SEVENTH FRAMEWORK PROGRAMME

THEME "Environment"

ENV.2010.4.2.3-3 Brokerage activities to promote sustainable consumption and production patterns

Collaborative Project

Project acronym: FOODLINKS

Knowledge brokerage to promote sustainable food consumption and production: linking scientists, policymakers and civil society organizations

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1. Introduction

1.1 The FOODLINKS project

The FOODLINKS project experimented with knowledge brokerage activities (KBAs) as new integrative modalities of linking research to policy-making in the field of sustainable food consumption and production (SFCP). These activities were carried out on two levels: (1) within the overall FOODLINKS project team, and

(2) within three thematic **Communities of Practice** (CoPs), focussing on

- Short producer to consumer food chains (SFSC CoP),
- Revaluing public food procurement (RPP CoP) and
- Urban food strategies (UFS CoP).

These CoP's included researchers, policy actors and CSO representatives originating from different organisations and different countries, all of whom were engaged in the domain of sustainable food. FOODLINKS, hence, brought together different types of knowledge and experience; that is scientific knowledge but also more practical knowledge from policy actors and CSO representatives.

Over more than two years the three thematic CoPs went through a process of interaction and knowledge sharing, which has been structured along four phases:

1. Scoping the topic
2. Envisioning the future
3. Exploring the research and knowledge reservoir
4. Reflecting on learning

Every CoP experimented with different tools for knowledge brokerage engaging sometimes only the project-members and sometimes also new CoP-members, who entered the CoP from outside the FOODLINKS project. KBAs included tools for face to face interaction, as well as ICT tools that were used for distant online interaction.

During the course of the project the three CoPs produced the following documents that are meant to support policymakers and CSO's in the further development of short food supply chains, sustainable public procurement and urban food strategies:

- Short Food Supply Chains as drivers of sustainable development. Evidence Document
- Revaluing Public Sector Food Procurement in Europe: An Action Plan for Sustainability
- Urban Food Strategies - The Rough Guide to Sustainable Food Systems

1.2 Cultivating Communities of Practice

FOODLINKS departed from the idea of Communities of Practice (CoP), such as developed among others by Wenger et al (2002):

> A **Community of Practice** is a group that evolves or is created around their common interest in a particular field with the goal of expanding knowledge related to that field. It is through the process of sharing information and experiences with the group that the members learn from each other and have an opportunity to broaden their understanding of the matter.

The three thematic FOODLINKS Communities of Practice involved members from multiple organisations and different countries. Each CoP was initially built around a core group of about ten members of the FOODLINKS project team. During the course of the project all CoPs expanded by inviting new members from outside the project. These new 'external'

CoP members participated in all online activities but generally not in the face-to-face activities. In the following we define the initial project-based CoP as the 'core CoP' group and the expanded CoP as the 'public CoP' group. While starting the initial core CoP we learnt that building a CoP resembles a process of cultivation: the community has to be developed and to grow, and this requires care, attention and facilitation.

Cultivating new CoPs entails efforts at three levels:

1. Negotiating a **shared domain** – the joint enterprise*:* What topics and issues do we really care about in our CoP? What are the open questions and leading edge of our domain? What kind of influence do we want to have?
2. Organising and nurturing **the community** – mutual engagement: What roles are people going to play in the CoP? How often will the community meet and how will its members connect on an on-going basis? What kinds of activities will generate energy and develop trust?
3. Develop some kind of **shared practice** over time: What kind of knowledge brokerage and learning activities to organise in the CoP?
   shared repertoire of resources: experiences, stories, strategies, policy tools, ways of addressing sustainability problems; ways of KB, learning activities.

1.3 Aims and scope of this report

In this report we synthesise the results and conclusions from the project monitoring and evaluation work package (Deliverable D6.1[1]), and the final CoP reports (Deliverables D3.1[2], D4.1[3], D5.1[4]). Specific attention is drawn to the usefulness of the chosen knowledge brokerage methods and tools. The report describes our experiences with developing Communities of Practice and the value created through this approach. We provide insight into the knowledge brokerage and learning process and assess the effectiveness of the methods used. Based on this we formulate recommendations how to effectively design knowledge brokerage processes and activities and support the collaboration of policymakers, scientists and CSO representatives.

[1] Hoekstra, F. and S. Karner (2013) FOODLINKS Deliverable D6.1: Evaluation Report.
[2] Galli, F. and G. Brunori (2013) FOODLINKS Deliverable D3.1: Final report of the Community of Practice 'Short Producer to Consumer Food Chains'.
[3] Smith, J. and D. Barling (2013) FOODLINKS Deliverable D4.1: Final report of the Community of Practice 'Revaluing Public Sector Food Procurement'.
[4] Moragues Faus, A. et al. (2013) FOODLINKS Deliverable D5.1: Final report of the Community of Practice 'Urban Food Strategies'.

2. Methods

To evaluate the usefulness and effectiveness of the chosen knowledge brokerage tools, we build on various reflective and participatory assessment methods, which were carried out throughout the project. Monitoring and evaluation activities engaged the entire project team (researchers, policy actors and CSO representatives). This allowed us to evaluate our performance, but regular reflection also supported the process of knowledge brokerage and social learning as it enabled us to identify what worked well and what did not, and to adjust activities accordingly.

Data feeding into this report were collected at different levels (individual, CoP, project level) and by means of the following methods:

A **Dynamic Learning Agenda** (DLA) was introduced to surface, which issues the CoPs struggled with. It helped to document and reflect upon the challenges that the CoPs were facing and to readjust activities.

Feedback surveys were used during or after the project meetings for understanding what the project team liked or disliked about the meeting and to 'measure' their satisfaction.

Group reflection exercises were carried out within the CoPs in order to share the individual stories of value creation and to collectively reflect upon the value of their CoP participation.

Assessments of the usefulness of **KB tools** were captured separately by every CoP in evaluation tables, and then analysed centrally.

The **network barometer** gave insight into the CoP development in terms of the key CoP elements, respectively community, domain and practice aspects.

Three times during the project we used a **questionnaire** to learn more about the project team's individual expectations, experiences and learning.

By means of a **social network analysis** the development of the project team in terms of interactions between stakeholder groups and CoPs and the degree of knowledge about each other's knowledge and experience was monitored.

Online community platform ('Knowledge Hub') statistics have provided quantitative insight in the degree of participation in the online community and the usefulness of our outputs, based on the number of downloads.

In **value creation narratives** the project team members reflected individually upon their motivation to participate, the experience of participation and the value this has created.

By combining a **critical moments reflection** and **visual timeline exercise** CoPs reflected on the overall CoP performance and the ups and downs they went through. Insights gained and recommendations for successful knowledge brokerage were discussed in a joint **final reflection workshop**.

Finally, **video interviews** at face to face meetings have served as project process documentation.

Moreover, each of the CoPs carried out an analysis of the process they went through; this report also draws on conclusions and findings from the corresponding **final CoP reports**.

The following chapters present the results of the evaluation of the chosen knowledge brokerage methods and tools. In particular, we present and discuss the five cycles of value creation in the FOODLINKS CoPs (chapter 3), the four phases of learning (chapter 4), the assessment of the usefulness and effectiveness of KB tools (chapter 5), and the challenges of the project process, as they could be identified based on the various sources of evaluation (chapter 6). The final chapter 7 presents conclusions and recommendations for the future use of knowledge brokerage methods and tools.

3. FOODLINKS value creation

Participating in a CoP is satisfactory only if it produces valuable results. In order to assess if and how CoPs create value for their members, we made use of the ***value creation framework*** (Wenger et al., 2011), which defines five levels of value creation:

- Cycle 1: ***immediate value***; CoP activities and interaction have value in and of themselves
- Cycle 2: ***potential value***; activities and interactions produce knowledge capital that might be realised later
- Cycle 3: ***applied value***; concerns changes in practice by putting the knowledge capital into use.
- Cycle 4: ***realised value***; the application of CoP resources may result in improvements in performance
- Cycle 5: ***reframing value***; value creation may finally lead to a reframing of value, which may for instance become manifest in a redefinition of success.

3.1 Cycle 1: Immediate value

Cycle 1, the most basic cycle of value creation, considers networking, community activities and interactions as having value in and of themselves.

From value creation narratives, video interviews, group reflection exercise and feedback surveys we can conclude that "social relations, group building and emotions" constitute the most frequently identified immediate value of participating in FOODLINKS. It is of particular importance, because it sets the ground for further learning activities. As the so called 'iceberg model' describes, communication proceeds at two levels: we communicate content, symbolised as the visible part of the iceberg; in addition, we communicate emotions usually 'under sea-level'. Most of this immediate value has been created through face to face interactions.

A second important immediate value concerns 'knowledge, expertise and experience'. CoP-members highly appreciated to get acquainted with project team members and the invited external experts, and to exchange knowledge and experience with them.

The third immediate value is "diversity", which refers to the curiosity that the differences between team members raised and the interest gained in further unravelling these differences in view, experiences and working domains.

Most team members explained that the knowledge brokerage tools applied during face-to-face meetings were particularly effective in producing this immediate value. Only few refer to the use of online KB tools, such as Skype.

3.2 Cycle 2: Potential value

CoP activities and interactions may also produce "knowledge capital" that is of potential value and to be put to use at a later moment in time. According to Wenger *et al.* (2011), potential value can take different forms. In FOODLINKS potential values was created in regard to:

(a) Human capital, which includes skills, knowledge, change in perspective and understanding of a domain, inspiration, confidence, and

(b) Social capital, including access to new people, relationships with these new people.

The team members reported on the potential value of **human capital** as follows:

- 'Knowledge, expertise and experience' :

learning about urban food strategies, short food supply chains or public sector food procurement in other places; becoming aware of the great variety of sustainable food production and consumption in different city regions; understanding how specific practices may be adopted differently in different local contexts; gaining a broad understanding of urban problems, policy and action fields, and a greater awareness of interdependencies of urban policies.

- 'Capacity building and KB skills':
  awareness of the importance of KB, network building and facilitation; the incorporation of different standpoints of stakeholders; and the practical skills people picked up by using the online networking tools.
- A source of 'inspiration':
  new topics and new people, rendering CoP participation into a stimulating and motivating experience.

Most team members expanded their skills and knowledge (80%)[5] and many (70%) believed that their engagement in the communities of practice contributed to their personal development.

The network barometer gave evidence of the process of 'building community' or **social capital**. After one year about 70% of the CoP members felt that the CoPs discussed the right topics; one year later this percentage had increased to 95%. The potential values of social capital regard:

1. Improved knowledge of team members working in this field;
2. Strengthened relationships within their own organisation, between cities and with local actors;
3. 'Diversity' in terms of meeting different types of people with different backgrounds and learning about their interests and their perception and approach to food system change.

After two and a half years the FOODLINKS network became more integrated, and especially within the CoPs the awareness of each other's experience and knowledge had improved. People like the project manager and the work package leaders for monitoring and evaluation were strongly embedded into the network, and built bridges between CoPs due to the nature of their work. In the first project year most 'knowledge ties' existed among project members, who had worked together before. After two and a half years the project members were much more at height of each other's knowledge, especially for what regards their fellow CoP-members.

There is a variety of potential values created around 'practice', ranging from feeling more confident, having access to new fields of research and seeing the potential of knowledge brokerage. Around 70% of the group members put the new knowledge, obtained in their CoP, to use in practice, while less than half of the people considered what is done in the CoP as relevant for their daily practice. The generated knowledge was evidently applied by the CoP members but how this contributed to 'real life' contexts was not always obvious. Either CoP activities did not properly fit the daily work practice of CoP members, or it needs more time to actually become aware of the relevance of their participation.

3.3 Cycle 3: Applied value

Looking at applied value means identifying how the new **knowledge capital** has been put to use to improve working practices. The question is, if and how the new contacts and network connections are exploited; what was realised through the application of new skills, knowledge and information, as well as the use of products, such as documents or tools produced or accessed through the CoP.

[5] Network barometer results; D6.1: Appendix 1

Following the project members the 'applied value' of the FOODLINKS experience materialised most clearly in the development of a more collaborative and integrated approach towards sustainable food. This could take different forms: a stronger engagement with multi-actor groups when developing food policies; investing more effort in knowledge brokerage across stakeholders; integrating non-academic expertise into research. Some researchers became strongly engaged in local initiatives or even initiated multi-stakeholder activities.

Changes in practice were addressed in particular by those who were not used to work in multi-stakeholder groups before. This included early stage researchers and people whose expertise had not been in the core of the CoP themes, or who were mainly disciplinary oriented in their work before the project.

Learning about knowledge brokerage and related tools has been fruitful for participants of all three communities. Nearly all team members reported that they now used KB methods in meetings, workshops, teaching courses, and other work related activities as a consequence of their participation in the project. Researchers, policy officials and CSO representatives used methods such as world café, speed dating, scenario building or storytelling in physical meetings, but they also applied online tools for distance interaction such as webinars, mind mapping, social bookmarking, Skype, blogs, wiki, or intranet for project management.

FOODLINKS participants were also multiplying what they learned. Knowledge about KB methods was not only used for their own purposes, but was also shared with colleagues, who did not participate in the project.

All team members identified applied value as a consequence of better access to documents and tapping other participants' expertise or by means of using CoP outputs. They addressed the particular usefulness of documents collected and shared, and reported about the use of material, which was either elaborated by single CoP members or collectively produced in the scope of FOODLINKS work. Some could tap the knowledge of team members by asking their advice on a work related issue that went beyond project activities.

3.4 Cycle 4: Realised value

The realised value relates to the results achieved by applying new knowledge and skills, implementing new approaches, utilising new contacts and networks. Realised value has a positive effect on the participants' work.

Because most effects manifest only in the longer run, it is difficult to reveal or specify the realised value at this stage, especially for what regards the value realised at organisational, community and societal level.

However, some team members realised value at the **organisational level**, for example by strengthening relationships and contributing to a better understanding of the expertise available among colleagues. This led to a more frequent and better exchange of information within some team members' home organisations.

Moreover, learning about how to use knowledge brokerage tools helped them to structure and share information within their organisations and in the context of diverse work activities such as teaching or research. For those team members who had not been so deeply engaged in the specific topic of the CoP before joining FOODLINKS, the project added an interesting element to their organisation's portfolio. This applies to research institutes in particular, but also the civil society organisations found it interesting to expand their organisations' status and expertise. Many team members referred to 'visibility' as an important realised value. This included the visibility of individuals within and beyond the project group and their home organisations. But also the home organisations and their domain of work gained more visibility, and their role as knowledge brokers more recognised.

Value realised at the **individual level** regarded usually personal performance and reputation. Project members emphasized more in particular:

- the expansion of their professional domain,
- a better reputation as experts,
- a more profound expertise in sustainable food consumption and production led to new projects, publications, presentations and invited speeches.

As a result individual team members became gained visibility outside their core working communities, and realised value through

- invitations to specific (local) events, and by
- receiving attention from other stakeholder groups and
- media attention.

Even if this primarily advantages the individual, it added to the above mentioned benefits on organisational level, as individuals also acted as figureheads of their institutions.

CSO participants gained additional legitimacy through CoP participation, which strengthened their position in the policy process, as one team member argued. FOODLINKS CSO representatives also addressed this by indicating that a joint scientific publication proved the project's success. Here the project realised value in terms of capacity building which allowed CSOs to obtain a new role as knowledge producers and experts for research in the field.

Cycle 4 also included value on ***community*** and ***society level***, reflected among others in the successful linkage of actors across social domains and the start and improved the performance of sustainable food initiatives. Several project members experienced the participation in FOODLINKS as empowering because of the agreement reached about key values guiding the building of a more sustainable food system, locally as well as internationally.

3.5 Cycle 5: Reframing value

Cycle 5 of value creation deals with reframing value and manifests itself in the emergence of new practices, and the reframing of criteria and metrics for the assessment of performance and success.

In FOODLINKS cycle 5 refers to reframing the value of food but also reframing the value of knowledge and knowledge exchange. Indicators of cycle 5 value creation are for instance the engagement in new relationships with stakeholders, the development of new communication and collaboration practices, as well as changing perceptions and expectations of the other actors in the field. Finally, developing new strategies or adapting social, institutional, legal or political systems that reflect a new understanding, indicates that cycle 5 value creation has taken place.

Value can be reframed at individual, collective, and organisational level. This implies long-term (systemic) changes that develop slowly and are difficult to identify during the run of a (relatively short) project. It is noticeable that the project stimulated the team members to fundamentally reflect on which role they could play in supporting certain developments, how they could contribute to trans-disciplinary research and knowledge exchange, and how they could add to the improvement of current evaluation practices in academia and teaching practices.

FOODLINKS project members defined **success criteria** at an early stage of the project run and redefined them one and a half year later. Reflecting on what matters for a joint attempt of brokering knowledge, resulted in a redefinition of success concerning certain aspects, which appoint some reframing of values.

The researchers, for instance, measured success initially by academic publications. Later on in the project they decided to let go of this indicator; instead they formulated new criteria such as ability to influence policies, increased capacity to attract research funding by demonstrating experience in knowledge brokerage. This suggests a stronger focus on relevance for the 'world outside academia'.

Policy actors have also changed the formulation of expected project outputs. Instead of expressing the need for the CoP to develop a common definition of 'short' in 'short food supply chains', they considered it important to inventory different modes of short food supply chains constitution. This suggests that the project reframed their notion of 'short food supply chains' recognising the multiple value of 'short chains' and cherishing their variety across places. In line with this, understanding national and regional differences was added as an indicator for success.

At this stage all groups recognised value of the project, its lasting impact and tangible outcomes, and many would like to maintain the network and its collaboration after the end of the project. Underlining the value of more integrated approaches, researchers and policy actors confirmed the need for on-going collaboration with each other and CSOs. Especially policymakers would like to expand collaboration to other policies, such as on climate change, land use, health and food security. Collaboration in FOODLINKS had raised their awareness of how important multi-actor and trans-sector approaches are for tackling food-related issues.

For what regards knowledge brokerage, aims shifted from learning more about KB tools towards more frequent use of such tool in other contexts and projects. At this point the earlier conflict of interest between team members mainly interested in content and team members prioritising process seemed to be resolved. Most team members now considered the additional focus on the process as adding value to the project.

3.6 Conclusions on value creation

In all five cycles participation in the FOODLINKS project created value; the added value included the following issues:

Added value in regard to **positive emotions**, **social relations** and **group building** was already evident in the very beginning of CoP interaction. Team members identified the immediate value of enjoying the friendly atmosphere and having fun with each other. They appreciated the growing connectedness and commitment, trust and understanding among CoP members, and they enjoyed becoming a well-functioning group. These positive feelings motivated them to continue the joint work. In addition, participation strengthened the relationships within the participants' home organisations as well as between cities and with local actors.

During different cycles CoP collaboration created added value in terms of the participants' **knowledge**, **expertise** and **experience**. The CoP members were inspired by fruitful CoP and project discussions, which stimulated their interest in sharing each others' experience and expertise. Potential value manifested in improved knowledge of project team members, especially within the CoP, encouraging people to call upon CoP members for advice. Potential value was also realised by learning about sustainable food practices and policies in other places, and by becoming aware about the variety in forms, processes, strategies, and contexts of initiatives.

Learning about **knowledge brokerage** methods, and gaining KB skills through experimenting with different methods added value in many respects. Team members valued the use of the KB tools in the project meetings. Growing awareness of the importance and relevance of KB, network building and facilitation, and the incorporation of different viewpoints produced potential value. Nearly all project members implemented KB methods in their daily work practices. Some project participants gained recognition as

knowledge brokerage experts, passing on experiences to colleagues and other actors interested in KB.

The added value in regard to **networking** was highly appreciated by all team members. The value of extending networks, by establishing new contacts with different actors across Europe materialised in different ways: by using these networks for knowledge exchange and dissemination purposes, by implementing joint activities, by getting advice and assistance for daily work. The enlargement and diversification of networks also increased the status and visibility of individuals and organisations.

In cycle 1 and 2, team members referred to the creation of immediate and potential value produced through the **diversity** of actors, viewpoints, interests and approaches represented in FOODLINKS and realised through multi-stakeholder involvement and the integrated project approach. Consequentially, new insights were gained and a broader understanding developed of the topics discussed.

Participation in FOODLINKS **inspired** the participants to start thinking 'outside the box', to reflect on their own approaches, and to elaborate new ideas. Moreover, the project **motivated** them to reconsider their standpoints and to change their practices, among others by collaborating with other actors, by dealing with new topics, by implementing knowledge brokerage methods in their work practice, and by acknowledging the diversity of what sustainable food may mean at different places and for different actors.

4. The learning phases in FOODLINKS: S-E-R-A

When preparing the project we envisioned that learning in the Communities of Practices would precede in a participatory, cyclical and iterative way. We expected a sequence of four stages, which might be run through repeatedly.

The four stages are the following:

I. **Scoping stage*:*** aimed at explicating the different perspectives present in the CoP in terms of underlying norms, values and perceptions of the topic of study, with the objective to build a shared interpretation of what sustainable short food chains, sustainable public sector food procurement, and sustainable urban food strategies mean;

II. **Envisioning stage*:*** aimed at a joint reflection about future developments, and to prioritise the most important problems of sustainable food systems to be dealt with in the CoP by considering the current (political) frameworks;

III. **Research and knowledge reservoir exploration stage:** aimed at exploring the current state of the art of (academic) knowledge and at understanding the need for more/different information and knowledge needed for addressing the prioritised problems in the three thematic areas;

IV. **Assessment of learning stage*:*** aimed at reflecting on the relevance of what has been learnt for addressing the prioritised problems of sustainable food systems and for using knowledge brokerage as modality to link research, policy and practice, and to identify future research needs.

This cyclical, iterative participatory process was inspired by the Integrated Sustainability Assessment approach (Weaver & Rotmans 2006), and based on principles of social learning and non-linear knowledge production.

Against this background **knowledge brokerage** in FOODLINKS was conceptualised as an interactive process of knowledge exchange and co-production that goes along with processes of social learning. It implied on-going interaction between people from different societal sub-systems (research, policy and civil society), all of whom were considered to be both knowledge producers and knowledge consumers. In doing so, we aimed at breaking through the usual duality of science as knowledge producers and policymakers and CSO's as knowledge users. Instead we started from the standpoint that all three groups had valuable knowledge to offer, and that the mutual exchange of knowledge and experience allowed for the (co)production of knowledge that none of the groups could have produced on their own.

Social learning in the FOODLINKS context referred to the learning content (the social relevance of sustainable consumption and production of food), the learning process (learning through social interactions), as well as the learning context (social environment of the learning individuals and the CoPs).

In practice, all three CoPs did pass all four SERA phases, and experienced the passing through the four phases as a natural process. But they did not follow the cyclic approach in the precise sequence as we originally envisaged. The following section describes how the CoPs went through the process and which knowledge brokerage tools they applied for which purposes. We also discuss the differences and correspondences in the process across the three CoPs.

4.1 Phase I: Scoping

Interaction between science, policy and civil society needs to start with explicating the views, needs and values of all actors involved. This is particularly important in the context of a problem driven co-operation, as the actors may start from a different problem definition. The aim of the first stage was to uncover and openly discuss in the group the whole range of perceptions and understandings of the issue at stake.

All three CoPs used **mind mapping** as an for exploring the key issues surrounding their topic. They started building core mind maps during the face-to-face meeting, which were further elaborated online.

In the **Short Food Supply Chain CoP**, the members started with the presentation of case studies, that is examples of short food supply chains from their home region that reflected their perspective on short food chains. In a subsequent mind mapping activity, they assembled those issues that were considered to be of key relevance for the case studies presented. Drawing a mind map helped to unravel how the various issues interrelated; for instance how the definition of short food chains informed criteria for classification and depended on operational contexts, actors involved and problems faced; this again influenced the relevance of short food supply chains for urban food policies. The core mind map was further elaborated and detailed and refined on the online community platform.

In addition, all CoP members posted information material in the library and on the blog installed on the online community platform. Labelling the material posted through 'tags' and exploring the variety of tags added allowed to identifying additional key aspects of short food supply chains.

The **Revaluing Public Procurement CoP** also undertook a mind mapping exercise for inventorying the key topics present in the discussion of the public procurement of sustainable food. The key aspects collected were then ordered along four dimensions, which were jointly identified in a face-to-face meeting:

(1) legislation and policy,

(2) values,

(3) good practice and learning, and

(4) barriers.

In a second step the CoP established a 'Plan of Action' in order to successfully implement knowledge brokerage activities. This included a CoP work plan, timeline and meeting agendas (fixed by the CoP coordinators), and a set of 'rules' agreed upon by all core CoP members. For knowledge brokerage the following key issues were identified (see Smith & Barling, 2013: 13):

- The CoP members agreed that knowledge needs to be presented, exchanged, discussed, and deliberated upon.
- Already in a very early stage it became clear that both face-to-face and virtual engagement is important.
- For optimising the results it would be necessary to engage CSO representatives who were not yet present in the core CoP group; externalising the CoP was, hence, considered as very important.

The **Urban Food Strategy CoP** built a mind map to capture key issues from group discussions and case studies of urban food strategies. The mind map was shared and further edited online. Based on this additional mind maps were developed for individual cities, including Basel, Vienna, Tukums, Vitoria-Gasteiz, Malmö, and Bristol. Departing from the same basic mind map facilitated cross city comparison and the highlighting of common themes as well as unique features. In a subsequent face-to-face meeting, the core mind map was altered based on the individual mind mapping experiences. A group prioritisation process then revealed which elements needed further investigation.

Mind mapping - the main KB tool for scoping

Mind mapping is a useful method for starting off the CoP process of collaboration. It serves as a frame of reference, which can easily be updated during the process. Creating a core mind map allows for inventorying different perspectives but also for aligning CoP members around a joint understanding. It allows to presenting and visualising different and common aspects of complex issues. Mutual learning is encouraged by comparing individually and collectively developed maps. Starting the design of collective maps in face-to-face meetings is important as it encourages discussions and the building of a common narrative. It is the process of creating a mind mapping, which is most instructive, rather than the mind map in itself. Our monitoring exercises confirm that the maps were considered as most useful by those who took actively part in their creation.

Case Studies

Case studies are useful for supporting knowledge exchange in the scoping phase as they illustrate activities taking place in the different places. They contribute to a better understanding of the differences in characteristics of and perspectives on short food supply chains across countries. They also serve as a starting point for identifying which aspects needed to be investigated in subsequent activities.

4.2 Phase II: Envisioning

The aim of the envisioning stage was to jointly reflect on the future development of the theme based on policy relevant agendas and strategies, and to prioritise aspects of high strategic relevance. Based on this the CoP members started to collect relevant research results (see Phase III: Exploring the research and knowledge reservoir). At this stage, the CoPs started to involve other stakeholders and expanded the core CoP group in order to cover a broader range of problem perceptions and to include all relevant knowledge providers.

All CoPs selected a number of specific issues and questions for further elaboration. All three CoPs decided to produce a **joint document** for this purpose. This document should embody the main output of their activities, reflect their common objective and integrate their different perspectives as well as knowledge and experience. Such a document may be identified as 'boundary object', which gives direction to the collaboration in the CoP and at the same objectifies the outcomes that were jointly produced (see e.g. Star, 2010). The general structure of the documents was discussed and agreed upon in face-to-face meetings, while much of the joint writing processes took place online.

During the envisioning phase the **Short Food Supply Chain CoP** prioritised the following set of key issues (Galli & Brunori, 2013: 27):

1. What is 'short' (in the perspective of 'short food supply')?
2. How, and to what extent, can short food chains contribute to sustainability and health?
3. To what extent does regulation (absence/presence of it) act as a driver or as a barrier for development of short food supply chains?
4. How can the up-scaling of short supply chains be managed? Are collective 'platforms' for short supply chains feasible / desirable?

To elaborate on these key issues, the SFSC CoP decided to write what they called the 'Evidence Document'. This document served as a 'vehicle' for discussing the main questions listed and the contradictions around these issues evidenced in the case studies.

During the envisioning phase it appeared that the members of the **Revaluing Pubic Procurement CoP** needed to better understand the work situations, experiences and orientations of the other core CoP members. For this purpose the CoP organised three

paired interviews between researchers and policy actors, in which one member interviewed the other based on the content of a document that the interviewee considered important for the issues raised in the scoping framework. This guided the common engagement towards the third research reservoir exploration stage. In addition, the CoP focused on elaborating a work plan with a common goal; in doing so they used two knowledge broker activities: 'the wheel' and 'ritual assent/dissent'. As a result of these exercises, the CoP agreed to produce a state of the art report that would recommend ways to promote the public procurement of sustainable food. This was decided during a face-to-face meeting in Tirrenia, which explains the initial working title of the document, 'The Tirennia Charter'. This report evidences the need for reorienting of public food procurement practices; it gives an overview of best practices and offers practice advice on how to revalue public procurement by way of an action plan. During this phase the Revaluing Public Procurement CoP recognised the differences in how public procurement is approached within Europe and in what is considered as main drivers for change; they also revealed how differently countries deal with EU procurement legislation (Smith & Barling, 2013: 18). Based on this, the CoP members agreed to engage in a collaborative writing of the above mentioned document, as the writing process would assist them in defining common goals.

The **Urban Food Strategy CoP** convened a series of online (Skype) meetings during which they discussed how to further develop the CoP theme, how to inventory common needs and values and how to come up with a mission statement. While comparing the collective and individual mind maps, they felt the need to develop a common understanding on a range of issues in urban food strategies. A science oriented conceptual document helped to tighten the iterative scoping and envisioning process. They expanded the individual mind maps into 'short stories' (case-studies) in order to capture the information available about the cities in greater depth and detail than could be done in the mind maps. This conceptualising effort helped to understand the wide range of urban action fields and to reflect about future food system transformation.

The 'Wheel' (a.k.a. 'Opera')

The 'Wheel' was useful for defining common goals, elaborating a work plan, and agreeing upon the structure of the collaborative document. A matrix containing all relevant issues was produced, which were then prioritised, integrated and agreed upon. This tool helped to structure discussions and to decide democratically about the process.

Ritual assent/dissent

This tool helped to elaborate a structure for the collaborative document. Each group focused on another chapter of the document. The method is a forced listening technique (not a dialogue); plans resulting from such a process are supposed to be more resilient than plans resulting from consensus based approaches. Each group's proposals were tested by subjecting them to ritualised dissent (challenge) or assent (positive alternatives).

Case studies (short stories)

Short stories were used to elaborate on the mind maps in more detail.

Collaborative writing – joint documents as 'boundary objects'

The writing of collaborative documents helped to define a common ground, and to integrate differences in perceptions, knowledge and experience. It gave direction to the process of collaboration and strongly motivated the participants to join in. It provided a rationale for the work as well as a sense of belonging, pride and accomplishment during the completion of the document and the preparation of its publication.

The UFS **conceptual document** contributed to a shared interpretation of what urban food strategies means; it also helped to explore the reservoir of relevant research.

4.3 Phase III: Exploring the research and knowledge reservoir

In this stage the CoPs selected, collected and exploited the existing information and knowledge needed to address the key aspects identified and prioritised during the envisioning stage. This process also included knowledge translation in order to make existing research results accessible for use in policy making and practice.

The **Short Food Supply Chain CoP** started to post information on the online platform and at the same time added research outcomes to the relevant 'Evidence Document' sections. In face-to-face meetings, the CoP members presented **case studies** of short food supply chains in Italy, Ukraine, Russia, Scotland, Basque country, Switzerland, France and Austria, which were also included in the evidence document. In addition, the CoP organised **webinars** around specific topics, which allowed for more in-depth discussion with external experts. A webinar on 'Challenges for small scale producers related to hygienic EU regulation' was held mid May 2012 and covered in a specific section of the Evidence Document. Besides, the CoP **shared documents** on the online community platform, and elaborated a joint document. A review of academic literature and detailed case studies were fed into this document. Both, the case studies and the whole draft document then underwent a **peer review** process where the knowledge of other CoP members, of members from other CoPs, and the Expert Board was tapped.

The **Revaluing Public Procurement CoP** invested in the expansion of the initial CoP in order to broaden their base of expertise. Firstly, they opened up the on-line platform for new members and sent out invitations to join within their respective networks. Secondly, they organised a **conference**[6] and again invited a targeted external audience, focusing on relevant CSO organisations that were underrepresented in the CoP. This conference was a key step in externalising the CoP to the UK based networks around sustainable food and public procurement. In particular, the NGO sector, in London and other regional areas from the UK, was mobilised. This has resulted in an increase in members on the CoP's online community platform and subsequent virtual engagement of the core CoP focused on policy frameworks for change. A **webinar** was organised around a presentation from the coordinator of the European Public Health and Agriculture Consortium, which linked the topic to actual EU policy developments.

The **Urban Food Strategy CoP** used **short stories** as basis for a comparative analysis of the range of strategies observed across Europe, and for more generalised probing and questioning of urban food strategies. Among the aspects investigated were the following: actors involved, activities, driving forces, barriers, motivating values, levels of governance, and a SWOT analysis of the UFS initiative. The CoP tapped the existing knowledge reservoir by exploring urban food concepts across those cities that were regarded as good practice examples. The short stories were analysed against the background of the conceptual outline, and the presented concepts were questioned through a **buddy exercise**. The research and knowledge reservoir exploration was oriented towards a practice-focussed output, with the objective of producing a brochure that explained how to develop urban food strategies. The CoP members collected different materials such as academic and 'grey' literature generated by practitioners, and stored them on their online community platform. Moreover, the UFS CoP organised a webinar to explore current academic literature on urban food strategies.

[6] see http://www.foodlinkscommunity.net/news-foodlinks.html?&L=0&tx_ttnews[tt_news]=666&cHash=22012a8f01a85c0afba9d075f7da780c

Cross CoP activities

The three CoPs and their working domains were linked through the online community platform and webinars, as well as in face-to-face meetings. We organised specific **cross CoP sessions** during project meetings. At the fourth meeting in Vitoria-Gasteiz we discussed questions prepared by the singular CoPs. The questions aimed at relating the CoP topics to each other, and to provide additional cross CoP perspectives to the knowledge exchange. In addition, the CoPs provided each other with feedback to their draft output documents. This was another step towards broadening the knowledge base and integrating the three themes. Besides, CoP members exchanged knowledge across CoPs through their participation in multiple CoPs or in in extra CoP meetings/activities. They contributed to other CoP's online community platform areas; they participated in webinars upon invitation by members of one of the other CoPs. Thereby and through informal talks with colleagues from other CoPs **single team members** functioned as boundary spanners and knowledge brokers between CoPs.

Besides, several **joint public events**[7] were organised back to back with General Assembly and CoP meetings. These activities did not only link the project group with local actors and local Communities of Practice, but served also for bridging the gap between the FOODLINKS CoP groups. For instance, the UFS and the RPP CoP organised a public event on public sector food procurement at the urban government level that stretched thematically across CoP boundaries.

Online community platform

The Online community platform has played an important role in connecting the CoP members in their online endeavours; in addition it facilitated interactions and knowledge exchange across CoPs and with external participants. It has also proven to be a valuable platform for collaborative writing on CoP documents. Some of the CoPs made use of additional devices for this purpose, such as google writing and the intranet website of FOODLINKS.

Webinars

Webinars were considered as a good way for organising online interaction and knowledge exchange on distance and in-between the face-to-face meetings. It also allowed the CoPs to engage the members of the other FOODLINKS CoPs, and to involve people from outside the project. Webinars need proper preparation and technically skilled facilitators. It is also crucial to provide clear instructions for the participants to check the adequacy of their internet connection. Moreover, it demands participants to have a certain ability of multi-tasking: simultaneous listening, reading and writing is sometimes needed to keep up with the conversation.

Several online instruments were tested: *Anymeeting*, *Blackboard Collaborate*, *GotoMeeting* and *Bigmarker.* Which instruments works best depends among others on the number of participants and the features needed for their engagement. They also differ in price. We had food experienced with Bigmarker, which is free of charge and very simple to use with webinars for small groups (up to 100 but we experimented with +/- 20 participants).

[7] See http://www.foodlinkscommunity.net listed under events.

Case studies (short stories)

Case studies allowed for a more in depth exploration of the knowledge and research reservoir, and supported a comparison across places.

Buddying short stories helped to clarify implicit assumptions and framings through questioning case study descriptions as well as the need for providing further information. It was appreciated as a useful and very motivating tool for mutual learning as buddies needed to read each other's stories carefully. Reading and comparing the different stories, allowed for the recognition of differences as well as correspondences, which was considered instructive also because it generate insight at a more abstract level.

Other **peer review** / **feedback** activities regarding the CoP documents served a similar function: it deepened and focussed the discussions within the CoPs, and it enriched the knowledge base through exchange with members of other CoPs, and the Expert Board.

Conferences / public events

Conferences and other public events served for further expanding the CoPs. By inviting speakers from stakeholder groups not represented in the core CoP, the knowledge reservoir beyond academia was tapped. Specific local events also provided a useful tool for linking up with local communities.

4.4 Phase IV: Assessment of learning

This stage was conceptualised as an iterative process of reflection and adaptation to support the collective learning process. For assessing the learning process we relied on two sources of information. First of the all, the learning outcomes such evidenced and reported in the different stages discussed above (in particular when assessing the existing knowledge and research reservoir, identifying knowledge gaps, and defininf further research needs). Most of this has been examined in the previous sections.

In addition learning has been monitored through several individual and joint reflection activities. Joint reflections took place within and across CoPs (see 4.3 Phase III: Exploring the research and knowledge reservoir) and regarded food issues but also experiences with knowledge brokerage. During the third project meeting in Pisa and the fifth project meeting, in Edinburgh we organised a **cross CoP exchange** of experiences with knowledge brokerage. In a 'critical friend' exercise challenges occurring in the CoPs were discussed with peers from other CoPs, who gave feedback and commented constructively against the background of their own experiences in other CoPs.

The assessment of learning included reflection upon the development of the CoPs (e.g. aspects of group dynamics), as well as reflection on the usefulness of the methods applied for knowledge brokerage activities and general.

Chapter 5 discusses the assessment of the knowledge brokerage tools and activities. In the following we discuss how the CoP members looked back on the development of their CoPs and the **inherent group dynamics**.

Like every newly constituted group, the FOODLINKS CoPs went through the typical stages of team building as described in the group development model of Tuckman (1965):

1. **Forming phase**: group members get known to each other, develop relationships, and agrees on goals and tasks
2. **Storming phase**: differences in ideas, goals and expectations between group members come to the fore

3. **Norming phase**: the team agrees on a common goal and on common rules for collaboration
4. **Performing phase**: the group functions as a team and starts to actually work

Results from the assessments of learning suggest, that these group development phases in practice overlap, and/or may be repeated.

The Urban Food Strategies CoP explicitly reflected on their group development in terms of group dynamics, and analysed the outcomes along these phases. The Revaluing Public Sector Food Procurement CoP assessed the learning outcomes along the SERA phases, and the Short Food Supply Chain CoP reported on their learning phase in general terms. All three groups elaborated on a visual timeline depicting the CoP performance along critical moments characterising high and low levels of group energy and productivity, which alternated throughout the whole project run.

Leadership and facilitation at the start

Starting from high expectations, all three groups perceived a low level of activity guided by a high degree of uncertainty when they started to constitute the thematic CoPs. A lack of clarity about the overall project goals and related CoP tasks, made team members remain passive awaiting further advice. Work package leaders felt uncertain about the adequacy of leadership styles in a project, which claimed a non-hierarchical and strongly participatory process. Thus they remained reluctant in giving the CoP a clear direction. Due to weak leadership the group forming phase took a considerable time in all three CoPs. Many people did not know each other and spontaneous interaction developed slowly. Especially in the beginning most interactions took place during face-to-face meetings, but hardly by means of distant interaction in-between meetings. Most team members, including the CoP leaders were not used to online collaboration or faced technical restrictions, which enhanced the already high level of uncertainty and delayed group building.

A coaching session on how to facilitate the development of a CoP after the second meeting helped work package leaders in gaining more confidence and to better understand their role in setting up and coordinating a CoP. However, online interaction remained difficult, and CoP leaders experienced learning how to facilitate a group as an iterative process that emerged over the whole lifetime of the CoP.

Based on their experiences, all three CoPs highlighted the importance of leadership giving a clear direction and proper facilitation especially for the start, when uncertainty in the group is high.

Unsteady level of activity

The third face-to-face meeting gave the CoPs a sense of momentum: already during the preparation clear tasks were assigned to CoP members, and responsibilities were shared for online facilitation and other activities. In this third meeting the CoP groups elaborated a common mission and goal, which built a sense of ownership and group identity. There was much enthusiasm about the decision to produce a collaborative document in all three CoPs. Several activities such as extra CoP meetings, webinars and virtual interaction followed this meeting and kept the level of interaction high for a certain time. However, the commitment raised during the third meeting did not carry all CoPs thoroughly through the next face-to-face project meeting, and the relevance of regular joint activities between the main project meetings became obvious. The UFS CoP, who did not organise an additional face-to-face CoP meeting during this period, experienced a lower level of activity compared to the other two CoPs, who organised extra meetings during this period. The development of a work plan that encouraged continuous interaction was important, and the allocation of clear tasks and shared responsibilities was considered crucial for advancing CoP development, and encouraging active participation. The

production of tangible outputs, relevant beyond the project community' proved to be a main incentive for active engagement.

Motivation and commitment

Despite serious efforts to actively engage all team members, some remained inactive for a long time. Following the UFS CoP explicating each other's motivations and expectations in the beginning could have encouraged participation. Besides, CoPs acknowledged the importance of personal relationships for high commitment, which could be established most efficiently through face-to face activities. Opportunities for informal exchange such as dinner talks or joint field visits were considered as supportive in respect to improving relationships.

Externalisation of the CoPs.

Building a group identity and personal relationships is easier in a small group, thus the CoPs initially invited external participants only for specific activities. The fact that they did not sufficiently link with external groups before they opened up their online community platforms was frustrating in particularly for those members who feared the artificiality and experimental status of the FOODLINKS CoP to continue. On the other hand the groups needed time and privacy to develop clear objectives, rules and a working routine before linking up with others. Here, the different objectives of the project also conflicted with each other; that is the wish to link the three CoP themes through joint activities, to actively engage the Expert Board, and to build up trust and ownership within the individual CoPs. As the UFS CoP highlights with reference to Tuckman's concept of group dynamics, staying within a confined group was reasonable as long as a group is establishing the sediment of a collective 'we'.

All three Communities of practice reported about a collective learning process.

CoPs organised along a SERA cycle encouraged social learning and knowledge brokerage between researchers, policy makers, and civil society organisation representatives by facilitating their collaboration as community members.

The CoPs established effective linkages between different actor groups and interests by building a shared understanding around the themes they elaborated on.

New knowledge was co-created through a process of collaboration and integration in Communities of Practice; key action points could be identified for the advancement of sustainable food production and consumption, and the collaboration resulted in useful findings about effective knowledge brokerage.

The collaboration in CoPs along SERA learning cycle reached a 'high sense of community', and in the end of the project the collaboration was assessed as productive and recognised as a catalyst for change.

5. Evaluation of knowledge brokerage tools

This chapter reports on the evaluation of the knowledge brokerage tools. We present an overview of the most effective KB tools and activities (5.1). We then discuss more in detail how knowledge brokerage tools and activities contributed to the development of the Communities of Practice and how they supported them in their coproduction of knowledge of sustainable food systems (5.2).

5.1 Purpose and use of KB tools

CoP members evaluated the knowledge brokerage tools and activities throughout the project (see final CoP reports Galli & Brunori, 2013, Moragues Faus *et al.,* 2013, Smith & Barling, 2013). In doing so, they considered which tools were most useful and effective for which purpose. Synthesizing the CoP's assessment of the knowledge brokerage tools we can see that the knowledge brokerage tools differ in which purpose they serve most effectively at which level. Below we give an overview of the different purposes referred to and considered as relevant at either individual, group or topic level.

1. Purposes relevant at individual level

- Empowerment of CoP members
- Commitment of CoP members
- Support understanding of CoP members' backgrounds and contexts
- Value own work

2. Purposes relevant at group level:

a. Process – defining group identity and dynamics

- Creating group identity
- Activating a group process
- Integrating the group, achieving inclusiveness
- Getting to know each other, developing social relationships in the group

b. Content – preparing a common ground

- Building a common frame of reference
- Creating common understanding and identification of differences
- Sharing feedback
- Building up a group memory

3. Purposes relevant for the topic at hand

a. Process – discussing content

- Initiating discussion/ new topics
- Focused, quick exchange of information and ideas
- Deepening a discussion, clarification, reframing a problem
- Identification of hidden aspects
- Sharing results

b. Output – producing results

- Create tangible output
- Making tacit experience/knowledge explicit
- Make information/output available to the outside world
- Visualisation of arguments and topics
- Condensing information

Table 1 testifies which knowledge brokerage tools and considered were considered as most useful and effective at which level and for which purpose.

Table 1 Sorting of KBA tools – according to their use and effectiveness as recorded by CoPs

Level where it was effective / **KBA tool**	Individual level	Group level: process	Group level: content	Topic oriented: process	Topic oriented: content/output
Offline					
Face-to-face meetings	X	X	X	X	X
Informal chatting	X			X	
Field visits / meeting the locals		X	X		X
Speed dating/ speed story telling / Elevator speech	X	X			
Brainstorming	X	X			
World Café		X	X		
The 'Wheel'			X	X	
Triangular / paired interviews	X	X			X
Assisted peer review of case studies with two presenters				X	X
Gallery walk		X		X	X
Cooperative time-lining	X	X			
Collective mind-mapping combined with individual mind-mapping		X	X		X
Online					
E-Mails				X	
Skype conference					X
Intranet discussion forum	X	X		X	
Online community platform ('Knowledge Hub')				X	
Collaborative mapping					X
Collaborative writing and peer review				X	
Buddying short stories	X			X	X
Webinar		X		X	
Social bookmarking					
Micro blogging (Twitter)					X

Note: KBA tools sorted roughly according to their level of innovativeness for the CoP members (from low to high)

5.2 Effectiveness of KB tools

Relationship between KB tools and particular purposes in the group process

All three Communities of Practice combined online and offline tools for knowledge brokerage. They did so in different ways using different tools for different purposes and at different moments. For example, the Urban Food Strategy CoP used a variety of innovative tools during face-to-face meetings, experimenting with different methods for group discussion. The Short Food Supply Chain CoP was more engaged in testing different online tools for knowledge brokerage and tools enabling distant collaboration. It is notable that all three CoPs produced one or more tangible output documents and did so by engaging in a collaborative writing process. Overall, this was evaluated as a positive experience. It seems that the process of knowledge brokering coincided and reinforced the output produced, process and content therefore matched well.

Overall, the members of all three CoPs considered the face-to-face meetings as more effective than online collaboration for brokering knowledge.

It is interesting to see that the online tools were evaluated as most effective for topic oriented collaboration, serving both the purpose of facilitating the process and enabling the production of tangible output. They supported the start of discussions on new topics, facilitated the exchange of information and ideas, and helped deepening the discussion, reframing problems, identifying hidden aspects and sharing results. Online tools, such as mind mapping, supported the production of outputs by visualising and condensing information, creating tangible outputs, explicating tacit knowledge, and by making output available to the outside world.

The online tools were assessed as less effective for what concerns the empowerment of individual CoP members or for nurturing their commitment to the CoP work; neither did they help a lot in understanding each other's background. Offline, face-to-face tools were assessed as very effectively supporting the development of a common CoP group identity and to support group dynamics. This regards in particular the integration of new members and the fostering of satisfactory social relationships within the group. Only two online tools were considered relevant in this regard - the intranet forum discussions and webinars.

Furthermore, the CoP members referred only to offline tools when explaining what helped them to identify differences, develop a common frame of reference and a common understanding of the subject at hand, as well as to build up a group memory .

Extending and externalising the CoPs

The statistics of the online community platform reveals that the three CoPs achieved similar levels of membership and participation.

The **Short Food Supply Chain CoP** had in total 68 members consisting of 13 initial core CoP members, 28 other project team members, 12 associates members (including the Expert Forum and PUREFOOD early stage researchers) and 28 external or 'new' members. From these 68 members, 33 have actively contributed to the online community platform by writing a blog post, starting a forum discussion, uploading a document or leaving a comment. FOODLINKS project team members were most actively contributing online: 86% were active, while only 21% of new members or 25% of the associates posted or uploaded something on the Knowledge Hub.

Knowledge Hub statistics for the **Revaluing Public Food Procurement CoP** indicate 54 members in total. The group assembled 11 core CoP members, 23 people from the project team, 5 associates, and 26 new members. Similar as in the SFSC CoP, 83 % of the active contributors were from the FOODLINKS team.

The **Urban Food Strategies CoP** online community had 52 members in total: 11 constituted the core team, 23 from the project, 9 associates, and 20 new participants. In

terms of contributors, 83% of the project team, 33% of associates, and 20% of new members were active on the virtual platform.

Looking across the project as a whole we may conclude that the CoPs overlap in membership, which clearly indicates cross-CoP linkages and common interests. All CoPs managed to involve people from outside the project team. All three groups have been able to expand their CoP by involving external participants in various activities and to varying degrees - ranging from informing them by newsletters to more active contributions in project meetings or public events. Generally speaking, active online participation remained limited among the new CoP members (including those associated to the FOODLINKs project through the Expert Board or the PUREFOOD sister project): on average not more than 12-25% of the new members became active online contributors. 'New' CoP members followed the online discussions and participated in events organised by the core CoP, but generally did not initiate activities. Overall, 576 external people participated in FOODLINKS activities or were regularly informed and updated on project activities and results through newsletters. The actual reach-out, however, of the many dissemination activities organised by project members and various spin-off activities at the local level goes far beyond this number.

In terms of geographic distribution, the core project team members represented nine 9 European countries. The external participants originated from 27 different countries, most of whom from the UK and Spain (each 20%), followed by people from the USA, Canada, Austria and Italy (each about 5%).

Organising local events and activities aside to FOODLINKS project and CoP meetings proved to be very successful for interesting new members to join. This may also help to explain why the interest was more prominent in some countries that in others. We organised several public activities both in Spain and in the UK and both raised considerable interest. Language is probably an important factor as well. The working language of the project was English, which makes it easy for English speaking people to participate and probably has impeded the participation of those with low proficiency of English (see 0 6.6 Linguistic barriers).

Many CoP members acted also as knowledge brokerage towards local food related initiatives, to whom they reported on the knowledge and experiences gained in the FOODLINKS CoPS. All CoPs reported spin-off' activities resulting from work in the project, such as contributing to local debates about public procurement, short food supply chains, or urban food strategies. In some cases the project acted as trigger for concrete activities in these fields and as catalysts for change: e.g. in Tukums[8], Vitoria Gasteiz[9], Pisa[10]. Here the FOODLINKS based KB tools supported in local processes of change and knowledge exchange and production expanded towards local actors, e.g. in conferences or smaller working groups.

The CoP members reported that it was very difficult to engage local stakeholders directly into the FOODLINKS CoPs. In their experience external stakeholders needed a concrete reason and incentive for actively engaging in such a distant CoP. Due to their personal relationships with the local stakeholders, the FOODLINKS CoP members were able to bridge the differences and to act as a knowledge brokerage between the two groups. Additional stakeholders were involved in the CoPs via the online community platform, and through meetings and public events. However, their engagement was largely punctual, and it is not clear in how far they were really integrated in the discussion processes.

[8] KB activities within the RPP CoP have provided a catalyst for new strategic development of public food procurement.
[9] Links between the international CoP, the local civil society and the key technical staff of the City Council were established.
[10] Activities in the context of short food supply chains and the local food plan.

The use of appropriate technology (accessible, easy to understand) and meeting settings (roles and tasks of external participants), and good facilitation is crucial as participation does not happen spontaneously. Besides, it is important to consider the emotional aspect and need to nurture a sense of belonging and with it willingness to participate.

Use of knowledge brokerage for bridging differences between CoP members

The FOODLINKS project team consisted of researchers, policy actors and CSO representatives; researchers represented a majority in all CoPs, while only three CSO representatives were in the initial core CoP groups.

By breaking down the number of external participants according to three different types of actor groups[11], we learned that the majority of the new members were representing either CSOs, industry or SMEs (39%) and researchers (36%), while policy actors stood for a quarter of the new members (25%).

Online activities, which were not specifically directed towards a certain actor group, like endeavours on the online community platform or the SFSC mailing list attracted a lot of researchers. Policy actors and CSO participants were more easily attracted when meetings and events focused on a specific topic or were tailor made to actively engage representatives of those two groups, for instance by inviting them as speaker or co-organiser

Table 2 gives an overview of the kind of new members reached through specific activities and events.

Table 2: Summary of external participants in FOODLINKS project or thematic CoP meetings & activities

Event / activity	# of participants		
	Research	Policy	Civil society[12]
Online			
FOODLINKS News	14 (35%)	10 (25%)	16 (40%)
Online community platform	26 (45%)	11 (19%)	21 (36%)
Webinar (UFS)	52 (43%)	29 (24%)	39 (33%)
SFSC mailing list	15 (65%)	3 (13%)	5 (22%)
RPP mailing list	11 (39%)	6 (21%)	11 (39%)
Offline			
Public event (Vitoria)	8 (12%)	22 (32%)	38 (56%)
Conference (RPP London)	5 (17%)	11 (37%)	14 (47%)
Event (Malmö)	7 (35%)	7 (35%)	6 (30%)
Meeting (Edinburgh)	10 (59%)	4 (23%)	3 (18%)
Hygiene regulation event (SFSC, Vienna)	2 (13%)	2 (13%)	11 (73%)
Meeting (UFS, Riga/Tukums)	2 (40%)	2 (40%)	1 (20%)
Final conference (Brussels)	15 (38%)	9 (23%)	15 (40%)
KB-Workshop (Brussels)	6 (50%)	3 (25%)	3 (25%)
Total external participants recorded (100%)	173 (36%)	119 (25%)	183 (39%)

The knowledge brokerage tools used in the FOODLINKS project were supposed to bridge across the different perspectives, backgrounds, knowledge cultures that were supposed to distinguish the group of scientists, policymakers and CSO representatives. There is, however, little explicit reflection on the links between KB tools and overcoming the differences between CoP member groups.

[11] Information about participants' affiliation or from which county they are was only available for 80% of all external participants; the numbers refer to this group.
[12] This category also includes some people from industry and SMEs, such as consultancies.

It was stated that the predominance of academic language made it difficult for the non-academics to participate and to fully integrate (see 0 6.6 Linguistic barriers). From this we may deduce that KB tools encouraging direct interaction without relying too much on written material could be preferred. The story telling activity and paired interviews of scientists and policy makers may serve as a positive example.

5.3 Conclusions on knowledge brokerage tools

Experimenting with different KB tools proved that it matters a lot which tools is used for which purpose and which context. Knowledge brokerage tool can be cumbersome to implement or work smoothly, be technically simple or complicated; people can force themselves to engage with them or have fun in trying them out. Based on the detailed discussion of the results achieved with the different tools we may conclude the following.

Most face to face knowledge brokerage activities were considered as very useful

- in terms of fostering interaction and the exchange of tacit knowledge,
- mitigating (knowledge) hierarchies,
- activating creativity,
- strengthening social relationships,
- highlighting and reconciling differences.

Virtual interaction turned out to be the most challenging for all CoPs, due to the following reasons:

- shortage of skills in using online tools,
- perceiving the use of virtual facilities as strenuous,
- use of different tools in parallel led to confusions about which would be the right place for which activity,
- technical barriers (firewalls and other security measures caused limitations for some partners),
- "personal" barriers in using online tools.

6. Challenges

Throughout the whole project a series of challenges have been identified, which related to group dynamics in general, but also to the particular project design. In order to steer the project process, and to explicate and then address problems, we used the **Dynamic Learning Agenda** (DLA) as a tool for reflexive process steering. This supported the recording of long-term challenges; formulating them as learning questions allowed us to do so in a non-threatening manner. All three CoPs elaborated their DLA by discussing specific problems they had been facing so far and by agreeing upon measures to overcome them. The DLAs were reviewed half a year later, checking which challenges the CoPs were met or not, adjusting the agenda and implementing new measures to tackle the bottlenecks impeding the knowledge brokerage process.

6.1 The joint topic and purpose of the CoPs

According to the project concept, FOODLINKS followed two main goals:

1. to enhance the use of research insights in policy making and practice to promote sustainable food systems, and
2. to test and evaluate knowledge brokerage methods.

In the beginning, these two – content and process related – goals caused confusion and also irritation as for many the emphasis on knowledge brokerage as a process was disproportional against the background of participants' core interest in promoting sustainable food systems. It was also confusing as in doing so the project differed greatly from usual, research-oriented projects.

This confusion was especially relevant during the early stage of the project, when we focussed on the issue of knowledge brokerage by discussing various methods for knowledge exchange, whereas team members were keen to discuss about sustainable consumption and production of food.

In addition, the rather broad definition of the three CoP themes caused uncertainty about which knowledge the CoPs were supposed to exchange. The high degree of flexibility and freedom in CoP design and knowledge brokerage implementation, and at the same time high demand of equal partnership of all CoP members caused some irritation as well. The researchers who were experienced in doing EU-funded projects, were used to follow detailed work plans, whereas the policymakers and CSO representatives had generally very little experience with EU projects at all. They felt unsure about how such a project should look like at all and what was expected of them.

It took the CoPs some time to realise that they could and should use the freedom of defining the CoP objectives and outputs as well as of designing the process themselves. After half a year they entered into content discussions and started to negotiate on thematic focuses (scoping phase) and the goals of the CoP activities (envisioning phase). Step by step, the work plans became more concrete and the CoPs engaged in specific activities dealing with explicit topics. This gave them a better sense of direction and common purpose for joint activities.

Due to the ambiguity of the purpose and outputs of the project, concerns also arose about how to communicate the projects results, in particular about social learning processes, to anybody who was not participating in the process. To properly communicate the value of the process to outsiders has indeed been experienced as difficult.

For a long time project members doubted the project's the ability to generate 'high quality output'. Eventually, however, all project members were satisfied with what has been achieved and in particular the commonly produced CoP document. In time they started to acknowledge the real value of the collective effort put in the process of collaborative working. Although the project proposal did not foresee the CoPs to produce

any tangible outputs, each of the three CoPs decided to produce a collaborative document in order to materialise their efforts. Retrospectively we may conclude that these joint documents represented important 'boundary objects' for the integration of different types of knowledge, views and needs from the various CoP participants without denying the given heterogeneity in the group. The documents served as a vehicle for knowledge brokerage, and gave the cooperation a clear direction. Producing tangible and useful outcome was also key to the motivation of the CoP members to engage.

6.2 Linking the CoPs with the 'real world'

While 'natural' communities of practice mostly develop spontaneously from an informal social network, a group of people, who are already connected through their passion about a topic or a shared concern, we started 'from scratch' and in an artificial manner, bringing together participants who did not knowing each other. This specific circumstance caused a dragging start and a low level of activity in between physical meetings. All three CoPs applied similar strategies to overcome this feeling of artificiality:

- The CoP dealing with urban food strategies started to elaborate on city mind maps and 'short stories' describing food strategies in CoP members' cities right after the second project meeting. This resulted in a process of on-going interaction – within the CoP as well as with local actors.
- The CoP dealing with short food supply chains grounded its work in the exchange of specific cases, which proved to be a successful strategy for enhancing interaction.
- Although the CoP dealing with public procurement also started to elaborate on concrete cases and a joint document as the other two did, the CoP was struggling with weak engagement of some CoP members during the whole run of the project. There was high commitment in physical meetings, but in between meetings activity and interaction remained low.

6.3 Making differences explicit

Assuming that learning in the context of knowledge brokerage takes place most efficiently by questioning each other's viewpoints, diversity should be valued and made explicit. And actually, all three CoPs implemented similar strategies to explicate the differences within the group. One CoP carried out an interview activity where people from different communities were asked similar questions. Answers were then compared along the identified differences. Another approach was to carry out interviews within the CoP group, and the third CoP established buddy systems where information produced was critically questioned or commented on by other team members.

6.4 Enhancing leadership and interaction

Especially in the beginning and in between the physical meetings it was a challenge for all CoPs to keep the interaction going. One reason for low activity may relate to different capacities in following the discussions (e. g. due to language problems), and different levels of perceived subject expertise as well as experience with online interaction. Some participants' expertise remained hidden until the end of the project because the modes of knowledge brokerage did not fit their needs or ability to contribute.

The facilitation of KB activities plays a crucial role: It needs to consider the different needs of participants, which may be traced back to personality but also experiences and the context people are socialised in. This was especially relevant for the FOODLINKS team, because participants were of different age, gender, language, education, working background, tradition and culture.

Ownership and responsibility were expected to be equally distributed within the groups, which was supposed to encourage partners taking initiatives. Active facilitation was, however, needed to stimulate initiatives among all CoP members. One way was to allocate tasks to small groups instead of single people, in order to ensure that tasks would be fulfilled, and to enhance interaction between CoP members. A lack of clear goals and a shared purpose were perceived as undermining discipline in sticking to agreements. Consequently, CoPs decided for a stronger engagement of all CoP members through shared leadership in planning meetings and designing specific knowledge brokerage activities. While for some CoPs this approach to a self-governing group worked well and opened up room for individuals to take up responsibility, for others it reconfirmed the reluctant attitude of group members and strengthened formal leadership.

Finding the right balance of leadership and self-governance posed a challenge during the whole duration of the project. Too much freedom can be inhibiting if it is unclear what should be contributed, while a targeted contribution engages and stimulates. On the other hand, too much leadership was perceived as 'dominance', as addressed by several non-research actors, who thought that there was too much influence from researchers, who were superior in number and had leading roles such as work package leaders.

6.5 CoP size: extending the thematic CoPs

The CoPs started off with a limited number of project team members. Gradual expansion of membership was considered to enhance their impact.

When it came to the knowledge exploration stage, CoPs started to externalise their work. They undertook a series of activities to facilitate CoP expansion and to share knowledge beyond the CoP:

The engagement of further participants was implemented through:

- the CoPs online community platform ('Knowledge Hub'),
- invitations to project meetings[13], and specific knowledge brokering events[14],
- linking up with other (local) CoPs and networks,
- initiation of (local) spin-off CoPs,
- linking up with teaching courses/student's groups for thematic exchange as well as concerning didactic concepts integrating knowledge brokerage tools.

6.6 Linguistic barriers

English as working language and specific jargon challenged the CoPs and the enlarged knowledge exchange.

One of the main challenges of using English as working language refers to the fact, that it impeded the development of relationships and building of trust. Some of the CoP members who were not native English speakers, addressed language problems on several occasions, since they faced difficulties in following and joining the communication. However, also English native speaking team members realised the imbalance in capability to engage due to language barriers.

[13] expert forum members attended the 1st 3rd and 6th project meeting

[14] e.g. Conference on public procurement and sustainable food, London; Short Food Supply Chain meeting, Rennes; Joint CoP meeting , Malmö; public event, Edinburgh; Short Food Supply Chain meeting, Vienna; ESRS 2013 working group, Florence.

The fact that all CoP activities and most information was provided only in English may have created a barrier for local actors to join, and CoPs also reflected on the possible consequence of a bias in terms of written material towards the English speaking territories. Information about local initiatives elsewhere is often available only in national languages, which required translation into the working language.

Ad hoc linguistic support could help participants to better understand and articulate. For some activities simultaneous translation was organised (e.g. public SFSC-CoP event in Vienna) or team members translated ad hoc (e.g. SFSC-CoP event in Rennes).

In order to tackle the language problem in accessing written material, specific information was translated into national languages. Due to the high time investment, comprehensive translations were not feasible, but the translation of core information in short summaries was practiced. Moreover, single persons acted as knowledge brokers by translating information between different language communities. Thus a mix of nationalities and people speaking different languages was perceived as being an advantage.

The use of community specific jargons caused barriers in communication as well. Policy and CSO representatives mentioned time and again that the predominance of academic language made their participation sometimes difficult. Expertise is not free from (informal) hierarchies, and in a diverse group the use of specific jargon may also be an account of belonging or boundary work.

The most efficient way for handling linguistic barriers is to regularly reflect on them. Facilitation should take care that speakers are not talking too fast or using specific jargon without explanations, and it should assure that the audience does not get lost by regularly asking if everything is clear. Sometimes smaller group settings can be helpful (e.g. one-to-one interviews were considered very useful).

The circulation of detailed minutes for further comments helped those with less distinct verbal skills to at least catch up after meetings. A compilation of jargon words had been suggested but has not been realised.

7. Conclusions and recommendations for knowledge brokerage

In the following we translate the experiences gained in the Communities of Practice and the FOOLINKS project as a whole in recommendations focusing first on how to realise a successful knowledge brokerage process, and second on which knowledge brokerage tools to use for facilitating a satisfactory and effective collaborative learning process.

7.1 Factors for a successful knowledge brokerage process

Resources

Knowledge brokerage is time consuming, and needs adequate time and resources in order to nurture an on-going long term process of knowledge exchange and co-production.

An equal participation is supported by an appropriate allocation of resources. In an internationally operating CoP it is useful to have resources for translation/interpretation.

Capacity building

KB needs capacity building and training for all participants; besides it needs a facilitator with experience in organising knowledge brokerage and in managing group dynamics

Facilitation

Knowledge brokerage relies on a good balance between openness and structure: Knowledge brokerage needs open minded participants, who are willing to think (and act) outside the box. But is also needs a a plan of action, defining responsibilities and objectives. The plan needs to be clear and define a concrete goal but allow for flexibility and adjustments during the process.

In developing such a plan it is important to consider the different cultural and organisational background of the CoP members and their working routines. For policymakers it was difficult, for instance, to plan online activities during their working day.

KB needs strong leadership, which coordinates activities and provides guidance throughout the process.

Proper facilitation can be provided in different ways: by hiring an independent (professional) facilitator, through a facilitative leader or through a rotation of responsibilities within the group. Especially online activities need strong facilitation.

When selecting specific knowledge brokerage tools it is important to consider the pleasure derived from their application. The 'Fun factor' of KB tools acts as an important driver of effective knowledge exchange.

When offering a pool of tools for CoP facilitation it is important to explain how the tools work and which specific added value can be expected from their application.

It is important to organise 'informal' occasions for knowledge exchange (e.g. field visits) as they support a sense of community. It is important then to enable a broad participation.

Goals and outcomes

A common mission, shared objectives and common goals give a sense of ownership and enhances active participation.

Producing tangible output(s) is important as it gives direction to CoP activities, a sense of purpose which motivates on-going engagement, especially when linking up with real life opportunities for putting the products to use. It also provides an instrument for integrating and recognising the different knowledge and experience present in the CoP.

Online and offline communication

Face to face activities are important for building trust, personal relationships and a sense of community.

Online interaction builds on robust face to face processes, has a clear complementary purpose and offers a low-cost opportunity for expanding participation.

In order to ensure continuity and long term persistence it is important to create a durable online platform for communication.

Securing a shared and easily accessible information infrastructure is important.

Membership

In order to ensure that the communication process does not rely on few key individuals, CoPs need to include a considerable number of participants. The minimum number needed increases significantly when communication takes place mainly online.

A diverse membership including the right key actors representing the relevant aspects and perspectives enhances the relevance of knowledge brokerage. An ex ante stakeholder mapping may help to identify relevant actors.

A balanced representation (number of participants) and participation (roles and responsibilities) of actor groups antagonizes imbalanced power relations. Members should have the opportunity to exchange with other members from the same societal subgroup.

All Cops need to develop a 'common language'. This is the more important the more diverse the background of the Cop members is.

Questioning each other's viewpoints helps to explore the added value of diversity in the group.

7.2 Selection and use of knowledge brokerage tools

In this final section we collect the recommendations on how to implement knowledge brokerage, such as derived from the reflections of the CoP members. Some of them were only addressed by single CoPs or individual CoP members, but because the value of this list is in its completeness, no difference is made.

Mix of tools

- A mix of tools is important to achieve different goals at individual, group and topic level. Consider linking offline and online tools, e.g. having an online follow-up of a face-to-face meeting.
- Some tools are better for low-threshold entry of people, others are good to use when a common understanding of a topic has already been achieved.
- Using different tools produces cumulative value as the outcome of one KB tool can feed into another tool. When selecting KB tools their iterative use should be considered. The right combination and sequence of tools can enhance learning.

- It is important to use the right tool at the right time: the tool needs to fit the goal and activity.
- The tool needs to be tailored to the actors engaged; especially experimental designs may cause irritation. The use of methods needs to be flexible in order to adapt to the participants' needs.
- The choice of software can be decisive: freeware is easily accessible, but not always easy to manage; various software might be blocked by firewalls of institutes.

Connect process and content

- Tools work better when connected to and resulting in a concrete output or task.
- The process of KB should always be directly linked to the content that is being discussed.
- Active participation in KB activities is supported when assigning specific tasks to all participants.
- Tools work better when they can be integrated into the daily life or work practices of participants.

The emotional aspect is important

- It is crucial to create an enabling environment, in which people feel comfortable enough to share their ideas, experience and knowledge
- The emotional aspects of KB methods are important because social learning is often experiential. People need to 'feel like' participating, i.e. they should be rewarded by having fun when engaging in a particular KB activity.
- In particular online interaction needs good incentives for participation, including fun.
- Some tools help overcoming linguistic barriers better than others.

Consciously plan and facilitate the process

- The process of KB needs to be organised and managed while allowing for flexibility and change during time.
- The sequence of tools should be strategically planned for achieving good results in knowledge brokering.
- Be aware that some tools need considerable preparation for effective application; some may need training of participants to work well.
- Fixing a date and time for online activities can be helpful.
- Often, an active core group of people helps to keep the larger community alive and discussions on-going.
- The emotional incentive for using particular KB tools needs regular 'fuelling'.
- Consider using a facilitator or KB expert to assist the process.

Table 3: Recommendation on KB tools for future use

KBA tool	Evaluation/Recommendations for further application
Offline	
Face-to-face meetings	Good facilitation and proper planning Division of responsibilities enhances participation
Informal chatting	Be aware of the context-dependency of informal knowledge It would be good to record it
Field visit / meeting the locals	Avoid one-way communication Link field visits to other points in the agenda
Speed dating/ speed story telling / Elevator speech	Good to use in situations with limited time for communication
Brainstorming	Requires good facilitation for being integrative and not dominated by few
World Café	Take care of recording the discussions by appointing a responsible person
Triangular / paired interviews	Good for warming up Be aware of hierarchical relationships between participants
Assisted peer review of case studies with two presenters	Requires a common understanding of the topic Limit time for presentation of cases
Gallery walk	Be short and simple Important how the information is processed afterwards
Cooperative time-lining	Requires a good process leader and adequate software
Collective mind-mapping combined with individual mind-mapping	Use in the beginning Use for complex issues Good for simultaneous use
'The Wheel'	good for defining common goals, elaborating a work plan, and agreeing upon the structure of a collaborative document
Online	
E-Mails	Low threshold Email is a trigger rather than a KB tool in a strict sense
Skype conference	Needs a facilitator if more than three people
Intranet discussion forum	Low-threshold for entry Define areas for different questions Requires effort to keep it alive
Online community platform (Knowledge hub)	Use only one platform with a simple structure If you want to engage with a broader audience, keep the platform public
Collaborative mapping	Useful for several people working on a topic at the same time Useful freeware software (e.g. Freemind) Confusing if not sorted
Collaborative writing and peer review	Requires good organisation of the process
Buddying short stories	Works best in face to face discussions; but asking questions on a public forum could stimulate others Can be difficult to do at the start of a relationship
Webinar	Requires good preparation and adequate technology
Social bookmarking	Fits into daily activities if used properly Regular update needed
Micro blogging (Twitter)	Useful to amplify connections Useful to strengthen the network

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