MISTRA URBAN FUTURES
MANUAL OF JOINT KNOWLEDGE PRODUCTION FOR URBAN CHANGE

Version 1
Lotten Westberg, Merritt Polk, Annie Frid

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Foreword

Mistra Urban Futures is an international centre for sustainable urban development. The purpose of the centre is to contribute towards making a real difference to the environment and to people's lives in the cities of the world. Practitioners and researchers cooperate closely to produce first-class, effective and relevant knowledge.

Mistra Urban Futures offers an arena for the development and transmission of knowledge, in which cooperation with business, interest groups and the general public is developed. The centre has five regional platforms in Cape Town, Kisumu, Gothenburg, Manchester and Shanghai.

Mistra Urban Futures is financed by the research foundations Mistra and Sida, together with a consortium comprising: Chalmers University of Technology, the University of Gothenburg, the City of Gothenburg, the Gothenburg Region Association of Local Authorities (GR), IVL Swedish Environmental Research Institute, the County Administrative Board of Västra Götaland, and the Region of Västra Götaland, along with joint financers on the various local platforms.

1. INTRODUCTION

We usually try to deal with issues and problems concerning sustainable urban development within pre-existing structures for planning and decision-making, and within traditional scientific disciplines. But poverty, limited resources, increasing ill-health, social exclusion and other tensions and problems which accompany the development of cities are complex. In consequence, they cannot be addressed within the framework of traditional divisions between sectors and academic disciplines. They require, rather, an approach to problem-solving which exploits and combines various types of experience and knowledge. This includes knowledge which has been developed in businesses and among civil servants, politicians and residents as well as by various kinds of experts and researchers. But our sector's divided community does not facilitate the forms of cooperation and collaboration which are in increasing demand for dealing with the growing problems faced by cities. Thus, the focus of Mistra Urban Futures is to support such cooperation. We are developing new ways of understanding and dealing with urban problems by creating space for the scientific community to collaborate both with the groups affected and with those who are in a position to influence urban development. We call this "joint knowledge production". This approach is by no means a new idea. Various types of joint knowledge production are being tried out and developed in a number of other contexts under names such as "practice-driven interdisciplinary studies" and transdisciplinary research. These terms may refer to knowledge production which takes place solely within the scientific community, but for

Mistra Urban Futures joint knowledge production means that the boundary between science and practice is erased.

The overall aim of the centre is to design a complement to traditional discipline-based knowledge production, a complement which is owned and managed jointly by representatives of practice and research. Because all steps in the process (from the formulation of questions and problems to the production of answers and solutions) take place in processes which are relevant for both research and practice, the understanding and the alternative possible courses of action which are developed can be continuously examined, evaluated and – where appropriate – grounded in practice.

So, how can joint knowledge production be initiated, designed and implemented? How can the results be evaluated in a way that makes it possible to judge whether they really contribute to more sustainable urban development? The purpose of this manual is to begin to answer these questions. On the basis of experience from the initial stage of Mistra Urban Futures, we have designed a first guide to working with joint knowledge production.

During the first two years of Mistra Urban Futures, five pilot projects were conducted in Gothenburg. With the aid of these, we have identified a number of challenges and difficulties which may be encountered by participants in projects for joint knowledge production. The pilot projects also gave us greater understanding of the opportunities created by working mode.

The five pilot projects which Mistra Urban Futures conducted during 2010-2011 concerned:
1. Multi-level governance - decision-making processes for sustainable urban development and regional development: how different forms of cooperation in decision-making and administration at political and civil service level address the various challenges posed by the complexity of cities.

2. Urban planning adapted to climate change - Scenarios for a future Frihamnen: an analysis of various climate adaptation strategies and their potential impact on sustainable development in a low-lying harbour area undergoing transformation.

3. Urban empowerment - cultures of participation and learning: how social and economic exclusion and socio-spatial segregation can be tackled by means of different types of capacity-building processes.

4. Business-driven sustainable development: how different types of interaction and cooperation with business can facilitate the planning, construction and renovation of more sustainable urban structures.

5. Urban games: the use of games and visualisation in urban transformation processes - schoolchildren, urban planners, interaction designers and researchers took part in game development, workshops and experiments.

Further information about these pilot projects is available at www.mistraurbanfutures.org

Particular challenges for joint knowledge production

The start-up phase of Mistra Urban Futures led to the identification of **three challenges** which are particularly important for managing and implementing the boundary breaking cooperation which joint knowledge production presupposes. The challenges are: **to accommodate different evaluations concerning sustainable urban development; to exploit the breadth of knowledge and expertise which exists among stakeholders; and to create arenas for legitimate and sustainable transformation processes.**

Sustainable development is a vague and ambiguous concept. It can refer to many different aspects of urban development, ranging from short-term local growth to long-term equitable exploitation of global resources. What the concept means depends upon whom one asks, and in what context it is used. As long as sustainable development is used as in the classical Brundtland definition, most people support it. When it comes to making decisions about specific actions and implementation strategies, on the other hand, many different interpretations are possible. In order to be viable in the long term, any attempt to put sustainable urban development into practice has to be adapted to meet many different interests and needs. They must also be handled with often contradictory definitions and evaluations. The first challenge concerns how the diversity of perspectives, priorities and evaluations which exist among those who influence and are influenced by urban development can be accommodated.

Sustainable urban development cannot be achieved without making use of the broad experience and competence which exists within the various groups who live and work in urban areas. The need for diversity of knowledge arises partly because a large number of actors are affected and partly because the problems are multi-faceted and the solutions are fraught with great uncertainty. Different evaluations and world views result in different views of sustainable development. Different views also determine what are regarded as valid sources of knowledge and expertise. The second challenge, therefore, is to identify relevant scientific and practical knowledge and expertise and to create frameworks for integrating both.

One of the biggest problems in creating robust and habitable cities the world over is the scope for setting an agenda for sustainable urban development which is in proportion to the limited resources and unequal power relations that prevail. Which definitions of sustainable urban development are then regarded as the most legitimate? Which kinds of knowledge are regarded as most relevant for finding long-term solutions? The question of legitimacy is of central importance when decisions are made concerning which perspective on sustainable urban development is to be taken and what kind of knowledge is to be regarded as most relevant. One way of tackling this is to create sustainable and legitimate transformation processes in which a number of the city's actors have an influence. The third challenge, therefore, concerns how arenas for these questions can be created.

Qualities needed for joint knowledge production

The three challenges above point to the need for a well-developed framework and clear criteria for joint knowledge production. As has already been mentioned, different types of competence, knowledge and experiences need to be integrated in order to make it possible to understand, and to find solutions for, today's urban problems. This is a matter of different scientific perspectives as well as knowledge and experience from other spheres of activity such as politics, administration, business

and voluntary community activities. A central starting point for Mistra Urban Futures is that everyone is a knowledge holder, everyone is a knowledge producer and everyone is a knowledge user. But there are no templates or ready-made solutions for how these challenges are to be met. Nor are there any ways for how all actors in a city are to be included and involved, how different types of knowledge are to be included, or how arenas for transformation can be created.

As the work of the Mistra Urban Futures pilot projects progressed, it became increasingly clear which qualities, or ingredients, need to characterise joint knowledge production if it is to fulfil the centre's ambitions. They are to:

1. <u>Involve</u>: identify, include and engage the perspectives from practice and research which are affected and which need to form part of the knowledge-producing process
2. <u>Collaborate</u>: formulate working modes which make it possible for different practitioner and research perspectives to participate and contribute to the various stages of the process
3. <u>Integrate</u>: combine different knowledge, perspectives and approaches so that they cover the whole set of problems and issues under consideration
4. <u>Apply</u>: guarantee applicability by ensuring that results are relevant and usable for both practice and research
5. <u>Reflect</u>: regularly investigate together whether the four above qualities are being fulfilled in the various activities which form part of the process If necessary, change working mode. Reflection guarantees learning and mutual understanding

The aims of the Mistra Urban Futures projects are to achieve changes through collaboration between the actors who are affected by the problems. In this manual, we make use of the five qualities in two ways. They are partly a guide for the planning and design of the work process, so that the projects really create the space for the in-depth collaboration which is sought, and they can be used partly as a tool for ongoing evaluation and reflection. This means they can be used as an aid for the participants as they critically and recurrently evaluate how the work is progressing and jointly develop knowledge about how the process works.

Table 1. Guidelines and quality criteria for practice-driven knowledge production

Particular challenges and qualities			
Challenges	Guidelines	Key questions	Qualities
Multiple framings	Joint problem formulation and project design	Representation Justification In-depth cooperation Negotiation	Involve Collaborate Integrate Apply Reflect
Knowledge Diversity	Joint production of knowledge and solutions	Map knowledge Integration of knowledge Joint analysis In-depth cooperation	Involve Collaborate Integrate Apply Reflect
Arenas for transformation processes	Continuous evaluation of processes and effects	Transparency Responsibility Joint reflection Evaluate effects	Involve Collaborate Integrate Apply Reflect

In order to facilitate the work of planning and moving Mistra Urban Futures projects forward, the work process is divided into three phases. The structure of this manual is based on these three

phases. The initial phase, *formulate,* covers the introductory planning and designing of the project. The implementation phase, *generate*, consists of the actual work of collecting information and the analysis and development of results. The final phase, *evaluate* constitutes a retrospective reflection of how the process has gone and how the aims of the project have been achieved. All these phases must be designed in relation to the five qualities which should characterise Mistra Urban Futures projects (see above).

The three phases of the work process:

1. **Formulate**: joint problem formulation and project design
    a) Initiate: gather questions and ideas which correspond to the various knowledge and interests which the practitioners and researchers concerned have in connection with the group of problems to be investigated.
    b) Reformulate and process: identify which stakeholders should participate, develop a joint description of the problems which the project aims to tackle, and design a project plan which takes into account the interests and backgrounds of the participants.

2. **Generate**: joint production of knowledge and solutions
    a) Collection of information: formulate information collection modes which cover the knowledge and expertise of both the researchers and the practitioners involved
    b) Analyses and conclusions: Adapt analyses and conclusions so that they relate to existing knowledge and expertise and contribute to concrete solutions, relevant products and meaningful conclusions
    c) Implementation and communication: apply to policy and practice, test conclusions, conduct workshops and seminars, produce scientific publications and communicate concrete examples to all the centre's target groups

3. **Evaluate**: evaluation of the process and the outcome
    a) Formative evaluation: recurrent joint reflection on how the qualities of involvement, collaboration and integration are being fulfilled
    b) Summative evaluation: evaluation of the process and the outcome, joint reflection on the applicability of the results and contributions to modifications

About "practitioners" and "researchers"

A distinction between professions which we will return to in the manual is that between "practitioners" and "researchers". This is, of course, a simplified distinction. There is not always a clear dividing line between these two professional categories, and there is also a wide range within each of the two categories. There are many practitioners with research experience and many researchers with experience of working in practical fields. But we sometimes need to be able to reason along lines which make it clear that participants in joint knowledge projects have different backgrounds and experiences, and come from fields of work with different tasks and purposes. We therefore want to clarify here what we mean by this distinction.

Practitioners work in public administration, in civil society, or in business, for example. Practitioners' tasks are often concrete, in the sense that they tackle challenges and solve problems in order to achieve improvements related to their work. Researchers have the task of producing knowledge in association with universities and colleges. The knowledge produced is often of a general nature, i.e. it

cannot be used directly in the work of practitioners, but must be adapted and "translated" in order to be applicable in specific contexts.

Many practitioners participating in Mistra Urban Futures projects have valuable inside perspectives on, and personal experiences of, the questions that are to be investigated and the problems that are to be solved. In their professional role, they see both the details and the whole picture, and they understand what works and what does not work in their own field, and why. Researchers seldom have personal experiences of the operations they study, or an understanding of how the knowledge they produce can be used. Researchers have an outside perspective on that part of the practical world they are interested in. They see the questions and problems which the project focuses on through very particular grids (theories) which reveal aspects which may be hidden from the practitioner's inside perspective. The combination of practitioner and researcher perspectives therefore has great potential. One could say that the whole idea of joint knowledge production is based on this potential. It can also cause problems if one is not aware of, or cannot deal with, the differences between the perspectives. This manual aims to support participants in Mistra Urban Futures projects in exploiting the difference in a constructive and innovative manner.

Structure of the project manual

Research projects based on joint knowledge production are unusual. As was previously mentioned, there are no templates to follow. The purpose of this project manual is to capitalise on experiences from the pilot projects, report what we learned, describe the pitfalls discovered so far, highlight sources of inspiration and give practical tips. It is important to point out that the manual is not finalised and makes no claim to be comprehensive; it should be regarded, rather, as a working document. As new projects are launched and new experiences gained, the text will be revised and added to.

Every project for joint knowledge production is unique, created by those who take part in it and constrained by a number of practical circumstances (shortage of time, lack of desirable resources or competences, participants who have to drop out, etc.) The manual discusses what it is useful to think about when one is considering various alternative courses of action in the circumstances prevailing. For someone who is used to working in projects characterised by collaboration between different actors and interests, much of what the manual deals with may be obvious. We hope the manual will prepare project participants for difficulties they may encounter. The manual also gives examples of how participants in the pilot projects worked, and encourages reflection on the work. Regardless of readers' experience of working in multi-faceted projects, the manual may be used as a joint reference and a basis for discussion among project participants.

Suggested readings; joint knowledge production

Gibbons, M., Limoges, C., Nowotny, H., et al., 1994. *The New Production of Knowledge*. Sage, London. (intro pages 1-16, and Chapter 1, pp 17-45).

Hessels, L and van Lente, H. 2008. Re-thinking new knowledge production: a literature review and a research agenda, *Research Policy*, 37, pp 740-760.

Jahn, T., Bergmann, M., Keil, F. 2012. Transdisciplinarity: Between mainstreaming and marginalization, *Ecological Economics*, 79, pp. 1-10.

Nowotny, H., Scott, P., and M. Gibbons. 2001. *Re-thinking science: Knowledge and the public in an age of uncertainty*. Cambridge: Polity Press.

Robinson, J. 2004. Squaring the Circle? Some thoughts on the idea of sustainable development, Ecological Economics, 48, pp 369-384.

Robinson, J. 2008. Being undisciplined: Transgressions and intersections in academia and beyond, *Futures*, 40, pp 70-86.

2. Phase 1: FORMULATE

In the formulation phase, the ground is laid for a working process characterised by the five qualities of joint knowledge production which are used in Mistra Urban Futures and which are described above. It is a matter of identifying problems and questions which are relevant for the consortium's partners, and matching them to suit potential participants, both in practice and in academia. The results of this phase include a problem formulation and project plan which all project participants have developed and which they jointly own. The challenge lies in developing an understanding of the problems identified which is interesting and relevant from both practitioner and research perspectives, and in finding connections between these perspectives.

The work includes a large number of elements, from describing the problem area the project intends to address, to identifying suitable actors to staff the project and designing suitable methods of working. In the work on the pilot projects these elements took place in parallel, and we assume that this will also be the case in future projects. It is not possible to staff a project with suitable actors before mapping which participants it is important to include. At the same time it is precisely these actors, with their knowledge of the area, who are best suited to conduct the mapping of who it is important to invite to join - a classic catch-22. This made it difficult to decide which step we should describe first in this manual. Even though the original idea of a project is certainly described in retrospect as the first stage of the project, it is likely that some form of mapping was actually begun even before the idea of the project took shape. The person, or persons, who first formulated the idea must have started from their knowledge of the problem area. Most probably, the instigators of the idea will also be included as stakeholders in the project, and in this case it may be a matter of formalising their role in the project rather than identifying them in a stakeholder analysis. It is impossible to describe all stages simultaneously; they have to be described in some sequence or other, and we have chosen to do this on the basis of an imagined chronological logic, though we are well aware that this does not always correspond to what happens in reality.

The problem area is identified, the project idea is initiated

During the first two years of Mistra Urban Futures, the centre worked with project development in a number of different ways. The five pilot projects were already developed by a process management group during the work preparing the application, i.e. before the centre had officially been formed. The process management group comprised two representatives from each member of the consortium, including representatives from both public bodies and research. The five problem areas around which the pilot projects were designed were chosen because they arose from issues which were deeply rooted in the daily work of one or more of the partners. They were also chosen because they had different characteristics and engaged various groupings of actors and decision levels. By starting from problems of varying character and complexity, the centre wanted to try out and learn as much as possible about how cooperation for joint knowledge production might work. The initial ideas for the pilot projects were developed later by those who were appointed responsible.

Other contributions to project development at the centre emerged when representatives of the consortium partners were invited to various types of meetings or workshops. Even though the principal purpose of these events was not to generate projects, exciting discussions about project ideas always arose, ideas which it was sometimes possible to take forward and develop into concrete projects.

A further way of identifying and developing projects was to issue an open invitation. The invitation resulted in around eighty extremely eligible suggestions. It turned out, however, that most of the suggestions came from researchers and very few from practitioners, probably because researchers and practitioners have very different levels of experience and ability in quickly coming up with suggestions in important areas of work. While participants among the centre's public partners need support for project ideas in their own organisations, researchers can put forward ideas on an individual basis.

In order to address the imbalance which arose as a result of this researcher dominance, the centre worked with other ways of developing projects which have broad support among the consortium partners. Sifting out current issues with a strong political focus among the public partners yields greater opportunities for involving participants from these partners. The consortium coordinators carried out mapping within their own organisations of interesting issues they thought Mistra Urban Futures should work on. One area which was selected concerned knowledge and tools for a fair and socially sustainable city. The politically-controlled partners arranged three workshops on topics related to this heading. A broad range of researchers and practitioners took part in the workshops and jointly formulated interesting problems. The consortium coordinators were given the task of producing a rough orientation plan plus suggestions for appropriate staffing to enable the questions to be specified in greater detail. This method is time-consuming, but in return we achieved broad support among our partners and, not least, an understanding of Mistra Urban Futures' working modes in the project groups which are formed.

Mapping of the problem area, External analysis and stakeholder analysis

Regardless of whether the initiative for a project comes from practitioners or researchers, it is important that the people behind the idea begin to think in broad terms, beyond their own areas of expertise and contact networks, right from the stage of designing the project. It is probable that the instigators of a project have already done some form of mapping of the problem area in connection with the formulation of the project idea, but it is important that this is done systematically. External analysis and stakeholder analysis identify the actors, authorities and organisations who have experience of, and who can contribute to, the development of knowledge in the area in question. Such an analysis also contributes to an understanding of which normative/political context(s) the project will take place in, who needs to know about the project, and who the project may influence or be influenced by. With knowledge of all this, the project can be phased in, and benefit from relevant activities in the community. This reduces the risk that the project will be perceived as competing with current "correct" procedures, or as reinventing the wheel.

Mapping:
- contributes to identifying authorities, institutions and organisations which are affected by, or have an interest in, the project idea, and highlighting those who have an influence over the project's questions and design.

- gives a better picture of who, apart from those who will be participating actively in the project, need to be aware of it. This knowledge is also important later in the project, to guarantee that the results will be relevant.

- helps to give those who take part in the work a better knowledge of each others' perspectives and approaches to the project.

It is important for the mapping to be started as soon as the project gets under way. Since a stakeholder analysis is actually never finalised and never gives a comprehensive picture, but reflects the perspective of those who carry it out, the analysis may need to be updated several times during the formulation phase, and perhaps also later in the duration of the project. Nevertheless, there is always a possibility of discovering, during the course of the project, that important perspectives and actors have been overlooked and that new measures need to be taken to capture aspects revealed by the new perspective. Being forced to think anew can be both refreshing and challenging, and need not necessarily be seen as a failure - at least as long as the project does not lose momentum.

During the introductory phase of Mistra Urban Futures it was important to get the projects going quickly. The consortium partners' networks were the main resource used to get the projects rolling. Each pilot project also carried out mapping based on the participants' contact networks. A more systematic method development of mapping was, however, not begun in connection with the initiation of the pilot projects. During later project initiations, on the other hand, more thorough procedures in connection with project development have been carried out - procedures which have brought together representatives from both practice and research. This has, not least, been a way of counteracting the imbalance described above, where researchers or practitioners have sometimes come to dominate, with unfortunate consequences. Instead, the centre has worked with processes in which practitioners and researchers jointly develop project ideas which have been formulated in various ways through the centre's activities. Such a process is often started by means of a large-scale open meeting in which interested practitioners and researchers engage in a discussion which opens up a project outline. After this there begins a consolidation process in which a smaller number of participants - as always, both practitioners and researchers - continue working on problem formulation and identification of suitable participants and stakeholders. To put it simply, the philosophy is that a higher quality of mapping is achieved if it is conducted by a broadly-constituted group.

PRACTICAL ADVICE: Stakeholder analysis

Most of the models of stakeholder analysis we find on the internet are cumbersome and directed at business and media companies. We have therefore developed a simple description of how an analysis can be conducted:

It need not be especially difficult to perform a stakeholder analysis in conjunction with the formulation of the project. Nor does it need to be particularly time-consuming; 2-4 hours is probably sufficient, depending on how detailed you choose to be.

Gather all those who have participated in the project so far. If there are only a few such people, you can invite additional people, such as those from the centre who are familiar with the project idea. 3-6 people is a sufficiently large group for conducting a first analysis.

1. Identify possible stakeholders:

Brainstorm which individuals, groups, authorities, etc. are affected by the provisional problem formulation of the project. Make a list of all the stakeholders, e.g. on a flipchart or at the side of a whiteboard. The more you can think of, the better. At this stage there is no reason to judge what is right/wrong or possible/impossible. The analysis comes at a later stage. Try to think of all individuals/authorities who:
- have experience of the problem/issue area of the project
- will influence the project
- the project will influence

- will make use of the results

2. <u>Conduct an analysis</u>

Write the main question/problem of the project in the middle of the whiteboard. Discuss and evaluate each of the stakeholders listed on the basis of questions such as:

- How much influence/knowledge does the stakeholder have on the project issue?
- Is the stakeholder primarily one who influences or who is influenced by the project issue?
- What is the stakeholder's attitude to the project issue - is it primarily positive or negative?

Try to assess the stakeholders in relation to each other. Write the stakeholders' names on the board - the greater the importance you judge them to have, the closer to the main issue in the centre of the board.

Discuss and try to judge which stakeholders need to be included in the project group and which ones only need to be informed about the project.

There may be further questions to be asked in connection with the analysis. The discussion contributes indirectly to a form of external analysis by giving participants a greater understanding of what is happening in the background context of the project.

To make the work of analysis easier, stakeholders can be written on Post-its which can be moved around the whiteboard. Stakeholders can also be given different colours, depending on their characteristics.

The stakeholder analysis is not definitive; it may need to be done again.

Document and save the analysis and the discussions you have had. They form an important document for the participants, but also for those who are invited to join the project as a result of the analysis.

On the web there are more to read about stakeholder analysis. You can also search for words like "project management" and "project work".

Staffing the project

The staffing of the pilot projects proceeded step by step and in parallel with the stakeholder analysis. It is a matter of identifying suitable people and offering them a project management role or a role in the project workgroup. Some important experiences from the staffing process of the pilot projects are discussed below. On the basis of these, recommendations and suggestions are given to ensure that projects have their starting point in a broad understanding of an issue and enable inclusion of, and cooperation with, actors who have different perspectives.

Shared project management

The centre's ambition is to have shared management, with one practitioner and one researcher in the management of every project. There are various reasons for this:

- Shared management signals one of the centre's most important principles, namely that problems and questions of sustainable urban development are complex, and need to be understood and addressed through collaboration between research and practice.

-   Shared management influences the design of the project and increases the likelihood that both scientific and practical perspectives on the problem area are perceived as valid, and are taken into account when the project is designed and purposes and questions are formulated.

-   Shared management is also a matter of quality; the likelihood that the purpose of the project needs to be reformulated is reduced if both scientific and practical perspectives are included right from the start.

-   Shared management enhances the preconditions for ensuring that the questions posed in the project, and thus also the results generated, will have relevance for both science and practice.

Almost all project managers for the pilot projects say, based on their experiences, that shared management was a significant factor in capturing both scientific and practical issues. However, it is important to emphasise that not all project management pairs have consisted of what we might call a "pure" researcher type and/or a "pure" practitioner type. The university world and the practitioner world are both inhabited by a large number of individuals who feel at home in both worlds and move freely between them. Not surprisingly, such people are interested in Mistra Urban Futures' approach of joint knowledge production. Project managers in two of the pilot projects had such a double role. This never led to any problems, since both these projects also formed working groups (see below) which included more traditional researchers and practitioners.

Active working groups

One of the most important aims of the Mistra Urban Futures projects is to gather competences which, together, represent a spectrum of perspectives on the problem area which is the focus of attention. These may include people with valuable expert competence, local knowledge, networks or experience of working across disciplines. By inviting in people who can contribute both to an understanding of the complexity and to ensuring that the questions posed in the project are relevant and legitimate, one increases the likelihood that the results will be usable and meaningful. They can then also continue to be used and developed within the organisations and authorities affected.

Most of the pilot projects had an active project group consisting of 5-8 actors from different backgrounds connected with the project. They usually dedicated between five and ten per cent of their working hours to the project during the two-year duration of the projects. Members consisted of a mixture of researchers and practitioners with a deep interest in the project issues. They were jointly responsible for designing the projects and for the activities which took place within the project frameworks. As a result of the pilot projects, we identified a number of preconditions for ensuring that the working groups become an active part of the project, in which the members both contribute to the work and benefit from their participation. These preconditions are described in more detail in the "Creating preconditions for constructive teamwork" section.

Staffing in practice

In the centre's initial phase, it was important to staff the project quickly, without pre-empting the ambitions of double management and broadly constituted working groups. It turned out to be sometimes very easy and sometimes very difficult to find interested pilot project managers and members for working groups. For practical reasons we had to be guided by suggestions from consortium representatives and their networks. Because many ideas were initiated by two consortium partners - the City of Gothenburg and the Gothenburg region - they were quickly able to find people who could take part in the projects. The task was delegated from the bottom up, so to

speak, and this ensured that the issue area was legitimate. Finding suitable and interested researchers often proved to be considerably more difficult. Several of the pilot project ideas sprang from practitioners' day-to-day work, and it was not always easy to find angles which would appeal to participating researchers (see below for more about this). These projects had an initial bias towards the practical. As the projects progressed, and those involved found viable working modes, this was balanced out.

This is what one of the coordinators of the pilot projects says about the task of finding suitable researchers for the projects:

> *"There's no system! In public organisations we have a system for communicating a question. We can turn to administrators or managers with the request to appoint someone, if we want to take the formal approach. But this structure doesn't exist [in the university world]. Every researcher is unique."*

On the same topic, another individual says:

> *"... for an employee in a public organisation, transparency consists of the possibility of influencing, connecting with and getting support in your organisation. There's a feeling of security in your role; you know why you're there and you're doing it during your working hours. Many researchers, on the other hand, want to see objective criteria for who is on board as an expert and/or project manager, and want to know from the start what the purpose of the project is."*

So when it came to bringing in representatives from private businesses or public organisations, we always had an idea of who we could turn to, even in cases where we had no personal access to an organisation. When it came to recruiting researchers, on the other hand, it worked quite differently. First of all, it was sometimes unclear which research competence should be prioritised, since projects for joint knowledge production can be the subject of many different scientific issues. Secondly, it was not possible to ask university managements for help. In universities there is no easy access to potentially suitable and interested researchers. If one does not know who they are, they are hard to find. Most of the researchers who chose to take part in the pilot projects were thus part of the centre's own network and had experience of, or were interested in, transdisciplinary work.

New methods of identifying and generating interest among researchers are currently being developed in Mistra Urban Futures, to facilitate staffing of future projects. More systematic networking within Gothenburg University and Chalmers is also under development. There are also coordinators for both Gothenburg University and Chalmers at the centre; their tasks include taking care of and developing contacts between Mistra Urban Futures and the research community.

To look out for!

The interviews we conducted with the working groups in the pilot projects show that the participants who put between 5% and 10% of their working hours into a project did not always have sufficient time to take part in a meaningful way in all phases of the project. The time allowed them to take part in working meetings and keep up to date with what was happening in the projects, but very little more. This is important to think about in connection with planning and distributing roles and tasks in future projects. Together, you need to consider how the project can best collaborate with those who are to devote 10% or less of their working hours to their participation in a working group. Maybe it would be better for them to work intensively during a certain phase of the project than to participate

more extensively for the duration of the whole project? Or perhaps they need to increase their participation in the project to more than 10%?

To look out for!

It emerged from our interviews that not everyone who took part in working groups had the support they needed from their regular workplaces. Even if their participation in the project was approved by their employer, there was not always a deeper understanding that this means they must be released from a corresponding proportion of their regular duties. Workload and stress therefore increased, and the possibility of contributing in a meaningful way was reduced. So it is important to make sure that all those who take part in working groups have support for doing this among their superiors and their regular colleagues. There must be scope for discussing what participation involves and keeping those affected at the regular workplace informed about project developments. This is also an important step in gaining support for the project and its results outside the centre.

Reformulate and process

Anyone who has produced a plan for a project knows that the work of planning can be at least as important as the final project plan. This work forces participants to operationalise ideas, consider alternatives and work out suitable and feasible ways of carrying out the work. In a joint knowledge project, with many different perspectives and approaches, it is important for everyone to feel that they are co-authors of the project plan. This is a question of ensuring that the statement of the problem is shared, that everyone agrees and subscribes to the purposes and questions, that there is a consensus regarding how the work is to be distributed, and that there is a plan for how the results will be communicated. If the participants do this together, the ground is laid for fulfilling the qualities of joint knowledge production which characterise Mistra Urban Futures projects.

As already mentioned, all steps that form part of the initial phase are undertaken in parallel. When the problem area is *to some extent* defined, stakeholders *to some extent* identified, and the project *to some extent* staffed, it is time for those who have so far been involved in the project to start work on the project plan. So it is not always possible to wait for all the other pieces to fall into place before starting work on the project plan. Instead, it is a matter of balancing the attempt to carry out a precise mapping with the need to get started and begin to implement the project.

Several of the people we interviewed point out that it is important not to get stuck in the preparations and allow the mapping to drag on too long. People feel keen to make a start, and it is important to capitalise on this energy and motivation. Making a start is therefore more important than creating an ideal working group. One project manager says:

> *"... you won't get everyone who should have been involved. You have to start somewhere with a group which you believe is a collection of people with an understanding of the subject and who want to do something with the subject, and there's a scientific and organisational range in the group. It will never be perfect, you can't get away from the fact. You have to make a start, and if something goes wrong you just have to try again."*

This quotation reflects a pragmatic attitude. Start together with those who feel motivated by the issues. Try, and be prepared for a "retake" if it turns out that important people are missing, or if new angles and issues in the problem area appear. Something which is not said in the quotation, but is

hinted at between the lines, is that it is important to share and discuss the issues that are considered. In other words, be clear in talking about points in favour of making a start and points in favour of waiting. A good way of starting is to organise a kick-off lasting a few days.

## PRACTICAL ADVICE: Problem trees - joint problem formulation

It is important for the project group to jointly clarify how the sub-problems and sub-questions which the project focuses on are interconnected. What is the cause and what is the effect - the chicken and the egg? Such a so-called "rich picture" of the problem area brings to light and creates awareness of both the whole and the parts, and motivates the focus and boundaries of the project, i.e. what the project is to include, and what not, and why. A problem tree is a way of jointly formulating the problem the project intends to focus on, and of jointly arriving at what is to be included within and outside the focus area. It is a question of jointly analysing the prevailing situation on the basis of the information currently available. In the analysis, the most important problems and the most important causal links between them are identified. There follows below an example of such a problem tree and how the group can work together to construct it. Assume that the work will take about half a day.

By constructing a problem tree, you get a picture of the connections between the causes and effects of the various problems you have identified. What you will need to conduct the analysis is: a whiteboard, a wad of A4 sheets on which to write causes (the "roots" of the tree) and effects (the "branches" of the tree) of the problem (the "trunk" of the tree), plus tape or magnets so that you can move the sheets around the whiteboard to experiment with different ways of describing the problem.

- Identify the problems which exist at the moment (not possible, imagined or future problems) and list them on a flipchart or at the side of the whiteboard.
- Decide what is the main problem.
- Formulate the problem briefly in the middle of the whiteboard.
- Identify important and direct causes, write each one on a sheet of A4 and place the sheets in a parallel line below the problem.
- Identify important and direct effects, write them on A4 sheets and place them in a parallel line above the problem.
- Continue adding further causes and effects in the same way to create a problem tree.
- Finally, check that it is complete. Try moving the A4 sheets around if necessary.
- The problem tree is finished when you agree that it includes all important information.
- Photograph or copy the tree before formulation of the project's purpose and issues.

Example of a problem tree (taken from: "Handbok för projektplanering i samverkan Praktisk vägledning för fackliga organisationer"):
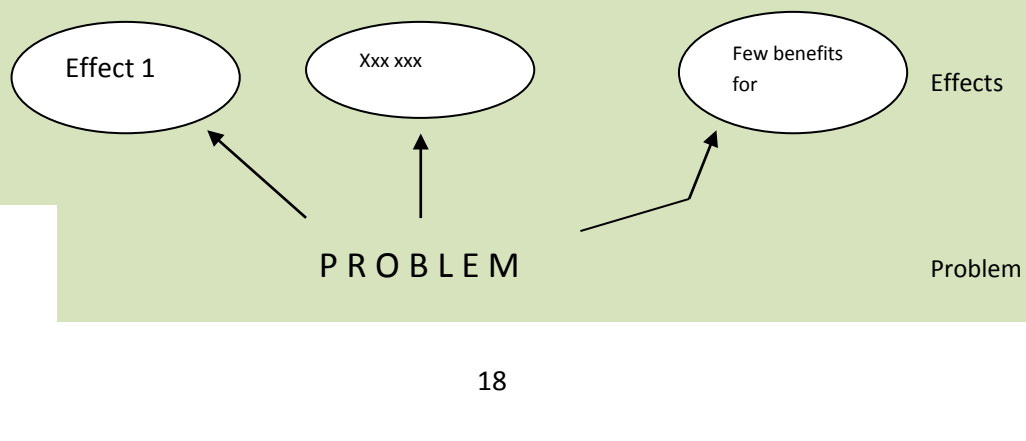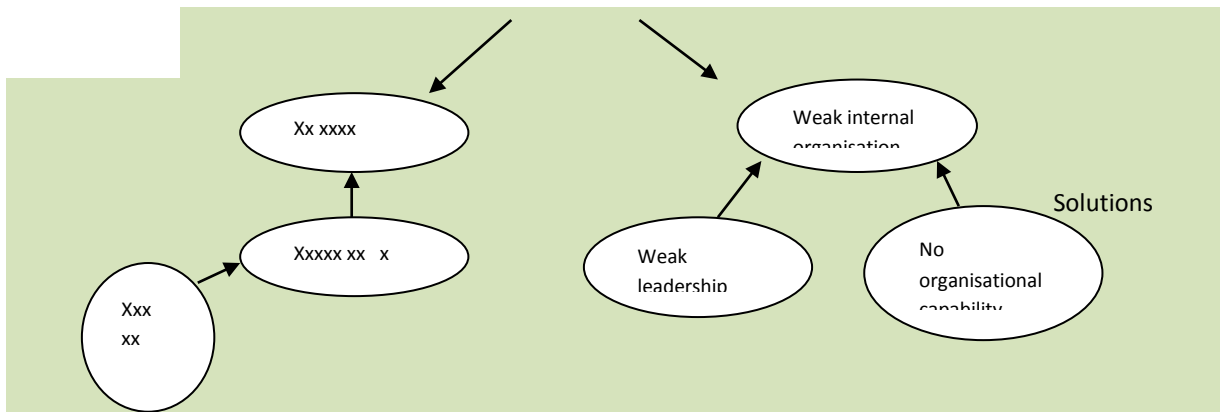
Suggestions for help
- Limit the discussion to the question the project is really about. Avoid digressions.
- Make sure the analysis includes information from various perspectives/stakeholders, including those who are perhaps not participating directly.
- It can be hard to agree on what is a problem, a cause and an effect. What appears to be a problem from one perspective can appear to be a cause from another, and an effect from yet another. Here it becomes clear how choice of perspective influences which aspects are highlighted as significant. The discussion is therefore an excellent opportunity for you to get to know each others' perspectives.
- One way of making progress if you disagree about what is the chicken and what is the egg is to remind yourselves that the problem tree does not represent a fixed picture of reality, but a picture which emerges when one chooses to see a certain given phenomenon as a problem. If this is difficult, you can choose a number of main problems to work on at the same time. One tree can have many trunks.

Kick off - a way of getting started

One way of getting started with the work of reformulating and adapting the project idea and any drafts of the project plan, which has proved to be popular, is to get together for a few days for a joint kick-off, a period of intensive work when those involved focus entirely on the project they are to take part in. There is a clear start to the project, the participants get to know one another, and experiences from the kick-off often become an important shared reference point.

The programme for the kick-off needs to be well planned. Important aspects to discuss, investigate and, where relevant, take decisions about are:

- A shared "rich picture" of the problem area based on the participants' perspectives (see e.g. the problem tree above).
- The project's purpose, aims and issues.
- The project's scope and resources.
- Overview of who may be affected by the project issues and expected results (see e.g. the stakeholder analysis above).
- Communication and implementation plan (see this section, below).
- Division of work: How the work will proceed, who will do what and why (division of roles).
- Forms of cooperation: How cooperation and communication will be developed and maintained (see section on constructive cooperation on page 20 below).

This is what one project manager says about the project kick-off:

> *"The critical moment was actually the kick-off. What was really good was that we had really lots of time, just to talk about the set-up. The energy from that helped to keep us going. Everyone had the chance to express themselves, to say what they thought, ...we discussed everything, decided on all the workshop dates, we did as much as possible."*

Another project manager who also took part in a kick-off says:

> *"... there's a mutual respect. There's no prestige, as it were. I can do certain things and the others can do certain things, and certain things we can all do together. And after all [some of the participants] have been recruited to do certain things, so they don't need to assert themselves. And when we disagree, we discuss why. Explain and discuss. When there's no prestige there are no [conflicts] either."*

We believe we can see that in those pilot projects which started with a joint kick-off, the participants agreed strongly with the purposes of the project and the activities included. They seemed sure in their roles in the project, what they contributed, and what they themselves get out of participating. The kick-off may have contributed to the development of a trusting working atmosphere which made it easy for the participants to be active and take part in the various phases of the project. They also seem to have found it easy to look up from what they were doing and ask critical questions about the project. They say in interviews that it felt like a big challenge to learn to work with people who have different perspectives and ideas about what is important and what needs to be done. But they also say that the work, once they got to know each other, was exciting, worthwhile and fun.

Such an open, equal and trusting atmosphere proved, perhaps not surprisingly, to be important in making the work done in the pilot projects meaningful and constructive. Note that we are not talking about open and team-playing individuals. We can all find ourselves in contexts and situations where we either do not want to see, or cannot see, any value in other views, and where we feel the need to defend or impose our own ideas. In other contexts we accept that we do not see the whole picture clearly. We are curious and prepared to listen to others, and to take on board new perspectives on the basis that they can contribute important pieces of the puzzle to our own understanding. It is the responsibility of all participants to contribute to such an atmosphere of cooperation and dialogue. A kick-off can contribute to the development of such a climate. But it is not sufficient. To facilitate the development of a constructive and productive cooperation, we present below a model of how the project group can work together.

Creating conditions for constructive teamwork.

The people who participate in Mistra Urban Futures projects have very varied backgrounds. As a result, the significance of various issues and problems concerning the focus of the project is evaluated differently, and assumptions and competences differ. It cannot, therefore, be taken for granted that the team will work together smoothly and effectively merely by meeting and beginning to talk. Here we present a template as an aid to developing constructive collaboration and building a functioning work team. The reasoning was formulated by Thomas Jordan (Senior Lecturer in Work Science at Gothenburg University) and builds on knowledge developed during the past few decades by experienced consultants, supervisors and researchers.

Project participants have three different tasks to address:

I. Create favourable preconditions for cooperation: In order to be able to work effectively, we need to feel respected and to respect others, for everyone's specific competence. We need to develop a feeling that the project group is a "secure framework" to be in. Everyone must also agree with allotted roles and responsibilities, and accept decision-making procedures and norms and rules which apply to work in the project.

II. Pay attention to, and support, interaction in the group: For constructive interaction to take place, we need to 1) develop open and trusting communication which helps us to focus the work on a manageable number of tasks which are worked through in a sensible order; and 2) learn to deal with conflicts and differences of viewpoint as they arise.

III. Produce knowledge: One major task consists of formulating problems and issues, designing work plans, gathering and analysing information/data and drawing conclusions. This work normally requires expert competence, but in a group consisting of practitioners and researchers, where the purpose is joint knowledge production, this task is dependent on a process of collaborative learning. The big challenge is that of finding ways to integrate and incorporate contributions from a number of different perspectives in a way that benefits the whole project.

In appendix X there is a checklist with questions which are intended to support project managers and working groups in discussing and reflecting on what needs to be done to benefit productive interaction.

Communication and implementation plan

Before the start of the pilot projects, the centre assumed that the results, insights and understandings which emerge from a project for joint knowledge production should also, automatically, be put to use and be of benefit. The thinking was that when people participate in the formulation of problems and questions, the answers will naturally be meaningful for them. So they will take the results with them and let them have an influence on their regular activities. But learning does not work like that. Knowledge and understanding which are developed by people in one context will not automatically be taken over into other contexts or other circumstances. The operations we form part of are also complex in themselves; they are sluggish and difficult to influence. In such an operation, even the view of what constitutes the problem and what must be changed may not be the same as the view developed by the person who has had the opportunity to take part in a project for joint knowledge production. A finding we often came across in the interviews that were conducted in connection with the end of the pilot projects is that the participants' experiences are individual:

> " *... administrations haven't been able to integrate the new insights into the system, which means that when someone is replaced, you lose everything…*

A question which Mistra Urban Futures projects need to work further with is, therefore: How can we create conditions for project participants to be able to manage and develop newly-gained insights and lessons in their regular workplaces, and together with their regular colleagues?
It is important that new Mistra Urban Futures projects take this question with them and return to it throughout the whole duration of the project. As early as the stage of drawing up the project plan, the participants need to design a provisional plan for how the results will be communicated and managed. In Appendix X there is a template for what a communication and implementation plan might look like. It is important for the participants to discuss and revise the plan as the project develops and it becomes clearer what sort of results the project is generating. At a number of points

in this manual, we recall and make suggestions regarding how one can work with results in order to ensure that they are applied and developed further (see also the section on results on page 31).

Example of an exception

One project never established any proper project group for the project, and the project plan consisted of a continuously changing draft. The two members of the project adapted activities to external circumstances which they considered valuable for the project, and hired in skills as the need arose. One reason why we think it worked well is that only two people were involved, and had full control over the project. With only two people, it is easy to maintain continuous communication, to come to verbal agreements, and to let the project take its course without losing control or the shared understanding of where the project is heading. When more people are involved (which we recommend, in general) such a set-up is hardly likely to work. Through this example, we want to illustrate that the recommendations and suggestions we give in this manual are matters of principle. These principles can of course be deviated from if this is done consciously, and if such deviations can be motivated in relation to Mistra Urban Future's criteria for joint knowledge production.

Joint reflection

During a kick-off, or before the project really enters the next phase, the implementation phase, it is important to review the project jointly in relation to the qualities for joint knowledge production. Below, these qualities have been reformulated as a series of questions which may be used as an aid:

- Involve (identify, include and engage perspectives from both practice and research which are affected and should be included in the knowledge-producing process):
    Have we made use of a suitable method, or methods, for identifying project participants? Which aspects of the problem area do we jointly cover? Are we lacking representatives for important perspectives? If so, which, and why? What can we do about this? What do we gain and what do we lose by doing what we are doing?

- Interact (design working modes which enable practitioner and researcher perspectives to contribute to the various phases of the process):
    What does the work plan/project plan look like, and how did we arrive at it? Which elements do we intend to cooperate on now, and why? Which elements do we intend to work on individually, and why? What will we gain and what will we lose by doing what we have planned?

- Integrate (combine or merge different knowledge, perspectives and approaches so that they cover the group of problems and issues which are being focused on):
    How did we work on the mapping/formulation of the problem area? Does everyone agree with the purposes and starting points of the project? Are all the project managers' interests and perspectives included in the formulation of the project problem? If not, what is missing, and why? Whose perspectives were instrumental in the formulation of the problems, and how are other problems linked to this perspective? What would you say you have learned from cooperating on the formulation of the problem?

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- Apply (ensure applicability by making sure results are relevant and usable for both practice and research):

    What are the current plans for the results? What strategies do you have for ensuring that the results will be meaningful for those affected? Are there plans for the use of the expected results?

- Reflect: (regularly check, together, whether the four above qualities are being fulfilled in the various activities of the process. If necessary, change working mode. Reflection guarantees learning and mutual understanding):

    Reflection is what you are engaging in when you investigate the above questions together.

Suggestions for reading - Formulate

- Bammer, G. 2013. *Disciplining interdisciplinarity: Integration and implementation sciences for researching complex real world problems*. Canberra, ANU epress.
- Bergmann, M. et al. 2012. *Methods for transdisciplinary research: A primer for practice*. Frankfurt, Campus publishers.
- Hirsch Hadorn, G. et al. 2008. Handbook of transdisciplinary research. Zurich, Springer.
- Pohl, C., et al. 2010. Researchers' roles in knowledge co-production: experience from sustainability research in Kenya, Switzerland, Bolivia and Nepal, *Science and Public Policy 37* (4), pp 267-281.
- Pohl, C. and G. Hirsch Hadorn. 2007. *Principles for designing transdisciplinary research*. Munich, oekom verlag.
- Wheelan, S. 2010. *Creating Effective Teams: A Guide for Members and Leaders*, London, Sage.

3. Phase 2: IMPLEMENT

In the implementation phase, the questions which were posed are answered and the problems which were identified are solved. The work needs to be designed in such a way that the qualities of joint knowledge production which apply in Mistra Urban Futures are maintained: involve, collaborate, integrate, apply and reflect. In concrete terms, this is a matter of putting the drafted project plan into practice, collecting information (or data), interpreting and analysing the material gathered, drawing conclusions and reporting the results. These are elements which form part of the normal working routine of researchers, but they take on very different forms in different disciplines. Many practitioner activities also include collecting and processing information, analysing and drawing conclusions. Here, the similarity between the competence and working mode of a researcher and a practitioner with a background in social sciences may be greater than the similarity between two researchers with backgrounds in social sciences and natural sciences respectively. The challenge of this phase consists, among other things, in finding working modes which balance and integrate different requirements for interpreting and understanding the material which has been gathered. It is also a matter of finding connections between different interpretations and ways of thinking.

It is impossible to give uniform recommendations concerning how a project for joint knowledge production should work on the implementation, since issues and conditions vary greatly from case to case. We saw from the pilot projects that doing "real" things together, i.e. not only planning and discussing, but also implementing and delivering concrete results, was found to be valuable and enjoyable for those who were involved. In this chapter, we make use of the experiences from the various methods of cooperation which emerged during the pilot projects, and discuss opportunities and difficulties related to collaboration and integration of different types of knowledge and expertise. Our starting point is not, however, that everyone who participates in a project needs to take part actively in every element. In general, we can see no reason why work tasks should not be divided in such a way that those who have competence and experience of carrying out certain tasks are also responsible for them. The purpose of collaboration is to create space for the participants to jointly investigate problems and phenomena in depth, in order to find out what the shared understanding which emerges can generate in the form of knowledge, solutions and innovations. The purpose is not to make practitioners into researchers and researchers into practitioners. It is important, however, that those who are not actively taking part in a particular element keep in contact with, and thereby have an understanding of, what is happening and the insights which are emerging. Then it also becomes possible for them to contribute. Bear in mind, also, that a division of work tasks does not necessarily need to follow the dividing line between practitioners and researchers. If you are doubtful about the possible consequences of a planned division of work, you can jointly discuss them in relation to the criteria of involvement, collaboration, integration and application.

Collection of information (data collection)

The working group responsible for a project in Mistra Urban Futures represents, as a whole, a broad spectrum of different knowledge and perspectives on the areas which the project focuses on. This knowledge base is important for discovering what further information (or "data", as it is often called in the context of research) needs to be collected and compiled. The whole project group thus needs to be involved, and to discuss jointly what sort of information is needed, why, and how it can be accessed.

There are many different ways, and possible combinations, of collecting data in this kind of project. Here we have chosen to describe several which were developed in the pilot projects, and to discuss how they worked in relation to the qualities of involvement, collaboration, integration and application. In general, cooperation in collecting information worked well and often meant that everyone, regardless of their previous experience of information collection, was able to take part. The methods used gave participants the opportunity to find an outlet for their curiosity and interest in understanding more about the questions and problems which the pilot projects worked with.

Focus groups

Focus groups are organised discussions with a selected group of people in order to capture their views and experiences. Focus groups are suitable if, for example, one wants to have many perspectives on a problem or phenomenon, and/or one wants to understand the group members' influence on one another. The communication which takes place in a focus group is more reminiscent of a discussion than a traditional interview situation. The discussion leader acts as a kind of moderator, putting forward open questions or assertions which the group members then discuss. Depending on the size of the focus group, there may be a need for additional people to be responsible for the discussion process - someone to observe/document group dynamics, someone to look after the tape recorder, someone to keep an eye on the time, etc.

Three of the pilot projects (1, 2 and 4) organised focus groups as a basis for (parts of) collecting information. They invited relevant actors to workshop-like thematic meetings which lasted several hours each. The number of people invited was often large (sometimes up to 30) and they were therefore divided into smaller groups. The group discussions were recorded and transcribed for later analysis.

The work of the focus groups engaged all participants of the pilot projects in which such discussions were held. The collaboration between researchers and practitioners seems to have worked well, and to have been stimulating. In identifying suitable participants for focus groups, the practitioners' networks and knowledge of the problem areas concerned was decisive. The practical preparations and implementation of the focus group activities were taken care of by practitioners and researchers together. In the development of the questions posed in the focus groups, the researchers in some cases made suggestions which were discussed in the whole group, and in other cases researchers and practitioners worked in pairs to produce questions which the rest of the group then commented on. Regardless of which method was used, the practitioners' closeness to the problems and the contexts in which the problems are set was important for the formulation of relevant and meaningful questions. The discussions in the focus groups were led equally often by researchers and practitioners. In an interview held in the middle of this phase of the work, a pilot project manager says:

> "... it was them, the practitioners, who did the interviews. So when we had this process... we, the researchers, do nothing, we keep in the background and it's the practitioners who do the actual work".

A project group member in another pilot project notes that they never even thought about whether they were working together with researchers or practitioners in the focus groups, because the work went so smoothly.

> "The same thing applies to the work we did in the workshops and how we went about it. There was really lots of cooperation, throughout the whole planning and implementation."

The whole working mode, arranging and leading focus groups is a reminder of activities which the practitioners involved had, in many cases, more experience of than the researchers. This meant that they were able to bring in important aspects and contribute to a stage of the process which could easily have become very research-dominated, since researchers are often used to interviewing. As a positive side effect, the focus groups helped to make the pilot projects known among a wider circle of actors in the city and region.

Profession-based workgroups

The focus groups carried out by pilot projects 1 and 2 included a mixture of actors with different backgrounds and from various professional areas. In the project group for pilot project 4, which consisted of nearly 20 people, the members split up for part of the time into smaller groups consisting of members from similar professions. This made the work of data collection more manageable, and meant that the various groups were able to immerse themselves in the project issues from the specific perspective of their own profession. According to those we interviewed, this was an effective way of capturing various aspects of the overall issue the project was investigating.

Lectures and workshops

Two of the pilot projects (3 and 4) gathered information by inviting external experts to give lectures and lead workshops. In pilot project 3, these were international experts with long experience of working with capacity-building processes. The workshop topics were of broad general interest and the workshops were therefore open, not only for the project group but also for the public. In pilot project 4, the focus group sessions were introduced with lectures which touched on the questions later taken up in the focus group discussions. In these pilot projects the participants also systematically exploited the breadth of knowledge in the project group, by allotting time for members to give lectures during the group's regular meetings.

Even though lectures and workshops are not among the traditional research methods of data collection, they can work well in this type of context. This applies above all if the whole project group takes part, since in this case all those concerned have the chance to be given the same information. The group then has the opportunity to develop a joint knowledge base and joint frames of reference for the project issues. The idea of letting the project group members report on their experience and knowledge for each other in the form of lectures can also be a good way of ensuring that everyone has access to the same information. This applies particularly, perhaps, if the project area is sprawling and the project group members have very different, or contradictory, initial knowledge.

Study visits

Two pilot projects (1 and 3) arranged study visits. Pilot project 1 visited sites away from Gothenburg to study processes resembling the Gothenburg-specific processes which the project was studying. In interviews with project group members, study visits were mentioned spontaneously. One member told us that, apart from getting to know each other better during these trips, they also learned about the processes they were studying:

> " ... *we had the chance to spend a bit of free time together. But we didn't sit talking about other things - we talked about this* (i.e. the subject of the study visit*) all the time... We got to know each other better and had the opportunity to develop our viewpoints a bit more and at greater length, so... I think that meant a lot for the project*".

Just like lectures where the whole project group takes part, study visits yield information which the project group can share as a basis and reference point. Study visits also have a team-building and revitalising effect, since the members spend considerably more time together than during a regular working meeting. According to one of the project managers for pilot project 1, study visits are therefore "a must".

Document and literature studies

Most project groups engaged in reading reports and articles with relevance for the focus of their project. In some cases the work was divided so that one or more members read up on one limited aspect, or a number of aspects, and then reported their impressions to the rest of the group. In other cases the whole group read the same text and then met to discuss it.

This method of working - rather like a study circle - can probably be very useful in projects for joint knowledge production, where members can devote varying amounts of time to the issues. It may be the case, for example, that one needs to form an impression of what has been done previously and/or an overview of large quantities of text material. The important thing here is to find ways of text reading which suit everyone, and likewise to find ways of structuring text-based discussions so that they clarify what the texts contribute to the project issues, and lead to conclusions about how the insights gained through reading can be put to use in the project.

Interviews

Interviews are one of the most common ways of collecting information in social science research. Interviews can be conducted in many different ways and can be quantitative or qualitative (or a combination of both) depending on what one wants to find out, and why. None of the pilot projects made use of traditional interviews to any great extent, and in the few cases when they were used, it was the researchers who did the work. The results of the interviews were then collated and reported to the rest of the group.

In general, both interviews and questionnaires can be important methods of information collection, including in transdisciplinary projects where there is a need, for example, to understand what various actors think about the phenomena the project is interested in. Practitioners or researchers without specific experience should not be expected to conduct in-depth qualitative interviews. In the case of more questionnaire-like interviews based on well-defined questions and short answers, however, it is possible for other interviewers, apart from experienced ones, to take part. The important thing about interviews (and other methods of information collection which presuppose professional competence) is that the whole group consider collaboratively which "knowledge gaps" the interviews are expected to fill (i.e. why they are to be conducted) and are jointly informed of the answers the interviews give.

Table 2: Some of the data collection methods used in the pilot projects and their relevance in relation to joint knowledge production

Type of activity	Pilot project participants' viewpoints	Comments
Focus groups	Inspiring, valuable No difference between researchers/practitioners	Seems to favour preconditions for collaboration and involvement Everyone can contribute and participate actively
Profession-based workgroups	Important to also be able to investigate issues based on relevance for own profession	Capacity-building. Can act as a good complement to mixed groups if issues are broad
Lectures Seminars Workshops	Appreciated Everyone can take part	Capacity-building. Helps the group to develop shared frames of reference, assuming everyone takes part
Study visits	Very important. Contributes to group cohesion	Capacity-building. Helps the group to develop shared frames of reference, assuming everyone takes part
Document and literature studies	Appreciated Everyone can take part	Capacity-building. Helps the group to develop shared frames of reference, assuming everyone takes part
Interviews, questionnaires	No comments from project groups	Some types of interviews can be conducted by everyone in a project group, regardless of previous experience

Analysis and writing

Analysis, in the context of research, entails penetrating and structuring (data) material so that it answers the questions posed. The material may consist, for example, of sets of measurements, questionnaire responses or transcribed texts from focus groups and interviews. It goes without saying that an analysis can be everything from relatively simple to very advanced, depending entirely on what sort of questions are to be answered and what sort of data has been collected. Transparent analyses based on given theories, models or issues are common both in research and in a number of other professions which engage in enquiry and evaluation. Methods of analysis vary greatly, depending on the discipline or sector they are used in, and it is rare for one person to be competent in more than one method, or at most a few.

The work of analysis requires specialist competence, which gives rise to one of the biggest challenges in joint knowledge production. It is impossible for everyone to be involved in, or to understand, all forms of analysis. At the same time, it is precisely the analysis that often has the function of an eye-opener, or a key that unlocks the door to a new understanding. So what form can collaboration and integration of different knowledge and experience take in this component of the project? This was one of the hardest questions the pilot projects grappled with. They tried, often under time pressure, to find ways of doing the analysis work which satisfied the centre's expectations. Among the methods of analysis which the pilot projects developed, we can distinguish three different forms. These are joint analyses based on discussions in working groups, joint analyses based on drafts written by researchers, and analyses based on strictly scientific approaches.

Joint verbal analyses

Almost all forms of information collection which the pilot project groups made use of together, such as focus groups or lectures, for example, were followed by reflective meetings in which the members discussed their impressions of what they had experienced. These analyses were scheduled, often followed some kind of structure, and lasted from an hour to almost half a day. They were important in capturing spontaneous thoughts and reflections. On the other hand, they were not structured in the sense of building on explicit theories or models. One researcher we interviewed notes that he and the other researchers had a tendency to quickly begin to make use of theories they like in order to understand what emerged in the focus groups:

> *"... But the practitioners don't take that approach (to the material)... so we didn't really do that in the working groups, but we talked about what we can see and so on, but more often than not, going through it becomes more a kind of repetition of what's happened. In a way, of course, that's also analysis, but not so structured, perhaps."*

Another researcher says that the meetings where researchers and practitioners jointly considered what had emerged from focus groups were especially exciting, because:

> " *... practitioners have absolutely no regard for the (scientific) disciplines*"

We think, just like the researcher above, that there is value in using this form of verbal analysis in a structured way. The discussions which are held can, for example, be documented in their entirety by being recorded (see Pilot 1 below). One can also let the project group's spontaneous reflections on the information that has emerged from the material collected be the basis for a joint mind map which is drawn up on the whiteboard (see, for example, the problem tree described in chapter 2). Such an image can make it easier to map how different aspects relate to each other and to the project's overall issues. Another way of working is to list spontaneous insights which the information has generated (on the whiteboard) and then jointly investigate whether it is possible to find a structure in what has come up. Analyses of this kind must be saved, since they are a reflection of developing understanding and can be valuable at a later stage of the project, when it is time to sum up and draw conclusions.

Joint written analyses

Data collection in the pilot projects generated large quantities of written material. Specifically, there were several hundred pages of text from focus group interviews, observations of workshops and meetings etc. to be read and analysed. In none of the pilot projects did the practitioners read through all the material that was generated. Instead, it was the researchers who took responsibility for reading transcripts, listening to recordings and performing analyses, which were then presented to, and discussed by, the rest of the group.

In pilot project 2, for example, at quite an early stage in the project, a researcher wrote a scientific article based on the focus groups. Several successive drafts of the article were distributed and commented on by the other members of the project group. In pilot project 4, the researchers worked with more preliminary analyses of the material collected. The analyses were discussed in the project groups and then finalised by the researchers. Pilot project 3 conducted a workshop with an overnight stay, in which the project group worked on the analysis together. The group answered the four questions the project was concerned with, with the aid of the documentation made during the project. As the project drew to a close, the two project managers of pilot project 5 also conducted a workshop in which they jointly reflected on their experiences and impressions. The discussions they held were transcribed by someone from outside the project, who was brought in specifically for this

purpose, and the text was then used by the project managers as a support for the final reporting of the project.

All the approaches described above are based on the assumption that the analysis is done at the end, when almost all the material has been compiled. Pilot project 1 worked in a somewhat different way. In this case the project group meetings were recorded, one of the researchers summarised what was said, and this summary was used as a basis for continued discussion during subsequent meetings. The analysis was thus on-going and articulated throughout the entire research process, and the project avoided finding itself in a situation where all the material had to be analysed at once, in the final phase of the project. This is what one of the researchers has to say:

> " *the understanding wasn't hidden somewhere, but it's there all the time... and we try to argue our way forward step by step... Such a huge amount of material has accumulated from what we've done that it's been essential to deal with it bit by bit."*

One of the practitioners has this to say about the on-going process of analysis and the development of results:

> "*It's been fascinating to see one's own work written in a form that increasingly develops towards a scientific text*"

The large working group for pilot project 4 was divided for a limited period of the project into profession-based groups, and one of the groups worked in a similar way to pilot project 1:

> " *This group really wrote together. Well, I wrote, but it's their statements. We started producing a text after the first meeting, and then we sort of talked about that text at the next meeting, and developed it. And so we sifted out more and more."*

Newly-gained knowledge and newly-awoken insights can easily be forgotten if they are not documented. In transdisciplinary projects, it is also a rare luxury to be able to work continually with the material, which further increases the risk that the insights and understandings which emerge in the discussions are lost, and the group has to start from scratch every time it meets. It is therefore important for someone to take responsibility for summarising the analytical discussions in written form. The written texts reflected the understanding which was emerging in the groups, and will be a clear and concrete document which can help the group to reach a shared view of how their knowledge and insights are developing.

Specific, purely scientific analyses

The empirical material generated in transdisciplinary research projects can be very rich. As well as forming the basis for analyses carried out jointly by the project groups, they can of course be used as a basis for specialist analyses. All the pilot projects conducted such analyses prior to working on scientific articles. In some of the pilot projects it turned out that these analyses also had relevance and value from the practitioners' perspective. Pilot project 2, for example, originally divided their analyses into one part with presumed relevance for the scientific community and another part with relevance for policy/practitioner perspectives. It became clear, however, that the latter analysis was rather one-dimensional. In order to appeal to the practitioner target groups, it also needed to include the scientific analyses.

Why don't practitioners write?

In the pilot projects, it was the researchers who took responsibility for performing analyses, drawing conclusions from the material collected, and writing. In some pilot projects (including 1 and 3) the project group initially tried to divide the work of writing between researchers and practitioners, but it turned out that the responsibility nevertheless drifted over to the researchers. In this respect, researchers have considerable advantages over other professions. The great majority of the practitioners who took part say that they appreciated the division of work which entailed that the researchers took responsibility for the writing, while they themselves took the role of a sounding board or critic of the written material.

Writing can be valuable since it forces and helps the writer to gather, sort and develop their ideas. Someone who writes can therefore gain a head start, or a prerogative in interpreting how the material collected is to be understood. In our interviews we therefore discussed the question of why practitioners seldom engage in writing in the same way as researchers. We summarise below the answers we received. Projects which have ambitions for everyone to take part and contribute to the writing should take note of these.

It is sometimes a question of time. Writing takes much more time than the 5-10% of working hours which many practitioners spent on the pilot projects. A few practitioners say they would have liked to spend more time on the project precisely in order to devote themselves to gathering thoughts and contributing to the writing. If you want practitioners to contribute to the writing, they may need more time on the project than 10%.

It is not always a question of time. Some of the researchers who took part in the working groups did not spend more than about 10% of their working hours on the project, either. In spite of this, they took part in the analysis and writing to a greater extent than the practitioners. A number of practitioners doubt whether they would have taken part in the writing even if they had had more time. We therefore assume that writing is also a question of how practitioners and researchers regard their respective roles in project groups. If you want practitioners to write, the question may need to be brought up and discussed explicitly in the project group: What can we do to encourage practitioners to write? What preconditions need to be fulfilled?

"Who are we writing for?" Some practitioners reported that they would like to have written but felt unsure about who they would be writing for. This reflects a problem which was taken up in chapter 2 (page xx). The practitioners' participation in the Mistra Urban Futures pilot projects was not always supported by their regular workplaces. There was no clear plan for how the insights and knowledge generated in the project were to be of benefit to their regular workplaces. If you want practitioners to write, you need to work out a plan for how the results of the project will be taken care of within the operations which the practitioners represent.

Results

Mistra Urban Futures has high expectations of the results of a project for joint knowledge production. They shall not only be of high scientific quality but also have practical relevance which reflects the fact that those affected by the issues in focus are deeply involved in, and contribute to, the process. The pilot projects were of relatively short duration, and the methods to be tested and

developed were new for all those involved, including those who were to support the work. It is therefore not reasonable to expect the results to fulfil these high demands in every case. What is clear, however, is that the closeness to empiricism which the researchers achieved by cooperating with practitioners had great significance for the authenticity of the scientific results. In a corresponding way, the practitioners' results were enriched by the researchers' tendency to raise questions and results to a more general level. The pilot projects also helped to identify a number of difficulties and questions related to transdisciplinary research.

The results of the pilot projects are of several different kinds. Every pilot project had the task of delivering a text to form the basis for a scientific article; a final report directed to practitioners and the professions included in the project; and a chapter for an anthology, summarising the transdisciplinary working methods. Here we discuss these results, as well as further outcomes of the pilot projects which do not emerge clearly either in scientific articles or in final reports.

Reports, seminars, conferences and articles

All pilot projects recorded their results in the form of reports with relevance for the practical operations affected. These are available at (web page). The results were also reported and discussed at seminars and workshops open to the public. All pilot projects also generated material for scientific articles and contributions to research conferences.

Other results and outcomes

The working modes which the pilot projects developed do not resemble traditional working modes in either research or practice. Apart from reports on activities and scientific texts, there are many other results which sprang from the close cooperation between researchers and practitioners. These include new ideas and insights which the participants gained, networks which were extended and new working modes which were initiated. It is impossible to give a comprehensive account of all these outcomes. (There may be some which have yet to be documented.) Below, we give some samples from each individual pilot project, on the basis of interviewees' own narratives.

Pilot project 1

In pilot project 1 more than in any other project, the practitioners talk about learning things from cooperation with researchers. They say they gained a deeper understanding of *multi-party collaboration,* their own role, and the conditions that need to be met in order to create and maintain such collaborative processes. They also say that they took their new understandings with them into their workplaces. Some have begun to argue in favour of new ways of looking at and working for sustainability and collaboration, while others say they now feel more competent and better prepared for multi-party collaboration. The researchers say that material from the pilot project is being used in teaching, and that thanks to working with practitioners they have extended their networks and areas of enquiry. Their experiences have suggested ideas for new projects and given rise to a number of new research applications.

Pilot project 2

According to the participants, the project has initiated new ideas concerning how to think about and work on *adaptation to climate change* in the city of Gothenburg. Even though the city is generally regarded as being in the forefront of risk analyses related to climate change, it has got stuck in the idea that urban planning constitutes a particular form of adaptation to climate change. The project revealed this limitation by offering a number of different approaches based on different scenarios for different types of adaptation. The working mode which was tried out in focus groups with researchers and practitioners from different fields of activity has spread, and forms the basis for the

work which is currently under way in central Älvstaden. The drafts (scenarios for adaptation to climate change) which were used in the project are now being used in a research project concerning climate-related risks and how they can be prevented.

Pilot project 3

The project worked specifically with testing and developing *capacity-building processes* in a suburb of Gothenburg. The purpose was, inter alia, to understand more about the roles that can be played by citizens, researchers and civil servants in the city administration when it comes to initiating and maintaining citizen involvement in planning and developing their own residential areas. The participants view the capacity-building processes which were initiated during the project as a result in themselves. The practitioners who took part in the project say that they learned more about the complexity in their own organisations in connection with the difficulties and scope for inviting citizens into working with their own urban district. Furthermore, the role of the university as a link between research, teaching and citizen involvement was developed. The project also generated new research methods in the field.

Pilot project 4

The arena for discussion around the concept of *business-driven sustainable development* which the project created has, according to the participants, both practitioners and researchers, proved to fulfil a very relevant and important need among the city's actors. The discussions which the project gave rise to suggested ideas about how business interests can be included in urban planning. These have been influential and are being developed further, for example in the planning of central Älvstaden in Gothenburg. Both practitioners and researchers, but especially the latter, say that their networks and contacts with various actors in Gothenburg were important for how they see their own roles as practitioners and researchers respectively. The project inspired new issues to investigate and new research ideas, and also influenced approaches to ongoing research projects which the researchers are participating in.

Pilot project 5

The *Urban games* project worked with testing and developing methods of visualising complexity in issues of sustainable urban development and thereby provoking questions, creating dialogue and encouraging reflection and learning. In the project, researchers and practitioners (educationalists, game and interaction designers) cooperated with groups including young people, civil servants and city authorities in the development of digital and analogue games. The project managers say that all those who were affected by the project developed a deeper view and understanding of the city and of urban development. The project gave rise to a large number of concrete products in the form of games and visualisation tools related to sustainable urban development. These have now taken on a life of their own. Within research, both the working mode and the products have inspired new research projects.

Individual learning, new research ideas and new networks between different professions

It is clear from the description above that the pilot projects gave rise to important experiences and knowledge development at an individual level among many of the practitioners and researchers who took part. Several of the practitioners we interviewed say that they found great value in being able to talk about and study new and old terms and concepts which they had previously treated in a perfunctory manner. In many cases, they themselves have one foot in the area of practice which the pilot project focused on, and through their participation they had the opportunity to study routines and approaches which had previously been hidden because they were taken for granted (in actual practice). A number of them also say they will make use of their experiences in their professional work. The researchers also say that they learned. They gained new contacts and new ideas about

how they can work and cooperate with other professions. The outward-looking working mode with workshops and focus groups which the pilot project chose to use for collecting information created new arenas for discussion and reflection on issues which proved to be highly relevant for the city's actors. These workshops evidently answered a need and an interest which were not being met in other ways. The pilot project has no further control over the networks that were created and the thoughts and ideas that were exchanged here. It is very likely that some of them are being developed further among those who found the issues important.

Practical advice: Safeguarding results

Some of the important conclusions that were drawn and the experiences and insights that the participants in the pilot projects gained have been formulated in articles and reports. In the world of research, progress is most often measured simply by the number of articles that are produced. In other fields of activity, the amount of text produced is hardly given any attention. Even a report directed towards a specific operation with suggestions for changes of approach and working mode might not be noticed by the operation if the organisation is not open to, or sees no need for, changes. We draw this to the attention of participants in Mistra Urban Futures projects. The results and conclusions derived from the projects are highly likely to be relevant, since they have after all been developed from issues and problems in the operations which are concerned. They may therefore, either directly or after a certain amount of modification, contribute towards improving the operations which the project participants are involved in. (This applies to both practical and more research-oriented operations.) But if there is no system or structure for capturing the results, there is a risk that they will be overlooked. At the same time, no one knows at the start of a project what sort of results and experiences the joint knowledge production will give rise to. It is only afterwards that the value of the results can be judged, and thus it can be difficult to have a plan worked out beforehand for how they are to be dealt with. As we have pointed out several times, we consider it very important for those who participate in projects for joint knowledge production to have some kind of backing and prepared structure for how the results and experiences are to be communicated in their own operations during the entire duration of the project. We think that verbal updates are preferable to written reports. Work out a plan for regular meetings with those affected in the regular workplaces, where the project participant talks about what is happening in the transdisciplinary project and their colleagues have the opportunity to ask questions and discuss. "How does this affect us?" or "How can we benefit from this?" may be useful questions to discuss. Such discussions create an interest and a willingness to accept the results which are generated.
Here we would also like to remind you of the importance of the communication and implementation plan which we write about on page 21.

Joint reflection

Even during implementation, it is important that you jointly investigate your project in relation to the qualities for joint knowledge production. Below, the qualities have been reformulated as a set of questions which may be of use:

- Involve (identify, include and engage the practical and research perspectives which are affected and need to take part in the knowledge-producing process):

Is everyone involved in discussions and in agreement on decisions about:
- How collection of information (data) will be done, and who will do the work?
- How interpretation and analysis will be done, and who will do the work?
- How the work of report-writing will be done, and who will do it?
- What are the consequences of having different perspectives and sources of knowledge? How is this dealt with in science and practice?

- Collaborate (design working modes which make it possible for different practitioner and researcher perspectives to take part and contribute to the various phases of the process):
  - What is the division of work for data collection, analysis and writing?
  - Which elements do we intend to collaborate on, and why? Which elements do we intend to work on individually, and why?
  - What will we gain and what will we lose by doing what we have planned?

- Integrate (combine or merge different knowledge, perspectives and approaches so that they cover the group of problems and issues which are being focused on):
  - How can we include different perspectives and ways of interpreting and understanding the data collected?
  - Are there connections between different ways of interpreting and understanding data? If so, what are they? Is everyone in agreement on the connections?
  - Are there perspectives that have to be "abandoned" because they, for some reason, do not fit into the picture which is emerging? If so, which, and why?
  - What have we learned from cooperating on the analysis?

- Apply (ensure applicability by making sure results are relevant and usable for both practice and research):
  - What are the results/answers to questions? Do the various results/answers cohere and, if so, how?
  - Which results concern the participants' regular operations, and in what way? Can they contribute to their respective fields of work and, if so, how?
  - What else needs to be done so that more of those who are involved in these operations take an interest in the results and their application?
  - Which knowledge and insights generated by the project are the most important, and how can they be transferred to other contexts?
  - How can the application of relevant project results be spread locally, nationally and perhaps to the centre's other platforms?

Suggestions for reading - Generate

- Bammer, G. 2013. Disciplining: Integration and implementation sciences for researching complex real world problems. Canberra, ANU epress.
- Bergmann, M. et al. 2012. Methods for transdisciplinary research: A primer for practice. Frankfurt, Campus publishers.
- Hirsch Hadorn, G. et al. 2008. Handbook of transdisciplinary research. Zurich, Springer.
- Pohl, C., et al. 2010. Researchers' roles in knowledge co-production: experience from sustainability research in Kenya, Switzerland, Bolivia and Nepal, Science and Public Policy 37 (4), pp 267-281.
- Pohl, C. and G. Hirsch Hadorn. 2007. Principles for designing transdisciplinary research. Munich, oekom verlag.
- Wheelan, S. 2010. Creating Effective Teams: A Guide for Members and Leaders, London, Sage.

4. Phase 3: EVALUATE

There were two types of evaluation of the pilot projects. One of them, the formative evaluation, consisted of on-going joint reflection on the transdisciplinary work processes, with the purpose of both supporting the work in progress and learning more about the difficulties of the approach and how they can be addressed. The other aimed at mapping the concrete effects of the pilot projects.

Formative evaluation

The suggested questions we pose in the section "joint reflection" at the end of every chapter are an important tool for the project members' own on-going evaluations. But this guidance was not available to the pilot projects. None of the consortium partners, or those who took part in the pilot projects, initially had any great experience of transdisciplinary work. It was a matter of trial and error, and learning from both successes and mistakes. The pilot projects therefore gave rise to a number of activities which had the purpose of supporting, documenting and evaluating the development of events in the pilot projects. Below we describe the activities which are also relevant for further projects.

Project manager meetings

During the entire duration of the pilot projects, the centre arranged monthly meetings with the project managers of the pilot projects. The purpose of these meetings was to support the project manager pairs and, at the same time, keep the centre informed about the pilot projects and their development. Since the centre, the transdisciplinary approach and the working modes were all new, it was not altogether easy to find a form for these meetings which suited everyone. We used trial and error, feeding in information and administrative issues that the project managers needed to know about and tips and discussions about various theories and methods of joint knowledge production. Some project managers, especially at the beginning, regarded the contents of the meetings as much too elementary and therefore not meaningful. We subsequently found our way to a form which worked for most of them. In one recurrent component of the meetings, the project managers reported on and discussed their projects, the activities, how much progress they had made, etc. Some meetings focused on aspects, problems or challenges which the project managers wanted to discuss or investigate in greater detail, sometimes with the assistance of invited lecturers/experts. For many project managers, the meetings functioned as an important forum for learning and reflection not only between the project manager pairs, but also so that the centre could understand better what sort of support the project managers needed. The meetings were well-attended, and one of the project managers says:

> "*You need to get continuous help all the time, and the chance to learn from the other projects. You need to be able to talk about issues such as how have you been working and how have we been working and why...*"

Project manager meetings will convene again in the Gothenburg Platform in 2013.

Interviews

The interviews were a further way of capturing and understanding the development of the pilot projects and, at the same time, giving the project managers an opportunity to discuss and knock

ideas and issues around. The project managers were interviewed during every phase. The interviews were an important basis for better understanding the difficulties that can arise in transdisciplinary work, and also how they can be addressed. They were used, as has already been mentioned, as the basis for this guide. The qualities for transdisciplinary projects in Mistra Urban Futures which were presented in chapter 1 were prepared as a guide for project participants and were used as a reference in connection with the interviews. These were designed as structured conversations with questions which gave the project managers an opportunity to reflect on or evaluate the project in relation to the qualities and the phase which the project was in at the time of the interview.

REFLECTIONS FROM THE PILOT PROJECTS

Below, we have selected some of the pilot project participants' own reflections on the process of joint knowledge production. The texts are taken from chapters of the pilot project anthology (texts from pilot projects 2, 3 and 4).

Pilot project 1

To summarise it in a few key aspects and lessons from our project, it is important for transdisciplinary knowledge projects to:

- *build in parts in the project that are owned by different actors in a working group (or the equivalent) as far as possible, so that everyone contributes knowledge and the contact networks that are needed.*
- *clearly discuss at the outset how much work - and what sort of work - each individual can contribute to the project. Drawing up clear contracts for this provides a basic opportunity for everyone to contribute their knowledge.*
- *plan in lots of time for joint discussions, because it takes time to get to know each other and understand how other people think.*

Forsemalm, J. and Montin, S. 2012. *Transdisciplinary dialogues*. Mistra Urban Futures

Pilot project 2 (one of the researchers)

When I read through the transcriptions in search of insights, I discover that the whole idea that there's a clear distinction between practitioners' knowledge and researchers' knowledge doesn't apply in our case. The only difference I can see is that practitioners have a tendency to locate their knowledge in a much more specific, often local, context. Researchers, on the other hand, often talk in general terms. Practitioners apply the same ideas and theories as researchers, but often in a context they have a deep knowledge of. Researchers try to avoid the limitations that this implies, and attempt to make knowledge as generally applicable as possible, for example by using examples from many different sources. In order to create a relevant joint platform for research and practice, we need to find subjects and topics that are relevant in a specific context as well as having general relevance.

Moback, U., Thörn, P., Morisson, G., Buhr, K., Knutsson, P., and Areslätt, H. 2012. *Reflections on the transdisciplinary process towards identifying climate adaptation and sustainability strategies for a waterfront development*, Mistra Urban Futures.

Pilot project 3

The project was neither a traditional research project nor a traditional development project. What was it, then? How "free" from our institutional constraints could we feel when we were producing joint knowledge? These questions came up a number of times. At the beginning we tried to formulate

joint "ethical rules", but as the project proceeded we discovered that the problems were too complex to be formulated on paper in the short time we had. At the end of the project we came back to the questions in a different form. It was when we discovered that even if the project wasn't seen as a traditional research project, we were expected to deliver a traditional scientific article based on the knowledge we produced. For practitioners with an academic background this is of course no problem. Those who work at universities do this type of work to advance their careers (and they often also like doing it, of course). But the project group got confused. Did we really feel satisfied with finishing the project like that, after producing knowledge together? Now, in retrospect, we have changed our view of this to some extent. We see these articles as products and not in the same way as before, as the result of joint knowledge production in itself...

Stenberg, J. and L. Fryk. 2012. Urban Empowerment through Community Outreach in Teaching and Design, *Elsevier Procedia – Social and Behavioral Sciences,* **46, pp 3284-3289**.

Pilot project 4
Advantages and disadvantages of the project design
In view of the fact that we had limited time and limited economic resources, our task was a difficult one. Our account of advantages and disadvantages has to be seen with this in mind.

- *Hard to limit the scope of the project while at the same time paying attention to issues of practical relevance*
- *An organic approach to the project with little scope for making conscious and active choices early in the project*
- *Hard to set limitations while at the same time maintaining the interest of the various actors who took part in the project*
- *Although several partners contributed personal resources at their own expense, the project seemed to have a very tight budget*
- *The methods we used consisted of a number of steps, which was hard to keep up with since the project could only last 14 months*
- *The profession-based approach requires tolerance and an open attitude towards different perspectives on knowledge in different professions This became especially clear in the final phase, when all the focus group reports were read by all the group leaders*
- *The approach was very dependent on the activities that happened late in the project This caused problems because of the short duration of the project It is hard to exploit the results fully when they have to be compromised*
- *It was hard to maintain the same degree of democracy and inclusiveness towards the end of the project, when we worked in focus groups*

- *An inclusive approach which can handle many perspectives and at the same time maintain high practical relevance*
- *The transdisciplinary preconditions, and the inductive approach which these preconditions gave rise to, gave the project group a mandate to step out of established roles and areas of expertise, and adopt a curious and questioning attitude*
- *Suits new and unidentified concepts which are characterised as "wicked problems" - similar challenges*
- *Division of responsibility for important activities such as seminars with stakeholders and focus group reports*
- *Devoted group participants mean that information is spread effectively. This was very clear in connection with the stakeholder meetings*

> + *Good opportunities to extend project participants' networks and understanding of other perspectives*

Sandorff, A. and E. Eriksson. 2012. *The process of structuring knowledge in the pilot project "Business Driven Sustainable Urban Development"*, **Mistra Urban Futures.**

Pilot project 5
Our day-to-day work has been enriched by our experiences from the project. Two questions we struggled with were:
- When is something finished? The practitioners and the researchers have completely different conceptions of what is finished. For a researcher, the result does not go to customers, but a document or patent is finished. For practitioners in GR - PC, it's finished when a third party can use it without your involvement.
- When is something usable? When we have created knowledge or when there's something tangible? Shared management, with one practitioner and one researcher who haven't previously worked with each other, makes for a rather risky project. Because Mistra Urban Futures management didn't provide any structure for team-building or how we should jointly work towards a shared goal, there was a risk that the project would become fragmented. After the honeymoon period and a short period of conflict, though, we think the work flowed better than expected, positively and productively.

Billger, M., Alfredsson, K., Lindkvist, J., Myren, P., and K. Clase. 2012. *Urban Games*, **Mistra Urban Futures.**

Evaluation of outcomes

We will return to this in a later version.

Suggestions for reading - Evaluate

Bergmann, M. et al. 2012. Methods for transdisciplinary research: A primer for practice. Frankfurt, Campus publishers.

- Evans, R. and S. Marvin. 2006. Researching the sustainable city: Three modes if interdisciplinarity. Environment and Planning, 38, pp. 1009-1028.

Appendix

Designing and leading a transdisciplinary research project:

Hints on how to create favourable conditions for productive teamwork

Thomas Jordan

Department of Sociology and Work Science,

Gothenburg University

Using the checklist and the table of suggestions

Below you will be presented with a quite comprehensive checklist with questions that may be useful to consider for a project leader. The checklist does not include considerations about who to include in a research team, but assumes that the selection of team members has already been made, and that you are about to start working together. Before starting to consider the items in the checklist, it might be important to spend some time reflecting on the conditions you are facing, in particular regarding the team members' backgrounds, experiences, perspectives, interests and possible attitudes to the work you are about to start. With these considerations in mind, you can work through the checklist by reviewing the possible relevance of each item. Some of them may be of less concern to your particular project, while others may play a crucial role for the likelihood of achieving a successful collaborative process in the team.

The checklist comprises 20 different aspects of transdisciplinary teamwork, listed in the *left hand column*. As an additional source for reflection, the *middle column* lists possible risks regarding the teamwork, if the functions listed in the left hand column are not actively managed. In the *right hand column* you are invited to assess the relevance of each of the items for your own particular project.

After having reviewed the items in the checklist and possibly identified some that really may need some extra attention, you can proceed to the second table, which offers a number of suggestions on what you can concretely do in order to scaffold those of the 20 functions you deem essential for your own team's success.

Checklist for project leaders: Scaffolding teamwork

I. CREATE FAVOURABLE CONDITIONS FOR COLLABORATION *(Relationships, Attitudes and feelings, Empowerment)*

Question: Is it in this case particularly important to be careful about ...	*Risk if function is not supported*	**Assess the importance:** – not important/not relevant * somewhat important ** important *** very important
1. Safe space and rapport ... building a sense of safe space, where participants feel at ease with the context and establish rapport with the other participants?	Participants feel insecure, are reserved and hold back. Conversations remain on a superficial level due to lack of rapport and trust; failure to establish durable personal relationships that might ease communication in future interactions.	
2. Open up communication ... intervening in order to open up communication so that participants can speak freely about personal experiences, concerns and ideas, even if these may concern sensitive matters?	People do not express their personal views, opinions and experiences; there are topics that are unspeakable even though they might be crucial to include in deliberations.	
3. Commitment ... taking care to mobilize the participants' sense of hope about achieving meaningful outcomes and thereby personal commitment to engage in the team's work?	Sense of being personally unimportant and powerless to achieve significant results; Expectation that someone else will take responsibility for needed action.	

4. Mobilize individuals' resources ... creating favourable conditions for mobilizing individual participants' knowledge, skills, creativity and other resources, so that they become available for the team's work?	Suboptimal outcomes because available resources are not mobilized in the process; Failure to surface creative ideas; Unintended negative consequences of decisions made, because significant factors were not considered.	
5. Dialogue in diversity ... surfacing and transforming tensions and conflictual relationships among the participants, so that differences in perspectives and interests can be worked with productively?	Conversations are permeated by debating, lack of openness; thinking remains restricted to pre-existing perspectives.	

6. Management of energy levels ... designing the work process in order to support energy levels and concentration?	People get bored and become distracted and/or passive.	
7. Creativity ... creating conditions that stimulate a high level of creativity in developing ideas?	Suboptimal outcomes because team members' creativity is not mobilized and creative ideas fail to surface.	
8. Accountability ... strengthening the participants' feeling of accountability for taking action and achieving desired outcomes?	No or too little action ensues, because noone feels accountable.	

II. ATTENTIONAL SUPPORT

Question: Is it in this case particularly important to be careful about ...	*Risk if function is not supported*	**Assess the importance:** – not important/not relevant * somewhat important ** important *** very important
9. Structuring the work process ... structuring the work process clearly, so that the team focusses on one type of task at a time rather than talking about all kinds of things at the same time?	People mix thoughts, ideas and suggestions referring to different tasks and do not penetrate and reflect deeply on each task; tasks are not thoroughly worked through.	
10. Learning ... supporting participants to reflect on insights and learning at regular intervals, in order to strengthen long-term learning?	People do not notice their own learning, and therefore do not transfer their learning to new situations.	
11. Decongealing ... supporting participants in stepping out of ingrained frames of mind in order to approach the issues in creative and openminded ways?	Discourse remains confined to pre-existing conceptions and points of view. Restricted range of new ideas.	

III. LEARNING AND PRODUCING KNOWLEDGE

Question: Is it in this case particularly important to be careful about ...	Risk if function is not supported	Assess the importance: – not important/not relevant * somewhat important ** important *** very important
12. Issue focus ... formulating the issue/problem/ task in such a way that partici- pants are clear about and agree on the focus of the work?	People talk simultaneously about very different issues and therefore get nowhere.	
13. Self-clarification ... clarifying the concerns, needs, interests and preferences of the participants themselves and of the organizations they represent?	Weak commitment to process and outcome, because proposals and decisions are not anchored in true needs.	
14. Complexity awareness ... supporting an inquiry into the complex conditions, causal con- nections and potential consequen- ces so that participants gain a more comprehensive under- standing of the issue complex?	Low quality of proposals and decisions because significant aspects of the issue complex have not been considered.	
15. Whole system awareness/ Context awareness ... supporting the emergence of a stronger whole system and context awareness?	Need to adapt to changing conditions is ignored; focus remains narrow and strategies only address parts of the system; time horizon is short.	
16. Stakeholder awareness ... developing an awareness of the	Significant stakeholders' perspectives and knowledge are not considered in knowledge	

spectrum of relevant stakeholders and an understanding of their respective interests and perspectives?	production and strategy development.	
17. Perspective awareness ... supporting an increased awareness and understanding of the respective properties of different perspectives that may be used in making sense of the issue, so that participants can productively use several perspectives when deliberating causality and actions?	Participants remain embedded in monological perspectives; knowledge production does not draw on the richness of different perspectives; Conversations tend to develop into debates between fixed positions.	

18. Common ground ... developing a shared description of the issue complex and consensus on recommendations?	Not necessarily a problem, but can be if tight collaboration is necessary; Communication breaks down because of disparate narratives of the situation; Action is impeded by unresolved conflicts about appropriate strategy.	
19. Decision-making ... supporting the decision-making process, so that the process leads to well-founded concrete decisions.	People talk a lot and generate ideas, but firm decisions are not made.	
20. Support implementation ... organizing the different steps in implementing decisions.	Agreed measures are not implemented, because accountability is unclear, or implementation is poorly organized.	

Suggestions on how to scaffold the teamwork

I. CREATE FAVOURABLE CONDITIONS FOR COLLABORATION *(Relationships, Attitudes and feelings, Empowerment)*

Function to support	*Examples of what to do*
1. Safe space and rapport ... building a sense of safe space, where participants feel at ease with the context and establish rapport with the other participants?	• Take time to have each team member talk about their background and views on the issue in terms of (1) their professional role; and (2) their personal stakes and situations. • Be careful about clarifying and agreeing on roles, expectations, working format, decision-making forms and restrictions that you need to take into consideration. Ask team members about issues they want clarity about. • Arrange for a kick-off activity that gives the team members opportunity to get to know each other on a personal level and establish
2. Open up communication ... intervening in order to open up communication so that participants can speak freely about personal experiences, concerns and ideas, even if these may concern sensitive matters?	• Set an example by being open with your own personal views, and invite team members to express their own concerns, reservations, personal assessments, etc. Take care to recognize the value of expressing subjective views, while fostering a climate of constructive critical discussion. • Ask questions that may expand the comfort zone, thus opening up what can be talked about openly (e.g. power realities in organizations) in the context of the research team.
3. Commitment ... taking care to mobilize the participants' sense of hope about achieving meaningful outcomes and thereby personal commitment to engage in the team's work?	• Take time to have each team member articulate what meaning the issue has for them personally, e.g. how the issue impacts them on a personal level. • Be attentive in asking for and listening to each team members views, thereby affirming the value and importance of their individual contribution to the team's work.
4. Mobilize individuals' resources ... creating favourable conditions for mobilizing individual participants' knowledge, skills, creativity and other resources, so that they become available for the team's work?	• Set aside sufficient time to take stock of each team member's experiences, knowledge, know-how and competences. Ask the team members what they need in order to be able to contribute freely.
5. Dialogue in diversity	• Initiate a conversation about how the team can constructively deal with disagreements, frictions and

... surfacing and transforming tensions and conflictual relationships among the participants, so that differences in perspectives and interests can be worked with productively?	differences of opinion and evaluations in general. Agree on communication norms and on forums for problem-solving.

6. Management of energy levels ... designing the work process in order to support energy levels and concentration?	• As a project leader, attend to what happens to team members levels of energy. If the level of engagement wanes, take action to restore energy levels (e.g. more breaks, more variation in activity forms, more activation of team members).

7. Creativity ... creating conditions that stimulate a high level of creativity in developing ideas?	• Use standard brainstorming techniques at appropriate times. • Consider using non-verbal, symbolic means of representing ideas, such as drawing pictures, using metaphors, or other forms of creative arts.
8. Accountability ... strengthening the participants' feeling of accountability for taking action and achieving desired outcomes?	• Articulate individual responsibilities clearly and review progress at regular intervals. • Explore the reasons why other stakeholders do not feel accountable for taking needed action, thus increasing understanding of the need for team members own engagement.

II. ATTENTIONAL SUPPORT

Function to support	*Examples of what to do*

9. Structuring the work process ... structuring the work process clearly, so that the team focusses on one type of task at a time rather than talking about all kinds of things at the same time?	• Collaboratively identify types of tasks in the research process and agree on a terminology for tasks (such as problem structuring, data collection, analysis, reporting) • Clarify roles, including mandate and responsibilities regarding leadership. • Develop a structure for the team's work, drawing on methods such as SCA, SSM, TIP.
10. Learning ... supporting participants to reflect on insights and learning at regular intervals, in order to strengthen long-term learning?	• Set aside meeting time at appropriate intervals for reflecting on lessons learned.
11. Decongealing ... supporting participants in stepping out of ingrained frames of mind in order to approach the issues in creative and openminded ways?	• Review thoroughly the properties of (1) the *narratives* different team members and other stakeholders have regarding the issue; and (2) the *perspectives* relevant to analysing the issue. • Consider using non-conventional ways of representing the issue, such as making SSM-style rich pictures or interviewing dissimilar stakeholders about their narratives around the issue.

III. LEARNING AND PRODUCING KNOWLEDGE

Function to support	*Examples of what to do*
12. Issue focus ... formulating the issue/problem/task in such a way that participants are clear about and agree on the focus of the work?	• Use SCA-style or TIP-style mapping and progressively narrow range of issues to work on. • Explore stakeholders' concerns and reasons for concerns before choosing issue focus. • Make an inventory and deliberate on criteria for assessing priorities regarding issue focus.
13. Self-clarification ... clarifying the participants' own concerns, needs, interests and preferences?	• Have team members reflect on and formulate their own concerns, needs and preferences.
14. Complexity awareness ... supporting an inquiry into the complex conditions, causal connections and potential consequences so that participants gain a more comprehensive understanding of the issue complex?	• Assess the gap between the issues' level of complexity and the team members' awareness of and knowledge about the issues' complexity. If the gap is significant, spend time educating yourselves about the relevant complexities.
15. Whole system awareness/Context awareness ... supporting the emergence of a stronger whole system and context awareness?	• Do a comprehensive problem analysis by reviewing and describing historical trends in and properties of the present wider context of the issue (e.g. technological, economical, social, cultural, political, environmental, demographical, juridical, organizational aspects). • If team members tend to focus on a restricted aspect of the problematic (e.g. their own handicraft), take care to emphasize the big picture, e.g. by making pictures of the whole system and referring to these pictures often.
16. Stakeholder awareness ... developing an awareness of the spectrum of relevant stakeholders and an understanding of their respective interests	• Set aside one session to make an inventory of relevant stakeholders and describe their respective concerns, interests, narratives, restrictions, resources, etc. • Review need to consult or involve different types of stakeholders in various parts of the research process.

and perspectives?	• When planning how to report results, review stakeholders again.
17. Perspective awareness ... supporting an increased awareness and understanding of the respective properties of different perspectives that may be used in making sense of the issue, so that participants can productively use several perspectives when deliberating causality and actions?	• Describe and compare properties of different interpretive perspectives. • If there is a potential for gaining deeper knowledge or developing better quality recommendations by working with several perspectives, consider using an issue framing procedure, such as in TIP.

18. Common ground ... developing a shared description of the issue complex and consensus on recommendations?	• Review the extent of agreement and disagreement respectively regarding conclusions and discuss how to handle remaining disagreements constructively.
19. Decision-making ... supporting the decision-making process, so that the process leads to well-founded concrete decisions.	• Regulate early how decisions are to be made. • If significant decisions have to be made by the team, use decision-making support techniques to clarify alternatives, review criteria for making choices and come to decisions.
20. Support implementation ... organizing the different steps in implementing decisions.	• Use forms that specify what shall be done, who is responsible, when it shall be done, how it shall be followed up and any considerations that need to be noted in relation to each task.