

Experiences from transdisciplinary workshops: Co-learning about the effects of global change on farming and rural areas

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Abstract

The Austrian research programme 'proVISION – Planning for Nature and Society' launches research activities on sustainable development. The article describes experiences with transdisciplinary research methods in one of these projects. Within the project future.scapes impacts of global change on farming and rural society in Austria are analysed and strategies to mitigate potential negative effects are developed. A series of workshops were designed to allow the co-production of knowledge, using scenarios as methodological link between scientific and non-scientific experts. As the goal was to ensure gender-balanced views the workshops were held separately with men and with women, predominantly from a farming background. With each group two full-day workshops were held. The first workshop focused on the effect of climate change on farming, the second on the effects of demographic change on rural areas. The scientific perspective and analyses on the topics were introduced to the workshop participants by invited experts. The remainder of the day was structured using various moderating techniques to elicit the participant's views of the issues. Scenarios of possible futures (desired and dreaded) were drawn and allowed to make explicit the interconnections between the drivers of global change and the local institutions, economy and society as perceived by the workshop participants. The workshops were lead by a professional moderator to ensure that the scientists were free of organisational duties and could work side-by-side with the other workshop participants. This setting allowed for an intensive dialogue between project partners from science and practice. The paper details the methods used in the workshops and analyses to what extent they allowed to co-generate knowledge by merging the views of scientists with those of practitioners. The emphasis is thus on the procedural aspects, rather than the results from the scenario.

Keywords: transdisciplinarity, workshop organisation, participatory approaches, farmers, Gars am Kamp, Austria

Introduction

As farmers cultivate most of the Austrian valleys and plains, they shape the cultural landscape, influence environmental quality and are the backbone of the rural areas. However, the effects of global change present an increasing threat to farm survival – a problem which is analysed to detail in the research project 'future.scapes'³ which is part of proVISION, a large Austrian research programme on challenges to sustainable development⁴. As the knowledge about the local effects of global change is still scarce and afflicted with high uncertainty, it is crucial to understand how globally induced changes might affect specific rural areas. To capture the perspectives and knowledge of the farmers, the research team organised a series of four workshops in the study site. During these, potential future developments of the region around the city of Gars am Kamp (see Fig. 1) were anticipated and scenarios developed.

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³ See <http://systemsresearch.ac.at/projects/futurescapes/>

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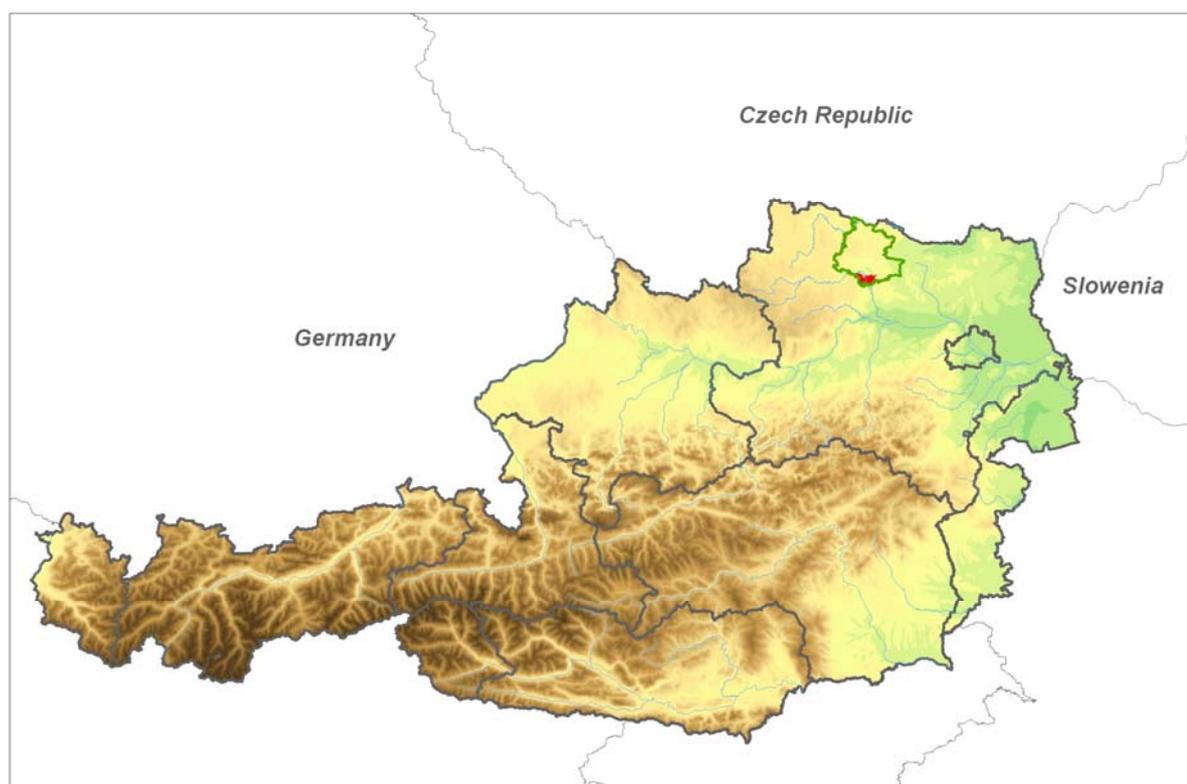


Fig. 1: Topographic map of Austria with the location of the study area: the city of Gars am Kamp and the District Horn.

As with other research focusing on sustainability, one of the major goals of the workshops was to enhance social capital and the collective capacity to respond positively to sustainability challenges (Blackstock et al., 2007:726). In the process of change towards sustainability, the importance of learning for both scientists and practitioners cannot be emphasised enough. For learning to occur an open environment, where practitioners hear what science has identified as likely developments and researchers learn about the specifics of the local situation, is necessary. The goal of the workshops was thus to achieve a mutual learning process in which both farmers and scientists are involved, and to achieve 'double-loop' or 'second-order' learning, i.e. new insights should not only be generated about the solutions to a certain problem but also into the problem itself and the context in which the decisions take place (see van de Kerkhof and Wieczorek, 2005:735). During this collective process, scientists and farmers generate new insights into, and a better understanding of, the different perceptions, ideas, interests and (normative) considerations that exist with regard to the nature of the likely impact of global change in the region. These new insights may lead to a change in the way of thinking of both practitioners and researchers.

The focus on the process and on mutual learning (rather than aiming at a clearly identifiable product or action to implement) was also selected in view of the insight, that most of the complex problems facing decision-makers today are messes to be managed, rather than problems to be solved. Indeed: "Managers are not confronted with problems that are independent of each other, but with dynamic situations that consist of complex systems of changing problems that interact with each other. I call such situations messes. Problems are abstractions extracted from messes by analysis; they are to messes what atoms are to tables and chairs" (Ackhoff 1979 in Rosenhead and Mingers 2001:4-5).

Given this characterisation of the problem to be tackled, a transdisciplinary approach was selected. Although there is yet no agreed-upon definition of transdisciplinarity (different 'schools' emphasise different aspects of the research process), most authors agree to following characteristics of transdisciplinary research: it addresses real-world problems (rather than being curiosity driven or guided by disciplinary interests), it includes interaction

with societal actors, it integrates knowledge from several scientific disciplines as well as practical knowledge, and it is context-sensitive in its recommendations (see Bergmann et al, 2005:16). Transdisciplinary research thus attempts to grasp the complexity of problems, take into account the diversity of life-world and scientific perceptions of problems, link abstract and case-specific knowledge, and develop knowledge and practices that promote what is perceived as the common good (Pohl and Hirsch Hadorn, 2007:20). The goal is to achieve an impetus for discourse and changes in the realm of practice as well as an impetus for discourse and innovation in science.

This approach is quite similar to participatory sustainability science, which Blackstock et al. (2007:729) define as “the co-generation of knowledge about socio-ecological systems drawing on multiple understandings in an ongoing collective dialogue in order to transform practice, where academics and stakeholders are all co-researchers”.

We thus followed the constructivist approach to learning, in which learning is regarded as an active process of constructing rather than one of acquiring information. Learning is seen as a mutual engagement and continuous attempt to construct and maintain a shared concept of a problem, by discussing ideas and exchanging arguments. Given the strong impact of self-direction and knowledge co-construction on learning, we cannot influence the conditions for the occurrence of learning directly. Rather, we structured situations where learning is most likely to occur.

The goal of the workshop was thus to offer a learning environment, i.e. tasks that would allow for farmers and researchers to enter into co-construction of knowledge and thus learning. To achieve this, scenarios were used as “boundary objects” (Star and Griesemer, 1989). They allowed to organise the participant’s visions for change, the future opportunities and threats they perceive as well as discuss the dynamics of change. Scenario building has been defined a “process of positing several informed, plausible and imagined alternative future environments in which decisions about the future may be played out, for the purpose of changing current thinking, improving decision making, enhancing human and organisation learning and improving performance” (Chermack and Lynham, 2002 in Chermack 2007). The aim is thus not to predict the future, but to examine and reconstruct mental models of how the world works and to reach a shared understanding of contingencies and possible actions and how intended results could be achieved. Building scenarios can thus bring about change by altering the ways in which the participants view the world in which they are operating. This shift in thinking can provoke other shifts in learning and decision-making (Chermack 2007:6).

Preliminary considerations on the organisation of the workshops

For this study the region of Gars am Kamp was selected. As the region had experienced dramatic floods in the year 2003, followed by a drought year in 2004, farmers knew from own experience what type of effects climate change, and the resulting increase in extreme weather events could bring.

Following the literature, the issues in global change most affecting crop farmers in the Gars region were identified as: climate change (especially the increased risk of weather extremes such as drought and intense rainfall as well as the increase of average temperature and thus the appearance of new pests and diseases) and demographic change (especially the threat of depopulation of rural area and the increase the share of people aged 65 and over). Of course agricultural policy and the globalisation of markets for agricultural goods are also important influences, as are newer developments such as the production of energy crops in view of increasing prices for crude oil.

Participation in the workshop was open to all interested people. However, given that the local project partner is an association (the ‘Landentwicklung Gars’ or ‘Rural Development Gars’) whose members are predominantly farmers, in practice most of the participants were farmers. Although this might bear the risk of not adequately representing the broad range of stakeholders present in the Gars region (e.g. government, business, societal organisations, knowledge institutions, etc.), the risk of a bias is reduced by the fact that the focus is on the

challenge for farming in the face of global change, and that most farmers are pluriactive, i.e. pursue a (part-time) employment off-farm. Especially the wives of farmers tend to work-off farm, so that the workshop participants in effect tended to carry multiple 'hats' and were thus faced in everyday life with the challenge of integrating the developments and challenges of various economic sectors and of the civil society. As the results of the scenario work shows, the participants had a thoroughly integrative perception of their region, being aware that the future of farming is intimately linked to the future of other sectors of the economy.

The workshops were separated by gender, i.e. two full-day workshops were held with men only and two with women only, each going through the same steps. Although this might have lowered the opportunity for learning, it ensured that the women would be given equal voice and that men's perspectives, even if they might perceive themselves as the main stakeholders and decision-makers, do not override women's viewpoints and interests. Also, as the research topic is not gender-neutral (e.g. women tend to have different risk perception regarding climate change and women tend to bear most of the burden of caring for the elderly), it was expected that by working with both groups separately, would allow to better identify the needs and priorities of each group.

The workshops were accompanied by a professional facilitator from an independent organisation who has in-depth experience workshop methods and process management. This proved to be a key to the ability of the scientists to work together with the farmers, as both were equal participant in the workshops. Often, a researcher will also moderate a workshop, thus switching roles between participant and organiser/facilitator which can confuse the other participants wondering in what role the researcher is acting at any specific moment. Given that the organisational responsibility during the workshops clearly rested with the facilitator, the researchers were free to focus on content-issues and discussions with the other participants. The fact that the professional facilitator was a man did not seem to disturb during the women-only workshop, which might be due to the fact that he was the only man present (with 8 women) and that he was not involved in content-generation but only responsible for the structure and the process in the workshop. The design of the workshop was planned together with the facilitator. This allowed to ensure that the procedures would enable the participants to work through a thinking process, taking their own practical knowledge and experience of reality, combining it with scientific data and processing it to produce scenarios.

In scenario-building the focus on the long-term (30-50 years ahead) can stimulate participants to take some distance from their daily concerns and interests and encourage them to become imaginative and creative, to see implications and new opportunities for action. However, given the rapid rate of changes and the 'surprises' (i.e. unpredictable new developments due to complex interdependences), we decided to settle the scenario horizon at the year 2020. This is far enough to allow for significant changes (e.g. the current programmes within the Common Agricultural Policy end in 2013). It is yet close enough to ensure that the participants will feel that it is a future they will live through and thus increase involvement and commitment in the scenario building process.

Workshops: the sequence of activities

The sequence of activities for the first workshop day was:

- The day started with a presentation by a scientist on climate change and its potential impact on agriculture (duration: approx. 40 min.). The presentation was meant as an introduction to the issues of the workshops, for participants to 'tune-in' to the issues and hear the state-of-the-art in scientific results. The scientist ensured that he presented in an understandable and accessible way and carefully avoided academic jargon.

- Then, to allow participants to ‘digest’ the information they received and articulate their own views on the issue, a World Café⁵ was held. Each ‘coffee table’ had as a background a poster related to climate change. The participants walked in small, changing groups from table to table, discussed various issues and were asked to write their thoughts on the ‘table cloth’. The researchers discussed with the other participants (and often functioned as scribes, since some farmers were reluctant to write their thoughts (fear of the thought not being ‘important’ enough? Fear of making spelling mistakes?). Having their associations written by the scientists also seemed to validate their train of thought, as if it was a confirmation that they have something valuable to say). The themes of the posters were:
 - General framework, overall societal developments (agricultural policy, societal expectations, information technologies)
 - Impact of global climate change on agriculture (expected long-term changes in average temperatures, interrelation between climate and crop yields for key crops)
 - Extreme weather events and their potential impact in agriculture (e.g. heat waves, storms, floods and droughts)
 - Green house gases and climate change: expected developments and role of agriculture (contribution of agriculture to the production of GHG and potential of agriculture as a ‘sink’ for GHG)
 - Climate change and gender: Climate change are perceived differently by men and by women, they have different priorities and policy preferences
- The next step was a written brainstorming session. Questions addressing the overall issue of “global change and local impacts” were written on 10 flipcharts. Participants walked from one flipchart to the next alone. They wrote their personal thoughts on each issue on the flipchart, and commented on the thoughts that other participants had written. As a final step, the participants selected the most important contribution on each flipchart (each had 3 points to give to the comments on each flipchart). The questions on the flipcharts were:
 - Where are the opportunities for my farm in the future?
 - Where are the threats for my farm in the future?
 - What are the most important global drivers that have an impact on our agriculture?
 - What will be the most important effect of climate change on my farm?
 - What do we need to learn quickly to be able to survive as a farm?
 - Which aspects of farm life in Gars should under no circumstance get lost?
 - For which vision and goals am I willing to get personally involved?
 - Gars in 2020: what will visitors say about our landscape?
 - What would the men/women say about Gars?
 - What I also wanted to say...

The goal of this exercise was to widen the view (from the previous focus of climate change) and ensure that the local context was taken into account. It was a step from a more general, abstract discussion towards a more concrete, localised consideration of potential futures. The fact that the work was to be done alone also allowed the participants to focus on their own views and thoughts, which can encourage the ‘quieter’ participants to communicate their associations. This was the only activity where the researchers were not participating, since the goal was to elicit the views and priorities of the farmers.

- Finally, two sub-groups were formed as asked to fill-out a A3-sized page with the central question “What is your desired vision for Gars in the year 2020?” and “What is your worst-case vision for Gars in 2020?”. At approx. half the time for this activity the sheets were exchanged between the two sub-groups, so that each sub-group had the opportunity to include their thoughts for both visions. There were approx. 17 empty

⁵ see www.theworldcafe.com

fields on each sheet (this helped ensure that the participants did not stop after two or three concepts, but pushed further to think about less obvious aspects). The researchers participated in the discussions in the sub-groups and encouraged the farmers to write down their thoughts.

To allow for some time for reflection the two full-day workshops held for each group (men and women) were held two weeks apart. This allowed all participants some time for reflection and the researcher the time to collect additional data to corroborate/substantiate the analysis of the driving forces that the participants had established during the first workshop day

The concepts and ideas written on these sheets (as well as elements from the previous activities) were used to prepare cue-cards for the scenario-building exercise in the second workshop day. Each concept was copied from the A3-sized pages and illustrated using the results of scientific data (where available). This allowed the perception of the participants to be linked to results from studies, thereby showing where the perception and the facts are congruent, and where they differ. Of course, since the concepts written by the participants were ideal situations of Gars in the year 2020, there is only a partial fit between them and results from studies. However, it is possible to see if the trends identified in studies are congruent with the developments foreseen by the participants.

The cue-card were printed out in colour and were the link between the first and the second day of the workshop, which took place two weeks later. The sequence of activities for the second workshop day was:

- Presentation by a scientist on demographic change in Austria and potential impact on rural areas. As during the first day, this allowed the participants to get input and see how scientists assess the situation, which aspects they think are most important and which impact science expects from the on-going demographic change.
- Then the work on scenario-building started. To explore various options, a best-case and a worst-case scenario were to be built. The participants were thus split into two sub-groups, with a researcher in each group. The groups used the illustrated cue-cards as a starting point and were free to add new aspects as well as discard cue-cards if they felt they did not fit). The cue cards were glued on a large paper (larger than A0) and (causal) links drawn between them. This allowed to 'play' with the set of issues until they are reshaped and regrouped in such a way that a logic emerges and a story can be told. In the process the potential interaction between certain variables is discussed in a way that challenges or provokes new perceptions and thinking about potential courses of action. Once the group reached consensus, the issues to be grouped and the interactions between the issues to be drawn, and causal chains, as perceived by the participants to be represented graphically.
- Since the graphical representation was rather detailed (many issues and many links), the sub-groups summarised the results of their scenario-building on an A3-sheet. The sheet was structured so as to elicit the six primary drivers of the scenario and a short explanation why this driver leads to (un-)desirable outcomes. This allowed to sort through the multitude of causal chains and synthesise them to identify the key drivers.
- Back in the plenary setting, each sub-group presented their scenario to the other group. The other group was supposed to question the validity of the causal chains established to build the scenario and ensure that no important issues were missing. However it proved difficult to achieve a real debate (too late in the day?).

Reflections on the workshop process

The use of a designated, professional facilitator turned out to be a major strength for the smooth flow during the workshops. On the one hand it freed the researchers from any organisational issues during the workshop and allowed the researchers and the farmers to be participants on equal terms. Indeed, by clearly communicating that the researchers are

participants only, it can greatly contribute towards reducing perceived differences in status (e.g. if farmers perceive the researchers as more knowledgeable and thus might be reluctant to question an opinion voiced by a researcher and/or perceive the researchers as those deciding what to do and how to do it). Still, for the researchers it often remains a balancing act between eliciting knowledge, encouraging farmers to speak their mind and engaging in discussions. Also, professional facilitators must be planned for in the budget of the project!

The setting of the workshops (mostly the fact that two full days were devoted to the project, and the ability to discuss and integrate the factual information provided in the expert presentation) allowed the participants to become involved. Involvement is important as actors are unlikely to change their understanding of a complex problem situation if they are merely provided with new ('factual') information (van de Kerkhof and Wieczorek, 2005: 739). Indeed, understanding a problem requires not only factual and empirical knowledge but also insight into the normative aspects of the problem, which may partly be unconscious. Ignorance does not primarily follow from a lack of information on the 'facts' but from a lack of insight into the (conflicting) normative assumptions underlying the different viewpoints (van de Kerkhof and Wieczorek, 2005: 739).

Presentations by scientists were also important for the success of the workshops as they allowed the farmers to have direct access to scientific expertise and hear information that may not usually be accessible to them. It was thus a clear 'added value' motivating farmers to attend the workshops. There were somewhat fewer women attending the workshops compared to men (6 women compared to 12 men). This might be linked to the fact that most women work off-farm and perceive the farm as being their husband's domain. Also women tend to have more household duties and it is thus difficult for them to attend whole-day meetings. One of the workshops was held on a Saturday to allow employed women to attend. However, that weekday is not very suitable either, as the week-end is perceived as family time (and time to attend to their household tasks), which is especially precious for those women working off-farm.

Working on the best-case scenario turned out to be much easier and pleasurable for the participants compared to rigorously thinking through the worst-case scenario. To them "thinking the unthinkable" was not an attractive exercise and it went against their optimistic and active engagement with the opportunities as they arose. In the worst-case scenario, farmers are mostly passive victims of global drivers, unable to counteract the effects of external threats, which is not a vision participants wanted to paint in detail. However, only when pushing through the blind spots and thinking through the unwanted consequences the participants realised that this worst-case scenario was plausible too and action was imperative. And this is the value of scenario building: it forces the participants to see more clearly the possible worlds in which the unimaginable, the unthinkable and the unpredictable actually come to pass. If the participants can imagine such worlds, and work with them conceptually for a while, then they can prepare themselves for whatever future does come to pass. The scenarios warn of challenges we may well face tomorrow. More importantly, the experience of confronting the future with rigor tends to leave most people energized.

The goal of the workshops was thus not on a 'solution' of a problem, nor on ensuring some technological implementation. Rather the objective was to enhance the process of the social resolution of the problem; participation and mutual learning among participants (see Funtowicz et al. 1998:104). Whether that goal has been achieved is difficult to assess. An indicator might be that most of the participants who attended the first workshop-day were also present at the second day. This can be seen as an indicator that participants were committed, that they appreciated the opportunity for learning as they were provided with information that they deemed relevant and that they had sufficient opportunity and freedom to voice their views and feel that they were heard. Indeed, during the feedback, the farmers stated that they enjoyed the challenge of scenario building as they appreciated the opportunity to take a step back from their usual preoccupation with their short-term assignments and day-to-day worries and take a look at the bigger picture. However, whether

the workshops lead to a lasting impact in the perception of interactions and options for future action is hard to establish.

Literature

- Ackhoff, R. (1979). The future of operational research is past. *Journal of the Operational Research Society* 30(2): 93-104.
- Bergmann, M., B. Brohmann, E. Hoffmann, M.C. Loibl, R. Rehaag, E. Schramm and J.-P. Voß (2005). *Quality criteria of transdisciplinary research. A guide for the formative evaluation of research projects*. ISOE-Studientexte 13. Frankfurt: Institute for Social-Ecological Research.
- Blackstock, K., G. Kelly and B. Horsey (2007). Developing and applying a framework to evaluate participatory research for sustainability. *Ecological Economics* 60: 726-742.
- Chermack, T. (2007). Disciplined imaginations: Building scenarios and building theories. *Futures* 39: 1-15.
- Chermack, T. and S. Lynham (2002). Definitions and outcome variables of scenario planning. *Human Resource Development Review* 1(3): 366-383.
- Funtowicz, S., J. Ravetz and M. O'Connor (1998). Challenges in the use of science for sustainable development. *Int. Journal of Sustainable Development* 1(1): 99-107.
- Pohl, C. and G. Hirsch Hadorn (2007). *Principles for designing transdisciplinary research*. Munich: Oekom Verlag.
- Rosenhead, J. and J. Mingers (2001). A new paradigm of analysis. In: J. Rosenhead and J. Mingers (eds.). *Rational analysis for a problematic world revisited*. Chichester. John Wiley & Sons, pp. 1-19.
- Roux, D., K. Rogers, H. Biggs, P. Ashton and A. Sergeant (2006). Bridging the science-management divide: Moving from unidirectional knowledge transfer to knowledge interfacing and sharing. *Ecology and Society* 11(1):4. [online] URL: <http://www.ecologyandsociety.org/vol11/iss1/art4>.
- Star, S., L. and J. Griesemer (1989). Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science* 19: 387-420.
- Van de Kerkhof, M. and A. Wieczorek (2005). Learning and stakeholder participation in transition processes towards sustainability: Methodological considerations. *Technological Forecasting and Social Change* 72: 733-747.