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Innovative, Intelligent, Constructive and Complex Clusters

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INNOVATIVE, INTELLIGENT, CONSTRUCTIVE AND
COMPLEX CLUSTERS

ARCTIC SMARTNESS EXCELLENCE (ASE)

Developing evaluation, Draft Final Report

29th May 2018

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Leverage from
the EU
2014–2020



Table of contents

1. INTRODUCTION	1
2. THE PURPOSE OF DEVELOPING EVALUATION PROCEDURES	2
2.1. Description of developing an evaluation report	2
2.2. Evaluation criteria	3
3. CASE ARCTIC SMARTNESS AND DESCRIPTION OF THE DATA	6
4. BUILDING ARCTIC SMARTNESS.....	10
5. RESULTS.....	13
7. RECOMMENDATIONS FOR DEVELOPMENT.....	17
REFERENCES	19

1. INTRODUCTION

The European Commission is contributing to the European Cohesion Policy with the Smart Specialisation (S3) initiative as a part of the Europe 2020 Strategy for smart, sustainable and inclusive growth. A total of €330 billion has been applied to the task of increasing European economic competitiveness and social welfare through research and innovation during the 2014 - 2020 funding period. All member states' research and innovation strategies for smart specialisation, and the regions are integrating development efforts and seeking financial support from the European Regional Development Fund (ERDF).

In Lapland, Arctic Smart Specialisation strategy was published in 2013 (Heikka, Jokelainen & Teräs 2013). After the program, the Regional Council of Lapland clarified the strengths, value chains and new forms of co-operation in the Lapland region and launched the Arctic Specialisation Implementation Project. As a part of the project they analysed 650 projects and this analysis was used as the basis for the construction of five clusters. Clustering started in 2015 with the Arctic Smartness portfolio project (Jokelainen & Jänkälä 2017). The ASE implementation has been carried out by defining five clusters during the 2016-2018 period.

In 2014, Lapland was selected as one of the six top regions of the European Union, as a model for developing clusters in the European Union, follow a decision by European Enterprise and Industry committee (Digipolis 2014). According to the decision, Lapland is a model area for industrial and circular economy where cluster activities have been developed for about 15 years. Lapland has emphasized many RDI activities in the last few years. For example, Lapland education and research activities have invested up to € 70 million to several development and innovation environments during the period 2007-2013 (Aarrevaara & Kangas 2017). These development environments make innovative testing, service development and production possible with Lapland's own resources, which enables the use of expertise and the construction of current and new clusters. The Smart Specialisation instrument will be configured to be in line with cluster policies, which are carried out purposefully and formed with the evaluation of research and innovation policies, joint platforms for dialogue, coordination of research and innovation policies and cross-border research and innovation strategies.

Cooperation between industry in Lapland and publicly funded developing organisations is based on long-term and sometimes complex collaboration. Companies and communities are quite different in terms of their interests, activities, goals and cooperation, which means that the operation of networks requires simultaneous consideration of the needs of different actors. Regional specialisation and the goals of smartness set new requirements for a region. Institutions, organisations and actors need to redefine roles and governance models, but the idea of specialisation is not wholly new. Smart Specialisation can be seen as a modification of universities' fundamental role through which higher education institutions determine their role as gatekeepers in networks, regional innovation ecosystems and knowledge triangles. University – industry linkages and the higher education institutions' core role is formulated naturally in the S3 process.

For the universities in sparsely-populated areas in European Union, the regional context is a prioritised operating environment when gatekeeper tasks are clearly based on their basic tasks. The relevance or demand driven principle for the universities of applied sciences is based on regulation, and therefore their gatekeeper tasks are sometimes clearer than those of the universities. This interpretation is also influenced by the fact that the universities of applied sciences are more managerial, whereas at universities, the curiosity driven principle is the starting point for research (Aarrevaara, Dobson & Pekkola 2011; Meissner & Shmatko 2017; EUA 2014; EUA 2018). Effectiveness tests the regional activity as a whole and it can be verified by evaluation. For example, Olsen (2007) has reported that the direction of growth depends on funds and political priorities and that is why institutions are evolving and adapting to the new policy environment of Smart Specialisation (Marinelli, Elena-Perez & Alias 2016).

2. THE PURPOSE OF DEVELOPING EVALUATION PROCEDURES

2.1. Description of developing an evaluation report

The purpose of developing evaluation is to support the proactive and active role of work packages and project management in the implementation of the ASE project. The purpose of the evaluation is to provide information for project management, clusters and for projects

implementing smart specialisation activities, taking into account the objectives of the project from the point of view of regional development. Evaluation examines the performance of five clusters and work packages from the view point of effectiveness. Lapland is seen as the most innovative sparsely populated area in European Union. Evaluation reports have been separated into two intermediated reports, published in May 2017 and January 2018. (Aarrevaara & Kangas 2017; Aarrevaara & Kangas 2018).

Developing evaluation has highlighted the factors which enhance clusters and work packages learning, development of know-how and interaction, as well as strengthening the operational capacity and collaboration model. Criteria emphasize learning, trust and accountability as well as the desired change and project outcome. The Arctic area is emphasised in the Lapland's smart specialisation program and in the choices made in the program.

The starting level of the project and the formation of understanding of the project were defined in the first report. The first evaluation report addressed the preconditions of the project implementation to create permanent, innovative and network-based cooperation. The report highlights concepts and notions that will help developing actions from the viewpoint of clusters and work packages. In the second evaluation report, preliminary results from the perspectives of competence, cooperation, leadership, networks and businesses was presented. The report focuses on clustering, decision-making, a common knowledge base and the use of policy at regional and EU program levels. Attention should be paid to the ability of project actors to respond to RDI needs and the timeframe of the capacity of competence that is growing in cluster cooperation.

This report shows the scope of the project by taking into account the previous points made in evaluation reports and emphasises the dimension of project interaction. We have paid attention to how new ways of workings have been utilized, especially in international cooperation and in increased capacity to exploit EU funding.

2.2. Evaluation criteria

The purpose of the evaluation criteria is to develop the implementation of the project, to inform the actors about the impact of the actions and to guide the projects to examine the

effectiveness of the results from the perspectives of knowledge, learning and regeneration. Evaluation provides information to the building of a regional knowledge-base, supports the project in financing, competitiveness of rural areas, digitization of creative industries and sustainable development of the environment. In the ASE project, cluster building is seen as being nationally and internationally credible and identified as a regional centre of excellence. The criterion of external effectiveness is based on the Smart Specialisation monitoring definition, which emphasises learning, trust and accountability (Gianelle & Kleibrink, 2015). Based on the performance data available, it can be determined how the five clusters and their key actors increase their capacity to become an attractive EU-level partner. What is crucial is the kind of verifiable functional changes the project can produce in order to build up Lapland's regional collaboration and economy. These can be actions or processes that support the project's goals. Secondly, they may provide information that can be used in a new context. Thirdly, effectiveness can be viewed with the achievement of wider societal goals.

The evaluation data consists of documents of the Smart Specialisation program, project documents, financial information of the region, operational information and interviews.'

Figure 1. The Data for developing evaluation of the Artic Smartness Excellence project.

Project documents: Documents from ASE-project.

Financial documents: Financial information of the use of ERDF fund in the region of Lapland in 2016.

Operational information: Operational information of ASE-project.

Interviews: Included 20 key actors: cluster managers, members of the project board, management of the participating organisations, officials of the funding organisations and representatives of the enterprises.

Evaluation is executed against four criteria: external effectiveness, reflexivity, interaction and the region's and actors' ability to regenerate. *External effectiveness* as an evaluation criterion means the ability to achieve the expressed effectiveness goals of the ASE project, which are verified as activities. We equate external effectiveness to *openness*, which refers to changes in working practices that improve the ability to achieve goals and *locality*, which refers to the

capacity building of clusters and actors in the region of Lapland. Based on the data, the question has been whether the external effectiveness of the project is in line with the objectives at the local level, in work packages, at the cluster level and at the EU and other stakeholder level. Are project actors and five clusters seen as an attractive EU-level partner and how these objectives have been achieved. Whether the project was comprehensive enough is also evaluated: have strategic project results been achieved with existing project operators and how have different individuals and communities been included in the cluster and RDI activities.

Reflexivity clarifies the construction of cluster model. For this criterion, the impact of work packages, cluster actors and project stakeholders from the future perspective have been evaluated (Rask et al., 2018). Verified changes in the reflexivity criterion are examined through their effects. Verified changes in the reflexivity criterion are examined through effects, so the focus has been on path dependence, the development of cooperation, learning and ability to regenerate. We have investigated whether the choices made during the project have been right towards the goals. Have the logic of the clusters and the objectives of the ASE project been taken forward and how have these activities interacted with the project's other actors and stakeholders? What capacity (especially resources widely understood: new modes of operation, cooperation, regulatory changes, guidance) have the solutions made constructed? Whether the results can be utilized in construction of clusters in a different context has also been evaluated. Evaluation has taken into account the common skills, knowledge base and tool kits, as well as their use for equalizing the actions with other EU actors. Evaluation shows how achieved goals are planned to maintain in the future.

Interaction as an evaluation criterion is part of the social interaction, which means the coarse cooperation between the parties to achieve the project's goals and the formation of knowledge. Without interaction the project results cannot be realized. The assumption for this criterion is that early involvement of the parties in the projects builds capacity to achieve the effectiveness goals. Evaluation has taken in account how the interaction has been created and what has created obstacles / breaks / blind spots for the multidimensional interaction network. Forms of cooperation, key partnerships, scope of interaction, and the functionality of the networks in relation to the desired outcomes and the interaction towards the collective goals, have also been evaluated. The depth of interaction between clustering and work packages has been studied collectively between external stakeholders and actors.

Ability to regenerate makes visible what permanent practices the project produces as a cluster model capacity. The starting point is that the cluster have not been built for operators so that they can continue their current operations, but the cluster will be built in cooperation with the actors. In practice, this means the evaluation of whether the project has built practices that evaluate clusters and their selection criteria for effectiveness (e.g. verified cluster-based Lapland RDI activity, participation in S3 regional cluster work). We have brought out the regeneration potential of cluster building, national and international readiness, and the prospects for regeneration and the reasons for success visibility and RDI activities.

Figure 2 Evaluation criteria of Arctic Smartness Excellence project.

External effectiveness: Ability to achieve effectivity goals, verified activities. Openness and locality.

Reflexivity: Future perspective - the impact of work packages, cluster actors and project stakeholders. Clarifies the construction of cluster model.

Interaction: Cooperation to achieve the project's goals, capacity building and the formation of knowledge

Ability to regenerate: Clusters built in cooperation with actors, permanent cluster practices.

The data provide information on building knowledge as capacity for the key actors, and support the program in terms of funding, competitiveness, digitisation and sustainable development of the environment.

3. CASE ARCTIC SMARTNESS AND DESCRIPTION OF THE DATA

The Arctic Smartness Excellence project (ASE) is part of the funding instrument of the Lapland Arctic Specialisation Strategy. The project consists of publicly funded expert organisations and industry such as universities, research institutes, regional development authorities, companies and a technology centre. The goal of the ASE project is to build the knowledge capacity by building up the five clusters supporting regional industry and

entrepreneurship. The ASE capacity is based on international funding instruments such as the European Fund for Strategic Investments (EFSI) and regional cooperation with the EU Joint Research Centre and Committee of the Regions. The plan of the ASE project has set the goal of creating five clusters and providing project executives with better capacity to increase the proportion of actors from Lapland having a role in internationalisation. The amount of international funding is not a key issue but is a factor in the success of the project. This success lies in the permanent capacity and conditions that are being built through the Smart Specialisation program, and how the generated capacity is utilised. The changing practices guide the regions in coping with a changing operating environment (Schmitt & Klarner 2015).

During the project, cluster targets have been strengthened through four work packages. Work Package 1 has implemented business-driven cluster activities by strengthening measures and intensifying regional cooperation. Work Package 1 has coordinated regional business-driven cluster activities and continued the role of the regional council of Lapland in the implementation of the Smart Specialisation Program and its cluster development. The coordinator of the work packet has been at the regional council of Lapland. Work Package 2 has supported the cluster objectives by tailoring research, development and innovation activities by increasing the RDI skills of the actors. The work package has created the basis for the Centre for Arctic Smartness Excellence and carried out an inventory of the needs of the innovation environment and services. The coordinator of the work package has been the University of Lapland in cooperation with Lapland University of Applied Sciences, the natural resources institute, geologic survey of Finland, Digipolis, Rovaniemi development ltd. and ProArgia Lapland.

Work Package 3 has focused on strengthening the internationalisation of cluster work by promoting networking and by defining clusters as part of EU cluster work. The coordinator has been Lapland University of Applied Sciences. In addition to good project management, the purpose of Work Package 4 was to promote synergy with other actors, to make project management transparent and to respond to the project communication and to produce a developing evaluation. The coordinator of this package was the University of Lapland.

In this final report, we have examined the Smart Specialisation documentation and conducted interviews. The data were collected between December 2016 and February 2017 and include

an estimation of the regional actors' investments in the realisation of the Smart Specialisation objectives. The data for this report are based on the program documentation and the interviews with representatives of project work packages and clusters, and public and private organisations as the partners of the project. Based on the data, we have defined the construction of clusters, and explain how the effectiveness of the program can be verified. For this task, we analysed 20 interviews with key actors in a regional smart specialisation program for innovation and research including cluster managers, members of the project board, management of the participating organisations, officials of the funding organisation and representatives of the enterprises. An Arctic Smart Specialisation is clearly identifiable, and for this reason organisation have not been named, but interviewees' gender and status in organisation a.

The analysis was carried out by using NVivo software, using the analytical concepts (nodes) of network cooperation, knowledge capacity, role of enterprises and project management. Analysis of networks reveals the functional opportunities that can be provided by clusters, and the results of the ASE program will be verified by the concepts of external effectiveness, reflexivity and societal interaction.

In addition to the interview data, we also examined the ERDF funding for Lapland in 2016. The key for smart specialisation as strengthening of the innovation activity of enterprises is still only a small portion of the funding (14%), and even lower is the development of research and innovation concentrations based on regional strengths (0.4%). The total sum of ERDF funding for the industries in the clusters was about €10 million in 2016. We assume that the larger funding instruments for research and innovation will emphasise the role of knowledge brokers.

Figure 3. Cluster building in the ASE project.

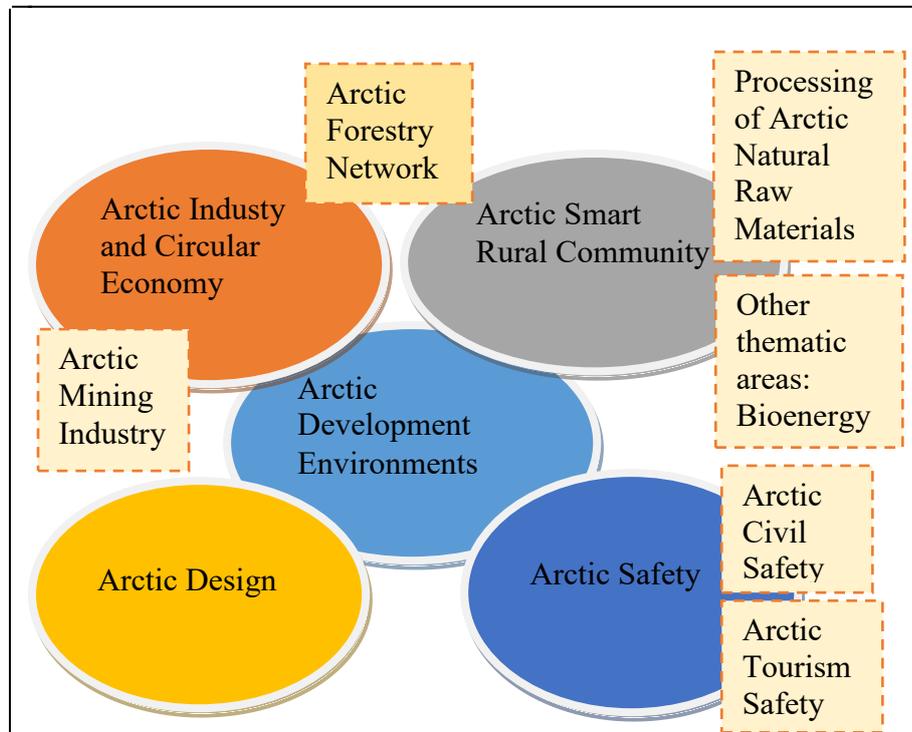


Figure 3 introduces the current state of cluster building in the ASE project. There are five main clusters with different thematic areas or sub-clusters. The Arctic Development Environments cluster works in cooperation with the four other clusters as a cross-sectoral cluster. Arctic Industry and Circular Economy has a strong network with the Arctic Mining Industry and the Arctic Forestry Network which has built up in cooperation with the Arctic Smart Rural Community cluster. The main theme of Arctic Smart Rural Community cluster is to develop systematic processing of Arctic Natural Raw Materials. Bioenergy is another thematic area developed in cooperation with other regional developers. Arctic Safety is divided between two sub-clusters: Arctic Civil Safety and Arctic Tourism Safety. The project has been in a state of constant change and the actors have overlapping roles, which is typical for innovation projects with cutting edge goals for innovation.

4. BUILDING ARCTIC SMARTNESS

The goal of Smart Specialisation is to strengthen the economic basis of the regions. We have determined how the five clusters and their key actors increase their capacity to become an attractive EU-level partner and found four important steps to achieve internationalisation and its benefits. It seems that in the ASE project the critical points of achieving goals have been decision-making and control which controls the uncertainty of environment, the social dimensions of networks which creates sustainability of operations, exchange elements like rules and consistency of actors and cluster capacity building. To achieve the benefits of networks, we have identified the need for knowledge brokers who connect parties and share knowledge between different networks.

Knowledge brokers have a key role in the Smart Specialisation process where innovations must emerge in an environment of productive cooperation and relationships between researchers and decision makers (Meyer 2010; Ward et al. 2009; Kauffeld-Monz et al. 2013). Generally knowledge brokers are defined as individual, organisational or institutional agents which coordinate knowledge resources and practices between different perspectives, audiences and users of knowledge. Brokers are able to influence network operations due to the large amounts of knowledge they hold.

Figure 4. The key themes of defining the knowledge brokers role in the regional smart specialisation program of Artic Smartness Excellence (2016-2018).

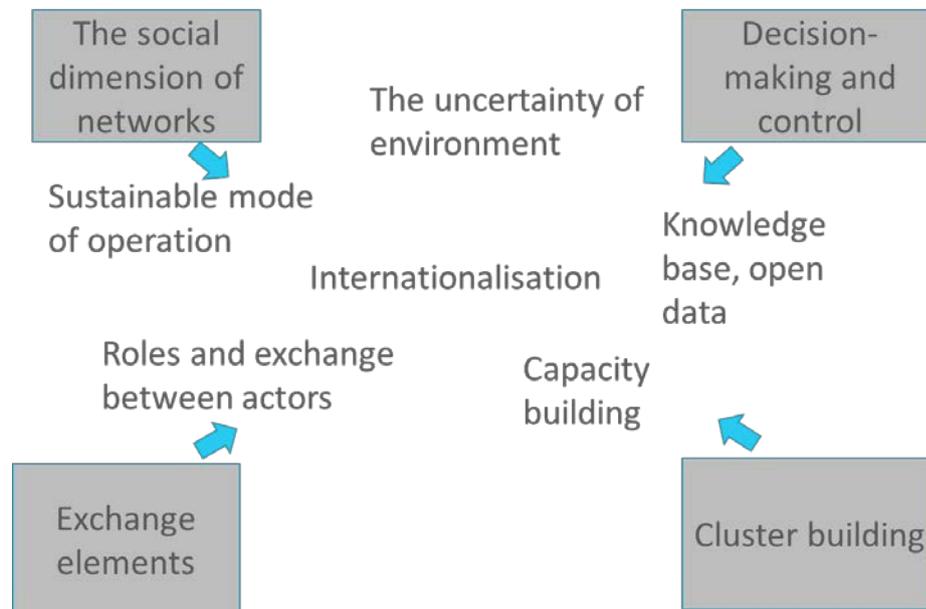


Figure 4 introduces four dimensions based on the social network theory. They are the key factors constructing the role of knowledge brokers in the case of a smart specialisation knowledge regional program. The factors influencing the social dimensions of networks are decision-making and control, support of exchange elements and cluster building. From these four perspectives, we have analysed the role of knowledge brokers in the case network. The themes discussed in the interviews were the definition of social relations and constitute 'absorption', decision-making, administrative structures and operating costs (Johanson & Smedlund 2015).

According to Oldham & McLean (1997) there are several contradictory frameworks within which to define knowledge brokers in publicly funded organisations where the broker role includes a broad range of activity focusing on knowledge production, management, and passive communication and management of these processes.

"... If they are to receive public support, then their clusters must be so closely coupled that it would not matter if I contacted any cluster member or guide (any of them) down the path towards direct European funding."

- civil servant, male

Civil servants expect the clusters to form a dynamic network mode of action. This perspective also allows for a more active communication of information, for example, through the location of information and thus becomes part of the actual broker's role (Oldham & McLean 1997; Ward et. al. 2009; Kempton et. al. 2013; Obstfeld et. al. 2014; Tripl et al. 2015; Kislov et al. 2017).

In regions with major industries, entrepreneurs are often found in the role of knowledge broker. But in a region such as Lapland, implementation is strongly led by public organisations like universities, where brokers are personalized as research leaders or individuals with a strong background in research and business cooperation (Foray & Goenaga 2013). A strong background in certain things is needed because many funding councils require applicants to articulate how knowledge will be disseminated, what kind of infrastructure there is beyond the community, and how the research will benefit the wider society (Donovan 2007). Work generally means formal and informal meetings with local and international stakeholders especially connections to thematic platforms, finding new projects or partners or finding new technological or market opportunities.

"There have been education activities and there has been knowledge dissemination on funding programs. We give advice and make comments, for example, on how certain ideas of organisation fit with specific funding programs."

-representative of developer's organisation, female

The quotation above is an example of how the knowledge broker's role is based on the core function of participating institutions. According to Rodrik (2004), the broker's role is to discover and produce interactive and new information of activities which will empower actors from various sectors. Knowledge brokers develop funding proposals and connect partners from different levels and areas, find new solutions for working together, and act as communicators and supporters for the regional and international needs of stakeholders.

"... there are also actors without previous experience of working in international projects but get an opportunity as a member of the cluster. They finally were part of a very large network for this purpose."

-representative of developer's organisation, female

Several authors (e.g. Foray & Goenaga 2013; Phipps & Morton 2013; Olsen 2007) have mentioned that institutions provide a framework or instrument for a broker to reflect on society. Institutions set the political lines, but brokers reshape institutional purposes for achieving preferences and interests. In the ASE, the broker's role is crucial in the Smart Specialisation program, because partner organisations, including industry, are not in direct contact with each other. However, there is active collaboration between developing organisations and together they determine what direction the project will go in.

5. RESULTS

The clusters of ASE project are based on five main clusters. As a result of the project and other projects, new sub-clusters, project entities and thematic responsibilities have emerged. The wholeness of the results is still in the construction stage. The benefit of re-designed clusters is that the networks have been able to engage different actors who have not previously sought cooperation. It has benefits for the construction of Lapland capacity and builds capacity for Lapland's knowledge base. Identification of competence has increased, and at the same time new opportunities for infrastructure building have been created. On the other hand, decision-making on the clusters has remained unclear for operators waiting for permanent organisations to participate based on verified rules.

The time perspectives of the project's results, particularly in terms of effectiveness, are different for different actors. Based on the interviews, the timing perspective in public funded organisations is longer than for enterprises. Numeric goals of the project plan have mostly been achieved, but permanent changes of actions are still unclear. Instead of numeric goals, it would be better to consider the ways in which the region is preparing for the changes in the new EU program period. Finding a collective way between operators will boost capacity building, but such a wholeness may not be detectable. Consistency is also important in

defining a national strategy, as well as the visualization and exploitation of tangible results. These factors contribute to the continuity of both inter-actor and national engagement. Attention should also be given to wider cultural change, particularly in relation to path dependency, as networks also become widespread in different areas of government

Based on the documentation and interviews, it seems that the objectives of the program and the expectations of the actors do not intersect. The problem appears to be with the incompatibility of the defined program goals and project results. In the case of Lapland, this can also be influenced by the structural basis of the program. The Smart Specialisation program's objectives are partly based on the assumption that clusters are created by the industry. In this case, the clusters have primarily been created by publicly-funded organisations.

"In this case, the enterprises are mostly not participating in the clusters, as we have built up the background for their participation. There are more civil servants and researchers and sympathisers of these clusters. This situation has been necessary, and it has taken a lot of time to reach this situation. The clusters' development stage varies a lot. "

-representative of developer's organisation, female

This is the case in public administration for public funded actors in Arctic the Smart Specialisation project. However, this problem with the goals and results can be corrected by knowledge brokers.

The clustering of industry is still at an early stage in Arctic Smart Specialisation. Based on the data for this report, the engagement of industry may vary and their intention to belong to a specific cluster is still unpredictable. Based on the interviews, it seems that some companies do not find international funding to be attractive. For example, tourism entrepreneurs and forestry operators have an identifiable threshold for launching or participating in EU projects. It is still unclear which decision-making companies engage in clusters and what rights and obligations attached to the network will follow.

"Around the universities, research institutes and development organisations, there are many companies so close or sharing the same activity that they do not think about how close they are to clusters work. If our starting point is to build functional clusters, we have to pay more attention to their interaction."

-civil servant, male

For them, the broker's role in social networks is quite valuable regarding social capital effects rather than empirical indicators (Burt, 2002). To make a difference in the universities, the authority structure should work reasonably well and in a proactive fashion (Clark, 2002). This is not always the case, and external actors are needed to implement fairness and predictability of performance. This looks like a task for knowledge brokers.

The overlapping roles of project actors in the various roles have caused confusion for management and decision-making. The members of the steering group and the members of the project leaders' group have overlapping roles that have an impact on project dynamics. These different roles of the same actors are caused by tasks and mandates based on the division of work between the member organisations of the consortium, and from various communication practices within clusters, project work packages and organisations. Large and medium-sized companies are broadly socially networked, and their needs are more evident than those of small and micro size enterprises. However, micro-enterprises are often not willing to commit to project goals such as internationalisation. Their need to develop their role in the regional innovation is related to the pursuit of non-international efforts, such as access to valuable information on markets and investments. This looks like an opportunity for brokers and multiple disciplines to add impetus for smart specialisation and regional development, as mentioned by Goddard et. al. (2011).

Clusters have been built on the needs of business sectors, but the problem is that several companies are connected to the several clusters. The construction of clusters is too strongly based on a sectoral starting point. As an alternative, a more functional starting point could be considered, as is the case with the Arctic Security Cluster, for example. In sparsely populated regions, the unmanned micro-enterprises may be a challenge for regional effectiveness. In this regional case, for example, tourism is a strong actor and the sector companies are often small companies that are not willing to open their business concepts to international markets. Their interest in forming a tourism cluster without separate functions is low. The tourism

companies participate in the Arctic Security cluster. A functional starting point would clearly support business needs such as development, internationalisation and joint marketing channels. The role of higher education institutions as a broker are similar to when discussing sectoral and functional starting point of clusters. The broker's role is similar in higher education institutions and cluster networks. These institutions emphasize the role of knowledge and their ability to overcome the weaknesses of the innovation system with brokering function (Sapsed et. al. 2007; Fotakis et. al. 2014).

The ASE project has operational challenges similar to those in the networks of private and publicly-funded projects. According to smart specialisation guidelines, businesses cannot be supported directly, but the operational benefits and incentives can be built in cooperation between the providers of project funding and the companies (Gianelle & Kleibrink 2015). The companies' engagement in long-term cooperation will be a key issue with these companies, as in the short term, the evidence of effectiveness is seldom visible. For example, the project has produced around 30 new internationally-funded projects, double the number of project goals. Their effectiveness and coverage in companies has not yet been verified.

The starting point for the ASE project is innovative, intelligent, constructive, and complex. The project management model should ensure that the perspective of actors and the funding agents will develop operations from a strategic point of view. The aim of smart specialisation is regional development, and it requires the beneficiaries of activity to recognize the potential of new operating models. Defining benefits and responding to their needs should turn to the conscious benefit and involvement of the beneficiaries. Conscious strengthening of the beneficiaries' own activities requires more extensive management and the steering group's position.

This report has been written according to the previous evaluation reports, evaluation interviews and documentation collected from the smart specialisation actors and program. The limitations of the data and interviews are primarily related to how the interviewees understand their role in building the clusters. Since the smart specialisation program has only received the first experiences, the interviewees have been quite careful to discuss their role without the status of developing and expert institutions. This starting point is different in cases in which clusters are primarily the result of an initiative by industry. The case in hand clearly indicates how permanent results or expectations of specialisation can be achieved.

Secondly, this case demonstrates the special features of clustering in Arctic, sparsely populated areas and particularly as a publicly-funded cluster. The report is predefined to sparsely populated areas and demonstrates situation of Lapland's Arctic specialisation.

7. RECOMMENDATIONS FOR DEVELOPMENT

The ASE project has created ways in which actors in Lapland can build successful cooperation. An indication of the development and internationalisation of clusters is the fulfilment of the consortium objectives related to EU funding. During the project, the cooperation between developer organisations has been strengthened in Lapland but in particular, business sector and developer organisations should create a common understanding of achievements. However, the modes of cooperation are still in the constructive phase.

The governance model of Arctic Smartness Excellence project was not clear for all. There was demand for clear rules of networking and cooperation, allocation of cooperation, resources and the documentation of these network functions. The commitment of industry was volatile in the project. The collective rules and actors' commitment would have increased the capacity building and networking of actors.

The role of the management group of the project has been reactive. The management and organisation model is not defined only by local and project-based decision-making, but requires a wider mentioning of the operating environment and networks. This is especially in regard to two perspectives, publicly funded development organisations and the industry in Lapland. It would be possible to include guidelines by the management group in such decision-making processes, for example, utilising the management group's expertise in project applications. It would make a strategic element for the project applications and the stability of networks. Based on the interviews, it seems that many actors in the ASE project found it difficult to recognize what the key objectives of the project are, and what the preference of actions to achieve the goals are.

There have been a lot of international activities in the ASE project. It would be necessary to define the road map for the new activities. Increasing the capacity building of the region has been discussed under the theme of internationalisation, but some actors do not find the international activities to be attractive. Will the collective capacity of the region develop faster than when the new program period has lower levels of ERDF funding? When will the new capacity building comes to be realized?

During the project, the capacity of actors has increased in terms of EU-funding, internationalisation and cooperation. The impressiveness of new capacities are able to verified in the region, nationally and EU-level? The evaluation data still lacks information how capacity building is developed in developing organisations. International project applications have been submitted more than expected in project planning. What is the plan, how to exploit the capacity effectively in the future? There is a need for clarifying the exploitation the capacity of actors.

Based on the interviews conducted for this report, the strengthening of multi-level governance models requires clarification of the knowledge broker role, which can be promoted from four perspectives. Firstly, achieving the effectiveness goals can be verified with regard to smart specialisation strategic goals achieved. The projects produced many unexpected and unpredictable results, which at best also support the strategic goals of the project. It is essential for the region's businesses and developer organisations to be in a position to be aware of the smart specialisation actors' role. Clear business practices and tasks create the prerequisites for enterprises to be aware of the future of the opportunities that smart specialisation can pursue.

Secondly, the case illuminates the way in which multilevel governance takes place in sparsely populated and Northern regions. Decisions on cooperation between the innovation system actors takes place with rather informal cooperation. Therefore, these data and interviews indicate that key areas of multi-level governance are the implementation and financing decisions of the program. Through these instruments, contractility is realised and the preferences of the actors are prioritised through project activities. The formal institutional decision-making is a minor role in network cooperation and very few actors emphasise decision-making to legitimize broker's role. This angle brings dynamism to the clusters of the region and enables industry to operate in multiple clusters. This is the case, for example, in

the Arctic Industry and Circular Economy and Arctic Design. The data also pointed enterprises to combine Arctic Smart Rural Community and Arctic Safety Clusters. In this case, it is justified that clusters can change their participants and the admission is kept open. From this angle, the clusters are open and social networks than closed consortiums. The consortiums take place in projects and consortiums, and the clusters are platforms for closer cooperation between actors. (Dąbrowski et. al. 2014; Uyarra et. al. 2017).

Thirdly, clustering should be organised in a way that those responsible for the various roles can identify their tasks and obligations. Funding guidelines and procedures have not guaranteed this. Thirdly, the overlapping roles resulting from the various sub-projects and the small number of developers should be taken into account in the governance model. The fourth obvious way of working is to be aware of the tensions of the present actors as part of the project's work. The overlapping roles and the movement of actors between different clusters is a natural part of the operating model but should be based on a clearer governance model.

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