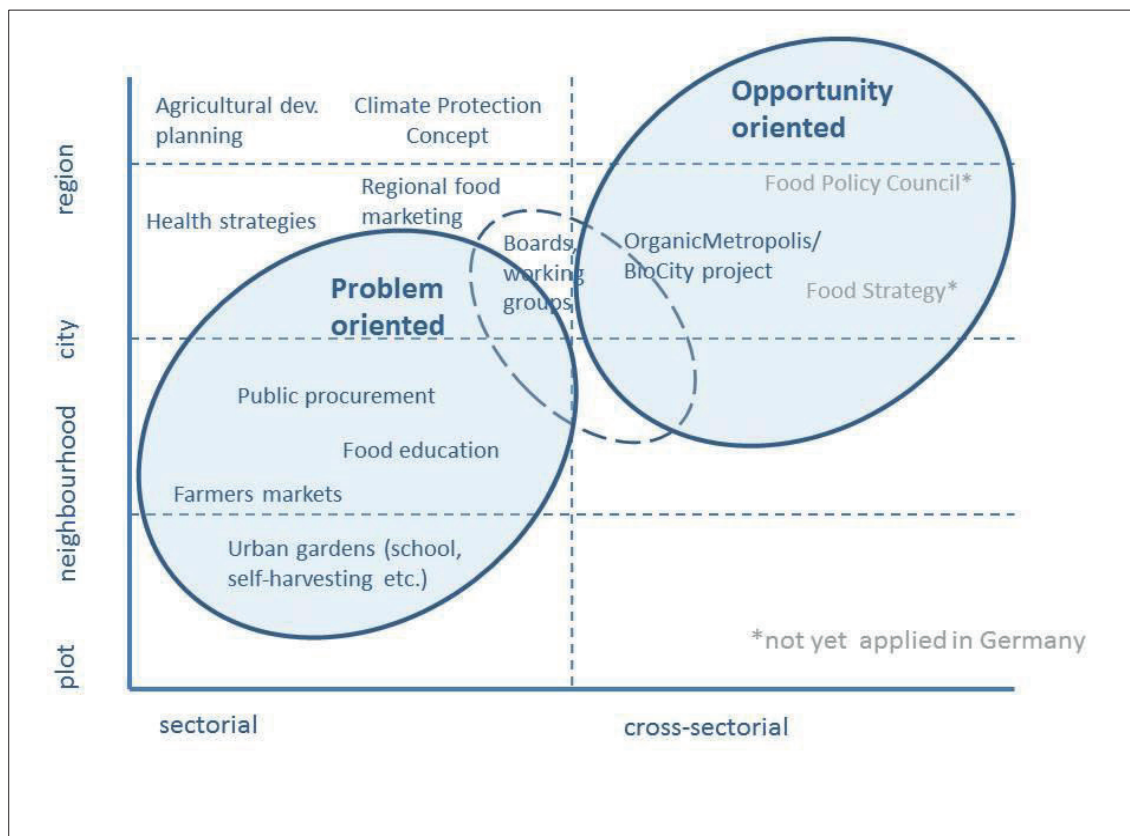


Figure 4. Orientation of approaches and projects applied by the studied cities. (Source: Own compilation based on interviews and Stierand, (2012 p.12)).

Urban food policy best practice: the cases of Munich and Nuremberg

Among the observed case study cities, Munich and Nuremberg represent best practice examples, as they are the only two cities that promote organic food with a broader urban policy approach. These approaches (BioCity Munich and Organic Metropolis Nuremberg) are well communicated and documented through city resolutions and reporting systems. The cities facilitate the implementation through self-commitments, adequate structures and resources.

In Munich the process for the BioCity project (“Biostadt München”) has been developed based on Local Agenda 21 processes and two city resolutions in the years 2006 and 2008. The resolutions define goals, and implementation including financing. Under the motto “ecological - regional - fair” the project aims at increasing the share of organic food from the region and fair traded food from the international market. Within the BioCity project there are three lead projects, which focus on different target groups: bio for children, bio in the catering business and bio in city administration. Measures like public relations and consumer information aim to increase the awareness of an organic diet. In a recent resolution (2013) the city council decided to increase the share of regional organic products in city institutions and events up to 20%. A report for the city council about activities and achievements is planned for 2015, but has not yet been published (RGUM, 2006, 2008, 2013).

The Department of Health and Environment, Munich (RGUM) is responsible for the implementation and steering of activities. Therefore one major position was created additionally, so that two persons are responsible for the project. They have a fixed budget for

equipment and activities at their disposal. The funding is carried out through redirection of funds and public-private partnerships (RGUM, 2008)

In Nuremberg the steering of food topics had already started in the year 2003 with the resolution to increase the share of organic and regional products in public administration up to 10% within five years. In the last resolution of 2014 it was decided to proceed with the project Organic Metropolis Nuremberg (“BioMetropole Nürnberg”) until 2020 and achieve a share of 25% in city facilities and 20% organic agriculture in the region (Stadtrat Nürnberg, 2003, 2014)

In comparison to Munich, which focuses mainly on changes in food consumption, the approach of the city of Nuremberg is much broader and targets the whole food chain from agricultural production, through processing to consumption. For this aim the city formulated five action fields (Nürnberg, 2012): which include: (i) children and youth in schools and kindergartens; (ii) events and markets; (iii) canteen kitchens and bulk consumers; (iv) consumer information and public relations; and (v) promotion of organic enterprises and conversion to organic agriculture.

In the resolutions of 2003 and 2008 the municipality established a specific working group in the administration and assigned them the responsibility of implementing projects and reporting duties. Organic Metropolis Nuremberg and its forerunner projects are organised as horizontal projects with the involvement of various city departments. The project coordination is localised in the Department for Health and Environment, which has two full-time persons for the networking activities and internal and external communication. Only since 2008 has the city committed itself to provide a fixed budget and adequate personal resources. Additionally the responsible administrative actors acquire successful financial resources from sponsors and public funding programmes (Nürnberg, 2008; Stadtrat Nürnberg, 2003).

The working group initiated a large regional network in order to organise the activities and information flows more efficiently. As far as in the region a lot of organic food enterprises are located the cooperation and cross-linking with the Chamber of Industry and Commerce, the guild of organic agri-food business (i.e. Bio Innung) and the Nuremberg Fair, which organises the BIOFACH – “the world's leading trade fair for organic food” (Nürnberg Messe GmbH) are of strategic importance (Nürnberg, 2014). Together with Munich the city of Nuremberg promoted the German BioCity Network, which formed in the year 2012 at the BIOFACH fair and cooperates with the European network “Città del Bio” (Nürnberg, 2014).

Discussion

Our findings show that in Germany integrated urban food policies and their communication and implementation in the form of urban food plans or strategies are still in their early stages. Actors in the administrative and planning departments are not aware about the concept of strategic urban planning and its potential for urban development. But they are quite aware of other relevant actors in the food system and cooperate mainly with economy and civil society on concrete projects or in strategic groups at local level. This constitutes a good basis for the future development of an urban food strategy.

Food-related policy and planning action is often driven by individuals in administration and civil society initiatives, but often lacking financial and staffing resources as well as continuity. The cities use for the implementation of their food policies mainly internal human resources and external funding, e.g. from funding programmes at a national and EU-level. The administrative actors are quite creative in acquiring external sources also from the private sector and

foundations. However, due to the high dependency from existing funding schemes and periods, we evaluate the urban governance capacity as rather limited. Moreover, due to the difficult financial situation of many municipalities in Germany (e.g. Berlin, Bremen) it will be quite unlikely that there will be additional resources for designing and implementing an urban food strategy. In this case the establishment of Food Policy Councils by civil society as a first step could be an option.

Up to now, municipality administrations and other regional actors are engaged in the food topic with a strong sector approach (like environmental, climate and farmland protection, economic development, social affairs and health) and use a wide array of steering instruments, where informational instruments and public procurement policies were dominating. Changing public procurement strategies by re-localising, greening and moralising the purchasing of food is a powerful (market) instrument of city governments and semi-public actors for enhancing the sustainability of the food system (Sonnino, 2009; Wiskerke, 2009). Here we see also for German cities and towns a still unexploited potential (Arens-Azevedo, 2012; Morgan, 2006)

In our research we identified municipal approaches that are rather problem- than opportunity-oriented. Holistic approaches are mainly absent, with the exception of the organic food projects of the cities of Munich and Nuremberg. We find these good examples for urban food policies and furthermore cases for food sensitive planning (Donovan et al., 2011) with the sectorial approach of municipal agricultural planning in Hannover and Leipzig. But we could not identify examples for an integrated urban or regional food (system) planning (APA, 2007; Raja et al., 2008). The status quo in Germany seems comparable with the situation in the United States around 15 years ago as described by Pothukuchi & Kaufman (2000).

Food system planning and other complex issues like sustainability (e.g. Local Agenda 21) or climate protection are quite new fields for policy and planning on the municipal level. They have in common the need for cross-sectorial thinking, and a limited body of regulatory instruments and resources for policy implementation on this level (Mendes, 2008).

The mainstreaming of the food topic, e.g. through international initiatives, the participation in thematic city networks, EU policy schemes (e.g. school fruit scheme) or the Milan Urban Food Policy Pact (2015) can serve as drivers for an enhanced commitment and awareness-raising at local level. Especially thematic city networks can be adequate working platforms for knowledge exchange and fostering innovation in this field. More integrated urban food policies are needed to overcome sectorial thinking and acknowledge the cross-cutting nature of food policy.

Driven by the Milan Urban Food Policy Pact ("Milan Urban Food Policy Pact") two of the studied cities (Berlin, Cologne) have recently created Food Policy Councils. While in Cologne the city administration is involved, we can observe in Berlin the parallel development of a municipal initiative (top-down) and a network of citizens (bottom-up) including actors from policy, civil society, NGOs, farmers, gardeners, academia etc. This shows again cities development of governance structures and instruments which reflect their local needs and capacities.

Conclusions

If policy and planning in cities and towns came to the decision that food is an important urban topic and should be steered, place based strategies and approaches are required. Resource allocation models are also needed, starting with informal knowledge exchange. In addition, institutionalised steps like the development of networks, sharing experiences on different

funding options or on personnel resource sharing make sense. Professional innovation brokerage for food policy, and forms aiming at establishing new financing models within established and novel institutions could also become promising models. A more targeted selection of policies and implementation of instrument mix should be applied. Already a smarter integration of existing policies and instruments might be valuable for bringing urban food policy objectives to a higher degree of effectiveness (reaching objectives) or efficiency (reducing cost). Promising novel combinations might lie in combined information support measures, connected to novel civil society based financing mechanisms (e.g. crowd funding) and to incentives for cooperation between farmers and consumer groups (rural development payments, European Innovation Partnerships).

The study presents a snapshot of the situation in German city administration and is so far based on single actor perspectives from city administrations. In on-going research we want to deepen the questions of legitimation, barriers and achievements. Future research about food policy and planning in Germany could touch topics like food governance in smaller cities and city regions, the role of actors outside administration, study the governance processes in the establishment of Food Policy Councils in German cities and towns, or check the feasibility of existing regulatory and planning instruments for urban food planning.

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Munich: Staff member in the BioCity project at the Department for Health and Environment [Referat Gesundheit und Umwelt, (RGUM)], 10-01-2014, 1h20.

Hanover: Staff member at the Department for Environment and Green Space Planning [Fachbereich Umwelt und Stadtgrün]: 19-12-2013, 1h25.

Cologne: Staff member at the Agency for Environmental and Consumer Protection and member in the Local Agenda office [Amt für Umwelt- und Verbraucherschutz und Lokale Agenda ("KölnAgenda"), 18-12-2013, 56 min.

Frankfurt (Main): Staff member at the Department for Environment and Health [Dezernat Umwelt und Gesundheit], 16-12-2013, 1h48.

Stuttgart: Staff member at the Health Department [Gesundheitsamt], 19-12-2013, 39 min.

Düsseldorf: Staff member and coordinator of the Local Agenda Office at the Department for Environment [Agenda Koordination im Umweltamt], 19-12-2013, 59 min.

Bremen: Staff member at the Networking Agency for School Catering [Vernetzungsstelle Schulverpflegung im Land Bremen], 14-01-2014, 45 min.

Leipzig: Staff member at the Department for Environment, Public Order and Sport [Dezernat Umwelt, Ordnung, Sport], 20-12-2013, 27 min.

Nuremberg: Project manager of Organic Metropolis Nuremberg at the Department for Environment and Health [Referat für Umwelt und Gesundheit, BioMetropole Nürnberg], 18-12-2013, 42 min.

Urban food governance in Tamale, Northern Ghana

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(Abstract only included at author's request)

Abstract: Urban food system governance is especially complex, comprising of a dense configuration of heterogeneous interacting individuals, organisations and institutions. We conceptualise this governance as a process. Within it, multiple state, customary, civil society and vernacular institutions, with different objectives, interact as they attempt to exert their preferred mode of governance on each other and other actors. Such governance systems are created recursively, as subjects negotiate attempts to govern them. We demonstrate these processes using interview and observational data from research and policy-making activities in Tamale, Northern Ghana. These activities took place within the context of the UrbanFoodPlus research project on West African urban food systems. We show how farmers, chiefs, NGOs, consumers and local authorities interact around the themes of irrigation and land. As they shape the governance process, they use strategies described in models of institutional and forum shopping. Actors take advantage of overlaps and ambiguities in governance to make selections between different discourses and institutions and the governance modes these represent, for example by acquiescing to irrigation water quality norms or challenging a chief's prerogative to sell land. Actors also create hybrid governance systems, comprising multiple institutions. In our case study, they carry out these processes within specific fora such as courts, NGO advocacy situations, media platforms and vernacular discourse, selecting the arenas that they think will benefit them. In doing this, they lend legitimacy to the institutions hosting those fora. We show how food system governance is therefore a process co-performed by individual, organisational and institutional actors.

Keywords: Conflict, forum shopping, irrigation, land, stakeholders, urban.

Governance of agricultural programmes in South Africa - potentials and constraints for local food systems adopting a right to food lens

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Abstract: In South Africa, centralised food systems not only shape unhealthy food environments but also contribute to decreased economic activities and employment in rural areas. In contrast, local food systems (LFS) can promote more equitable, empowered and resilient local communities. This study explores the governance of programmes supporting local food production and distribution. National food security, nutrition and agriculture policies and programmes were analysed and implementation of three government-supported projects investigated, conducting focus groups and interviews with different actors. A right to food lens was adopted, focusing on the commitment of programmes to the human rights' principles Participation, Accountability, Non-discrimination, Transparency, Human dignity, Empowerment, and Rule of law (PANTHER). While the legal framework in South Africa is supportive towards LFS, various challenges are being experienced with regard to implementation of programmes, such as lack of transparency and accountability of projects, and limited participation and empowerment of beneficiaries. The focus is on food production while important aspects of LFS such as healthy nutrition and environmentally sustainable production and consumption are neglected. The projects observed have the potential to empower farmers and the wider rural community and therefore to promote LFS if training, infrastructure, tools and production inputs reach beneficiaries. We conclude that adopting a right to food lens enables people to be perceived as rights holders instead of beneficiaries, who actively participate in programmes that promote LFS and enhance rural livelihoods. The PANTHER principles can serve as a guideline to assess and monitor projects in order to reveal the potentials and constraints of LFS.

Keywords: Governance, local food systems, sustainable development, right to food, PANTHER principles, South Africa

Introduction

Background and objectives

The South African government aims at eliminating poverty and reducing inequality by 2030. Agriculture was identified to be a priority area in achieving this goal (National Planning Commission (NPC): 2012). Despite growing per capita income (Organisation for Economic Cooperation and Development, 2013) and being nearly self-sufficient in agricultural production (United Nations Environment Programme, 2015) South Africa remains one of the most

unequal societies in the world (NPC, 2015). As the South African National Health and Nutrition Examination Survey (Shisana et al., 2013) showed, more than a quarter (26%) of the population - especially rural households - are food insecure. Yet, South Africa has a high rate of obesity, especially among women (42% with BMI \geq 30 kg/m²) related to unhealthy eating patterns. According to the former UN Special Rapporteur on the right to food (De Schutter, 2012) current centralised and highly commercialised food systems in South Africa favour these unhealthy eating patterns and hinder sustainable rural development.

Based on the history of racial discrimination and inequality, South Africa is characterised by highly unequal farming systems, namely the commercial farming sector and the emerging smallholder sector. Bridging this gap poses the main challenge to South Africa, with strengthening Local Food Systems (LFS) being one of the suggested solutions, wherein strong governance structures are considered crucial (De Schutter, 2012).

The aim of this study was to assess South African policies and programmes that promote sustainable rural development, with a focus on LFS. Existing policies were analysed (macro level) and the implementation of selected programmes examined in Vaalharts (meso and micro-level). Emphasis was further laid on determinants for success and failure of these programmes with regard to their commitment towards the human rights (PANTHER) principles: Participation, Accountability, Non-discrimination, Transparency, Human dignity, Empowerment and Rule of law (Food and Agriculture Organisation of the United Nations (FAO): 2014): thus their contribution to the realisation of the right to food.

Local food systems

LFS are regarded as a crucial measure to counteract some of the detrimental effects of global food crises and modern food systems by creating more equitable, empowered, and resilient local communities, particularly in rural areas (McKibben, 2007). To date, there is no generally agreed definition for the concept of LFS. Drawing on different international classifications and the geography of the research area, this study considers products as being local when they are produced and consumed within a radius of 50km. Kelly and Schulschenk (2011 p. 563-564) describe local food economies as “[t]he flow of resources (financial, human, social, environmental and others) within a network of community based enterprises that produce and distribute food at the local scale for local consumption.” There is a direct and immediate link between actors within this network based on personal interaction of farmers and consumers (Hinrichs, 2000). Lemke and Bellows (2016) refer to the inherent characteristics of LFS in which civil society plays a crucial role and wherein an integrated public-private-civil society approach strives for healthy, just, and sustainable local food economies. They further argue that the human right to food provides a useful framework to promote participatory LFS.

Right to food

In South Africa the right to have access to sufficient food and water is embedded in section 27(1)(b) of the Constitution (Republic of South Africa, 1996). It guarantees every citizen the justiciable right to have regular, permanent and unrestricted access to adequate and sufficient food. The human right to food was first mentioned in the Universal Declaration of Human Rights of 1948 (FAO, 2014). Building upon this declaration, the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR) was adopted and entered into force in 1976 as the “(...) *most important binding guarantee of the right to food* (...)” (Söllner, 2007 p.293). State parties recognise “*the right of everyone to an adequate standard of living for*

himself and his family, including adequate food” (Article 11.1) and *“the fundamental right of everyone to be free from hunger”* (Article 11.2). In the context of human rights, people are regarded as rights holders and states as duty bearers that have obligations towards rights holders. In order to clarify states’ obligations regarding the right to food in international human rights law General Comment (GC) 12 on ‘The Right to Adequate Food’ describes what is understood as adequacy and sustainability of food availability, stability and accessibility. It also highlights states’ obligations to progressively fulfil the right to food, imposing three types of obligations: to respect, protect and fulfil (facilitate and provide) the right to food (FAO, 2014). According to the Right to Food Guidelines (FAO, 2005 p.9) *“States should (...) promote good governance as an essential factor for sustained economic growth, sustainable development, poverty and hunger eradication and for the realisation of all human rights including the progressive realisation of the right to adequate food”*. Progressive realisation of the right to food implies that the state continuously and proactively takes appropriate legal, administrative and operational measures towards the full realisation of economic, social and cultural rights, even when resources are scarce. The state has to tailor measures and programmes for the most disadvantaged groups in society. In South Africa, this refers especially to the groups affected in the past by racial discrimination (McLaren et al., 2015). In order to make the right to adequate food internationally justiciable, the Optional Protocol to the ICESCR was adopted by the UN General Assembly (2008). Policy formulation and laws should be guided by the seven human rights (PANTHER) principles (FAO, 2014).

Methods

This study is part of a project funded by the Programme to Pro-Poor Policy Development (PSPPD2) of the South African Department for Planning, Monitoring and Evaluation, in partnership with the EU. The project is situated at the African Unit for Transdisciplinary Health Research (AUTHeR): North-West University, South Africa and investigates the potential of LFS for rural sustainable development in the Vaalharts region. Situated in the Northern Cape and North West provinces, this region comprises the largest irrigation scheme in South Africa. The relevance for this project emerged from ongoing research on “Sustainable diets in rural South Africa - Linking nutrition, food systems and the environment at local level” carried out since 2013 (Claasen et al., 2015): highlighting that rural households encounter unhealthy and unsustainable diets, with LFS not being fully utilised. Thus, the potential role of LFS in contributing to economic activities, livelihood diversification, and enhanced food security and nutrition required further investigation.

A conceptual framework (see Figure 1) was developed guiding data collection and analysis. In the centre of the framework are the six sustainability dimensions of LFS derived from the Sustainable Development Commission (2011) as applied in the larger project, with several sub-studies investigating these dimensions: economics, environment, food quality, socio-cultural aspects, nutrition and health, and governance. The present study focuses on governance aspects of the agricultural programmes investigated here, and integrates a right to food lens by applying the human rights PANTHER principles to assess how these programmes perform regarding governance, and whether they are supportive towards LFS and sustainable development. From a rights-based perspective the state is considered as a duty bearer towards rights holders (FAO, 2014) such as smallholder farmers and consumers, and therefore has an obligation to design policies and programmes that contribute to the realisation of the right to food.

This study followed a qualitative research design. National programmes that shape various agricultural projects in Vaalharts were analysed and their implementation was investigated in three ongoing projects: a female farmers' group rearing broilers, a school garden initiative, and a local farmers' market initiative. Various actors are involved in production, distribution and consumption of local food, such as local government officials, distributors, schools, and NGOs, as illustrated in Figure 1. Relevant questions are: do rights holders (e.g. smallholder farmers) participate in programme implementation?; are duty bearers (e.g. local government representatives) held accountable regarding their performance?; is information shared appropriately among all actors involved? A focus was further laid on identifying communication and resource flows among actors, as these are essential for identifying specific characteristics of the LFS.

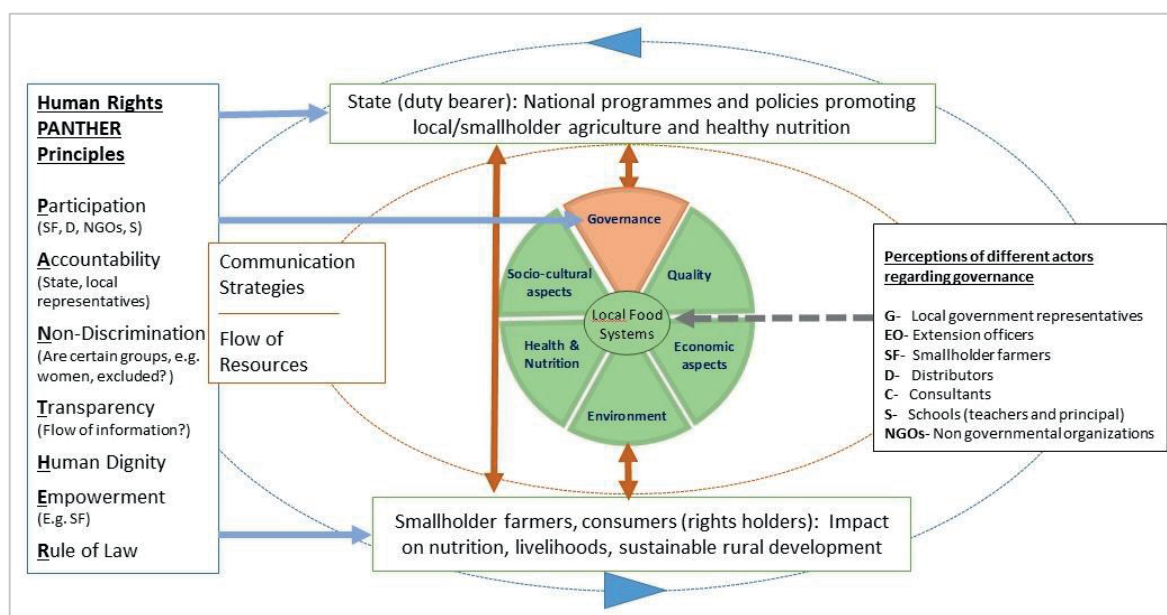


Figure 1. Conceptual framework adopting a right to food lens to explore local food systems and actors involved (partly based on Sustainable Development Commission, 2011; Claasen et al., 2015)

Semi-structured interviews and informal conversations were conducted with different actors involved in the selected programmes, exploring their perceptions specifically regarding governance. This included interviews with representatives from local and provincial governments (duty bearers): municipality (n=2): local Department of Agriculture (n=3) and provincial Department of Education (n=1). In most cases, government representatives were able to provide information on several of the projects investigated, as the boundaries with regard to funding streams and responsibilities of the various programmes was not always clearly differentiated. Interviews were further conducted with rights holders such as programme beneficiaries (n=5) and food system actors in the retail sector (n=2): customers (n=3) as well as with key-informants such as business consultants (n=1) and local NGOs (n=2). In addition two focus group discussions (FG): one with 8 farmers who were beneficiaries of implemented programmes, and the other one with 5 members of a farmers' cooperative were employed. In addition, non-participant observations were carried out and recorded in a field

book. At least two beneficiaries and one other food system actor per project were interviewed in order to gain a balanced perspective.

All data resulting from observations and interviews were transcribed and then processed using the computer-based analysis software ATLAS.ti. Content analysis was conducted to single out local actors within the food system, their role as well as their communication strategies. Moreover, potentials and constraints of programmes' contribution to LFS as well as their contribution towards the realisation of the right to food were analysed.

Results

Overview of policies and programmes

Several agricultural policies and programmes in South Africa explicitly address national and local agriculture and nutrition objectives. At the macro-level, the National Development Plan (NDP) guides all political actions to eliminate poverty and inequality by 2030. In line with broader framework documents, various programmes were implemented to clearly support rural development.

Analysis of previous research and insights gained during the community entry phase revealed four government programmes that shape various agricultural projects in Vaalharts:

Comprehensive Agricultural Support Programme (CASP)

CASP focuses on post-settlement support. Emerging farmers, including women in rural areas, are specifically targeted. Today 70% of CASP funds are directed towards the Fetsa Tlala (seTswana for "End Hunger") production initiative that aims at taking 1 million hectares of land under production by the 2018/19 production season (McLaren et al., 2015).

Integrated Food Security and Nutrition Programme (IFSNP)

The IFSNP provides agricultural production packages to households (Department of Agriculture, Forestry and Fisheries (DAFF): no date). At a provincial IFSNP-platform all social cluster departments meet on a quarterly basis to discuss their actions regarding food security.

Ilima/Letsema Programme (Meaning "Working together to liberate ourselves from the oppression of poverty and to build this nation" in seTswana/Zulu)

This programme is implemented by DAFF to increase food production through provision of production inputs and to rehabilitate irrigation schemes and other value adding projects (Parliamentary Monitoring Group (PMG): 2012).

National School Nutrition Programme (NSNP)

The NSNP aims at improving attendance and performance in school of South African learners in lower income areas by providing a nutritious daily meal. Furthermore, the programme encourages the establishment of school gardens and other production initiatives and promotes healthy lifestyles and nutrition education (Department of Basic Education (DBE): 2009).

The following section provides insights into the local implementation of the above mentioned four programmes in three projects in the Vaalharts region and their direct and indirect impact on different actors in local communities.

Three case studies of project implementation in Vaalharts

Chicken meat production (CASP and Ilima/Letsema Programme)

Background and origins

According to one of the farm managers rearing broilers in barns, they previously experienced serious cash flow problems until the farm was about to be auctioned. A national government official who grew up in this village initiated a comprehensive support strategy. A steering committee was formed consisting of farmer group delegates, extension officers, the director of the district Department of Agriculture as a mentor, and consultants, in order to provide guidance, training and to monitor progress.

As stated by the female farm manager and the mentor, the Comprehensive Agricultural Support Programme (CASP) and Ilima/Letsema programme were implemented. The mentor clarifies that CASP funds were spent on infrastructure development such as renovation of chicken houses and the abattoir. Ilima/Letsema funds were directed towards machinery and production inputs, i.e. chicks and feed.

Specific characteristics of Local Food Systems

The chicken project depicts several of the previously described LFS characteristics. The farm manager remarks that the departmental support contributed to an improved performance of the farm. The programme support initiated a flow of financial and human resources within the LFS. The farm is today capable of permanently employing 56 workers from the local community, who buy meat at this farm. The farmers, the mentor and the consultants explain that meat is mainly marketed directly from the farm. This is why it can be offered at a comparatively low price and constitutes a quality source of protein affordable and accessible to the local poor.

A local NGO and a retailer mention that low prices, good quality and proximity are the reasons why they purchase at the farm, as do schools, crèches, hospitals and a prison. Moreover, local retailers (supermarkets, spaza shops and tuck shops) are purchasing chicken in bulk and distributing them to the wider community. There are no contracts between distributors and the farm because the business is based on immediate, personal contact between the farm and its customers. Nevertheless it is important to foster contracts with other government departments and institutions in order to find reliable customers when using the full production capacity in future.

However, the mentor and the farm manager point out that production inputs such as feed and chicks are purchased from a distance of 300 km, contributing to high costs and resulting in the project not yet being sustainable.

Compliance with PANTHER principles

Strong participation of beneficiaries in the implementation process of the programmes can be identified. Accompanied by the steering committee of experts the farmers were involved in project planning and development. Due to their intensive collaboration over a period of four years, the close relationship with the Department of Agriculture contributes to a sense of accountability on both sides. Farmers state that an extension officer and their mentor are always available for advice. Beneficiaries don't perceive any discrimination in terms of gender or ethnicity, stating that the project provides dignity and empowers them. They share their

knowledge with young people and other farmers, contributing to improved communication and enhancing broader participation and transparency.

Vegetable garden in a secondary school (NSNP and IFSNP)

Background and origins

The garden was initiated in 2008. According to the DAFF district director it was benefiting from the IFSNP that provides seeds, fertiliser, cover nets, water tanks, tools, basic training and extension services. The Department of Agriculture visits the site occasionally to monitor the project. The garden workers who are all women state that farmland, water and electricity are provided by the school, while they contribute some of their harvest to school meals as part of the NSNP. The women have already won two competitions related to female farmers and school gardens, but complain that the school governing body claimed the prize money although the school did not contribute to the garden work. This resulted in a conflict.

Specific characteristics of Local Food Systems

The workers and the agriculture teacher feel that the project is well integrated into the local community and is providing affordable, healthy food to the local community. They regularly sell to a crèche, a disability organisation, pensioners and households, especially for functions, as illustrated by the following quote:

“The community, they give us support [...] they phone me and then “Oma, I want ten bundles of spinach I’ve got a party, I’ve got a tombstone, I’ve got a funeral, I’ve got this” – I must [...] feed the community. Without community we shall never have the money.”
(Female garden worker, 15th of December, 2015)

The school does not offer any nutrition education, which is supposedly part of the NSNP. On the contrary, NSNP and IFSNP do not utilise the potential to create synergies. A provincial government official reveals that there is no coherent strategy on how to implement and fund food production which would require cooperation with the DAFF. Communication between the DBE and the DAFF is stated to be difficult and political will - even within the DBE- seems to be missing.

“Their [DAFF] own district officials used to sit with us and then we would plan. And then give them a list of schools. But at the moment they are not really doing it.”
(NSNP manager at provincial level, male, 28th of November, 2015)

This lack of communication at provincial level negatively affects local implementation. As stated by one worker, face-to-face interactions and trust exist between the vegetable farmers and their local customers, but not towards the school. Workers share their knowledge with young people who perceive the garden as a way out of unemployment, contributing to the sustainability of the project.

Compliance with PANTHER principles

According to the workers the IFSNP was implemented in a participatory manner. Beneficiaries were asked what they would require to improve the garden. Assistance was provided once and occasionally the extension officer visits the project, contributing to accountability. Referring to the DBE the NSNP is currently only providing a budget for the school feeding

scheme, which is neither implemented in a participatory manner nor can clear accountability mechanisms be made out. However, the DBE claims that it contributes to the accessibility of nutritious food for learners and that the Department is currently developing a monitoring tool. The conflict about the prize money between workers and school is pointing to a lack of communication, transparency and accountability mechanisms at different levels in several programmes. Even at provincial level the DBE admits that communication is missing and responsibilities are not clearly assigned. This violates the human rights principles of transparency and accountability. Nevertheless, the workers feel empowered and have gained dignity through the programme. The women can manage the garden without support and have a source of income.

Smallholder farmers' market (CASP)

Background and origins

The CASP-funded project was initiated in 2010 by the Department of Agriculture and a group of farmers. An extension officer states that the market is a trial for an Agro-Hub that is currently built as part of the national Agri-Park programme. The Hub is supposed to provide storage and processing facilities for smallholder farmers' produce, to provide bigger bulks of produce to customers and to make fresh produce available to the local community. Further, the market will be the outlet of the Hub once it is finalised. The market involves 14 CASP-funded small scale farmer projects selling vegetables, meat and fish on a fortnightly basis.

Specific characteristics of Local Food Systems

The farmers in the market committee highlight that the vegetable projects do not only provide employment to local people, they also make healthy food available and affordable. The extension officer in the organising committee points out that through direct marketing and transport costs covered by the DAFF, food prices can be kept low compared to big retail outlets in town. As indicated by the market manager of a local supermarket it is attractive for him to cooperate with local farmers:

"I think local it's fine because it's cheaper. You can check everything that you buy from local farmers, very, very cheap [...] you get fresh stuff from there."
(Male market manager of a local supermarket, 14th of December 2015)

Still, local produce accounts for only 3% of his supermarkets' assortment. An essential element highlighted by the market committee is the personal, immediate relationship between smallholder producers, consumers and the DAFF.

Compliance with PANTHER principles

The market committee and the director of the district Department of Agriculture report that the market was initiated by farmers and is now jointly managed by the elected committee and extension officers. Extension officers organise the transport of all farmers. This allows a broad participation in the project and integrates farmers who otherwise could not afford transport. If there are any concerns or complaints, farmers can directly get in touch with the market committee. However, when looking at on-farm support provided by the Department in the villages, all participants highlight the missing availability of extension officers, which is mostly due to limited staff capacity, resulting in a lack of accountability, transparency and empowerment. Although farmers can sell some of their produce through the market, actual production support is neglected. Many farmers state that they therefore look for other support

and sometimes benefit from funding opportunities such as the national lottery, the British High Commission or the Independent Development Trust. They claim a general lack of skills and training and call for stronger support in this regard. According to the CASP design, training and knowledge management would be an integral part of the programmes. However, actual implementation is limited to the provision of inputs, equipment and improved market access. This results in dependency on the department, and thus in a lack of participation and empowerment.

Discussion

Findings demonstrate that there is a wide range of support programmes and a policy framework supportive towards more localised food systems and towards progressively realising the right to food in South Africa. However, projects often seem to have a local orientation rather by default. At local level, distribution of food is found mainly in close proximity to the investigated projects, however in a rather unorganised manner. Recent efforts to combine smallholder food production with an organised local distribution infrastructure in the form of a local market as promoted by the Agri-Park initiatives are promising and encouraging. Whether these initiatives will be successful and sustainable requires further investigation. The former UN Special Rapporteur on the right to food (De Schutter, 2012) points out that coherence and practical implementation of programmes face various challenges in South Africa. Cresswell Riol (forthcoming) who investigated the implementation of the right to food among emerging economies, also known as the BRICS states, stresses that implementing policies effectively at community level poses a major challenge to South Africa because coordination between the state and civil society is missing.

Smallholder farmers worldwide face multiple barriers with regard to accessing local food markets, such as capacity constraints, lack of distribution systems, limited education and training, or uncertainties regarding regulatory processes (Martinez et al., 2010). Our findings show that governmental programmes in South Africa assist emerging and smallholder farmers mainly with financial incentives to increase production of food, supplying infrastructure and production inputs. The Fetsa Tlala initiative that aims at large-scale production of staple food is currently the government's new flagship food security programme (McLaren et al., 2015). If implemented without accompanying programmes that offer training in how to use those inputs and how to manage and market the produce, the impact of Fetsa Tlala might however be limited. It is further unlikely that the focus on staple food production for national and international markets will serve to support LFS and to realise access to local, affordable, healthy and diverse diets, aspects that are urgently needed in light of the ongoing challenge of malnutrition and unhealthy diets. Binswanger-Mkhize (2014) argues that governmental agricultural programmes do not have a significant impact on production, food security, employment and market access because approaches that target the whole farm as a business are neglected. Additionally, investments are often not matching the needs of beneficiaries, inputs arrive too late and marketing support is lacking (Business Enterprises, 2014 as cited in Binswanger-Mkhize, 2014 p. 261).

Findings further reveal that extensive support by DAFF seems to be aimed at larger projects such as the chicken farm and the farmers' market in our study. This could be explained by the lack of extension officers and therefore the need to concentrate on selected projects. McLaren et al. (2015) point out that extension services geared at small-scale farmers are expensive and labour intensive and do not fit actual financial, administrative and human resources

allocated to CASP. This trend may adversely affect the support given to smallholders. As Hall and Aliber (2010) point out, while the budget of CASP is constantly rising, fewer small-scale farmers are benefiting from it. The case of the chicken farm in this study demonstrates that individual commitment and participatory programme implementation are important factors contributing to success. This is in line with Binswanger-Mkhize (2014) who found that intensive participation of beneficiaries is crucial throughout the project cycle, including the identification phase, planning, and implementation as well as with regard to financial management. Giving more responsibility to beneficiaries would further allow government officials to focus more on land acquisition, investment plans, supervision of financial management and implementation of projects.

It further becomes obvious that certain aspects of the holistic concept of LFS do not receive adequate attention yet, such as consumers' health, environmental and economic aspects. In the example of the chicken farm, inputs such as feed are sourced from long distances, with negative implications in terms of financial resources and the environment. Alternative considerations towards more sustainable production practices should be the subject of further investigation, but were beyond the scope of this study. With regard to integrating aspects such as nutritional adequacy, sustainable farming practices and respective training, the NSNP is a promising programme implemented in schools. The school garden observed in this study shows potential to not only provide nutritious food to students, but also to have an impact on nutrition and agricultural education with an ecological orientation. However, the lack of staff and financial resources as well as tensions among actors involved seem to be the main obstacles to a successful implementation. This is confirmed by the Financial and Fiscal Commission (2014 p.84) stating that "*the budget allocated does not match the poverty profile*" of the schools, staff capacities are limited, and centralised organisation cannot meet local implementation and monitoring. In addition, Nguyen et al. (2015) stress that not only school curricula should be strengthened with regard to nutrition education, but also school principals, management staff and school governing bodies have a decisive role to play for creating a healthier school environment.

Lack of broader participation remains a core challenge in practical implementation of programmes observed here. This is in line with De Schutter (2012) who, following his country mission to South Africa, acknowledges the South African governments' efforts with regard to improving food security but calls for better translation into concrete action. We share his view that a way to achieve this is to adopt a rights-based approach. This would enable marginalised groups to be integrated in programme design and to be regarded as rights holders who can claim certain services from their government as a duty bearer.

Globally, 164 states have ratified the ICESCR that translates the PANTHER principles into legally binding obligations (McLaren et al., 2015). However, most states struggle to meet their obligations. A case in point is Brazil that has some of the most progressive policies and programmes with regard to the right to food, but faces huge challenges in implementing them appropriately.

Further research could investigate how the ICESCR-ratification in South Africa in 2015 actually effects policy formulation and the realisation of the right to food. It could also be assessed how to facilitate broader participation in policy processes and how to develop appropriate communication tools and an inclusive language for duty bearers and rights holders. Research

could additionally look deeper into possibilities of how civil society could play a stronger role in supporting governmental efforts to promote LFS.

Conclusion

Although not referring explicitly to the concept of LFS, South African agricultural policies and programmes do support local rural development and have the potential to contribute to improved livelihoods in rural areas through various measures. Overall the investigated programmes support beneficiaries' enhanced participation and empowerment and lead to visible benefits for them and other actors they are linked to, thereby contributing to the realisation of the right to food. However, most programme beneficiaries do not manage to keep up their performance when government departments withdraw from the project. A lack of staff capacity and lack of communication lead to projects not being fully utilised, thus reducing participation, transparency and accountability for the majority of rights holders. To date the programmes fail to actively link LFS actors with each other and to integrate environmental aspects, health and justice. In order to fulfil the states' obligations to respect, protect and fulfil the right to adequate food, it is a requirement to consider these aspects in a comprehensive manner, to harmonise governmental support structures, to clearly assign responsibilities and to progressively improve communication. For rights holders better access to information is essential for realising their right to food and for holding the state as duty bearer accountable to comply with human rights principles. The PANTHER principles represent a useful tool for shedding light on the governance of LFS and whether aspects such as participation, accountability, and empowerment, are adhered to, applying both to the Global South and Global North.

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Governance for urban food systems – recommendations from SUPURBFOOD project

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Abstract: Within the EU framework 7 project SUPURBFOOD different urban and peri-urban initiatives were analysed, which are involved in recycling of nutrients, water and (food) waste, short chain delivery of food and multifunctional land use. Backed up by a survey among 262 private and public experts, recommendations are given concerning how the governance of urban food systems could be improved. The survey and the best practice examples showed the important role of innovative and flexible organisational and administrative structures of local city governments in order to facilitate and support more sustainable and efficient food systems in cities. To reduce food waste and optimise recycling much can be done at city level with education and awareness rising measures as well as collaborating with innovative private initiatives. To shorten food supply chains high priority was given to support farm-to-school programmes and promote local and sustainable public food procurement, e.g. with financial public support for start-up companies, learning/cooperation networks and specialist advice. To ensure a sustainable and multifunctional land use, priority should be given to support of innovative SMEs and organisations by enabling access to land for food production and developing new ways of managing urban and allotment gardens, aiming at wider societal functions in those gardens. There is a need for a more adapted and regulatory framework.

Keywords: Short food supply chains, food waste, food provisioning, multifunctional land use, governance, urban food systems

Introduction

Within the EU framework 7 project SUPURBFOOD (towards sustainable modes of urban and peri-urban food provisioning) different initiatives in seven case study city regions in Europe (Bristol, Gent, Riga, Rome, Rotterdam, Vigo, Zurich) and 26 case-studies in the South of Africa, Asia and Latin America (Renting, 2015) were analysed. These are involved with recycling of nutrients, water and (food) waste, short chain delivery of food and multifunctional land use. SUPURBFOOD ran from 2012-2015 and was a project in which SMEs were actively involved in the design and implementation of the project. This means that recommendations and a number of best practices originated from these SMEs, which were of different kinds (e.g. community farm, initiatives for local food and urban gardening, machine ring with engagement in recycling, specialised wholesalers for organic and local products, etc.) Backed up by a survey among 262 private and public experts, recommendations are made concerning how the governance of urban food systems could be improved.

Methodological approach

The paper focuses on governance and the role of innovative organisations and administrations at city level, which deal with three different aspects: a) urban food provisioning, b) recycling and waste, and c) multi-functional land use. Expert interviews and workshops were organised in seven cities across Europe dealing with these aspects, which are summarised in city reports and in three thematic synthesis reports (see www.supurbfood.eu). Many good practice examples were described. Based on these reports an on-line survey was conducted among public and private experts from June-August 2015 in the participating European countries. Altogether 262 persons participated in the survey, including Switzerland (61), Spain (52), Latvia (18), Italy (25), United Kingdom (31), Belgium (36) and other countries (39). The total response rate was around 37% with differences between countries (e.g. higher in Switzerland with a 48% response rate). Most of the respondents indicated a geographical focus of their work in city regions (40%) or at regional level (35%). Others worked more at the national level (19%) and European Union level (16%). There was a good representation of public administrations (27%), market actors (27%), Civil Society organisations (27%), and researchers (15%) as well as independent experts (11%). In the survey, 13 closed questions were addressed in the above-mentioned three areas, of which, for the purposes of this paper, we have selected the responses to those dealing particularly with governance aspects. Other questions, not explored here, were more on the personal involvement of the interviewed persons in urban agriculture and food issues. The recommendations were presented to the respondents who rated them according to the question: “Do you think the recommendation addresses the related problem effectively? Please rate from 1 (not at all important) to 5 (very important). Qualitative comments were also collected. The results below show that not all the questions were always answered; therefore the response numbers are lower than the total number of questionnaires received.

Results

Closing the cycles of nutrient, water and urban food waste

The survey addressed five questions related to nutrients, water and food waste. The results of the survey related to this theme are summarised in Table 1.

Table 1. Importance ranking of five questions related to closing the cycles of nutrient, water and urban food waste

On-line survey questions (June-August 2015)	Mean	Variance	Standard deviation	Number of responses
1. City-regional and local governments should support grassroots, community, Small and Medium Enterprises (SME) and other initiatives dealing with sustainable waste management and food waste reduction through targeted events, awareness raising campaigns, funding support and promoting examples of good practice.	4.51	0.68	0.83	196
2. Local governments, private sector companies (including housing management &	4.19	1.07	1.07	192

corporations) and civil society organisations (CSOs) should allocate space for biogenic waste storage and recycling (such as small composting sites) in current and new housing units.				
3. Policy makers should co-finance innovative technologies in sorting and processing of biogenic waste (such as biogas units or improved composting facilities) to enhance compost quality and biogenic waste recycling	4.11	0.98	0.99	194
4. National governments should collaborate with the private sector and consumer organisations to reform policies and regulations related to quality grading standards of food to minimise food waste.	4.05	1.22	1.11	197
5. National governments should collaborate with the private sector and consumer organisations to develop policies and regulations related to expiration dates of food to minimise food waste.	4.03	1.15	1.07	195

Scale: 5=very important; 4=important; 3=medium important; 2=little important; 1=not at all important

From the survey we can conclude that most experts think in order to reduce food waste and optimise recycling the most important and effective measures for city-region and local governments would be through targeted events, education and awareness raising campaigns, funding support and promoting examples of good practice.

We also identified and described several good practice examples (Dubelling et al., 2015a, 2015b) which deal in a creative way with food waste:

- In Ghent (Belgium), the city hosts a 'soup kitchen' *Soupcafé* in one or their buildings, where people cook and eat together food that would otherwise be wasted and voluntarily pay a donation for their meal;
- *Rotterzwam* is a business growing mushrooms on coffee waste in an abandoned indoor tropical waterpark close to the centre of Rotterdam (The Netherlands). The coffee grounds (which would otherwise be incinerated) are collected from local cafes by cargo bike;
- *FareShare* in Bristol (United Kingdom) delivers food leftovers to over 70 organisations. The food they supply contributes to thousands of meals weekly for vulnerable people. FareShare only has a few employees. Many of their volunteers are, or have been, vulnerable for whom training opportunities and support is provided.

Short food supply chains (SFSC) and urban food provisioning

Regarding short food supply chains and food provisioning three main questions were asked. The results of the survey related to this theme are summarised in Table 2.

Table 2. Importance ranking of three questions related to closing the cycles of nutrient, water and urban food waste

On-line survey questions (June-August 2015)	Mean	Variance	Standard deviation	Total responses n= 262
1. National and local governments should support farm-to-school programmes and promote local public food procurement through public kitchens (schools, council offices, prisons, old peoples' homes and those contracted to the local government) so that they serve local, healthy and seasonal food.	4.59	0.69	0.83	188
2. Local governments should support, improve and expand local food markets and food hubs, both physical (facilities, spaces, basic infrastructure) and on-line.	4.25	0.9	0.95	173
3. Local governments should have delegated responsibility for food provision planning in a similar and allied way to their responsibilities for spatial planning	3.84	1.32	1.15	174

Scale: 5=very important; 4 =important; 3=medium important; 2=little important; 1=not at all important

As Table 2 shows, the participants rank effective measures for national and local governments to support farm-to-school programmes and promote local public food procurement through public kitchens the highest. There were no significant differences between the countries. Experts from city regions were more supportive of this measure than those from the national or EU level. Respondents from civil society organisations were more supportive of this measure compared with those from the policy, market or research area or independent experts.

Some additional questions dealt with the kind of support. The answers show that the involved experts think that local governments should support the development of innovative short food chains mainly financially (especially at the developmental stage) as well as with legal issues. Independent, local specialist food retailers could be supported by: 1. Incubation support for start-up companies; 2. Connection with peers to support learning/co-operation between similar companies; 3. Initiation of space and access to basic processing facilities; 4. Specialist advice relating to business and finance models.

We also identified and described several good practice examples (Dubelling et al. 2015a, 2015b), which strengthen short food supply chain and local/regional food provisioning:

- The city of Bristol promotes via a “*Good Food Plan for Bristol*” and a “*Food Policy Council*” the development and strengthening of regional supply infrastructure local wholesale markets, food processors, local abattoirs, dairies and farms.
- *RoomeR* in Ghent (Belgium) produces an alcoholic beverage using elderflowers gathered from trees located in public and private areas in and around the city, reducing costs for land and tree production.

- The city of Zurich organised, thanks to the strong support of a private foundation (Mercator), during a whole month in September 2015, an information campaign (“Zürich Isst”) on nutrition, environment and food pleasure (with around 200 events offered by 100 organisations/institutions).

Developing multifunctional urban and peri-urban agriculture and land use

The results of the survey related to urban agriculture and land use are summarised in Table 3. The table shows that the most highly rated and effective measure for local city governments would be to support innovative SMEs and organisations which deliver multifunctionality through food production, e.g. by protecting and enabling access to land for food production in urban and peri-urban areas. Interesting best practice examples described (in Dubelling et al. 2015a, 2015b) are:

- In 2013, Rotterdam changed the zoning designation of a large piece of peri-urban land to a multifunctional area for education, food production, biodiversity and leisure, managed by an initiative. *Uit je Eigen Stad* (From Your Own Town).
- The Rome (Italy) and Zurich administrations promote farms in their cities with a special website, allowing citizens to buy directly from city farmers.
- Zürich promotes high biodiversity on 10% of its urban area. The city actively buys land to protect these spaces from construction and provides incentives for better biodiversity preservation and organic farming. The department in charge supports the farms also with investment funds for i.e. stable constructions or farm shops, as well as with technical advice.

Table 3. Importance ranking of six questions related to multifunctional urban and peri-urban agriculture and land use

On-line survey questions (June-August 2015)	Mean	Variance	Standard deviation	Total responses n= 262
1. Local governments should protect and enable access to, and tenure of, land for food production in urban and peri-urban areas, e.g. by limiting building projects on agricultural urban and peri-urban land and renting public areas to farmers, including cooperatives.	4.36	0.98	0.99	174
2. Municipal governments should work together to strengthen capacities, align urban food policies and influence relevant regulations (i.e. land use policies, biogenic waste recycling and short food chains) at national and European level.	4.19	1.06	1.03	173
3. CSOs should enhance and facilitate cooperation between all types of urban food producers and gardeners at city-regional level in order to strengthen their collective influence on local legislation through a dialogue with policy makers and other involved stakeholders (incl. SMEs).	4.16	0.81	0.90	173
4. Local governments together with gardeners should develop new ways of managing urban and allotment gardens, aiming at wider societal functions in those gardens (e.g. community building, social inclusion, education, nature conservation?)	4.14	0.95	0.97	173
5. Local governments should set up an integrated food department to ensure greater coherence and alignment, increase efficiency of the policies and programmes that have an impact on the food system (such as agricultural land use, green space management, food transport and marketing, waste management, environmental health and food standards etc.).	4.01	1.38	1.17	173
6. National and local governments should develop regulations to make (commercial or non-commercial) food growing areas mandatory in new or renovated housing settlements and building projects, e.g. rooftop farming, community gardens, allotment gardens.	3.75	1.84	1.36	174

Scale: 5=very important; 4 =important; 3=medium important; 2=little important; 1=not at all important

Discussion

The authors are aware that the survey returns what experts think is most important - it does not say what is best or most efficient as experts can be collectively wrong. However the

findings are supported by the city-level studies and workshops held in the seven cities involved in Europe. In addition we used closed questions which means the survey may have missed the most important question (not likely, but still possible) - have you asked also some open questions to find out what was missing in the closed questions from your audience?

The survey and the studies at city level have shown that innovative and flexible governance and administrative structures are very important to facilitate and support more sustainable and effective food systems at city level (Morgan & Sonnino, 2010). Food can be used as a medium to link different urban policy objectives to achieve wider societal goals such as community building, social inclusion, education, nature conservation, improved health outcomes and enhanced quality of life.

However, in many cities this is only partially achieved. The analysis has shown that different sectoral policies that affect food provisioning nowadays tend to be counterproductive and that is why more innovative and flexible urban food governance arrangements are needed. However the different perspectives of the actor groups and the kind of policy level and socio-cultural context in different countries and regions has to be taken into account. For example experts from the Mediterranean countries and Latvia, ranked the role of national governments lower than the experts from the other countries in Middle Europe.

Different challenges and barriers have to be overcome, as the city region reports in SUPURBFOOD Project (2015) revealed. For example, in the city of Zürich there are several challenges and barriers the city policies have to deal with (Schmid & Jahrl, 2014).

- There is still a low awareness and willingness for personal action although food waste is more often in the media. Challenges are, for example, the high collection costs.
- For local and regional provisioning of sustainable food several challenges and hindering factors exist: low pressure on policy makers, missing overall city strategy for sustainable food beyond departments, partly low professionalism of initiatives, high logistic costs for small local companies, existing public procurement and calls for tender systems with little flexibility, etc.
- There is an insecurity of long-term land-use because of conflicting goals of different users. The farmers are between a productivity orientation and a nature conservation orientation. There is also a competition between urban gardening groups and traditional allotments gardens for land.
- Until now there is insufficient awareness of the population for agricultural land (littering).

Therefore, it is important that at city level clear strategies for sustainable food provisioning, urban and peri-urban sustainable agriculture and food waste reduction & recycling are developed and are well coordinated. This is also emphasised in the Milan Urban Food Policy Pact 2015, which can be considered as a signal for municipal/regional governments to take the challenge of developing innovative and flexible governance and administrative structures to govern sustainable food systems. Although in October 2015 over 100 cities signed the contract (and later others joined) and expressed a commitment for action, it remains unclear if there will be a follow up of this initiative or if it remains just a declaration.

Conclusions

In general, the recommendations for improved governance of urban food systems can be divided into five strategic fields of action.

First, **supporting market development for sustainable and short food supply chains.** Here, a recommendation is to support independent, local specialist food retailers in order to sustain short food chains. Furthermore, local food markets and food hubs, both physical and on-line, should be improved and expanded; farm-to-school programmes and local public food procurement should be initiated and promoted so that they serve local, healthy, organic and seasonal food.

Second, **providing space for civic and business initiatives.** In particular, it was seen as relevant to protect and enable access to and tenure of land for food production in urban and peri-urban areas and to allocate space for biogenic waste storage and recycling in current and new housing units. A much stronger collaboration between city administrations dealing with agriculture and space planning with urban agriculture and gardening initiatives is needed to find land for cultivation and deal with conflicting demands for land (as for example in Zurich, see also Bengtson et al., 2004).

Third, **enabling both technical and social innovation from civil society and businesses.** The experts saw the need to support initiatives and be courageous enough to allow for experimentation with new ideas from grassroots, small and medium enterprises (new forms of organisations and public-private partnerships). In addition, city regions could co-finance innovative technologies e.g. for reducing, re-using and recycling (food) waste.

Fourth, **adapting policies and regulations.** Within the regulatory field, the main recommendations were to review the quality grading standards, as well as the expiration dates of food to minimise food losses. Furthermore, it was recommended to make food-growing areas in new or renovated housing settlements and building projects mandatory. This would also mean reflecting on how to take this up in land planning laws and policies at city-region, national and even EU level.

Fifth, **improve coordination and planning to make use of synergies and knowledge exchange** within and between administration, civil society and business. These actions include, at the administration level, setting up an integrated food-planning department with sufficient financial resources to ensure greater coherence and efficiency policies affecting food (e.g. like London Food Board); and to link up with other cities to strengthen capacities, align food policies and influence relevant regulations (national, EU). Moreover, efforts are needed from both administration and civil society to enable a dialogue between both. Therefore, civil society organisations should join forces and campaign together for the right to better food for everyone in urban areas.

These five strategic fields show that improving governance of urban food systems entails a comprehensive view of this system. It requires a high level of openness towards new actors and actions (initiatives as well as business models), and needs to consider and encourage diverse approaches: business driven, civil society driven, and make use of the room for manoeuvre of administration. New governance models also need to acknowledge the widely spread expertise on shaping urban food systems that exists in society, business and administration. The challenge and skill is to bring these different forms of expertise together and deepen a fruitful critical exchange. The analysis of the role and business models of the SMEs in the different city regions and the several city workshops with stakeholders showed the important role of private and business-oriented actors, supported by civil society

organisations, in taking a leading role in developing more sustainable urban food systems. If these actors collaborate well together they are also able to influence city administrations and policies in a more long term perspective.

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The health belief model as a tool for food safety governance for milk and cheese produced by settled Fulani pastoralists in Southwest Nigeria

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Abstract: This study analysed consumers' perception of the safety of milk and cheese produced by settled Fulani pastoralists (SFP) in Ogun and Oyo States, Nigeria in terms of microbial and organic contaminations using the Health Belief Model (HBM). Data were collected from 55 pastoralists and 222 consumers of pastoralists' milk and cheese from 13 communities in the two states. Two hundred and twenty (220) milk and cheese samples were collected for heavy metals and bacteriological analyses. Descriptive statistics were used to analyse social data while the heavy metals were investigated using an Atomic Absorption Spectrometer. Furthermore, the study investigated bacteria present in the milk and cheese samples using standard micro-bacteriological methods. The result of chemical analysis shows contamination with Zinc, Copper, Chromium, Lead, Nickel and Cadmium. All the heavy metal levels analysed were higher than the European Union (EU) of 5.0 ppm permitted for intake of heavy metals in food. Results of bacterial analysis showed the presence of *Escherichia coli*, Coliform bacteria and *Staphylococcus aureus*. These contaminations have grievous implications for public health although the HBM analysis shows that respondents' perceived a low risk of susceptibility to disease through the consumption of contaminated SFP milk and cheese. They also have insufficient orientation on possible health threats that could result from consuming unsafe food products. In conclusion, the perceived benefits to the respondents was higher than the perceived barriers, which implies that they have confidence in SFP milk and cheese. As a tool for food safety governance, HBM analysis will help in safeguarding public health through consumers' orientation. Enforcement of food safety practices by environmental sanitation officers during milking and processing will help to improve the quality of milk and cheese produced by SFP households in Nigeria.

Keywords: Health Belief Model, food contamination, susceptibility to disease, milk and cheese, Fulani pastoralists, Nigeria

Introduction

Fulani pastoralists are often described as the largest pastoral group in the world and are found in most parts of West Africa in search of pasture for their herds. There are three major Fulani sets in Nigeria and this includes Bororo (they are the set of Fulanis that migrated from Kaduna, Kastina and Kano), Hausaji (Sokoto and Kebbi) and Baku (Kwara State). The SFP found in Southwest Nigeria are majorly Baku. According to Sodiya et al. (2006), the men are specialised in herding and cattle business, while the women are specialised in the processing of raw milk to cheese.

Consumers' perception of food safety is determined by the interplay between scientific, legal/regulatory, social and economic forces, and goes beyond the avoidance of food borne biological pathogens, chemical toxicants and other hazards (Bektas et al., 2011). The

increasing complexity and length of food chain has led to an increase in opportunity of contamination by chemical or biological agents. In particular, chemical and microbial contaminants in food represent an important food safety issue. The physical contaminants which could be a result of methods of food production and/or eating habits of consumers have given rise to emerging and reoccurring food safety problems (Sirieix et al., 2007; Mohammad et al., 2014). Consumers' perception of choice of food is influenced by their psychological interpretation of the benefit that is attached to the food and this could be related to the Health Belief Model (HBM). The HBM principles include; perceived susceptibility, perceived severity of the disease, perceived benefits of treatment, perceived barriers to treatment, barriers to behavioural change, self-efficacy, cues to action and likelihood of engaging in health-promoting behaviour.

The principle 'perceived susceptibility' combines with 'perceived severity' to form a perceived threat, which may influence how consumers of SFP products will process health information and how motivated they are to engage in food safety practices. It also refers to the way consumers view the consequences of a serious health event or outcome of consuming SFP product without considering food safety practice. 'Perceived benefits' could be the extent to which consumers' believe that, adhering to a recommended health action will effectively alleviate a health threat associated with the consumption of raw milk and cheese produced by SFP. 'Barriers to behavioural change' refers to consumers' feelings towards performing a recommended health action such as engaging in food safety practice. 'Self-efficacy' is the extent to which consumers of SFP products believe they are capable of performing specific behaviours in order to attain certain goals. 'Cues of actions' refer to the stimulus needed to trigger the decision-making process to accept a recommended health action such as food safety practice. These cues can be internal (e.g. chest pains, wheezing, etc.) or external (e.g. advice from friends, illness of family member, newspaper article, etc.). The above principles determine the likelihood of consumers engaging in health- promoting behaviour.

Methodology

Study Location

Ogun and Oyo State are two of the states in Southwest Nigeria. These states are occupied mainly by Yoruba people who are primarily sedentary arable crop growers and small business entrepreneurs. History has it that the movement of Fulanis into the southwest Nigeria dated back to the late 19th century during the Dahomey war (Fabusoro et al., 2008). The affected Fulanis migrated from the Republic of Benin and settled around the southern guinea of southwest Nigeria.

Sampling

The population of the study involved consumers and processors of milk produced by SFP in Ogun and Oyo State, Nigeria. A multi-stage sampling approach was used to select the pastoralists and consumers of milk and cheese produced in the two states. Local government areas (LGAs) where pastoralists reside were selected purposively based on a high population of SFP. Households involved in production of raw milk and processing of cheese were selected purposively for Focus Group Discussion (FGD) in each pastoral settlement. The FGD involved formal meetings with groups of 5-10 respondents in Ogun State (Yewa North and Odeda LGA) and Oyo State (Atiba, Atigbo, Itesiwaju and Saki West LGA). The focus was to discuss their reasons for continuous consumption of milk and cheese produced by SFP.

Furthermore, a total of 55 processors were selected from each State. From each of the 55 processors, 10 ml of milk sample and 12 g of cheese sample were collected making a total 1100 ml of milk samples and 1320 g of cheese samples collected from the two states. Also from each state, 111 consumers of milk and cheese were selected purposively to have a total of 222 respondents in the two states.

Data analysis

Two types of analyses were carried out: statistical and laboratory. The statistical analyses were used to analyse social data while the laboratory analyses were used for the isolation of bacteria and detection of heavy metals in the milk and cheese samples collected. The statistical analysis includes frequency counts and percentages. Laboratory analyses such as Atomic Absorption Spectrometer were used for investigating heavy metals while standard bacteriological methods were employed for the isolation of bacteria as recommended by Cheesebrough (2006).

Results and Discussion

Consumers' perception on safety of milk and cheese produced by SFP

Consumers' perception of the safety of milk and cheese produced by SFP was analysed by adopting the Health Belief Model. The importance of this model is that it attempts to explain and predict health behaviours by focusing on the attitudes and beliefs of individuals. From all the dimensions of HBM, 30 statements were developed and subjected to a 5 point Likert scale (Table 1). The 30 perception statements were scored along a Likert scale from 5 to 1.

For 'perceived susceptibility' of disease, Witte (1992) asserts that susceptibility is measured as a person's perception of the likelihood of developing an illness. The results in Table 1 show that 41 % of the respondents agreed that their health is at risk when they consume SFP milk and cheese while about 49% disagreed with the statement. Many (62%) of the respondents agreed that they could be exposed to health problems by what they consume while 28% disagreed with the statement and 9% were indifferent. The implication of this is that the majority of the respondents perceived the risk of susceptibility to disease through the consumption of SFP milk and cheese.

For 'perceived threat', 50% of the respondents believed that milk and cheese have major consequences on their health while 31% disagreed with the statement (Table 1). This implies that consumers have sufficient orientation on possible health threats that could result from consuming unsafe products. According to Sturges and Rogers (1996) and Witte (1992), perceived threat of a disease can influence how people process health information and how motivated they may be to engage in a particular behaviour. With this, there is the likelihood that consumers will be willing to receive information that can reveal the safety of the milk and cheese.

Findings under 'perceived benefits' versus 'barriers to behavioural change' reveal that 69% of the consumers agreed that Fulani milk and cheese are very nutritious and tasty. Only 14% of the respondents disagreed with the statement. Most (68%) of the consumers agreed that Fulani milk is natural and therefore very nutritious; 18% were indifferent about the statement and 13% disagreed (Table 1). This implies that consumers perceived milk and cheese from

SFP as natural, tasty and nutritious and that it contains the essential nutrients required for growth and development. This result supports Rosenstock (1974) that if an individual believes that a particular action will reduce susceptibility to a health problem or decrease its seriousness, then he or she is likely to engage in that behaviour regardless of objective facts regarding the effectiveness of the action.

Table 1. Consumers' perception of the safety of milk and cheese produced by SFP (n=222)

	Perception Statement	SA	A	U	D	SD	Mean
		%	%	%	%	%	
	Perceived susceptibility						
1	My health is at risk when I consume / drink Fulani milk and cheese	25.7	15.3	9.9	26.6	22.5	2.95
2	I know I can be exposed to health problems by what I consume	33.3	28.8	9.0	14.4	14.4	3.53
	Perceived threat of the diseases						
3	Sour milk and cheese have major consequences on my health	28.4	22.0	18.0	21.2	10.4	3.37
	Perceived benefits versus barriers to behavioural change						
4	Fulani milk and cheese are very nutritious and tasty	34.2	35.6	16.2	5.9	8.1	3.82
5	Fulani milk is natural and therefore very nutritious	32.9	35.2	18.9	6.7	6.3	3.82
6	Anything that is natural will be pure, so no problem	26.1	25.7	16.2	18.0	14.0	3.32
7	Milk and cheese produced by Fulani are affordable	38.7	39.6	12.6	5.0	4.1	4.04
8	Pastoral milk and cheese are readily available	27.5	41.0	18.0	8.7	5.0	3.78
9	My religion does not stop me from taking pastoral milk and cheese	53.2	30.2	7.2	3.5	5.9	4.21
10	Irrespective of pasteurised milk being available, I will continue to consume milk and cheese produced by settled Fulani pastoralists	16.7	21.2	22.5	18.0	21.6	2.93
11	Milk and cheese from pastoralists does not contain any contaminations	11.7	12.6	27.0	24.8	23.9	2.64
12	Hygiene status of the pastoralists does not affect the quality of their milk and cheese produced	12.2	17.6	20.3	22.0	27.9	2.64
13	I can recommend pastoral milk and cheese because it contains the essential nutrients required by the body	20.3	35.1	17.6	13.0	14.0	3.35

Source: Field Survey 2015: SA= Strongly Agree; A= Agree; U= Undecided; D= Disagree; SD= Strongly Disagree.

In addition, this may influence consumers' continuous consumption unless they perceive any form of health threat. Therefore for safe public health, food safety practice has to be encouraged by educating the pastoralists to improve on their method of production. This result supports Janz et al. (1984) and Glanz and Bishop (2010) that even if an individual perceives a health condition as threatening and believes that a particular action will effectively reduce the threat, barriers may prevent engagement in the health-promoting behaviour. In other words, the perceived benefits must outweigh the perceived barriers in order for behaviour change to occur and to effectively reduce the threat.

Results for 'self-efficacy' reveal that 69% of the consumers were actively working to improve their health status while 16% of the consumers disagreed; 14% were indifferent as shown in Table 2. The majority (77%) of the consumers agreed that they were in control of how and what they learnt about their health; 12% of the consumers disagreed. This implies that consumers' perception about their health status was positive. This orientation may stem from individual health conditions, which may be generally good. Rosenstock et al. (1988) posit that interventions may also aim to boost self-efficacy by providing training in specific health-promoting behaviours, particularly for complex lifestyle changes. For instance, changing diet or engaging in physical activity, adhering to a complicated medication regime among others.

For 'cues to action', 34% of the consumers revealed that the information obtained from news articles about SFP products is not positive. The news articles state that SFP are life threatening; 27% were unable to decide whether they had heard any information about milk and cheese contamination while 38% disagreed with the statement. About 36% of the respondents revealed that they do not pay attention to health information unless it is related to a problem they have; 14% were indifferent about the statement and 50% believed that they pay attention to health information apart from the ones related to them (Table 2). Half of the respondents reveal that they have been consuming the Fulani milk and cheese for years and have never been sick; 9% were unable to decide while 41% disclosed that they were sick after consuming milk and cheese. The implication of this is that majority of the respondents do not perceive that their health is at risk and they do not need any medical check-up. Glanz et al. (2008) posit that interventions based on the health belief model may provide cues to action to remind and encourage individuals to engage in health-promoting behaviours. That intervention may be news from articles or sickness of a close relation. Two issues are evident here: response of the consumers to health information and the non-expression of ill health after consuming SFP milk and cheese. This indicates that consumers will take action when they experience ill health after consuming unsafe products and if health information about the product is alarming.

In the area of 'likelihood of engaging in health-promoting behaviour', 10% of the respondents disclosed that they have had frequent cases of dysentery in recent weeks from milk and cheese produced by SFP while 17% were indifferent about the statement and 73% of the consumers disagreed with the statement. Some (31%) of the consumers disclosed that they will investigate the hygiene level and food safety practice of the Fulani and decide if they should stop consuming milk and cheese or not as shown in Table 2. About 30% of the consumers were unable to decide and 40% of the consumers disclosed that they will not investigate the hygiene level of the Fulani and would continue to consume SFP products. This supports the work of the Committee on Communication for Behaviour Change in the 21st Century (2002), that "*a person's perceived likelihood or subjective probability that he or she will engage in a given behaviour is based on his/her intention*". Ajzen (1991) also asserted that behavioural intention reflects how hard a person is willing to try, and how motivated he or she is to perform the behaviour.

Table 2. Consumers' perception of the safety of milk and cheese produced by SFP (continued)

	Perception Statement	SA	A	U	D	SD	Mean
	Self-efficacy	%	%	%	%	%	
14	I have set some definite goals to improve my health status	33.3	28.4	14.4	11.7	12.2	3.59
15	I have been able to meet the goals I set for myself to improve my health	20.7	33.8	17.6	15.8	12.1	3.35
16	I am actively working to improve my health status	31.5	37.4	14.4	8.1	8.6	3.75
17	I feel that I am in control of how and what I learnt about my health	41.4	35.1	11.3	8.6	3.6	4.02
18	The contamination in milk and other products from Fulani pastoralists can still be tolerated	12.2	19.4	26.1	20.7	21.6	2.8
19	I am fine, I don't need any medical check up	21.2	14.4	10.4	27.0	27.0	2.77
20	Even if milk and cheese of Fulani are contaminated it cannot be life threatening	14.9	15.3	20.3	27.0	22.5	2.73
21	Fulani women are beautiful so I believe they will be neat	9.9	13.1	19.8	22.1	35.1	2.41
	Cues of actions						
22	My doctor has certified my consumption of Fulani milk and cheese	5.0	10.8	12.2	27.5	44.5	2.04
23	Information obtained from news articles shows a serious health threat from consuming Fulani milk and cheese	18.0	16.2	27.0	23.4	15.3	2.98
24	I don't pay attention to health information unless it's about a problem I have	17.6	18.5	14.0	24.8	25.1	2.78
25	I have been consuming the Fulani milk and cheese for years and I have never been sick	24.3	25.7	9.0	19.8	21.2	3.12
26	The milk and the cheese is a major source of income to Fulani women so I consume it to help them generate income	15.3	18.5	14.4	24.8	27.0	2.7
	Likelihood of engaging in health-promoting behaviour						
27	I will be healthier if I take pasteurized milk and cheese and not the pastoral milk and cheese	26.1	15.8	26.6	18.5	13.0	3.23
28	I have had frequent cases of dysentery in recent weeks from milk and cheese produced by settled Fulani pastoralists	4.1	6.3	17.1	31.5	41.0	2.01
29	I will try and fry the cheese before I consume	11.7	14.9	29.7	18.0	25.7	2.69
30	I will investigate the hygiene level of the Fulani and decide if I should stop or not	16.2	14.4	29.7	15.8	23.9	2.83

Source: Field Survey 2015: SA= Strongly Agree; A= Agree; U= Undecided; D= Disagree; SD= Strongly Disagree.

In summary, the aggregated value was used to categorise perception of the respondents on the safety of milk and cheese into two (favourable and unfavourable perception) (Table 3). The findings show that 62% of the respondents had a favourable perception of the safety of milk and cheese produced by SFP. Using the health belief model indicators, the perceived benefit of the respondents is higher than the perceived barriers which implies that they are

confident in SFP milk and cheese and that it cannot be life threatening. For cues to action, consumers won't stop consuming SFP products until they experience ill-health or sickness from a family member and negative newspaper coverage. The perceived benefit versus perceived barriers, self- efficacy and cues to action will in-turn affect the respondent's likelihood of engaging in health-promoting behaviour. Although they may have experienced some physical symptoms of ill health due to consumption of milk and cheese from the pastoralists they cannot stop buying it from the pastoralists' women because they believe that there are nutritional benefits attached to pastoralists' milk and cheese. This calls for the need to build the level of confidence in the consumers' ability to undertake some preventive measure before consuming milk and cheese from SFP.

Table 3. Summarised result of consumers' perception (n=222)

Category	Percentage of Consumers
Unfavourable consumers' perception (score of < 90)	37.8
Favourable consumers' perception (score 91- 180)	62.2

Source: Field Survey, 2015

Contaminations in milk and cheese

Mean and standard deviation of heavy metals in milk and cheese

The concentration of heavy metals in the samples of milk and cheese analysed are reported in Table 4. All the heavy metals analysed were exceeded the European Union (EU) permitted level of 5.0 ppm for the intake of heavy metals in food. The mean concentration of zinc was found to be the highest at 8.52 ppm for milk samples and 9.33 ppm for cheese samples in Ogun state. When compared to the mean concentration of zinc in milk and cheese in Oyo state (milk= 6.90 ppm and cheese = 18.50 ppm), that of Oyo state cheese is higher. This high concentration has negative implications on human health (particularly when consumed regularly) which include abdominal pain, nausea, vomiting, diarrhoea, irritation, headache, irritability, lethargy, anaemia and dizziness (Le Mone, 1999). The zinc concentration in the cheese sample analysed in Oyo state was also higher than the zinc concentration in the milk samples in the two states and several fold higher than other metals analysed. The high concentration observed for zinc may be attributed to uncontrolled administration of mineral supplements by the pastoralists to meet the zinc requirement of the animals. It could also be attributed to the environment where the animal grazed or browsed, or the sites where the *Sodom* apple plant used as the coagulant in cheese grows or is found. The environmental factors can be related to improper disposal of rubber materials. This conforms to the findings of Ogundiran et al. (2012) that residues from burnt tyres' sites are known to contain high levels of zinc.

The metal with the lowest mean concentration (Table 4 and 5) was cadmium with a mean concentration of 0.23 ppm in milk samples and a mean concentration of 0.14 ppm in cheese samples in Ogun state and a mean concentration of 0.23 ppm in milk and 0.20 ppm in cheese in Oyo state. This could be ascribed to the coagulant used during cheese processing and the low heat treatment. However, these values are far higher than the EU standard (0.05 ppm).

The presence of cadmium may be due to contamination of the soil, fodder that grows in the soil and the water consumed by the animals. Previous work in support of this finding includes those of Faust and Aly (1981), Peter (1993) and Mansour (1999) who showed that accumulation of cadmium in the human body will lead to hypertension, gastroenteritis, pulmonary oedema, severe pain, soft bones and finally death.

Table 4. Mean and standard deviation of heavy metals in milk against standards

State	Cd	Cr	Cu	Ni	Pb	Zn
Ogun Milk	0.23±	8.18±	8.36±	1.82±	2.98±	8.52±
Mean± SD	0.14	2.57	4.12	0.92	2.43	2.94
Min	0.51	0.01	4.94	0.72	1.98	5.42
Max	3.11	0.49	10.91	7.7	13.04	13.33
Standard	0.05	0.1	0.4b	≤0.1	0.2	5.0b
Oyo Milk	0.23±	6.76±	6.75±	2.29±	2.77±	6.90±
Mean± SD	0.11	2.20	3.37	0.29	2.34	2.39
Min	1.92	0.14	3.42	0.83	1.86	5.1
Max	2.66	0.4	8.8	6.66	10.03	10.92

Source: Field Survey, 2015

The results show that the mean concentration of cadmium in the milk samples in the two states were the same (0.23 ppm) due to the fact that Ogun state has a mean concentration of 0.23 ppm and Oyo state with a mean concentration of 0.23 ppm (Figure 1 and 2). The concentration of chromium, copper and zinc in the milk samples were several times higher than cadmium, lead and nickel. This could be attributed to the difference in geographical location. This conforms to the findings of Ogundiran et al. (2012) who recorded high levels of lead in milk samples produced in animals raised around contaminated sites.

For the cheese sample analysed, there was a difference in the level of zinc content in the two states. The residual content of zinc in Oyo state was higher (18.50 ppm) than that of Ogun state (9.33 ppm) with a mean concentration of approximately 9.0ppm as shown in Figure 3 and 4. There was a significant variation in the level of heavy metals detected in the cheese samples analysed in the study area.

Table 5. Mean and standard deviation of heavy metals in cheese against standards

State	Cd	Cr	Cu	Ni	Pb	Zn
Ogun Cheese	0.14±	6.04±	9.94±	2.96±	3.08±	9.33±
Mean± SD	0.07	3.31	2.42	2.37	2.32	3.39
Min	0.69	0.05	0.82	0.81	5.83	3.21
Max	7.63	0.25	9.63	8.33	12.58	13.05
Standard	0.05	0.1	0.4b	≤0.1	0.2	5.0b
Oyo Cheese	0.20±	6.37±	9.32±	2.93±	2.92±	18.50±
Mean± SD	0.15	1.82	3.01	0.68	1.38	8.37
Min	2.1	0.04	3.42	1.65	4.56	12.66
Max	3.88	0.44	8.19	4.74	12.08	32.9

Source: Field Survey, 2015

The residual concentrations of the heavy metals (Cd, Cr, Cu, Ni, Pb and Zn) in raw cows' milk and cheese samples are presented in Figure 3 and 4. Detectable residue concentrations of Cd, Cr, Cu, Ni, Pb and Zn were observed in 54 of the 55 milk samples and 54 of the 55 cheese samples in Ogun and Oyo state. In Ogun state, the minimum and maximum heavy metal values in milk samples are Cd (0.51 to 3.11), Cr (0.06 to 0.49), Cu (4.94 to 10.91), Ni (0.72 to 7.7), Pb (1.98 to 13.04), and Zn (5.42 to 13.328) while that of cheese samples are Cd (0.69 to 7.63), Cr (0.05 to 0.25), Cu (0.82 to 9.63), Ni (0.81 to 8.33), Pb (5.83 to 12.58), and Zn (3.21 to 13.05). The presence of lead content in the sample analysed could be attributed to its high affinity to casein which is one of the contents found in milk. It can also be attributed to contamination from pastoralists and their environment. This result is supported by Aniello et al. (2006) that lead in milk can be a consequence of contamination during milking and processing of cheese. The result shows that all the heavy metals detected in the milk samples analysed were above the European Union heavy metal intake permissible limit.

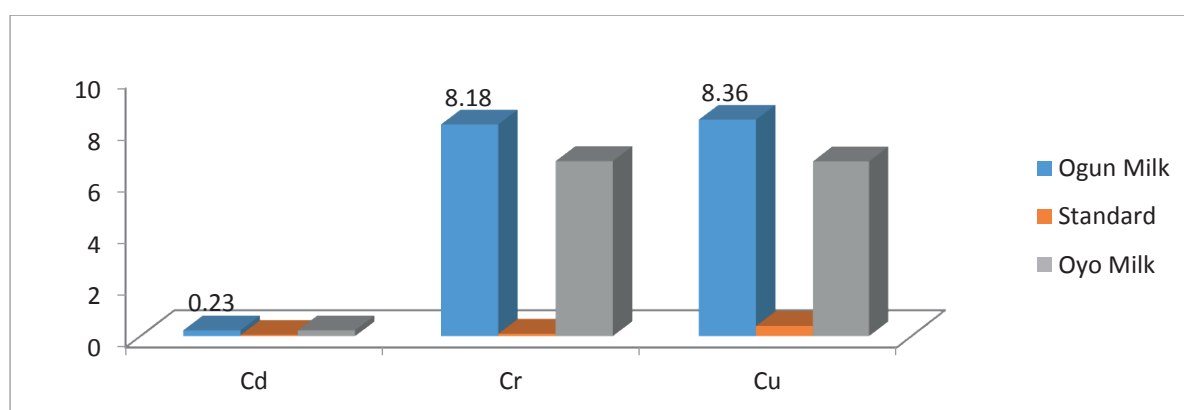


Figure 1. Result of cadmium, chromium and copper present in milk samples compared with EU standard

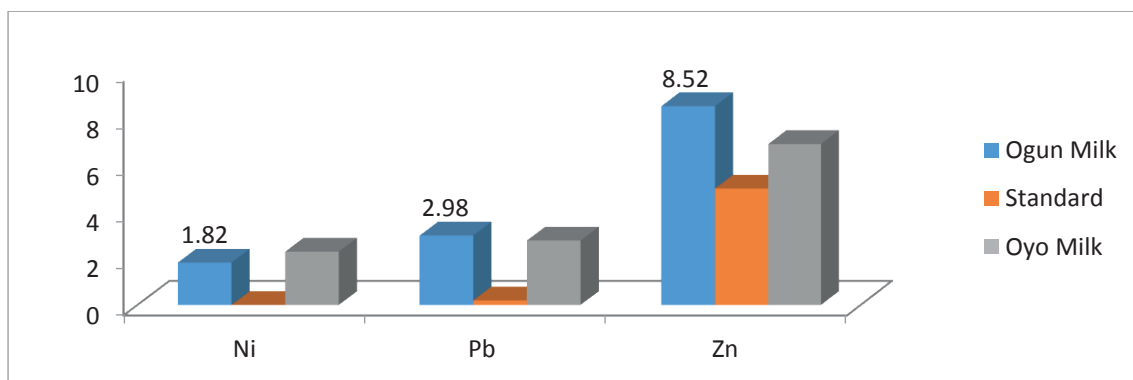


Figure 2. Result of nickel, lead and zinc present in milk samples compared with EU standard

In Oyo state, the heavy metal content in the milk samples analysed were as follows; Cd (1.92 to 2.66), Cr (0.14 to 0.4), Cu (3.42 to 8.8), Ni (0.83 to 6.66), Pb (1.86 to 10.03), and Zn (5.1 to 10.92). The mean value for cheese ranged from Cd (2.10 to 3.88), Cr (0.04 to 0.44), Cu (3.42 to 8.188) , Ni (1.65 to 4.74), Pb (4.56 to 12.08), and Zn (12.7 to 32.9). The results of the cheese samples analysed in this study were beyond the European Union standard for heavy metals permissible limit in food for human consumption. Furthermore, the higher value of zinc (Zn=18.5ppm>E.U=5.0ppm) detected in all the milk and cheese samples analysed in this study is in line with previous work by Tripathi et al. (1999); Martino et al. (2001) and Licata et al. (2004).

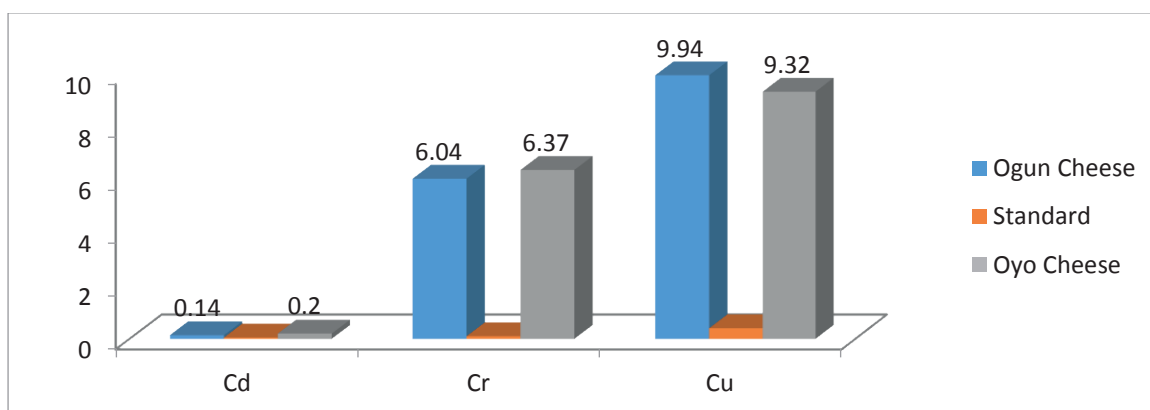


Figure 3. Result of cadmium, chromium and copper present in cheese samples compared with EU standard

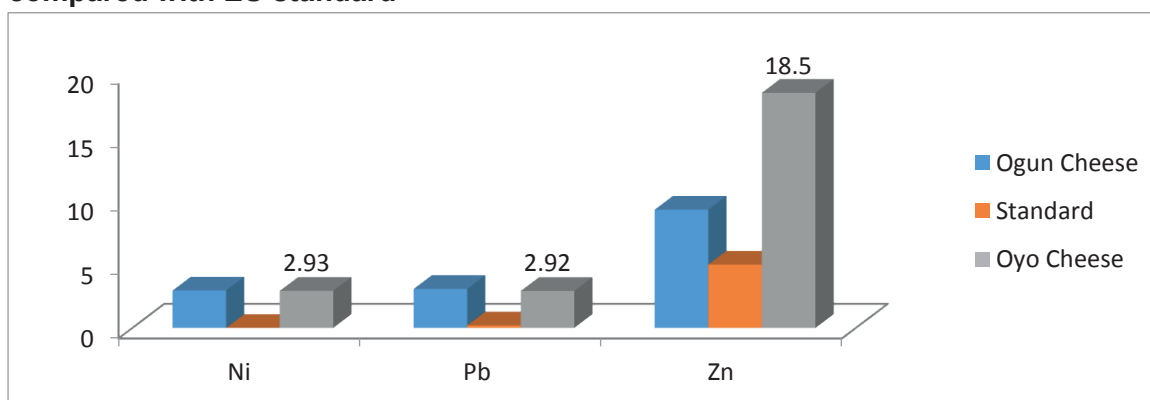


Figure 4. Result of nickel, lead and zinc present in cheese samples compared with EU standard

Bacteriological analysis of milk and cheese

Raw milk and cheese are good sources of microbial growth that cause infection in consumers. Micro-organisms gain access into raw milk through some external factors such as water, bedding materials, infection of the udder, storage materials and human waste. Observation during this study reveals that raw milk is consumed directly by a large number of pastoralists every day and by some rural people living close to the pastoralists. Also, a large number of both rural and urban people consume raw milk indirectly through consumption of cheese because it is usually produced under a very low temperature.

The results of this study are summarised in Figure 5 and 6. According to these results, the highest occurrence of *Staphylococcus aureus* was found in milk samples (27%) while 25% was recorded for the cheese samples. This implies that 27% of the milk samples and 25% of the cheese samples collected in the two states were infected with *Staphylococcus aureus* which could be attributed to poor handling of milk during collection, and processing of milk and cheese in an unhygienic manner. Figure 5 and 6 also shows that 26% of the cheese samples and 17% of the milk samples analysed were contaminated with *Bacillus spp.* In this research, the occurrence of *Bacillus spp.* in the milk and cheese produced by settled Fulani pastoralists was high and may be due to improper handling of milk and milk products, use of dirty cooking utensils and unhygienic processing techniques used by the Fulani women. The presence of *Bacillus spp.* (*B. cereus*, *B. subtilis*, *B. megaterium*) in the samples of milk and cheese is of public health concern and it can be associated with pastoralists' source of water and the soil around them. This result is similar to the findings of Omotayo et al. (2013) who disclosed that almost all the cheese samples analysed in Ogun and Oyo states were positive for bacterial contamination.

Furthermore, 19% of cheese samples and 16% of milk samples tested positive for *Escherichia coli* in the two states. The presence of these potentially pathogenic organisms in milk could be as a result of poor hygiene or contamination from poor handling of the milk samples by workers, particularly carriers of these organisms. Figure 5 and 6 also shows that 13% and 12% of the milk and cheese samples respectively were contaminated with *Proteus mirabilis*.

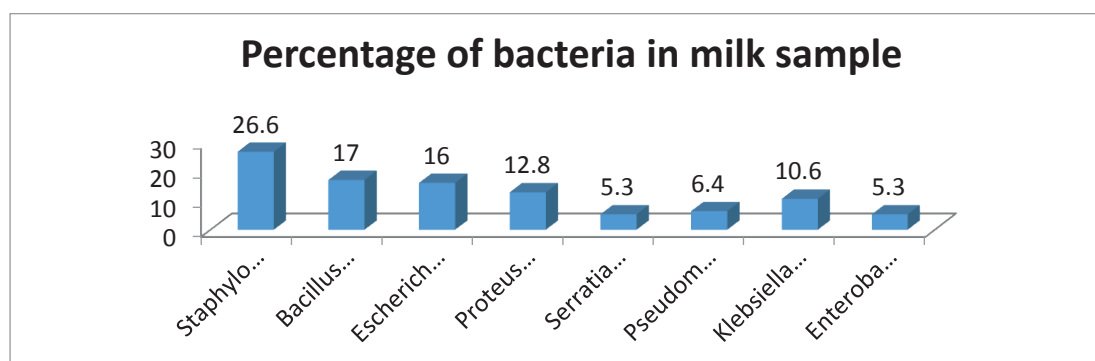


Figure 5. Different types of bacteria present in milk samples from Oyo and Ogun State

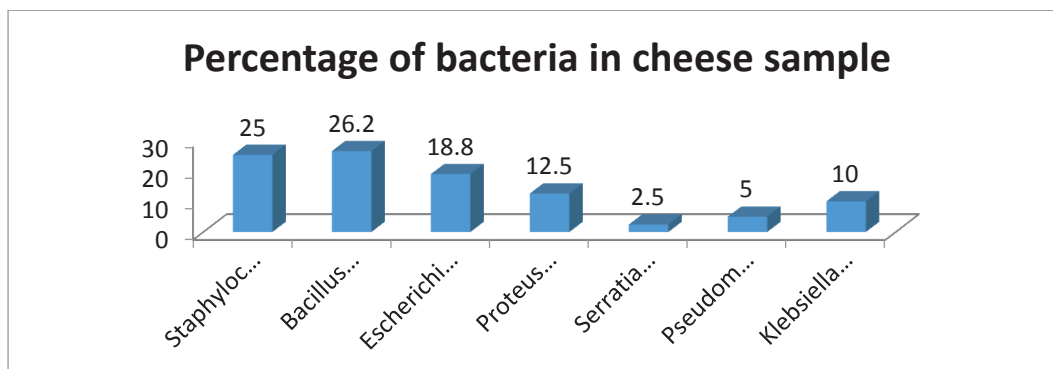


Figure 6. Different types of bacteria present in cheese samples from Oyo and Ogun State

Source: Field Survey, 2015

Conclusion and Recommendations

Arising from the findings of the study, the quality of milk and cheese produced by Fulani pastoralists is of food safety concern, having high levels of contamination with heavy metals and bacteria. These contaminations have serious implications for public health, although perception of the consumers is favourable to continued consumption of the products. The implication of this is that there is a low knowledge of food safety issues among consumers. They also do not feel threatened by the possible health challenges that could result from consuming unsafe food products. The analysis of the health beliefs further implies low cues to action except in emergency situations or widespread health hazards. Based on the above, the study recommends the following:

1. Government agencies such as extension organisations, research institutes and development partners would need to invest efforts in training, seminars and workshops for the general public on food safety awareness and attitudinal change towards contaminated food substances. This will increase awareness among consumers of the risks associated with the continued consumption of contaminated milk and cheese.
2. Efforts should be increased by government agencies such as extension organisations and development partners around provision of training and capacity building for Fulani pastoralists on hygiene and safe procedures in the processing of milk and cheese.
3. Appropriate government agencies in charge of environmental sanitation and food safety procedures should conduct regular monitoring of milk and cheese production sites to monitor compliance with safe procedures. The capacity of Fulanis should be developed to enhance their adherence to food safety practices during milking and processing.

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