

Communities of practice as a learning theoretical perspective on developing new water environmental planning processes in a Danish context

Mads Lægdsgaard Madsen and Egon Noe

Department of Agroecology and Environment, Faculty of Agricultural Sciences, Aarhus University, Denmark, MadsL.Madsen@agrsci.dk, Egon.Noel@agrsci.dk

Abstract: *The Danish Agwaplan project is a water environmental planning project trying to find new ways to change practice in terms of land use on farms. The project has its starting point in a dualistic learning theoretical perception that improving of farmers' environmental knowledge will lead them to change their management practices. The project results show that the expected change in farming practices in many instances failed to happen, especially in a long-term perspective. This study introduces the theory of communities of practice as an analytical framework to identify the sources of the problems in the Agwaplan project and demonstrates that to get from knowledge to an actual change in practice you need an integrative perception of learning and practice that incorporates knowledge and practice in a social context around the farm. The change depends on the opportunities the farmer has to create new identities. This paper suggests to base future water environmental planning projects on the actual social context. Such projects can improve their results by considering the farms involved as communities of practice and that these communities of practice including meaning negotiations as the generative unit for change.*

Keywords: *Social learning; Communities of Practice; Identity; Practice; Learning*

Introduction

Farmers are facing more complexity in their decision making, partly because of the development of the enterprises getting bigger and bigger units and partly because enterprises are faced with new demands on environment and nature and recreational issues. The potential fracture surface to the surrounding society has become bigger and leads to a new pressure on the farmer. Within farming the demand for multifunctionality and the environmental problems are known but nevertheless it is difficult to get the changes all the way to practice. The starting point of this text is that the farmer can learn to navigate in this landscape in a way that integrates these issues and demands in his strategy for his enterprise and as a foundation for his daily practice.

A recently ended Danish water environmental development project with participation of a broad range of stakeholders tried to establish new ways to create a learning process to change farming practices. One of the main assumptions was that a profound scientific description of a farms impact on the surrounding environment was the main factor leading farmers to change farming practices. The project showed some good results but also a lot of problems occurred in the learning processes aiming to change farmers' practices. In order to improve future environmental processes involving different stakeholders in smaller catchment areas a better understanding of the reasons of these problems is needed.

The main question of this study is how to improve results in water environmental planning projects from a learning theoretical perspective. We will analyze results from the Agwaplan project on the background of the learning theoretical aspects from the theory of Communities of Practice proposed by Etienne Wenger. The communities of practice theory is chosen because it challenges the conception of learning as an individual learning and incorporates a broader definition of practice including social networks and negotiations in a learning theoretical whole.

The AGWAPLAN project

The main aim of the Danish three-year EU-LIFE Agwaplan project was to develop and test an integrated advisory concept for implementing “good agricultural practice (GAP)” and to measure and estimate effects of GAP on the leaching of N and P to surface- and ground water” in three catchment areas; a lake, a fjord and a groundwater reservoir area in Eastern Jutland in Denmark. This integrated method is based on participation by relevant stakeholders: The environmental authorities, represented by three municipalities, the Agricultural Advisory Service and agricultural advisors from two advisory centers, agricultural researchers from Aarhus University and farmers from the three areas. About the development and testing of the integrated advisory concept, the project description states that “farmers will participate actively in establishing a strategy and procedure for support and advice and participate in developing decision-support-tools for evaluation of costs and advantages (environmental and economic) by implementation of “good agricultural practice”.

All stakeholders were involved in creating the best foundation for the integrated advice. Scientists and technicians produced maps of every field of every farmer in the project to create indisputable facts as a foundation for the advice. The assumption was that farmers would only change their practice if sound scientific knowledge was provided, so a list (GAP-manual) of measures to reduce leaching was created in cooperation between stakeholders with different interests in the project. All the three different catchment areas had initial information meetings, on-farm advisory meetings with the farmer, the agricultural advisor and a representative of the municipality. Later in the project follow-up group meetings have been arranged in different ways in the areas, depending on the activities chosen and the kind of commitment from the advisor and the farmers in the areas. A workshop to promote further integration between stakeholders and improvement and stabilization of communication was arranged at a late stage in the project.

Empirical data

The analysis of this text is based on a sociological interview research conducted by the authors to produce a report that evaluates the integrated advice concept developed in Agwaplan (Madsen & Noe, 2008). Farmers, agricultural consultants, environmental officers from municipalities, representatives from Environment Center Aarhus were interviewed in a semi-structured interview design focusing on the effect of the integrated advice concept. The interviews were transcribed and analyzed. Furthermore, a workshop was conducted with all stakeholders represented. The workshop integrated knowledge and conclusions from the evaluation process and group-work sessions were conducted by the authors. Group discussions within the specific stakeholder groups were arranged and group work integrating all the different stakeholders was arranged. The participants were asked to discuss specific and general aspects of AGWAPLAN. All discussions were recorded, transcribed and analyzed.

Learning in Communities of Practice

Members of all stakeholder groups in Agwaplan felt that the most important prerequisite for making farmers take the difficult leap from learning to implementation in practice was detailed science based knowledge of the farm’s nitrogen and phosphorus leaching. Later we shall see that not all farmers took the leap which reflects that knowledge does not necessarily lead to action and therefore there is a need for a theoretical framework to describe and analyze the problems and to suggest an alternative strategy for future projects such as Agwaplan.

On this background it is relevant to introduce the theory of Communities of Practice (CoP). Practice is a central concept in Etienne Wenger’s perception of learning. Practice should not be understood in a

duality between cognitive learning on the one side and practice on the other side for implementation of the learned (Wenger, 1999). A CoP is 'a system of relationships between people, activities, and the world; Developing with time, and in relation to other tangential and overlapping communities of practice' (Lave & Wenger, 1991). Wenger links knowledge and practice into a learning theory based on mutual engagement, joint enterprise and shared repertoire, which are all social dimensions to the fact that individual people do things together and create a history and develop new meanings and identities (Wenger, 1999). As such learning is not an isolated event of cognitive learning but a social continuum of meaning negotiations in the CoPs that every individual takes part in. This is a more challenging learning concept to operationalize than an ordinary cognitive learning concept based on the individual person. Furthermore the concept of CoP has been interpreted in many different ways, partly because of the adaptation of the theory in different working environments including management literature outside academic environments (Amin & Roberts, 2008). There is a need to emphasize the original definition of CoP as relatively stable communities of face-to-face interaction between members working together and forming identity through participation and negotiation of meaning (Amin & Roberts, 2008). Probably in order not to focus too narrowly in future analyses, Wenger states that CoPs as an analytical tool is 'neither a specific, narrowly defined activity or interaction nor a broadly defined aggregate that is abstractly historical and social' (Wenger, 1999: 124f). Instead Wenger proposes a list of indicators to capture all kinds of CoPs including the not acknowledged or informal ones. Indicators include sustained mutual relationships, shared ways of doing things, rapid flow of information, conversations and interactions as a continuation of an ongoing process, there is an overlap of participants' descriptions of who belongs, there are mutually defining identities, specific tools, representations and artifacts, a local lore, shared stories, jargon and shortcuts to communication and, last, a shared discourse reflecting a certain perspective on the world (Wenger, 1999: 125f). The list reflects the three dimensions of a community: mutual engagement, negotiated enterprise and a joint repertoire of negotiable resources accumulated over time. Before we show that a farm is a CoP we have to present a few other concepts.

Meaning negotiation

Human life can in a trivial existential interpretation be considered as being a quest for meaning like, for example, searching for answers to the big philosophical questions. "Practice is, first and foremost, a process by which we can experience the world and our engagement with it as meaningful" (Wenger, 1999:51). So in Wenger's eyes meaning is a more down-to-earth concept; meaning comes from the meaning negotiation, which is a kind of harmonization between artifacts, members and their perspectives in the CoPs. Meaning is not a priori or cannot be invented or decided in for instance a formal pragmatic ideal negotiation (Habermas, 1981), because it is not a matter of finding the best solution from competent rational individuals but rather a matter of a contingent social negotiation that will take place because of the social nature of man. Meaning is thus negotiated by two fundamental human activities, participation and reification. Participation reflects the fact that any person is situated in a world and that he coexists with other persons by which new and spontaneous things and situations occur in a transformative process (Wenger, 1999). Results of participation are for example a text, a statement, a tool or maybe a document which are all reifications (Wenger, 2000). Participation and reification find place in interplay in a duality where the dynamics of participation give the transformative power to the CoP and reifications state some negotiable anchors to link up meaning negotiations and the created identities in the community (Wenger, 1999).

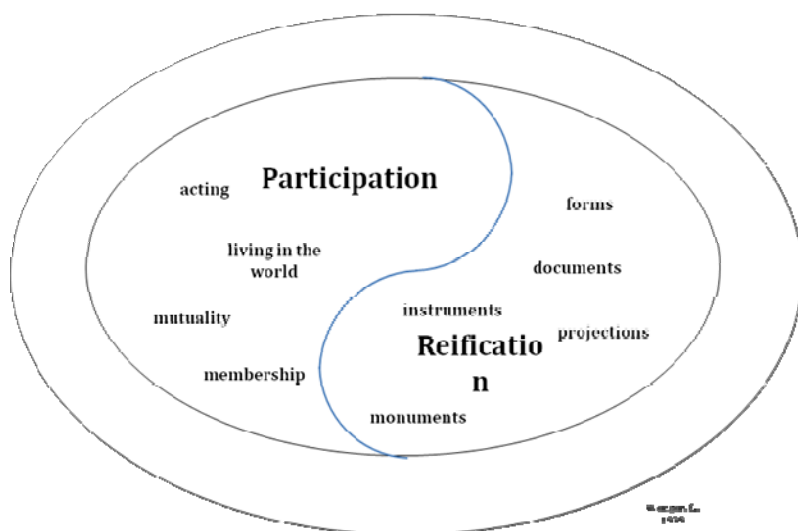


Figure 1. Meaning negotiation as a duality of participation and reification.

“The negotiation of meaning... is the level of discourse at which the concept of practice should be understood” (Wenger, 1999: 72), and the association between practice and community is interlinked by three dimensions entailing coherence in communities. There is a mutual engagement which makes people act and negotiate these acts among themselves. There is as mentioned joint enterprise which is the result of a collective negotiation process and it is defined by participants in the enterprise. Furthermore there is a shared repertoire, which denotes a community’s resources that are relatively static by nature and at the same time the potential engagement in the practice (Wenger, 1999). This brings a community by virtue of its repertoire in order to reflect the history of mutual engagement and it is ambiguous by nature, which opens up for generation of new ideas. Community does thus not necessarily imply that you are actually present or that you are in a well-defined group with visible boundaries (Lave and Wenger, 1991). When you invest yourself and your meaning in the negotiation of meanings and involve reified statements you are in interaction with others creating relationships of responsibility between the participants (Wenger, 1999).

If you invest practice in both participation and reification it will lead to both continuity and discontinuity in the meaning negotiation (Wenger, 1999). Participation entails that persons infuse something new to the community of practice, but at the same time this new thing is negotiated on background of something that exists on beforehand in the repertoire of the community of practice and furthermore this new will often get an expression that is static by nature and that in future will be subject of new meaning negotiations. Thus there is a distinction or rather a duality of temporality between participation and reification which is pivotal to creation of practice. Reification entails remembering and forgetting because their expressions persist and change according to their own laws. Participation also is a source for remembering and forgetting because we create identities and thus recognize our selves in the past (Wenger, 1999). It is probably here Wenger gets closest to a cognitive standpoint since he actually proposes that the brain converts experience to memories that all together tell the story about a person’s identity. These aspects are quite parallel to Anthony Giddens’ concept of narrativity (Giddens, 1991). Yet this cognitive aspect of learning in practice does not stand alone because learning does not concern a static object but concerns engagement and participation in developing a persistent practice which means the ability to negotiate meaning and develop new aspects in practice.

Identity and power channels

According to Wenger identity is ‘a layering of events of participation and reification by which our

experience and its social interpretation inform each other' (Wenger, 1999:151). Where practice is negotiation of meanings the identity is in the 'negotiated experience of self' and the community will thus turn into a membership and the identity should be seen as a nexus of multimembership. The identity is not 'equivalent to a self image; it is not ... discursive or reflective' (Wenger 1999: 150f). This express a difference to Giddens' concept of the narrative self (Giddens, 1991) and instead the multiple membership or the nexus does not 'decompose our identity into distinct trajectories in each community' and the identity is in the reconciliation of meanings in an individual (Wenger, 1999: 159-161). Based on symbolic interactionism it has been argued that Giddens' theory is an appropriate framework for describing transitions between productivism, postproductivism and multifunctionality because it states that farmers can function in multiple paradigms at one time which can be reflected in the framework of Giddens' notion of the narrative of self-identity which exactly is dependent on the differences of the practices an individual farmer is involved in (Burton and Wilson, 2006). The structural or macrostructural influences 'play a critical role in moulding identity' and thus based on the structuration theory (Giddens, 1984) it is seen that farmers are selves 'constructed of identities that are multiple, layered and hierachical' (Burton and Wilson, 2006). We are aware of the descriptive power of this standpoint, but it does not necessarily conflict with our aim which is to focus on the social reality around a farm as the starting point and generative milieu for reaching long term change in decision making. In this sense CoP and its concept of identity is more than descriptive, it can be used as a platform for a new perspective on water environmental planning processes.

We now have to focus on reasons why farmers get multiple identities instead of integrating perspectives from meaning negotiations in one identity. Participation and reification are pivotal to human interaction but at the same time open to be used as power channels which is called 'the politics of participation and reification'. An individual can 'promote specific artifacts to focus future negotiation of meaning in specific ways' (Wenger, 1999:91). An individual can influence practice by on the one hand convincing specific persons that reified strategies or documents in some bureaucratic context has become too stiff and contra-productive. On the other hand it could be necessary to reify strategies to prevent internal fractions in the community from influencing the politics of participation (Wenger, 1999). All together control of power channels can lead to control of the possibilities for individuals to create meaning and ultimately control of what possible identities one can create in the community (Wenger, 1999: 93). A part of the rigidity of farmers in the Agwaplan project concerning changing procedures could be caused by colonization of possible identities to be created. This does not mean that a group of e.g. farmers can be strapped down in a dictated reality with fixed rules for participation because learning in a CoP is dynamic by nature. Learning does really entail a social structure but not a structure that in any way exists by itself because the structure cannot be dissolved from the process that creates it. As such this is an emergent structure (Wenger, 1999: 96-98). Bourdieu's concept of habitus is often proposed to be more deterministic than Wenger because he presumes a closer relation between structure or habitus and the practice that will follow from it (Bourdieu 1977). Mutch wants to reestablish the generative aspects of habitus but still he contrasts Bourdieu to Wenger because Bourdieu presumes 'an inevitable reproduction of existing patterns of thought and action.' (Mutch, 2003). Wenger emphasizes an open social field for generation of new identities but at the same time this emergent and contingent meaning negotiation is vulnerable to the politics of participation and reification which constrain this social field.

Boundary objects and brokers

CoPs are internal processes defining the line of demarcation for a community which implies relations to the world around. Participation and reification are cornerstones in the interchange between different communities of practice and members of communities of course participate in multiple CoPs. Brokers are the persons that "can introduce the elements of one practice to another" and 'make new connections across communities of practice, enable coordination, and ... open new possibilities for

meaning' (Wenger, 1999: 109). The boundary objects are "artifacts, documents, terms, and other forms of reification around which communities of practice can organize their interconnections" (Wenger, 1999: 105).

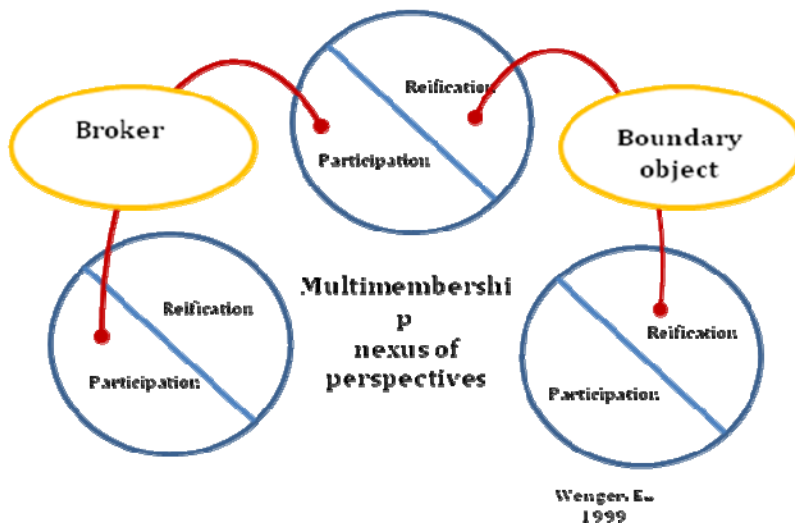


Figure 2. Reification and participation as connections between communities of practice.

Figure 2 illustrates how participation of an individual can be present in several different CoPs which enables transfer of perspectives from the meaning negotiation of one CoP to the meaning negotiation of another CoP. The dynamic in a CoP comes partly from the creative process in the contingent meaning negotiation of the involved individuals and partly by inputs from alternative perspectives in the meaning negotiation. Reifications from e.g. a farm workers' other CoPs can influence the meaning negotiations on the farm. This is the case in a broader perspective but reifications from different CoPs can deal with the same object. These particular objects are boundary objects and boundary objects can be objects that in one CoP signify a certain thing but in another CoP the very same object might signify something very different, and thereby they can be the pivotal spots for exchanging meanings and perspectives between CoPs. The strategic use of boundary objects can be done either by designing new objects for participation rather than just use (Wenger, 1999: 108) or a broker can identify objects on a farm that is used or could be used in meaning negotiations in different CoPs.

Farms as communities of practice

A farm has e.g. a vet, different advisers, technical support personnel, employees, family members and more participating and reifying and thereby negotiating meaning while discussing and working with the objects on the farm. All of these persons including the farmer are part of multiple CoPs in addition to the farm and the farm has boundary objects related to some of these multiple memberships. Some of them might not know much about the farm as a whole even though they participate and negotiate on substantial issues on the farm. Furthermore the repertoire does not have to be entirely locally produced (Wenger, 1999). For instance, the productivist standpoints of many European farms have to a large extent been induced by outside factors (Wilson, 2001) and this would not disqualify a farm as a CoP in Wenger's eyes.

To classify a farm as a CoP, the earlier mentioned list of indicators and dimensions of communities must be considered. On a farm the kind of planning and discussion of the tasks involved depends on the mutual engagement, which is often reflected in the argument that farming is a lifestyle. Engagement thus often gets the character of commitment to a lifestyle that results in a strong feeling of belonging.

Often negotiations are not of a pure technical or instrumental character but could be about sensing the needs of the animals or the crop or the soil. In this sense negotiations result in a distinct mode of enterprise and a specific joint repertoire on the specific farm founded on the natural prerequisites and the people involved in the negotiations on the specific farm. On this background we propose that a farm can be seen as a CoP and at the same time we admit there is a need to elaborate the field to reach a more precise definition for the theory and its learning potentials in agricultural contexts.

Results and findings from the AGWAPLAN project from the perspective of the communities of practice theory

The concepts of learning and practice in Agwaplan

The whole justification for the Agwaplan project is to find new ways to change practice in the use of the land on farms. Agwaplan did make some farmers change some routines and introduced new practical solutions to replace old ones. It is hard to say exactly how many farmers did not really participate in the project, since some farms were found to have a very low contribution to, for instance, phosphorus leaching to the aquatic environment, which made them almost irrelevant in the project. But a considerable number of the farmers were not active in the project and in implementing the new practices. Furthermore, some of the farmers who joined the project and stayed the whole period expressed afterwards that they did not make use of the knowledge from the project in their practice after the project. They might have changed practice but only within the time frame of the project, and after the project they switched back to the usual practice. Therefore Agwaplan did not succeed in changing practice in a long-term perspective on all farms which points to the fact that the knowledge about a farm not necessarily leads to a change in practice.

Agwaplan works in a learning paradigm characterized by a duality between cognitive learning and practice. The presumption is that the foundation for change of practice is a profound knowledge based on scientific information on the fields of the farm. Once the knowledge is in place and it has been transferred to the farmer, he is expected to do the leap from cognitive learning to sufficient practical action and Agwaplan does not verify that leap. From the perspective of our theoretical framework Agwaplan is a case where structures or stakeholders use power channels through representatives who at the advisory meetings mediate knowledge to farmers. Farmers are expected to be competent agents and thereby be able to convert knowledge into practice. No focus is on the social reality or the CoPs of the farmer which has to be the generative unit of meaning negotiation, learning and long-term change. When some Agwaplan-farmers actually implemented activities on their farms it can be explained by Burtons interpretation of multiple layer identities and therefore they often turned out to be temporary since the farmer had other identities apart from the Agwaplan identity to fall back on.

Agwaplan and the concept of meaning negotiations

Agwaplan's central feature is the integrated advice meeting where a representative of the environmental authority and the agricultural advisor have an on-farm meeting with the farmer. Here the triade is meant to build mutual understanding and confidence which Wenger probably would be positive about, but change has to find place in a certain social environment. Meaning negotiations found place in the meeting but the problem is that there is no ongoing mutual participations and reifications possible for this triade. It is not a CoP because is no mutual engagement, joint enterprise or shared repertoire and the social setup in this triade is a social event independent of the social milieu where the learning and change has to take place namely the CoP on the farm. This event leaves no possible creation of new identities back to the farmer and this is the reason for the lacking persistence in actual changes in

agricultural practices.

Boundary objects and Agwaplan

The central themes in Agwaplan were nitrogen and phosphorus. They made a good meeting point for the involved stakeholders in communicating and establishing dialogue. Farmers and environment could both win for instance by using catchcrops. But the win-win situations are not the only thing farmers were talking about to people outside the project. The most active and positive farmers were not motivated by win-win situations; for instance a farmer established a nitrogen-filter-mini-wetland on his land, which he and the group of farmers in the area are still very happy to show to the media and the public. This little pond is a designed object that was ment to be mono-functional from a productivist perspective, but other CoPs around the farm are able to find alternative functionalities as recreational and as such the project actually created a boundary object. To reach long-term change you need to focus on objects that can function as boundary objects between the farmers' actual CoPs because the learning can only find place in meaning negotiations in the farmers own CoPs where the farmer can actually create new identities. A concrete object that has relevance in the individual farmer's different CoPs will be more successful if a long term change is wanted than would stakeholder abstracts as nitrogen or phosphor. If a project such as Agwaplan is to succeed the objectives have to be identified locally on the farm as boundary objects. Alternatively new objects can be designed for participation and not just use. Agwaplan showed that such boundary objects are able to support the farmers as brokers between different CoPs around a farm.

Power and practice in Agwaplan

The constellation in Agwaplan is based on scientists to create knowledge to be transferred to farmers by the help of the two traditionally conflicting wings of environmental debate in Denmark, the farmers' association and the environmental authorities. These three parties are not part of a farmer's usual CoPs, maybe except the advisor. They are all powerful producers of reifications that represent truth, public best and interests of all farmers. This is the constellation the farmer meets in the advice meeting in the project. What is left back to the farmer is to introduce some measurements on his farm to make all three parties happy. For the farmer not much room is left for meaning negotiation and creation of new identities in relation to this project. The stakeholder approach might be a contra-productive way to go because the stakeholder organisations by definition are in the world to take power in negotiations between them on these agricultural and environmental matters and therefore they have a tendency to set the scene for potential meanings negotiated by the farmers and creation of new identities in the project. This statement is supported by interviews of attendants from the advising meetings who expressed that the main obstacle for change was not necessarily the farmer himself but it could actually be the farm advisor. In Danish context advisors are relatively frequently involved in decision making and the advisors are most often from the consultancy company that is a part of the Danish farmers' association. There could be strategic motives or values from the farmers' association that could influence the possibilities for changing agricultural practices on farms.

Perspectives for future learning processes in water environmental projects

This study has shown that a farm can be analyzed as a community of practice and that the learning theoretical aspects in the theory of communities of practice have potential in terms of improving results in future water environmental planning projects to change agricultural practices. At this point there is a need to get better understanding of the specific social dynamics in the communities of practice within

and in relation to farms in order to be able to plan and implement efficient learning processes. Furthermore there is a need to describe the power channels from structures and organizations influencing the meaning negotiations and the possible identities in the community of practice around a farm. Last there is a need to describe boundary objects' relation to the farmer as a broker between communities of practice and the possibilities for creation of new identities in the communities of practice around a farm.

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