Presentation addressing the question *'How do they (researchers and non-researchers) work together to produce new knowledge, to develop new understandings, and learn from one another?'*

The co-production of knowledge about alternative agro-food networks: experiences of involving civil society organisations (CSOs) in 'co-operative research'

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Abstract

This paper discusses the concept and practice of knowledge integration in a co-operative research process by reflecting on the experiences gained in a project, which involved researchers from academic institutions and practitioners from civil society organisations in research on 'alternative agro-food networks'. The transdisciplinary process was designed in altering phases of differentiation and integration steps in order to make different motivations, expectations, interests and knowledge explicit, and to integrate these differences in joint efforts. This paper focuses on the relevance of differentiation and integration in the context of knowledge integration and illustrates how these concepts have been implemented in practice. Our experiences illustrate that the implementation is complex, and that the knowledge integration process is determined by certain conditions.

Keywords: *'co-operative research', transdisciplinarity, knowledge integration*

Introduction

'Co-operative research' has been defined in 2005 in the scope of the expert workshop 'From Science and Society to Science in Society: Towards a Framework for 'Co-operative Research' organised by the European Commission. The idea was rooted in a demand for democratising science governance and related policy decisions through recognising the value of different forms of knowledge and expertise. The resulting report defined co-operative research as "a new form of research process, which involves both researchers and non-researchers in close co-operative engagement" (Stirling, 2006:9). This specific form of scientific and practical inquiry requires a close engagement of the involved actors in order to explore the aims and purposes, the alternative orientations, and the wider social implications of research and/or innovation. In principle a variety of specific approaches could ensure an inclusive engagement in different contexts and at different stages, levels and scales in science governance. Since co-operative research is a rather new concept in the literature and little

methodological discussion exist on this very specific topic, we decided for a rather pragmatic approach: linking the idea of co-operative research with existing concepts, that tackle the co-operation of researchers and non-researchers as central aspect - such as transdisciplinary research.

We consider transdisciplinarity to be a useful approach to carrying out co-operative research because it orients research towards participants' needs and towards developing actor-oriented strategies, which support the empowerment and agency of participants involved in research. The close engagement of actors from academia and practice aims at serving the development and implementation of actor-oriented strategies to solve the problem at stake. Thereby transdisciplinary research aims at overcoming the mismatch between the production of knowledge in academia and the requests for knowledge to solve complex problems (Godemann, 2008). Furthermore the concept emphasises the need for bottom-up engagement by involving non academic actors from the beginning to allow for the co-shaping of the research process. All these aspects characterising transdisciplinary research are in line with the basic ideas of co-operative research.

An important aspect of co-operative research refers to the way in which knowledge is used and integrated. The goal of co-operative research is to produce knowledge, which goes beyond the narrow designation of being called 'academic' or 'scientific' and embraces different kinds of knowledge represented by different actors participating in the research process. Such other kinds of knowledge may constitute of tacit, local, common-sense and non-expert knowledge. The process of knowledge production is defined as a relational action-oriented process, which acknowledges *"the crucial role played by cultural values, sectional interests and political and economic power in the shaping of knowledge"* (Stirling, 2006:21). This is reflected in the notion of 'framing of knowledge', which refers to the process of giving knowledge a certain form or shape, prioritising its most important elements, stressing some dimensions versus marginalising others, referring to other concepts and parts of knowledge and interlinking it with the perception of societal problems, interests and needs. Framing is related to various stages of the research process, like framing the problem at stake, formulating the research questions, the choice of methods, and the interpretation of data. All these activities are shaped by the goals, values and pre-assumptions underpinning the research process, thus framing plays a crucial role in co-operative research. Participation in co-operative research is based upon the assumption of the equal status of different kinds of knowledge. Taking this into account in the research design has an important impact on the framing of knowledge production. Such a perspective on the framing of the knowledge production process leads us to the 'transdisciplinary integration concept' (cf. Klein, 2004; Loibl, 2005; Pohl & Hirsch Hadorn, 2006; Bergmann et al., 2008), which offers a useful conceptual framework for knowledge integration in the context of co-operative research. The 'transdisciplinary integration concept' epistemologically emphasises the integration of knowledge from several disciplines and from non-academic fields by transcending and integrating disciplinary paradigms and the realm of practice that the research is related to. The outcome is an integrated knowledge, a kind of 'hybrid knowledge', which is the result of 'making sense together' (Klein, 2004).

In the scope of this paper we will reflect on the practical implementation of knowledge integration within a concrete co-operative research activity. In order to approach this phenomenon we are discussing three central theses:

1) Making differences within the team explicit is a prerequisite for meaningful knowledge integration.

2) A common ground based on mutual understanding of differences is necessary for integrated knowledge production.

3) A shared frame of reference is the basis for negotiation and decision making processes, which integrate the existing differences.

The FAAN project

Our reflections on the process of knowledge integration are based on experiences gained through an experimental project called 'FAAN – Facilitating Alternative Agro-Food Networks: a Stakeholders' Perspective on Research Needs'[1]. In FAAN co-operative research was implemented as a transdisciplinary process engaging five civil society organisations and five academic institutes from five European countries[2]. The aim of this project was to investigate alternative agro-food initiatives in order to identify policies and other factors influencing their development, to discuss further research needs in this field, and to test and evaluate the co-operative research process. We considered research on alternative agro-food networks as suitable for trying out co-operative research, because agriculture in general and alternative agro-food networks in particular are complex, multidimensional and inter-sectoral subjects, and they are characterised by an intense interaction of Therefore possible visions of sustainable agricultural production for the future should be defined not only by including different knowledge dimensions (the environment, the economy, technology, society, policy and values) but also by taking into account viewpoints of different actors from society. Smith et al. (2004) argued that in order to provide effective solutions or responses to the major constraints of agricultural and rural development, various challenges have to be considered (e.g. related to policy and institutional issues, or to social and economic problems). Moreover, "*These represent formidable and complex challenges that cannot be tackled by researchers working alone or even amongst themselves in multi or trans-disciplinary teams. They need to work across stakeholder groups and engage civil society organizations such as farmers and their associations, relevant NGOs, private sector groups such as processors, commodity and input traders, and other relevant civil society groups.*" (ibid: 2)

Data

Data presented in this paper are based on an interpretative analysis of diverse material collected in the scope of reflexive project steering. Data were gained during the course of the project through:

I) A questionnaire was circulated among project partners before the first consortium meeting in order to explore their motivations for participating in FAAN, their expectations in regard to outcomes, their envisaged roles within the project, the expertise they intended to contribute, and former experiences in

similar research activities. Answers had to be provided on an institutional team level. The main aim of this questionnaire was to gain meta-knowledge on all these aspects in order to identify differences and common grounds.

II) Reflection exercise: Another set of data was generated through answers to a group reflection exercise, which was carried out in the middle of the project run. In order to facilitate the differentiation and integration processes within national teams[3], team members were asked to discuss and reflect on the partnership of the academic and CSO partners in each country. The reflections focussed on the research design and its practical implementation in general, and on interaction processes and learning experiences in particular.

III) Reflection and feedback sessions during consortium meetings: For some aspects related to differentiation and integration of knowledge, learning experiences and interventions, we carried out feedback sessions and reflection exercises during consortium meetings aiming at reviewing and adopting the co-operative research model, identifying the most important aspects of co-operative research, and evaluating the co-operative research process.

IV) Notes from observations during discussions and within the scope of correspondence: During the whole course of the project notes were taken on process relevant observations and statements. In addition, all consortium meetings were recorded to be used for the analysis of the process.

Methodological challenges we are facing with regard to the analysis of the co-operative research process are related to the various role(s) we had within the FAAN project as coordinators, as part of the research team, and as facilitators and observers of the process. The role of facilitating the process while co-shaping it by participating in all project activities has been a demanding task. On one hand the facilitation needed to be based on being aware and open to consider specific aspects determined by the confrontations between actors with different backgrounds (researchers vs. practitioners, various disciplines) and cultural relativism (diversity of working cultures), on the other hand these aspects, of course, included our own specific approach. Indeed it was a demanding exercise for all project partners to critically reflect on a current project while working on it, since this requires a potential for self-criticism. In general reflection and self-evaluation is done more easily after the completion of a project, because this allows for an increased epistemological distance and greater detachment from own interests, as well as from the idiosyncratic position of any participant in the project.

Towards a meaningful knowledge integration process

Specific process design

The decision to carry out co-operative research within FAAN was based on the intention to involve practitioners and other stakeholders in a different way than it is usually the case in participatory research. The desired and expected involvement was characterised by a strong bottom-up approach of already setting up partnerships in the incipient phase of developing the project idea and writing the proposal. We would like to underline that in fact some basic ideas for the FAAN proposal originally

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[3] Each national team consisted of one CSO and one academic partner, comprising 4 team members in average.

came from a CSO partner, and while elaborating the project outline many partners contributed considerably. In elaborating the concept for FAAN we tried to systematically address and consider the main features of co-operative research, namely the integration of different kinds of knowledge, a bottom-up engagement and a permanent reference to the policy making process. In addition, we ascribed a crucial importance to a step by step process design to be developed and adjusted according to the results from process reflections.

As a methodological framework we decided to apply transdisciplinary research because it seemed to be the most appropriate approach since we found several aspects corresponding to the concept of co-operative research as described in the introduction. Thus, in the FAAN project the process design has been elaborated based on concepts for the implementation of transdisciplinary research methods (c.f. Bergmann et al., 2005; Jahn, 2005; Pohl & Hirsch Hadorn, 2006), namely along alternating phases of 'integration' and 'differentiation' steps. Both phases were characterised by a process of interaction between project team members and further participants that allowed them to express their individual interests and viewpoints and knowledge to be exchanged, discussed and shared. While *differentiation* steps were supposed to make differences explicit, integration steps served to identify common grounds and to implement identified differences in a way which created the basis for agreement on the next step in the project.

The core aim of all efforts in designing this process was to provide conditions which allow for a meaningful integrated knowledge production. In the following section we will reflect on the core theses, which we refer to in the context of knowledge integration, and which we tried to consider in the project design.

1. **Making differences explicit is a prerequisite for meaningful knowledge integration**

Different (groups of) actors with various perspectives on the issue at stake were engaged on different levels in the FAAN project. There was close engagement of researchers from academic institutes and members from CSOs through 'equal partnership' in co-operative research activities. The core FAAN team comprised of nine people from five academic institutes (3 female, 6 male) and ten team members from CSOs (7 female and 3 male).[4] On the one hand we expected that actors from academia and civil society may not have the same perception of the problem field, on the other hand we also assumed differences *within* the group of academics and CSOs. This would also be related to different disciplinary backgrounds, expertises, and institutional and personal interests. It is not the fact of existing differences per se, which may cause problems for co-operation, it is more about becoming aware of the existing differences and to find a way to handle them (Loibl, 2005). To make this explicit, meta-level information on potential differences was provided. Team members were asked to share information in regard to their motivations for participating in FAAN, their expectations of outcomes,

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[4] In addition, in each of the participating countries several stakeholders have been involved (e.g. farmers' organisations, local action groups, public authorities, policymakers, smallholders, consumer groups, journalists). Their engagement in the FAAN project occurred formally or informally by using different 'strategies': via direct involvement of people in the empirical work (e.g. interviews, focus group discussions, and workshops); via introducing FAAN at scientific and non-scientific events; by publishing information about FAAN in different kinds of media and thereby attracting interested people; and via official or personal contacts of team members seeking exchange, support or advice.

their envisaged roles within the project, the expertise they intended to contribute, and former experiences in similar research activities.

1.1. *Different motivations involve different commitments to knowledge integration*

Our basic assumption was that there would be divergence in regard to academic and CSO partners' motivation to participate in FAAN, put simply: academics would like to bring forward the academic discussion; CSOs would aim at coming up with concrete problem solutions directed towards different potential beneficiaries from the practical field.

To grasp the rationale behind academic and CSO partners' motivation to participate in FAAN, we distinguished between three perspectives: a normative, a substantive, and an instrumental perspective. For this paper, the substantive dimension is most relevant, because it refers to the process of knowledge production. It relates to the concrete way of generating and integrating diverse types of knowledge by also eliciting salient forms. Rather than focussing on the participation as an aim, the added value within this dimension is based on improving outcomes by valorising different ways of knowing, being, and meaning. We argue, thus, that this dimension can be used as an indicator for the general commitment to support the knowledge integration process.

In terms of differences with regard to all three dimensions, academic partners' expectations and motivations to participate in the project related more to the normative and substantive dimensions, while interests indicated by CSO partners were more in line with the instrumental dimension (e.g. campaigning, lobbying and influencing future policies). Nevertheless, even though we could identify certain trends within these two groups, no clear distinction between CSO and academic teams' motivation was possible. This may be traced back to the heterogeneity within these two groups – both with regard to the participating institutions and to individual team members.

By comparing the overall emphasis on these three dimensions in regard to the research and knowledge production process, it was found that the substantive dimension was indeed of highest relevance. This can be explained by the specific focus of the project on knowledge integration. Partners not being attracted by the general underlying idea would not have been interested in participating. One might argue that the substantive dimension may also be instrumentalised, e. g. by providing arguments along the line of producing outputs of higher societal relevance and of higher legitimacy. We consider such a perspective as an additional incentive for showing high commitment to an integrated approach.

1.2. *Meta-knowledge on different types of expertise determines the performance of different roles in the knowledge integration process*

When knowldge is exchanged within a group, there is always shared and unshared knowledge, each participant possessing both (see also 2.1). Shared knowledge is known by all group members, while unshared knowledge is possessed by only one or a few people, which can be considered to be their specific expertise. As revealed in social psychology (cf. Greitemeyer et al., 2006), shared knowledge has advantages in terms of acceptance, thus group decisions are preferably based on such knowledge. Shared knowledge is usually based on a common ground (Stewart & Strasser, 1995), but knowledge integration should go beyond this, integrating very specific expertises to achieve an added

value. The exchange of unshared knowledge can enrich this process considerably. Since it is more likely that people contribute shared knowledge, we argue that it is important to force the exchange of unshared knowledge through facilitating arrangements. As studies have shown (cf. Littlepage et al., 1997), meta-knowledge of the expertise available in the group has a positive influence on this. Providing such meta-knowledge also links to the roles ascribed to team members. The conscious attribution of specific roles to oneself and to others impacts on the confidence to contribute specific expertise in the interaction process. The more explicitly this is carried out, the better it can prevent hidden power relations in the knowledge integration process. This is especially important for the integration of 'informal' forms of knowledge. Partial or uneven integration is often based on an unbalanced valuation of different forms of expertise and their legitimacy, either because of a lack of awareness of different forms of relevant knowledge or due to a poorly conceived negotiation process.

We identified a broad range of expertise within the FAAN team, some areas of expertise overlapping, others complementing each other. The overall 'map of expertise' turned out not to be in line with stereotypical expectations of the role of academic and CSO partners. Academic partners were expected to be the experts in research in general, and the role of CSOs partners was to represent civil society, to contribute their field expertise, to inform research about their needs, and to bring forward research for specific interests. In fact, the assumed roles needed to be redefined according to the interrelation of project partners for each co-operative activity to be carried out, because expertises were hybrid in some way. Several of the CSO team members held academic degrees, some had carried out research before, and a few academic team members turned out to be engaged in social movements or worked as consultants for CSOs. As reflections in regard to mutual learning processes during the course of the project revealed, the changing perception of 'who is the expert for what' actually caused disturbances unless clarified.

"*At certain points I was confused about who is actually the expert for what. I assumed that [name of the partner] is the expert for policy issues, but then I realised that it is us, who are deeper in the issue […] in certain situations we felt as being interviewees […] and in other situations we needed to discuss about the legitimacy of information resources […] this was really strange, I was not sure about our role […]* " (C7, RE)

It turned out that not every kind of existing expertise has been equally relevant. We tried to map the existing repertoire in the beginning of the project, but to reveal the actual relevance only occurred during the run of the research process In this context the flexibility of the FAAN research design on one hand proved to be a useful environment in order to handle changing roles in terms of adaptations to the work plan; on the other hand this flexibility also caused uncertainties about partners' role(s) in the research process.

1.3. *Different expectations of outcomes require a differentiation of the knowledge integration process.*

Not just FAAN partners' motivation and expertise was diverse, but also their aims and expectations of the project outputs. Academic partners' expectations of outputs were more or less formulated in terms of academic outputs, such as "*(…) identifying future research needs (…) visibility of results [on AAFNs] within the scientific community (…)*" (A3, Q). Policy relevant outputs were mainly addressed

by CSO partners, thus statements like *"it is quite important to get results which can be used for our political work (…)"* (C3, Q) or the expectation that the project bring *"(…) arguments to propose and defend innovative projects (…)"* (C5, Q) were not surprising. Expectations of outputs seemed to be in line with the dichotomy suspected, but boundaries became blurred in regard to the envisaged benefits resulting from research outputs. Both academic and CSOs partners were aiming at elaborating on results, with the intention of benefitting the subjects of research on a very practical level. As one of the academics summarised in his statement, and what had been addressed by others too, they were aiming at *"(…) developing practical knowledge and finding solutions (…)"* and *"giving voice to silenced and disadvantaged networks"* (A4, Q). Thus a commitment to the 'real world impact', which is often cited in literature on transdisciplinarity, was shared among partners, and consequently served as a common ground from the beginning. Nevertheless during the run of the project it emerged that conceptions of how this overall aim could be reached were divergent due to conflicting epistemologies. The main responsibility to keep track of this was ascribed to CSO partners. Some team members regularly appealed to be careful not to end up with an 'academic exercise', thus we strongly kept CSO partners' needs in mind. This approach, however, turned out to be perceived as imbalanced and disadvantaging the usability of results for the academic context by some academic partners.

"I had the feeling that we mainly took into account CSO partner's expectations. We should have considered more academic work […] we always were under time pressure, I expected more room for academic discussions […] I would have wished more of this […]" (A3, IP)

"I think some academic partners were a bit disappointed. Maybe the research level was not high enough for them. I don't know, sometimes I had this impression […]" (C3, RE)

Another aspect we would like to address is related to time: academic partners expected outputs by the end of the project, while CSOs already used intermediary results for their daily work. Aiming at concrete interventions, CSO's activities need to match with certain points of time which allow for intervention. While the scientific community widely tends to disclose preliminary results during the course of a research activity, CSOs are used to distribute new information within and outside their networks in order to induce interventions as soon as possible. Since inquiry is valued in and of itself in the academic context, research might be open-ended, iterative, and ongoing. For the CSO partners, however, inquiry is time-bound and valued only to the extent that it produces results that can be acted upon or put into practice. Thus we suggest taking the different expectations of the timeline for the use of outputs into account as an important factor for an integrated approach.

In fact, meeting all expectations of outcomes, considering the diversity of envisaged utilisation and purposes, is nearly impossible, and the project group needs to decide in which direction to go. Not least this also relates to pragmatic reasons, especially in the context of funded projects, which usually suffer from restricted time and financial resources. The inherent aim of transdisciplinarity to 'solve real world problems' implies a certain risk of neglecting academic approaches, which was criticised at certain points in FAAN. Thus a meaningful integrated approach should allow for differentiation not only before, but also after integration. Even if the final step of differentiation cannot be carried out within the project, the basis for a subsequent differentiation already needs to be considered in the integration process.

2. For integrated knowledge production a common ground based on mutual understanding of differences is necessary.

The common ground within a group might not only be related to common goals or interests, but also to communication, negotiation and decision making processes, which aim at reaching a mutual understanding.

2.1. 'Communicative action' influences the establishment of a common ground.

As already addressed above, making differences visible is a crucial factor for knowledge integration. The exchange of knowledge via discussions and other kinds of interaction has a specific role in this context. Julie Thompson Klein has denoted this 'communicative action' (2004:521) as an important step not only for defining the problems, concepts and methods for research but also for making differences explicit.

Knowledge exchange is the first step towards creating a shared pool of information which is accessible to all members of the project. This serves as the basis for the next steps of the process: negotiation and decision making. In contrast to such a shared knowledge repertoire, unshared knowledge is reducing the effectiveness of the transdisciplinary research approaches (Godemann 2008). Thus, there should be enough space for encouraging the exchange of unshared knowledge or disciplinary knowledge in order to offer a better understanding of potential solutions and strategies to be considered for solving the specific problem addressed by research. This supports the creation of a common ground which facilitates effective negotiation and decision-making processes (Godemann 2008). Different actors enter the process with different knowledge, different perspectives, different aims and expectations, thus mutual understanding needs to be achieved.

Within FAAN one of the highest priorities in regard to the co-operative process was related to acquiring a mutual understanding through communicative action in order to achieve coherence between discourse and practice. Since de facto all partners were involved in all activities, we had decided on high transparency and a mode of decision-making based on consensual agreement. We wanted to achieve a symmetric distribution of knowledge and equal opportunities for all partners to participate in any kind of relevant communicative action. Thus we installed a FAAN Wiki, where any kind of information and all documents were uploaded and we formed a habit of electronic exchange via mailing list, which gave all team members the opportunity to join discussions. In addition an anonymous Wiki area was set up to share delicate thoughts (e.g. criticism) without exposing oneself. This space has never been used by any team member.

Physical meetings turned out to be the most important forums for creating a common ground and the discussion and negotiation of project relevant issues. Discussions encompassed the work process (e.g. planning work, division of tasks, responsibilities, decision-making, etc.) as well as the content (formulating research questions, defining analytical categories, etc.) of our work. In order to allow for high participation, we introduced a kind of pre-information procedure to ensure the same level of information for all team members when starting the discussion. This procedure has been acknowledged as useful by most consortium members. Still, communication is not only related to the exchange of knowledge and information, even more important is social interaction. Thus we always

reserved some time for informal social interactions to get to know each other better, thereby establishing personal relationships and facilitating the team building process. This encouraged emergent networking, knowledge sharing, exchange of knowledge beyond the project activities, and integration:

"During the consortium meetings the social programme is a way to achieve integration, better knowledge and exchange. The vision that can be drawn on the same reality by the researcher's eye and the CSO's eye are directly confronted to 'what happens' in an informal way." (C52, e-mail correspondence with the authors: comments on a project report elaborating on the co-operative process).

Both communication and assuring a common ground for knowledge integration seems to have a crucial impact on the integration process and its results, as it has been addressed within a reflection on project outcomes:

"[…] sometimes enthusiastic results because of the variety of partners; sometimes deceptive, superficial and too simple analysis, because of the difficulty of defining enough common points." (A5, Q).

This statement illustrates the importance of making differences explicit on the one hand and on the other hand the necessity for reaching a common ground or a shared frame of reference as a key point for integrating these differences (see 3). Within the FAAN project team the existing differences were not very obvious, and this made the conscious differentiation difficult. When conflicting differences stayed hidden, power relations, but also alliances between group members gained relevance. It takes a certain time to realise and handle conflicts arising from such circumstances, since they occasionally occur covertly. This was confirmed by one of our 'external advisors', who joined the consortium meetings in order to comment on intermediary results, but also to observe the process. She informally told us during the fourth consortium meeting, that this was the first time that she was observing a considerably more effective discussion and negotiation processes. Although – or maybe *because* - the meeting had started with the escalation of a conflict, the group, to her, appeared to become a team openly addressing issues at that point. That observation we consider being an indicator for successful integration.

3. A shared frame of reference is the basis for decision making processes, which aim at an integration process.

Not only a common knowledge base, but also a shared frame of reference was considered being a sine-qua-non condition for successful negotiation and, implicitly, for the decision-making processes. The shared frame of reference can refer to the group's culture of interaction as well as to the group's shared reality and self-perception.

The ideal for constructing a common ground as shared knowledge and reality within a co-operative research activity is the achievement of consensus. Meta-knowledge about the individual realities is crucial in order to integrate them in a way that individual realities converge towards a shared reality. We argue that the clarification of what represents the common interest and the consortium's vision as a group is extremely relevant in the process of taking decisions which are broadly accepted.

Very early in the FAAN project it emerged that a shared idea about decision-making existed, based on a democratic ideal, which became apparent in the agreement that participatory and co-operative research methods are *"(…) valuable because they constitute themselves an experiment of 'participatory democracy and decision-making' on the micro level" (C4, Q).* In line with what has been described by Heng and de Moor (2003), we considered fairness in negotiation and decision-making processes as the cornerstone to meet this ideal. The most relevant issue within the democratic process was to find a balance between consensus and dissent.

As the experience within FAAN has shown, a negotiation process aiming at democratic, if possible even consensual, decisions is very complex and time consuming. This needed far more time than expected, also in comparison with most projects carried out by partners before. Presuming that this was an effect of the co-operative project design and the specific transdisciplinary approach, we learned that the additional effort for decision-making needs to be taken into account before entering the discussion and negotiation processes. Moreover, due to the recursiveness of an ideal-typical transdisciplinary process, considerably more decisions need to be made compared to other kinds of projects.

We did not set up specific rules for decision-making in the beginning of the project, but reaching a consensus on decisions was what we were aiming at – not only at the consortium level, but also within national teams. As addressed above, in reality, group decision-making among more than 20 people needs a lot of time, and turned out to become an exhausting exercise at certain points. A stronger facilitation of the process was expected to lead to more efficiency in making decisions under time constraints. CSO partners that have worked with community groups proved to be skilled in making group decisions with a high level of commitment while being pressed for time. Thus we introduced rules suggested by them, e.g. stopping the discussion and negotiation process at certain points where all group members were asked to evaluate the stage of the process by hand signals. In addition, co-moderation focusing on facilitating the negotiation and decision making was introduced. This strategy proved to be effective without forfeiting the basic democratic idea.

Decisions beyond physical meetings followed a more consultative style. This either happened consciously and for pragmatic reasons, to bring the process forward, or it took place implicitly in the scope of taking pre-decisions based on negotiations between a few team members. Consequently that narrowed down the options to be decided on by the whole consortium. We consider this to be an effect of the actuality that even in transdisciplinary projects the involvement of different team members in single tasks usually varies over the course of time. Hence also the engagement of different disciplines and with partners from practice also varies, making the process more or less transdisciplinary at certain points (c.f. phases of a trans-disciplinary research process: Hurni & Wiesmann, 2004). This might make decisions, at specific stages, less democratic in the basic sense of democracy.

As reflections on the co-operative research process revealed, decision-making was perceived and evaluated differently by different partners, which again links to their expectations. While some partners were satisfied with the mode of decision-making, for others it was not always transparent how decisions have been taken. Although democratic decision-making based on consensus within

meetings was regarded by some partners as a very tiring exercise and less efficient, for most team members it was important that everybody had the opportunity to share her/his viewpoint.

Synthesis and conclusions

The process of knowledge integration is a key aspect in transdisciplinary research, and we have been reflecting on how integration can be achieved in practice. We have identified basic requirements and factors that influence the integration process in a heterogeneous group.

The first basic requirement to carry out integrative activities is the project design, which needs to allow for a certain degree of flexibility in adjusting the process. This is necessary because integration is a stepwise process, which needs to consider outcomes from the previous in the subsequent step. The second is the existence of a shared reality and a common ground within the group. Assuming that such communality does not exist within a heterogeneous group, it first needs to be established. This can be achieved through a project design, which is organised along alternating steps of making differences explicit within the project team ('differentiation'), and integration steps, which either identify communalities or integrate the differences ('integration'). Factors influencing this are related to team members' general commitment to an integrated knowledge production process. This becomes manifest in the following activities:

- communicative action related to knowledge exchange within the group;

- reflection and understanding that assimilates other's knowledge into one's own knowledge structures;

- negotiation and decision-making processes for co-operative action in order to produce new knowledge.

The general commitment to an integrated approach depends on team members' motivation to participate in the project, and this is furthermore linked to the outcomes they expect. Either they participate for substantive reasons due to their appraisal of different forms of expertise, or they aim at an instrumentalisation of the integrated approach. The better motivations and expectations match within the project team, the stronger we consider the commitment to knowledge integration.

Interaction and communication for the purpose of knowledge exchange gains an added value through the contribution of unshared knowledge. This can be influenced positively through sharing meta-knowledge on existing expertise within the group, which has the potential to encourage team members to perform a specific role of experts within the project.

Knowledge exchange is an important basis on which to achieve knowledge integration, but the assimilation into one's own knowledge structure is the ultimate aim. Since the knowledge production process is a relational issue, this does not only happen through the interaction and discussion processes, but it is supported by social interactions and reflections. Ongoing reflections in the scope of reflexive project steering did not only serve to adapt the co-operative process, but also to reflect on knowledge integration in terms of building up mutual understanding and learning from each other.

Negotiation and decision-making processes for co-operative action need a shared frame of reference to be successful. This builds on the common ground of a shared reality, which determines the rules for negotiations and decision-making.

According to our experiences within FAAN we conclude that knowledge integration processes are complex and time consuming. Not just the outputs but also the process of knowledge integration itself has an important value as an experience for participants, thus we would like to encourage future activities for further experimental approaches to the process design. Finally we conclude this paper with a statement from one of the FAAN coordinators reflecting on the complexity of the project and the process:

"The negotiation on and the adjustment of all the work, which moreover is interlinked, takes much more time than planned. For carrying out an experiment on co-operative research, it would have been better to design a less ambitious project (less complex design, less inter-linkages between the work packages, less ambiguous research aims, longer period of time), but to put more emphasis on organising the process, team building, preparing the frame for participation. It is a pity that the process suffers from time constraints, and that we do not have enough resources to carry out the co-operation in a more experimental way." (A33, RE).

References

Bergmann, M., B. Brohmann, E. Hofmann, C. M. Loibl, R. Rehaag, E. Schramm, and J.-P. Voß (2005) *Qualitätskriterien transdisziplinärer Forschung. Ein Leitfaden für die formative Evaluation von Forschungsprojekten*. ISOE-Studientexte, Nr. 13. Institut für sozial-ökologische Forschung ISOE: Frankfurt am Main.

Godemann, J. (2008) Knowledge integration: a key challenge for transdisciplinary cooperation, in *Environmental Education Research*, 14 (6): 625-641.

Greitemeyer, T., S. Schulz-Hardt, F. C. Brodbeck, and D. Frey (2006) Information sampling and group decision making: The effects of an advocacy decision procedure and task experience. *Journal of Experimental Psychology: Applied* 12(1) : 31-42.

Heng, M. and A. de Moor (2003). From Habermas' Communicative Theory to Practice on the Internet. *Information Systems Journal*, 13(4):331-352.

Hurni, H. and Wiesmann, U., 2004 Towards Transdisciplinarity in Sustainability –Oriented Research for Research Development, In Research for mitigating Syndromes of global change, eds. H. Hurni, U. Wiesmann and S. Rist, *Perspectives of the Swiss NCCR North-South*, Vol. 1, Berne: Geographica Bernesiana, University of Berne.

Jahn, T. (2005) Soziale Ökologie, cognitive Integration & Transdisziplinarität. Technikfolgenabschätzung. *Theorie und Praxis* 2 (14): 32-38.

Klein, J. T. (2004) Prospects for transdisciplinarity, *Futures* 36: 515–526.

Littlepage, G., W. Robison, and K. Reddington (1997) Effects of task experience and group experience on group performance, member ability, and recognition of expertise. *Organizational Behavior and Human Decision Processes* 69(2): 133–147.

Loibl, M. C. (2005) *Spannungen in Forschungsteams – Hintergründe, Methoden zum konstruktiven Abbau von Konflikten in inter- und transdisziplinären Projekten*. Verlag für Systemische Forschung (VSF). Carl-Auer Verlag, Heidelberg.

Pohl, C., and G. Hirsch Hadorn (2006) *Gestaltungsprinzipien für die transdisziplinäre Forschung*, Ein Beitrag des td-net München. oekom Verlag.

Smith, O., Avila, M. & Abdi, N. 2004. *Strengthening Linkages between Farmers' Organizations and Agricultural Research Institutions* [online] The Global Forum on Agricultural Research. Available from: http://www.egfar.org/egfar/old_newsletters/pdf/IFAP1.pdf [15 December 2009].

Stasser, G., and W. Titus (1985) Pooling of unshared information in group decision making: biased information sampling during discussion. *Journal of Personality and Social Psychology* 48,(6): 1467–1478.

Stewart, D.D., and G. Stasser (1995) Expert role assignment and information sampling during collective recall and decision making. *Journal of Personality and Social Psychology* 69(4): 619–628.

Stirling, A. (2006) *From Science and Society to Science in Society. Towards a framework for 'Co-operative research'*, Report of a European Commission Workshop, Governance and Scientific Advice Unit of DG RTD, Directorate C2, Brussels; available online at http://www.eurosfaire.prd.fr/7pc/doc/1146233108_gover_science_final_report.pdf.

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