

RESEARCH DIALOGS AND CLUSTER STRATEGIES - INNOVATION IN REGIONAL DEVELOPMENT PROJECTS

Nils Finstad and Jarle Løvland

Nordland Research Institute

Abstract

This study is based on analyzing four settings of firms (clusters) joining in regional innovation programs to facilitate research driven innovation. The meso level as a meeting point between micro level with firm strategies and macro level with programs, markets and branch actors, is studied as a level facilitate change. Local development depends on the institutions, competence and learning on local and regional levels (Cook and Morgan 1998). The autonomy at the meso level to make decisions and act in a learning and strategies context is a crucial question to regional problem solving and innovation. The confidence at the meso level as a learning arena where firm actors meets to cooperate and act in local strategies is an important developmental factor. It is also as Ahrne (1990 s 4) says, an arena where action and structure must be intertwined. The framework of social capital development also provides useful insights into how these levels can be present and linked in local innovation and entrepreneurial activity.

Four clusters of firms is the setting of this study. The first case is a rural industrial cluster related to innovative technology development for production of wafers for renewable solar energy production. The second case is the Norwegian Centre of Expertise cluster related to R&D and commercial development of new marine species for aquaculture (cod in particular). The third case is a regional network program for the development of experience based tourism in the Northern part of Nordland County, whereas the last case is related to the organizing of a R&D and innovation center in technology development for cold climate conditions. The clusters are developed through different programs and methods to support local innovation. In this paper we discuss the experiences and implications from findings in the program development for improving learning and innovation in aligning individual and systemic innovation processes.

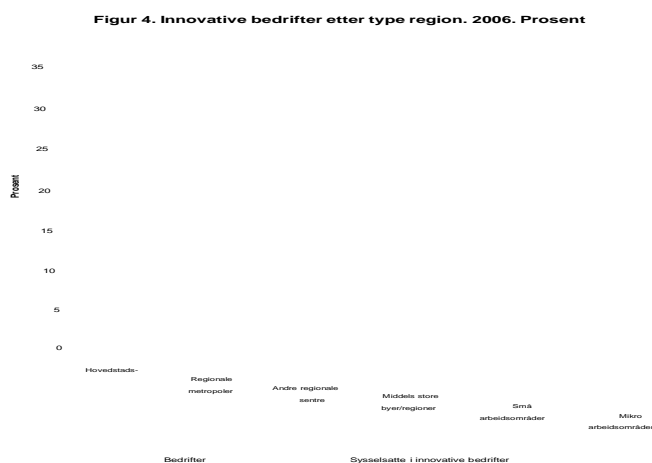
BACKGROUND

The Norwegian Innovation Survey Report for 2009¹ shows the spatial distribution of enterprises and innovation where small urban regions shows a higher portion of innovative enterprises than the larger

¹Innovation Survey Norway, 2009

urban regions and labor markets. This tendency can also be seen from the growth of new rural centers and towns. In this process we may see an interaction between regional planning and the development of enterprises at the micro and meso level. The innovation in enterprises is strongly related to the local geographical context as the statistics show. Especially we find this relationship for smaller regional centers and towns, where local cooperation is crucial for innovation activities (see Onsager 2010).

However, in Northern Norway where the cases are localized, local resources and widespread competencies found in the coastal labor markets seems to play an important role in shaping regional development. In the coastal regions strong traditions in industrial development have developed based on broad social participation due to the peripheral situation of these communities. Our aquaculture case represents a type of regional development where places and coastal regions have developed from coastal fisheries. The “cold climate infrastructure” case also represents a continuation of the coastal labor markets (Seierstad, 1992). We also find local competence and natural resources important to understand the innovation processes found in the tourist industry, which also is a case we present in this paper.



We explore in this paper the relationships between different levels of regional innovation. At the regional level we find innovation system designed around the principal development actors; county government, industry and knowledge institutions. Within the meso level approach we find local contexts depending on the participation from enterprises and local industries. Our industry cluster is situated in a local industrial context; whereas our tourism consists of a network of experience production enterprises from different geographical tourist destinations and municipalities.

Regional policies are in Norway strongly related to the regional (county) level as a facilitator. Over time these policies have developed from planning as Brox (1966, 1984) shows, towards more active involvement in facilitating regional learning processes and partnership development following the Triple Helix approach to innovation. We thus can see a movement from public spatial planning processes and investment programs, towards administrative systems aimed at regional industry development and growth in order to strengthen regional innovation and employment. Traditionally the

migration flows have been from peripheral areas to more central areas. To reduce this migration, regional policies have focused on creating new jobs in rural areas through implementation from regional institutions (Onsager and Selstad, 2004, Berg, Dale, Lysgård and Løfgren, 2004).

In this context, R&D supported innovation in enterprises has also become an increasingly more important contribution to regional development processes. However, the preconditions for the use of regional strategies and methods in such processes have only been explored at a small scale. Therefore we find it relevant to question the impact of the regional innovation system on innovation as the general statistics show (fig 1). We argue that innovations are more related to the spatial and specific industry context at meso level. The innovation system at the micro and macro level is governed by different logics of action that also can be conflicting. At the enterprise and meso level, the innovation system of enterprises seeks to maximize the direct outcome of cooperation and interaction with others. Our tourism cluster has in this respect a direct goal to increase the destinations` share of the tourism and experience business market.

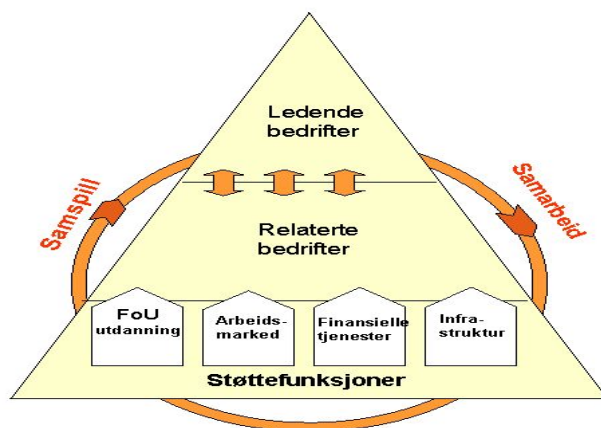
Regional policy actors often have an intention to spread growth to new areas as an uneven growth pattern can be regarded as problematic. Local demands for maximum growth for a place/destination can therefore also face a regional need to distribute and reallocate development resources between different areas. Many of the Norwegian regional development programs have been initiated by actors within the regional system, and factors related to the intermediate meso level of cooperation and development are seldom described explicitly. We find other European innovation programs where the focus is set on cooperation between large and advanced enterprises and their partners within their value chain. Examples can be found in programs like the EU Plato program (reference).

FOCUS OF THE PAPER

We wish to describe the impact of developmental strategies on three levels for innovation. Based on the analysis of four clusters we will discuss the innovation opportunities and dimensions of program development and cluster governance. The four cases are selected from two R&D supported development programs administered by the Norwegian Research Council (VRI and Enterprise Development 2010). As researchers within a regional research institute (Nordland Research Institute), we have been engaged in the process of following this development for a period of almost four years. Our data have been collected through qualitative and quantitative methods both through visits to individual enterprise participants and network activities within the programs. We have interviewed a selection of enterprises both on startup and during the program activities. (Finstad et al, 2009 and Finstad and Løvland, 2009).

MODELS AND THEORIES FOR REGIONAL DEVELOPMENT

Within Norwegian regional policy development, means and methods to strengthen the innovation capacity play an important role in the recent years. At the same time we find several regional development programs governed by public institutions as the Norwegian Research Council and Innovation Norway. The main role of Innovation Norway is to support enterprise development and strengthen network and cluster innovation especially in the rural parts of the country. This support is provided through financing, innovation activities and strengthens the enterprise relationships with other development actors to facilitate knowledge and technology transfer. The role of the Norwegian Research Council is to support innovation by programs to facilitate the access to R&D based knowledge in enterprises and clusters. Examples of these types of intervention are found in the national programs like Arena, National Centers of Expertise and R&D-supported regional innovation (VRI). It can be argued that these programs are based on a too optimistic assumption of the possibilities to plan and direct regional innovation processes and innovation systems (Jakobsen og Fløysand 2010). Both of the state institutions mentioned, are emphasizing the role of regional systems at the county level as a basis for developing and improving the interaction between actors in the regional innovation system as illustrated in the model below. In this Triple Helix strategy, regional institutions like universities and research institutions are important to R&D development and support.



In these programs we often find imbalances between the expectations from actors within the regional innovation system, and the ideas from local actors and enterprises regarding innovation. In one of our cases, a business leader put it this way: "I try to keep a distance to the innovation system. They have many and good intentions, but tend to draw my focus away from the needs of my company and our priorities towards the aims of regional authorities". This situation also presents a question of the interplay between the administrative and operational regional innovation system developed by the enterprises themselves: Can regional policies and the institutional actors be more related to existing "bottom-up" innovation actors and activities in order to contribute to stronger innovation processes?

Innovation requires interplay between different kind of actors including both the traditional entrepreneurs and enterprises, complemented with local partners and supported by regional development actors and R&D institutions to form a learning environment for local innovation. A theoretical background the cluster development strategy in many "Triple Helix" innovation processes, can be described by the development phases found in the Cluster Dynamics Model Model (Smith, 2006, 2008, see modified version on page) where a stepwise development of clusters have been identified.

In the CDM model network and cluster cooperation is developed between enterprises through a stepwise process where joint resource dependencies and limitations form the basis for interaction. Network cooperation involves support activities and common resources while the enterprises still operate individually in competition both locally and regionally (level 1 and 2). Through experiences trust is developed, reducing transaction cost and stimulating innovation activities. This also can create joint action and a more common based market orientation within the cluster enterprises (level 3), and the cluster environment becomes more interesting for new entrepreneurial activities and recruitment. In this way the cluster becomes more complete and competitive. In our discussion of the cluster experiences in our cases we will describe how and active meso level of innovation necessitates a modification of the steps in the model.

THE MESO LEVEL AS A POTENTIAL FOR DEVELOPMENT

By meso level we think of the innovation environment that enterprises and local actors operate within, also described by the concept of flexible specialization (Pior and Sabel, 1984). The meso level can be seen as an arena where conditions for interaction and innovation will decide the outcome of the activities; either in the form of the "tragedy of the common" , where the interaction is limited and the participants maximize their own interests, or as an arena where growth and development is created through interaction and interdependency among the actors.

The meso level can also provide degrees of freedom for implementation between the market and the enterprise (Arent 1990). It is actors forming a value chain or complementarily of joint interests as an arena for development, innovation and competence. By using the concept meso level we wish to emphasize the importance of the enterprises own innovation system and at the same time focus on the linkages to regional system. However, studies of innovation activities at the meso level seem limited (Finstad 2007). Activities at the meso level are complex and need an interdisciplinary approach to address both governance and planning processes, as well as political and conflicting interests must be identified and clarified. Interaction with R&D institutions seems to open a possibility to clarify common problems and solutions to strengthen the potential for innovation.

The traditional role of the entrepreneur is strongly market and production oriented, and has a limitation towards local organization. The main motivation is own success, and the contribution to local cooperation is mostly guided by the anticipated effects for the enterprise in this respect.

Following Hirschman (1970) this might create an "exit" strategy concerning local cooperation. An alternative relationship could be what Hirschman calls "voice" or involvement in local processes. A prerequisite for "voice" strategies seems to be a long term orientation in the relationships combined with participation from the actors, thus allowing for an open learning process. In cluster development this means that a trust based relationship must be built between the different actors and activities. In relation to regional development "voice" alternatives will depend on regional institutions and knowledge infrastructure that can contribute with R&D support to the regional actors (Cooke and Morgan 1998). In our setting, "Voice" describes active local environments and inhabitants that interact and participate in processes and create trust. A good condition for this process attracts people bringing new resources and job opportunities. Active interaction at the meso level can such contribute to building social capital and trust necessary for innovation. Cooperation at the meso level raises the question of local dimensions of development. In the Norwegian context the emphasis on regional learning and transfer of knowledge to the enterprises created a need to develop the regional R&D role and the enterprise relationships to research. Experiences from building these relationships have shown considerable inertia in this process stemming from the strong scientific traditions found in R&D institutions more oriented towards scientific merits than participation in problem solving in enterprises and regional development.

ENTERPRISES AS AN ARENA FOR INNOVATION AND CLUSTER INNOVATION

At the micro level, individual enterprises form the basis for innovation by staging and coordinating the configuration and accumulation of internal sources of innovation. The enterprises are also important by managing and developing the organization's capacity for learning. Within innovation context in Norway, emphasis has been put on industrial democracy in work organization and in enterprises, allowing for broad cooperation between employer federations and trade union both at the macro and local level. Internationally this is referred as the "Scandinavian model" of enterprise development. This model of work organization is strongly learning and development oriented (Gustavsen, 2007²). In the initial steps of the emergence of the Scandinavian Model in the 1960s and 70s, it was supported through research support and field experiments in Scandinavian countries. In the comparative research by Gustavsen on the foundations of this model of work organization there are also strong indications that work organization still is an important determinant in building regional and technological clusters. Indeed the model's emphasis on broad participation among employees and

²“Work organization and the Scandinavian Model”. Economic and Industrial Democracy & 2007 Uppsala University, Sweden, Vol. 28(4): 650–671.

open dialogue processes seem important to develop trust and relationships in regional clusters consisting of a conglomerate of actors as in the interplay between our three levels of innovation.

CASES – FOUR REGIONAL CLUSTER DEVELOPMENTS

In Our four clusters the relationship between the enterprises are different. One of the clusters is based on co-localization in an industry park. The tourism network is a regional network project with joint interests related to product development for destinations for tourism. Within aquaculture there are common interests related to learning and development. Within the "Cold Climate" cluster the enterprises are competitors and relate mostly individually to the knowledge institution and share a common interest in developing the research field and recruiting students. How these different common interests between the enterprises are developed, is the basis of the analysis.

CASE 1: THE INDUSTRY PARK

The industry park was established with the abundance of large quantities of cheap hydroelectric energy, attracting energy intensive industry. A large Norwegian concern established a fertilizer plant in 1946 and became the major opportunity for employment in the region. The local plant was part of a diversified global concern until the fertilizer production was restructured as a new concern company from 2003. A rationalization process was started which reduced the need for areas, energy and opening the local infrastructure and facilities as an industry park. At the same time, part of the resources was used to create new businesses within production of wafers for solar energy systems. The new company was established from 1994 and rapidly expanded its production both locally in the industry park and at other locations in Norway and USA.

During very short time, a number of enterprises within solar raw material and production development have been established, and the industrial environment around the fertilizer production has been differentiated by new companies within new production processes and process technology development for wafer production; one within raw material recirculation and another within production of process equipment for solar wafer production. The investments are about 1 billion NOK per year and the companies have totally 300 persons employed.

Elements of interaction

It has been a considerable change for the principal company, from owning the local facilities and deciding on local development up to the situation today, where these processes are taking place in a group of different enterprises. During the first phase after establishing the new enterprises,

collaboration was limited with few initiatives to create synergy effects within the industry cluster. The establishment of new businesses contributed to stabilize the activities in the industrial park and strengthen the argumentation towards local government to improve new infrastructure as education and other basic community needs. But to initiate joint investments in the industry park was a long way to go. Even if reinvestments were needed, this was considered to be done by the original company which still was the formal owner of the facilities. The strategic interests of the companies pointed in different directions, and lack of concerted action and dialogue led to a halt regarding future investments. During the first two years, the interaction in the industry park can be described as an “exit” relationship, where the different actors only interacted within contracted areas where the main focus hiring of the physical capacities of the area. The original fertilizer producer is still part of a major concern, where the local plant does not have responsibility for sales and marketing, which is carried out by the headquarter. The companies within solar wafer production are owned by an external concern holding company. This concern company has grown the production capacity rapidly and has a leading position with a market share of 60% of the global market. In order to meet the new challenges in the industrial park, a development company initiated by the municipality was established in the park to support enterprise development and take care of joint internal processes of co-localization of the companies in the industry park (Madsen, 2007).

The background for enterprise development in the fertilizer production company was to improve the climate for cooperation between employees and management within the concern. A good relationship between management and unions was important to implement decisions on restructuring the business and necessary reduction in employment. The cooperation between the parties of work life became an important arena for dialogue in the industry park. Therefore the fertilizer company engaged in the national enterprise development program “Value Creation 2010”, where researchers were related to the industry park to support in developing the arenas for interaction with the other companies. In this way, the cooperation between management and unions/employees became both an internal enterprise activity as well as part of the development of external relationships between all the enterprises in the industry park.

In addition to being single business units co-located in the industry park, the companies also were part of international concerns and part of their division of labor and obligations. These external relationships both proved to be limitations and opportunities in respect to the development of local cooperation. This situation is often found in rural industrial communities in Norway. Very often the local company is specialized in production, whereas strategic functions of development and competence building are centrally localized. In downsizing periods we often see that the local degrees of freedom are reduced through restructuring activities. The development of the industry park as a resource pool for competence and development seems to contribute to balance the process and create new strategic opportunities to the local units of the concerns. At the same time central concern staff resources can contribute to improve the interaction in the local industry park, if the will is there. Such

interplay between concern and Industry Park as we here have seen can provide the local units larger autonomy within the concern for joint development of strategic competence and innovation (Kristensen & Zeitin, 2005).

CASE 2: TOURISM CLUSTER

The cluster project "Innovative experiences" was formed in 2008 by initiative from regional development actors. The County office of Innovation Norway invited 25 companies from the northern part of Nordland county to participate, many from the Lofoten area. Today the cluster consists of about 25 companies varying much both in size and type of experience production and markets. Totally the enterprises have an annual turnover of about 350 million NOK and employ 255 persons. The smallest company has a turnover of 0,25 million and employment less than 1 man-year, whereas the biggest company has an annual turnover of 200 million NOK and employs 90 persons. Among the biggest companies we find two museums. A large number of the companies offer nature based tourism experiences by activities such as tourist fishing, sailing, kayaking, winter sports, (motor) cycling, paddling, and whale safari, glacier walking and different types of tour/hiking experiences. Another major group is companies offering experiences based on local food traditions and raw materials. We also find four companies packaging different local experience products to visitors as part of their transport activities to the area. All together the cluster is a network offering a broad selection of different experiences as well as the opportunity to combine them in assorted experience packages.

The companies were mobilized from their role as leading companies with strategic ability and capacity for long term development in a region with fragmented industry environment. The initiative of cluster development was much inspired by the "triple helix" approach in mobilizing the efforts of industry, competence institutions and local development actors to create clusters, networks and improve the local innovation system. The intervention in the project was through supporting a foresight process in the cluster on identifying strategic challenges and actions areas. It was expected that the network building process will create a learning process that can be supported with a closer interaction between the companies, R&D actors and regional development actors.

Elements of interaction

After interviewing the companies we see three levels of interaction and innovation. At the cluster level run by the Arena project, the companies have become more active both regarding joint activities and in their relationships with one another. At the meso level, or at the local arena, where the companies interact with other local producers of experience as suppliers individually, or with complementary elements of total experience packages. This was originally not a part of the Arena projects' network cooperation, but still seems to be an important arena of interaction for the companies. Each company

is on their own hand an important level of innovation, where ideas are to transform into development strategies and actions through internal processes of interaction.

The cluster activity was considerable, and the companies meant that they had achieved a significant result of the cooperation. Initially there was limited competition among the companies and by the cluster cooperation the companies gradually had a leading role within experience production in the region. The contact between the companies created trust and support to each other. The cluster consisted of selected companies belonging to different tourism destinations, and therefore local institutional issues or destination management was not a focused area of development. Within the cluster project emphasis was put on the overall knowledge building around experiences production and tourism product development with relation to national programs. This focus was a choice of the project management, as the institutional development of tourism destinations had to be done in other constellations. To address both areas at the same time could result in fragmented use of resources in the cluster with few results. This was a choice supported by the companies, and during the project it was argued that this focus on understanding the specific nature of experience production had contributed to learning, improved competence and represented a common platform that was important to develop tourism destinations after the program period. The board of the project was the involved companies in cooperation with the project manager engaged by the regional development actors. The weakest part turned out to be the relationships with the knowledge (R&D) institutions, where it proved difficult to create a dialogue between the companies and the researchers on innovation. In order to address this problem, the decision was taken to institutionalize this area of knowledge within the regional university and the county by establishing a new “Centre of experience production”.

The tourism companies within a destination are in a complementary local relationship with other companies, products and experiences that contribute to create an attractive destination for visitors. In addition to a former institutionalized cooperation as exemplified with “destination Lofoten and winter tourism”, a more informal local cooperation is emerging. This results in a more vivid environment for destination development, demanding new local products and services and increased employment like:

- Increased demand for local food and products, where local producers in cooperation with tourism operators have achieved an increased local market.
- System cooperation towards special market segments; Lofoten has frequent visits of cruise ships demanding a number of local services and cooperation needs between the suppliers like guide services, transport, food and local attractions.
- Logistics and transport; visitors would like to use several experience offers, demanding more tailor-made logistics solutions than available by existing bus and boat offers.

A local cooperation is in this context an important factor of development and innovation. Such a meso level cooperation should be supported and developed in order to strengthen the ties and trust between the participants in the cluster. We see varying extent of formal arenas of cooperation for different

tourism destinations, resulting in different scope of innovation. In Lofoten, where a large number of companies in the cluster come from, we find a destination with a long record of network cooperation and with a formal destination development organization. The tension between the local arena of cooperation, and the macro level perspective on experience development in the cluster, maybe led to that the companies from Lofoten having the destination in common, could utilize the cluster cooperation more actively. Thereby other companies could feel somewhat left at the sideline. However, over time the relationship among the Lofoten companies could become stronger and lead to a more passive role for the other companies even if this was not the intention.

The tourism companies had a small staff with few year-round employees. During the top season the staff was expanded by part-time employees. The year-round employees formed a core working closely together with an open dialogue among them. Seasonal employees were mostly recruited locally and they often knew the company. However, many also were recruited nationally and internationally. Therefore it was necessary to have an introduction to work areas and to the company's core ideas about experience production and customer treatment. Most of the companies have tried to develop team and work relationship in order to achieve this. The traditional forms of cooperation between management and employees through unions were not present, but the common challenges in meeting the visiting customers still created an open dialogue. The need for seasonal labor was varying between the companies regarding functional areas like hotel, restaurant and guiding services. Recruiting of seasonal labor was mostly carried out individually by the companies, based on their network developed over time. Some of these contacts could be rather specific, like the need for skilled craftsmen able to demonstrate working methods from the Viking age. However, there were also some common areas and needs that could form the basis for more widespread local interaction and cooperation. We now can see a new field of cooperation emerging at the meso level.

THE AQUACULTURE CLUSTER

The aquaculture industry along the Nordland coast has since the 1970s become one of Norway's most important export industries, providing 19 billion NOK and important job opportunities for the coastal population. The coastal fisheries consist of both wild caught fish, particularly cod, and aquaculture production. The aquaculture cluster has been established by developing atlantic salmon as a farmed species and now consists of companies within breeding, technology development, feed production, sales and export, R&D and financing. When establishing the formal National Centre of Expertise in aquaculture the industry focused on developing cod as a new marine species for farming. The companies are oriented towards international markets and have over time documented to be competitive both nationally and internationally. R&D has given important contributions to the quick development in the Norwegian aquaculture industry. A business oriented partnership was the core of the initiative that during the summer of 2007 was accepted as a Norwegian CoE within aquaculture.

The strength of this CoE is that leading companies and competence institutions have joined forces to develop the aquaculture industry in the coastal region. These companies were originally competitors and had little tradition in cooperation. On average the companies had a turnover of 15 million NOK and an employment of 11 man-years.

The development of cod farming as a new coastal industry was the core idea of the national CoE within aquaculture. Considerable differences existed among the companies, from large scale industrial production companies to small scale niche producers for restaurant markets. The cluster was heavily influenced of the former experiences within salmon farming, which was the main activity for most of the companies. All companies participated equally in a partnership that elected a board acting as a working group. The development of the cluster was discussed in partner meetings and a foresight method of analysis was applied. The priorities for development were solution oriented towards technology and improvement of growth related issues and the productivity of cod farming. However, the financial crises in 2008 represented an acute challenge not only to the individual companies, but the existence of the whole cluster. Cod farming appeared to be especially affected of the crisis with low production and profitability at the present stage of development. The present crisis can be related to three major factors; a) The price of cod is too high in a falling market segment. B) Farmed cod is a new product that only to a small extent has managed to establish as a new category of fresh fish, and c) The fish farming companies have had too short time to develop production regimes productive enough to give a cheap production.

Elements of interaction

In the startup period most important was to find development areas where the companies had shared problems not sensitive to disclosure, and where cooperation could be mutually beneficial to develop more trustful relationships. The cluster project being managed by a regional partnership and a responsible project manager, also created trust and interaction. At the same time this led to a demarcation towards the R&D institutions which were considered somewhat theoretical in dealing with the industry innovation needs. Strategic issues related to market and sales were left out as they were considered more problematic to the former competing companies in the cluster. Initially cooperation was sought to be established within four areas: a) Fish health, b) quality of fry, c) escape of fish and nutritional needs of farmed cod. However, there were problems in getting to an agreeable operationalization of the problems that could be supported by research institutions. The R&D supported competence teams were experienced as successful and concerted a discussion on common experiences. Much of the cluster development took place within the groups as a competence accumulation process. However, broad development processes were only established to a small extent. The operators of the fish farming companies traditionally formed a group with few options for career development outside of the companies. With support from the regional innovation program in Nordland (VRI), a centre for education and training was established in cooperation with the regional

university of Nordland. This center seems to be an important factor to mobilize a broader participation in enterprise and competence development among the employees and thus open up for complementing the tacit knowledge already in place. Also regarding gender issues the cluster seemed necessary as the production work is male dominated whereas the female representation in cluster cooperation was considerably higher.

The connection to R&D institutions seems not substantially developed during the cluster cooperation, and the relation proved to be more like a channel for requesting scientific studies. The researchers experienced that the users had too limited knowledge of general R&D (codified) knowledge, while company managers felt that the researchers were occupied with their research ambitions and merits. The researchers meant that it was difficult to define R&D projects in cooperation with the companies. On the other side the companies meant that the researchers were too theoretically oriented and lacked a will to meet their practical needs. From both sides more contact between researchers and the operator level was requested, thus providing access to better and more relevant research support. The question was how the practical level and the operators could be incorporated in the development work and thus creates a potential for development of research tasks? Opportunities to develop joint projects were requested. The recently established center for aquaculture related competence development and training at the regional university in Bodø can be an agent in this context.

At present Norwegian cod farming seems at risk of being eradicated as the production has been very limited with only a few production companies able to continue. This also raises the question whether it is possible to change the innovation strategy from the target of developing a large scale new industry of cod based aquaculture to a more extensive form of production with cod farming as a seasonal supplement to coastal fisheries and in response to segments of the market (like restaurants) willing to pay high prices in order to be able to guarantee fixed supplies with high quality. This also seems to indicate a more widespread use of R&D knowledge in validating the present knowledge status and identifying potential production models and areas of growth within the industry.

CASE 4: THE COLD CLIMATE TECHNOLOGY CLUSTER

The fourth cluster we have investigated consists of companies within construction and building with entrepreneur companies, consultants and suppliers in northern Norway related to the Narvik University College of technology. The measures of cluster building were targeted towards students, content of the studies and the needs for education and training within the construction industry. The initiative in Narvik was aimed at developing the R&D based education and research in Narvik as a technological supporting environment to individual companies and not as a common development cluster for the industry. Cold climate technology development has a long tradition within the research institution who intended to contribute in developing a more active cluster between companies of the

industry. This also raises the question of the construction of a new arena with companies interacting on R&D development.

The composition of the cold climate network seems to behave very much determined by the regional university's need of development of new substantial areas of knowledge production, more than a form of cluster development. If this network should be able to go fully into the regional innovation initiative (VRI), this would imply that both participation and interaction at the meso level has to be given higher priority. Such a choice must also be made in close interaction with the actual companies. Traditionally companies within the construction industry are often competing with one another based on quick management decisions with little space for discussions on cooperation on strategy development. Use of increased R&D support would also mean that it will be important to address common challenges and commitment to interaction in order to start trust building and cluster enhancement at the meso level.

4. DISCUSSION

Based on the four cases investigated we now will focus on the potential they represent for innovation. We then move on to a discussion on the three levels of innovation and contributions to strategies and methods for future regional cluster development projects.

4.1 POTENTIAL FOR DEVELOPMENT IN OUR CASES

In the industry park the basis for development was the major fertilizer company and the large abundance of hydroelectric energy, opening new opportunities for new businesses in the area. When the fertilizer company was reorganized, new opportunities emerged in the industry park. In the first phase, the fertilizer company also owned the infrastructure of the Park and new businesses was established within business areas that did not compete with this company. Therefore, the new companies concentrated on their own business, resulting in limited interaction within the local environment. An initiative from the municipality resulted in an process leading to cooperation on education and competence development, as well as focus on the use and renewal of the infrastructure of the industry park.

In the next step focus was developed to increase the cooperation to develop the industry park to become more attractive as an industrial environment. By exploring the complementarities between the companies, new challenges and business opportunities emerged and new companies was established to increase raw material utilization and supporting activities (process technology) to wafer production. In this process external industrial and competence relationships to Chinese partners were developed, and the local development relationships were increased. The overall result of the process was that the companies developed a better coordination and division of labor within the cluster with

more opportunities locally to develop the value chains of the companies. The recognition of common interest became thus important both in relation to the owners, regional development actors and the necessary degrees of freedom for development locally.

Originally the companies within the industry infrastructure were related to different industrial concerns and were very passive regarding local strategy development. Through the process, the external owners (concern) saw new opportunities in the local network, much in line with the observations of Kristensen and Zeitlin (2005). By allowing for local autonomy, a new arena for development was created. Local success strengthens the position of the local unit as part of the internal competition in allocation of resources within a larger concern. Global resources through competence and technology can thus become available for local development. On the other hand, being part of a business concern can also imply a significant degree of internal standardization and thereby create tensions among employees and their opportunities to participate in local innovation processes.

The tourism cluster was originally selected from a regional perspective. Recruiting strong companies with a focus on innovative development has, according to the interviews, given these companies a leading role regionally. The cooperation among the companies in staging and performing a foresight process also has contributed to increased development and innovation ambitions in the companies (Løvland and Samuelsen, 2009). However, it soon turned out that the local context at the meso level was important for the strategy development, even if this was not a primary part of the project. Many of the companies came from a leading destination (Lofoten) with already established cooperative relationships and ongoing development activities related to product development and regional branding of the destination (examples “Lofoten Food” and “Lofoten Winter”). We saw in the project work that the Lofoten companies developed a closer cooperation, whereas other companies maybe felt less influence to the cluster activities and became more passive. Through the competence development in the cluster project, and increasing activity at the meso level, the companies in the tourism cluster improved their competitive position even when the financial crisis hit the industry. Lofoten was the only destination area in Norway increasing the number of visitors in 2009.

The Cold Climate cluster was established in relation with a regional technical university. The main purpose was to build a broad network for the university. The idea to form a development project for technology development related to cold climate conditions was therefore more motivated in order to develop the research strategy for the university than the developing needs of the involved companies. The construction companies were mostly competing individually and had limited traditions for cooperation. Therefore the cluster activity did not function as a learning and competence development arena. If the R&D activities related to the cluster development and the establishment of a “Cold Climate” center should be continued, with more focus on R&D support, the process would necessitate a stronger selection of participating companies. Shifting the focus from individual competition to cluster formation and development can therefore be demanding as it also would require a identification of possible areas for R&D cooperation and interaction to increase the level of trust

necessary to create new cooperation areas. New challenges related to technology and industry development related to offshore oil and gas development in the Arctic area could mean examples of new market opportunities and strong incentives for further cluster development.

Being in a very competition oriented industry also meant that the relationships were more of “exit” type dominated by the common relationships to a joint competition arena. Further development through enterprise development and the cluster’s competitive position will demand a discussion of which arenas for interaction would be required in addition to the already established arenas. This has not been the case to the present point of time. Regarding the development of a more R&D supported strategy, the participation from the companies among employees and engineers could be regarded as a crucial development area to address for the cluster companies. It could be a question if not increased interaction on innovation would require additional competences related to cluster development and innovation support. The meso level cooperation was only mobilized to a small extent, the same also applied to internal actors in the company.

The aquaculture companies were related to a national CoE project located in the northern part of Norway with focus on developing cod farming as a new species and product for the European fresh market. In addition companies from supporting industries producing feed, fry, process equipment and financial resources was included. Initially the level of cooperation was limited and the mode of competition was mostly through individual companies looking at each other as competitors. The cluster cooperation was constructed to facilitate their opportunities for learning and innovation to support technological product development to master a commercial production regime for cod as a new species for fish farming. The companies were more critical to cooperate on areas related to sales and market development. The R&D support was developed by the companies individually, mostly focusing on the technological and physiological improvement aspects. As many of the local companies belonged to industrial concerns, the meso level was only developed as a strategic area of cooperation to a small degree. It also proved difficult to mobilize companies within supporting industries to the network development as they often seemed not to be regarded a part of the local environment. However, the cooperation on competence development emerging, and the formation of a R&D supported center, also created room for a more active engagement and participation from the employees in the companies. Competence development within the focus areas of the aquaculture cluster aimed to develop unskilled workers by a flexible and decentralized use of bachelors and master education programs at the regional university in Bodø, adjusted to the demand in the companies.

The financial crises at the end of 2008 led to a dramatic fall in demand for farmed cod, regarded as relatively expensive seafood product. Within the cluster, the overall activity was reduced and several companies were threatened by bankruptcy. The market orientation and size in production among the companies varied considerably, from companies aiming at supplying the market with fresh, high quality products on a year-round basis, to other companies looking at farmed cod merely as a substitute to naturally caught cod from the traditional fisheries. The identification of commercially

viable production regimes for farmed cod after the financial crisis will be an important question for the cluster. Alternatively, would it be possible to change from a full scale and intensive industry approach to a more extensive strategy aimed to supplement the natural marine coastal seafood production? This approach could also be more in line with the overall analysis carried out earlier in the foresight process of the fish farming cluster.

4.2 CASE COMPARISON

The development of each company in the cluster depends on many factors. Generally we can point to the situation in the industry and the market that forms the environment to the company (Aldrich 1979, 1999, Hannan and Freeman 1989), internal strategies and resource dependency (Pfeffer and Salancik 1978, Child 1979), competence, network relationships and linkages to partners (Powell and DeMaggio 1991, Cook & Morgan 1998). When taking the general market situation into account, we find that this crisis affects our clusters as a ecologic effect to a varying degree. Especially within the industry park and our aquaculture cluster the effect is severe. The ongoing development taking place in the industry park with complementary enterprise development, competence development and investments, to some extent seem to shield the companies from the general reductions of activity with the concerns. On the other hand, the aquaculture companies operate isolated and experience the effects of the financial crisis fully. The considerable price reduction in the seafood market hits the company in a vulnerable stage of the development of cod farming with high investments and low equity in many of the cluster companies. Also the tourism industry was affected by the financial crisis with large reductions in the number of visitors – with Lofoten as an exception. An explanation could be that the destination, in addition to being attractive scenery, the companies in Lofoten is cooperating to develop variation in experiences and services by flexible specialization. The high level of interaction at the meso level also contributes to the attractiveness of the destination when the demand is reduced. For the “Cold Climate” companies the intervention from government did reduce the effects of the crisis.

In the clusters we have exemplified four different conditions for interaction. First, a common fate among the co-localized companies within the industry park where interacting on the development of the industry park and to create a complementary partnership in production. The cluster activity is organized at the meso level and the regional innovation system is not related to this process. The next case is a cluster of tourism companies related to a regional cluster project. Basically this project is a project for competence development where exchange of ideas and experiences are important elements. The learning create obligations and trust among the participants. The meso level or the innovation network of the companies is not directly related to the project as a development arena. However, the destination level is important for the development activity in the companies.. The third project is a regionally located CoE project directed towards development of cod farming as a new species in Norwegian aquaculture. The relation between the companies are weak as they individually are

competing on the market. The strategic interests at the meso level are not established. The last cluster is a network of companies, only having relationship to the technical university. Even the project tried to relate the companies to a common strategy for “cold climate” technology development, still each company interact individually with the knowledge institution and not as a cluster. Both the joint learning arena and an interactive innovation process is not developed in the project.

4.3 ARENAS FOR INTERACTION AND INNOVATION

In the clusters the level of interdependency among the companies varies –from the common fate of the co-localized companies in the industry park, via development project community in the Arena and CoE-programs, to a relationship to a knowledge institution. This affects the level of trust and competition among the companies of the clusters. How the cooperation and interaction process is developed within these settings are summarized in table 1:

Table 1: Importance of different interaction arenas in the four innovation projects

Cases Interaction	Co-localized industry park	Tourism arena network project	CoE Aquaculture Cod farming	Cold Climate Tech./ university network
Regional cooperation /	Little	Large	Some	Little
Meso level interaction	Large	Some	Little	Little
Enterprise network cooperation	Large	Some	Some	Little
R&D interaction with university/institutes	Some	Some	Some	Some

The regional learning arena is represented by the tourism arena project and the CoE-cluster within aquaculture. Also it is the meso level activities demonstrated by the industry park and the destination level activities of some of the companies within the tourism cluster. Thirdly, is the work cooperation in the companies and fourth it is the R&D interaction on innovation found.

4.3.1 Regional clusters as arena of innovation

The regional level of innovation is organized from the regional development actor’s initiative, and consists of development oriented companies with experience from development work. The companies are not co-located and therefore local partners are not necessarily involved unless many of the core companies are co-located as we saw in the tourism cluster. We find the regional level of innovation present in two of the projects; namely where the Arena and CoE network has a role in the regional learning system to support innovation. We initially raised the question of the interplay between the regional innovation system and the system developed by the companies themselves. In models of regional innovation, the focus is on the overall innovation system from a perspective of “Triple Helix” approach between government, industry and knowledge institutions. Very often this reference appears to be a “black box” where the operational descriptions are lacking. Through our cases we want to open up this black box and contribute to the discussion of innovation.

Triple helix models represent a regional macro model for development where the regional development organizations are the active partners and define the frame for supporting systems that the companies are related to. An advantage can be that companies are directly connected to the supporting environment and competence. By activating and coupling several networks it is possible to create a learning system where strong companies can learn from each other. Within this framework new knowledge and the exchange of experiences form the basis of the regional learning system. The strategic element often supported by the use of foresight analysis of regional conditions for innovation.

In the cases we, especially in the tourist project, see establishing trust necessary to utilize the opportunities for interaction and learning which the regional system provided. Especially the learning focus of understanding the nature of adventure production within the companies contributed to a transfer of knowledge between the companies. The aquaculture cluster did also develop the learning system even if the point of departure was characterized with competition between the companies. The expansion of the interaction was stopped by the severe financial crisis experienced by the industry. The strength of the learning system is measured by its ability to open up for regional cooperation and reducing the competitive elements between the strong companies. At the same time new development actors can be linked to the cluster in the form of regional knowledge institutions and R&D support.

In order to understand the mechanisms of moving from an “exit” toward a “voice” cluster regime we have drawn upon the studies related to the development of the “Cluster Dynamics Model” (Smith, 2009), where a stepwise process of interaction has been observed. We have related our experiences regarding meso level development issues at each step of the model. The steps of the model are shown in table 2 below.

Table 2: Development steps in the Cluster Dynamics Model (Smith, 2009)

Levels/steps of interaction and mechanisms	Dynamic factors of innovation in cluster
Level 1: Rivalry between companies ⇒ Create learning system	The companies reacts to competition pressures by individual innovation and price competition, thereby creating a collective advantage to the collectiv group
Level 2: Enterprise cooperation on common challenges ⇒ Foresight	In reaction to external competitive pressure, companies can establish cooperation and create trust to deal with common challenges and develop a collective supporting environment.
Level 3: Cooperation on knowledge and innovation. ⇒ Create learning system – regional innovation network ⇒ Supplement with meso level companies, internal network and employee participation	Transfer of learning from the cluster process to the regional innovation network by R&D supported innovation. Develop relation to new innovation actors in the companies.
Level 4: Attraction of resources (knowledge, capital, talent and new companies)	The cluster attracts new external actors finding the innovation environment more complete. ⇒ <i>Example: R&D institutions</i>
Level 5: Distinctiveness generation: Strategic cooperation on knowledge development.	Focus on future innovation opportunities and development of competitive advantage with increasing R&D support.

	⇒ Strategic destination cluster development (tourism)
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A problem in cluster development processes can be that natural partners for product and strategic development are not related to the planned innovation models. The value chain relationship between the companies and their environment on meso level is important for product development (Julien P-A 2007). The companies' innovation thereby becomes an important linkage between their micro activities and their participation in regional innovation. The expected progression in cluster development described in table 2 can thus in our experience be modified by introducing a linkage between the learning system represented by regional development, and the local innovation environment of the companies at the meso level as confirmed by our studies. A modified development model is shown in table 2 where the participation of advanced companies in the cluster is supplemented with value chain partners of the companies or the local environment for product development (level 3). The other weakness of the regional innovation model is that the company participation can be based on a management driven process with limited participation from company employees. In two of the project a lacking linkage to participation from employees was described as necessary in order to facilitate access to all forms of knowledge needed in a R&D supported innovation process.

4.3.2 Meso level and innovation

In the regional project studied, we are missing an explicit strategy to enact the meso and company (micro) level. We therefore find it necessary to strengthen the organization of innovation development in the CDM model by including local partners of the companies as well as the employees as explicit participants. Interaction at the meso level is particularly demonstrated in the tourism and industry park cases. The activities here are both formalized by development actors as the municipal agency for strategic development within the industry park, and the local organization for branding of food in the tourism case. In the tourism example we see a large degree of direct interaction between the single companies related to serving the needs of visitors. In the interviews with the tourist companies several ideas for development arose from companies not being able to carry out this process individually. They therefore expressed a need for a better institutional setup in order to operationalize common areas of innovation.

Comparison of the cases also shows that the institutionalization of interaction activities in the clusters seem to create a joint buffer against effects of external crises. The comparison of the cases, and the learning spiral in the regional cluster project and interaction at the meso level, clearly demonstrates this effect in the industry park and tourism cases. The institutionalization of interaction and dialogue also contributes to the development of "voice" relationships in a way that avoids the possibility that short term strategies define the scope for innovation. The development in the industry park was structured by an institutionalization of a joint development actor in the industry park. This

development body was initiated by the local municipality and is today employing 3-4 persons. In this way the strategic development of the industry park was put on the agenda and several actions were launched. In this process a two-sided leadership role was established; the technical role staffed by a former manager from industry combined with an organizer of the overall activity. Both emphasized to act as social entrepreneurs in their relationship with the companies. This led to mobilize employees in the process, creating engagement and trust. Especially the focus was on three areas of action:

1. Strategic competence development
2. Renewal and development of infrastructure and facilities in the industry park
3. Entrepreneurship, innovation an enterprise development

In the tourism cluster the companies participated in a regional learning network where the responsibility for innovation was individual. An institutional responsibility was not defined within the framework of the tourism innovation project. However, as we have seen there was already established a cooperation between some of the companies at the tourism destination level. In consequence of these experiences the companies expressed their wish that the destination level should be included in the project by mobilizing local partners. This was necessary to be able to create adventure innovations and to extend the tourism activities to the winter season. This can be seen as creating a linkage between the learning arenas within the regional project and destination actors with opening for social entrepreneurs, as several of the companies had ideas that would demand new actors. The transcending role of the social entrepreneur already has been developed in several of the companies regarding new local areas of innovation and adventure production and culture based entrepreneurship on activities and roles within museum institutions etc . R&D support can provide an important contribution to more explicit development strategies for innovation. Tourism companies from the Lofoten have created a local context for product development within the destination setting. At the same time they are part of global networks forming the basis for travel, tourism and experience production. A similar relationship we find in the industry park with the linkages between industry park development and their owner concern (Finstad og Løvland 2006).

If innovation is dependent on internal interpretation and acceptance, an area for the meeting of actors must be created. Empowerment seem to put the innovation actors in a development position where own practice and experiences will motivate to improvement (Fox, 1971). A wish to create empowerment also will presume linkages both at the internal and meso level. R&D can contribute by interdisciplinary strategies to support learning at the regional level. The autonomy at the meso level is an important factor both in term of resource and competence development.

4.3.3 Enterprise as innovation system

The responsibility for innovation and product development lastly will rest on each company. In the regional project following the “Triple Helix” it is presumed that the role of the project is to support

innovative companies engaged in innovation, to cooperate. The project does provide only limited support and guidance to each company on their own innovation processes. For many of the companies it was a huge step from the ideas proposed in the foresight process and industry development perspectives, to the companies' internal processes and experience product development. The need for guidance and help to operationalize this to enterprise development was requested. In Norway there is a long tradition for enterprise development supported by action research to enhance broad participation in the companies, often referred as "the Nordic Model" (Gustavsen, 2009). In this model the emphasis is on mobilizing employees and thus opening up for adaption to local needs and actors. This also ensures high legitimacy in development processes and often creates trust relationships and social capital among the actors. This reduces transaction costs among the participants.

Industry parks represent arenas of interaction where the participants are joined in a common fate where management and unions have necessary roles in developing of the industrial environment. Strategy and development processes should not only be management driven, but rather as a joint development process where employees have an important role and are important according to the experiences of the Norwegian Federation of Employer and the Norwegian Labor Union (Gustavsen, 1998). Experiences from a former regional development project showed that mere management driven processes have limited value because of the need to integrate the different development perspectives represented. Active engagement among employees is depending on the opportunities for participation (Finstad and Løvland, 2006). Leaders are often oriented towards external factors as markets, supporting networks and competitive issues, whereas the operational level and union representatives are more oriented towards knowledge and technological development within their professional framework. When external pressure is increasing towards the company (competition, market related processes) the leaders often tend to reduce the contact with both unions and external supporting partners like enterprise development researchers, but these relations were later opened up when the conditions became more "normal". By linking the development context to both the strategic and operational level we point to implications both from management and workplace culture. Davenport and Leitch (2005) shows that open processes in the strategy development work can reduce inertia and open up for creativity. The local development of autonomy thus created room for the employees to contribute to innovation and development at the meso level. The tourism companies only had limited experiences with the formal cooperation between unions and management. The employees were separated in two groups; fulltime and seasonal employees. The fulltime employees were a small team with delegated responsibilities also within enterprise development. In this way this group had a considerable level of participation even if there were no formal agreements established. The companies also tried to have seasonal workers to participate by giving training and giving new employees access to joint arenas. This became important as the seasonal workforce played an important role when meeting visitors to the regional and the experience companies. Thus a

considerable effort was made to ensure feedback from seasonal workers to the company by feedback and “debriefing” arenas, in order to enhance organizational learning.

In the aquaculture companies the cooperation with unions and employees was established as a tariff negotiation model where the employees only had limited possibilities to participate in enterprise development and strategic work. Blue collar workers in this industry were a group with very limited career development opportunities. Within the companies the question was how the employees could participate more actively in innovation processes. In order to relate R&D support to the cluster innovation process it was necessary to engage the tacit knowledge of the workers. As a result of the project, a resource centre for education and training has been established. This opens up for competence and career development with the companies that can allow for increased participation from the employees of this industry.

Within the “cold climate” cluster, recruitment of educated personnel to the companies was a common interest that led to a cooperation between the regional university and the companies. Within this new setting a program for recruiting women to the industry was established. Participation from employees was not formulated as a mode of development, even if the individual companies were organized and had tariff cooperation with unions.

4.4 R&D and cluster innovation

At the tree arenas for interaction on innovation, R&D has over several years been a part of the development perspective. The point of departure was action research related to the industrial relations between management and employees in the companies. A target has been also to develop a company related model to deal with development at the meso level as part of the interaction within the industry park (Finstad and Løvland 2006, Finstad 2007). Within the tourism companies R&D has played a role in supporting the foresight process and analysis, as well as bought investigation on specific areas of new knowledge like how to deal with new knowledge within the area of experience economy. Only to a small extent R&D has been related directly to the individual companies or related to issues of development of tourist destinations and joint experience product development. In the other two cluster cases R&D was engaged at a small scale for specific deliveries of knowledge related to technological development.

The Triple Helix model through its interactive approach also presumes a development of the R&D institutions and innovation research as such. The researchers experienced that company management lacked competence to describe their research needs at the same time as managers felt that the researchers were too occupied with their meriting ambitions. From both sides a wider contact between the employees (operators) and the researchers was requested. Maybe such a closer contact might be a fruitful contribution to ideas for research and scientific support to innovation.

The question was if the practical level and the operators could be incorporated in the development work, and thus creates a potential for developing research tasks. The emphasis of regional learning created a need in the companies to develop the regional R&D role at all three levels. In Norway regional universities are supposed to be a part of the regional infrastructure to regional innovation and development. They than has to develop inertia related to the way research can contribute to regional development and problem solving in enterprises. The potential to generate R&D processes in the companies therefore has been mobilized to a small extent, even if this is considered an important precondition to regional development and innovation. The role of the researcher is divided. One role is related to expertise and support related to production areas within different industries, like we have shown within the experience industry cluster. In addition there is an action based role with emphasis on implementation and strategic development processes where issues of learning and interaction are central.

It is a question if research can be a mediator between the development activities at the three levels, with the intention to bridges between enterprise development, meso level development and the extension to regional perspectives for innovation and development. That means a third alternative, with research being a part of a development process and with arenas for joint development of R&D needs. Such a model with the use of R&D as a mediator between the three different levels has not been validated sufficiently. This would imply that the interface with practice must be developed in a dialogue based learning process or with the use of action research to clarify possible challenges. The regional universities with their R&D institutions represent the disciplines and theoretical knowledge able to develop more applied research. This would mean research with a deductive approach as theoretical knowledge is used in practical settings. The development within our "cold climate" cluster is an example of such development.

With reference to the companies we can also think of a more inductive R&D approach based on the needs of the companies. This could lead to the generation of both research tasks and development activities based on the activity in the companies which may lead to a more inductive R&D approach where conditions in the companies form the basis to generate research tasks and joint development actions.

From the interviews we have had a number of explanations on the limited experiences on the researcher as a more responsible partner in the cluster processes. The interviews point to the following conclusions:

- 1) The companies have too limited knowledge of relevant R&D areas to be able to demand relevant support from research. It is important allow for time to have a learning process in the companies to develop "ordering" competence.
- 2) Researchers are biased by their meriting ambitions and opportunities, thereby giving few opportunities for the companies to affect relevance of knowledge building.

- 3) Research questions are modified on the way to become request for research support. The researcher must be part of the development at different levels to be aware of these processes
 - a. In the regional cluster projects R&D tasks are often generated by management. Our experience is that this could be better solved by direct interaction between the operational level and researchers.
 - b. If the linkage between the company and research support is taking place through a process at the regional level, project management at the regional level could end up in a process with that hampers the dialogue between researchers and participating companies.

REGIONAL INNOVATION I THREE DEVELOPMENT STEPS

After a period with regional planning as a driving force for development (as shown by Brox in his critique of the spatial planning processes in Northern Norway), we have had a transition to a period where industry development and enterprise development should be central to regional innovation strategy development, we now can see three steps of such a strategy for enterprise development and innovation.

The first step was to contribute to learning and innovation in single companies. The Nordic cooperation model between different interest groups was developed with the consequence to create learning and trust through a negotiation and dialogue system. A central aspect to this development was the internal conditions for development in crucial areas of health, work environment, technology and organization. This development of the so-called socio technical approach was supported and built by engineers, psychologists and economists. External references and strategic approach toward market relations seldom were discussed. In dealing with innovation processes this approach meant a clear limitation for this socio technical approach.

The next step was formulated by geography and sociologists through the “Triple Helix” perspective. It was an interaction model between regional development actors at the regional level, meaning enterprises, development actors as well as knowledge and education institutions. The development arena was established to create connections between the three actor groups that could create synergies for a regional learning and innovation process. After some time the concept “cluster” was used to develop a regional community of enterprises that could form the operational action group for a more focused regional development process. Such a network of actors for interaction can be well suited as an arena for active companies exploring innovation alternatives. For strategic development and innovation the composition of participants can be a source to local “lock-in” effects. Joint development of strategies and innovation also necessitates that relevant product and development

actors are represented. These can be found within the environment of individual companies with relations to their value chain or in the form of local initiatives at the meso level related to the production relationships of each company. Within the aggregate "Triple Helix" approach the meso level is often regarded as a complicating element. This can be a result of the different logics of action between the administrative and enterprise innovation system as we have suggested earlier. We have given examples from the tourism cluster where the administrative (regional) system wanted to transfer development resources from the developed destination area in Lofoten to a less developed region (Helgeland). We therefore argue for the linking of both the administrative system and its development resources with innovation strategies in cooperating enterprises at the meso level. The third development step is to contribute to a meso level development following the lines put forward in this paper. This could be done by adding a regional development strategy the following elements (see also Bryden and Hart, 2004):

1. Supplement a regional enterprise network with operative subgroups for product development from the operating environment of participating companies
2. Development of local initiatives and autonomy by local supporting institutions and social entrepreneurs.
3. Develop creativity and relationships/network relationships with knowledge institutions (R&D)

REFERENCES

- Aldrich, Howard. (1979). *Organizations and Environments*. Englewood Cliffs, N.J.; Prentice-Hall.
- Aldrich, (1999). *Organization Evolving*. London
- Ahrne, G. *Agency and Organization: Towards an Organizational Theory of Society*. London: Sage. 1990.
- Berg, Dale, Lysgård and Løfgren, 2004
- Brox, Ottar (1966).: *Hva skjer i Nord-Norge*. Oslo Pax
- Brox, Ottar (1984) *Nord-Norge: Fra allmenning til koloni*. Romsø, Universitetsforlaget
- Cook, P. & Morgan, K 1998: *The associational economy – firms, regions, and innovation*. Oxford: Oxford University Press.
- Davenport, S and Leitch, S (2005). *Circuits of Power in Practice: Strategic Ambiguity as Delegation of Authority*. *Organizational Studies*. 26 (11) 1603 – 1623.
- Finstad, N. 1995. "Allmenningen eller "Segelfoss by" - hvordan tolke flyttetall fra Nord-Norge? Artikkel i *Sosiologisk tidsskrift*. Nr. 1.
- Finstad med fl. 2009. *Innovasjon gjennom samhandling*. Nordlandsforskning, Bodø. 1010/2009. ISSN-nr.:0804-1873
- Finstad, N. og Løvland, J. 2006 : "Dialog og endringsstrategier – aksjonsforskning i en retorisk kontekst.. *Beta.Scandinavian Journal of Business Research*. Nr 02
- Finstad, N. 2007. Artikkel i: Nyseth Toril, Jentoft Svein, Førde, Anniken og Bærenholdt Jørgen Ole. *I disiplinens grenseland. Tverrfaglighet i teori og praksis*. Fagbokforlaget. Kapittel 16, Mesonivået som utviklingsarena.
- Gustavsen, B. (1998). *From Experiments to Network Building: Trends in the Use of Research for Reconstructing Working Life*. *Human Relations*. Vol 51. No 3.

- Hannan, M.T. and Freeman, J. 1989. *Organizational Ecology*. Harvard University Press. London.
- Jakobsen, S-E og Føysand, A. 2010. Hvordan regissere innovasjoner. Plan. Nr 01.
- Julien, P-A. (2007), *A Theory of Local Entrepreneurship in the Knowledge Economy*. Cheltenham. UK
- Hirschman, A. 1970 *Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States* Cambridge, Mass.: Harvard University Press
- Kristensen & Zeitin 2005: *Local Players in Global Games*. Oxford University Press.
- Madsen, E.L. 2007. *Muligheter og utfordringer for Glomfjord Industripark. Om grunnlaget for videreutvikling av framtidig felles infrastruktur og tjenestetilbud*. NF-arbeidsnotat 1011/2007, Bodø: Nordlandsforskning
- Meyer, J. W. og Rowan, B. 1977. Institutionalized Organizations: Formal structure as Myth and Ceremony. *American Journal of Sociology*, 83.
- Mintzberg, H. 1994. *The Rise and Fall of Strategic Planning*. Prentic Hall. New York. 1994.
- Onsaker, K. 2010. Regionale fortrinn og innovasjon I Norge. Plan Nr 01.
- Onsager and Selstad, 2004,
- Pfeffer ,J and Salancik G,R. (1978). *The external control of organizations. A resource dependent perspective*. New York.
- Powell W,W, and DeMaggio P,J. (1991). *The new institutionalism in organizational analysis*. Chicago.