The Development of the North-West Russia and the Delphi-method – evaluation of the industrial, social and logistical developments in the Murmansk Oblast

Yrjö Myllylä* & Oleg Andreev**
*Department of Geography, University of Joensuu, **Barents Centre for Social Research

Abstract: The development of the logistical system between the Murmansk Oblast area and other areas in the Barents Region assumes the anticipation of future commerce, industry and structure of population. The objective of the research is to create a scenario of the structure of commerce and industry and the population in the area and based on the this scenario to estimate the logistical development needs In the research the strong prospective trends belonging to the scope of futures studies as well as the cluster approach will be used as theoretical starting points. The main method applied in the research is the Delphi-method, which belongs to the wider field of futures studies.

The most important trends influencing the development of the Murmansk Oblast area are the main trend of *logistical flows* and the main trend of the *technological development* and *globalisation* based on the preliminary results from the Delphi-panel´s second round. By estimating the continuation of the trends until 2025, it can be stated that the main trend of globalisation would be strengthen in the first place then the main trend of the logistical flow and technological development which all would be strengthened or would have a slight increase.

Among the individual trends with special emphasis most of them support clearly the development of transportation and logistical clusters, energy and environment clusters and the development of mining and refining of metals clusters. In the transportation and logistical clusters the development of railway connections and traffic forms the most important part, followed by the development of harbours and harbour services. According to the Murmansk panel the development of the energy cluster requires in the first place the construction of an oil pipe and then the development of electrical transfer capacity . The most important level of decision making concerning as well emphasised clusters as the most important logistical development undertakings related to them seems to be federal level which means the central government of the state or the management of big enterprises.

Backgrounds and Objectives

After the collapse of the Soviet Union, the economic integration of Murmansk Oblast has created new opportunities not only in relation to the utilisation of natural resources in the region, but also regarding the development of knowledge-based industries, such as information technology,

the environmental cluster, tourism and logistical services. Developing the transport and logistics infrastructure system of Murmansk Oblast in a rational manner requires an assessment of the future population structure and economic conditions of the region. Futures studies approach provides suitable methods to develop this assessment. Murmansk Oblast has to be examined not only as a part of the Barents region and Northern Europe, but also as a part of a global system (fig 1.). Russia is integrated in the global trade specially through the export of energy over the last years and this fact strengthens the role of the Barents and Murmansk Oblast area (Tykkyläinen, 2003).

The aim of this research is to forecast the economic structure of the region,

particularly in relation to the industrial structure, population, and logistics infrastructure. The starting point of the analysis is that appropriate planning for future infrastructure in regard to logistical needs is impossible without a well-grounded assessment of the region's future population structure and economic conditions.

Theory framework

The trend approach of the *strong prospective trends* belonging to the futures studies forms the most important theoretical starting point. Central to the concept of futures studies is that it is not possible to predict the future

Figure 1. Research Area. Primary object of the research is Murmansk Oblast the future of which will be investigated specially as part of the Barents Region and from the view of a possible co-operation with EU (Source: The basis for traffic evaluations and forecasts in the Barents region, Final, November 2001. Norwegian ministry of Transport and communication.)

only on the basis of past developments. Strong prospective trend is a future trend or way of development which is based on the fact that there is (e.g. statistical time series) showing the existence of a the trend and that the experts evaluating this trend agree on that the trend will continue in the future. In practice, the SPT- concept means in practice the same as the commonly used megatrend-concept, but it is more scientific.

Strong prospective trends may lead to different kind of futures. Prospective trends can relate to phenomena that have a long history or they can be phenomena in which

a certain direction of development has been detected only lately. Prospective trends can continue in the future along their current direction or the trend may break off and lead to a different kind of future than it could be deduced from today's development. Weak signals, whose current appearances may be the reason for the discontinuance of the trend. Weak signals may with time become stronger, turn out to be significant phenomena and develop to become even strong trends. A strong trend can also emerge when several weak
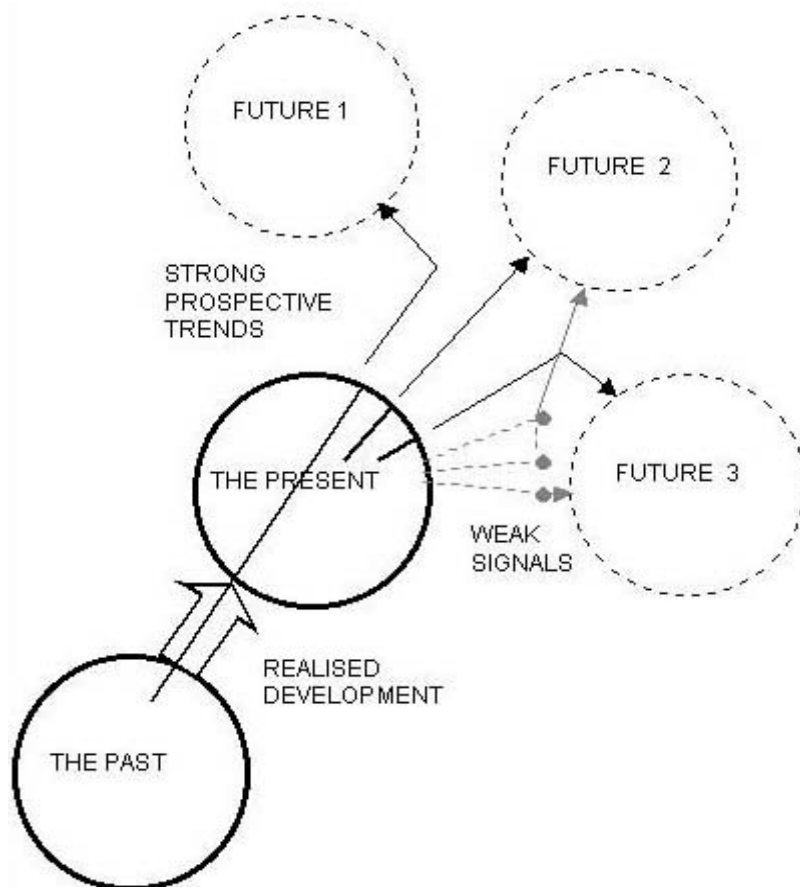

Figure 2. Optio. Model of a strong prospective trend (Source: Toivonen, 2004, p. 10.)

signals combine with one another. (Toivonen, 2004, p. 10).

The most important objective aimed for in the research program and result seen from the scientific community and future application point of view is to recognize the most important SPT-trends in the Murmansk Oblast area because based on these it is possible to later on do other evaluations concerning the development in the area.

The trends influence the development of *the clusters* in the area. The word cluster normally means bunch (e.g.of currents). In this context it means a co-operation network where there are companies and others actors like research institutes and schools. In the definition of the cluster in this research is that there are companies in the cluster producing their products for the market (e.g. Porter, 1990). These "locomotive companies" commanding the market are normally big companies – but there can be significant differences between the lines of business activities. Specially the research and school sector form an important group of actors because the success of the clusters are depending more and more an know-how. The finance sector forms an important group of actors in the cluster. Clustering as described above is called vertical clustering. In the horizontal clustering learning and creating of innovations form an important reason for enterprises and other activities to find their ways closer to each other (Malmeberg and Maskell, 2002).

Specially the vertical clusters manifest themselves and materialise in geographical spaces, which require the analysis of transport infrastructure. In the research nine clusters have been selected to be more closely examined. The objective has been to examine existing strong clusters and so called rising clusters. Data on the structure of the economical life of the area as well as pilot interviews have been used as instruments.

The intention has been to collect the cluster in sufficiently big groups in order to make the handling using the method of specialist interviews possible. Mining and metal refining, food stuff, transportation and logistical services form most clearly the existing clusters. Specially tourism, ICT-clusters, environmental clusters, welfare clusters and partly also security clusters can all be considered as rising clusters. In the energy cluster there are existing activities (as electrical production) as well as rising activities (possibly e.g. gas production)

Finding key actors who have a strong influence on the above-mentioned development of the Murmansk Oblast area, will be the most important challenge in carrying out this research project. The theoretical starting points of futures studies and the cluster-based approach will be used to identify those actors with the greatest influence over the region's development.

Methodology and data

The main method applied in the research is the *Delphi-method*, which belongs to the wider field of futures studies. Here, the method shows its capability of triggering a learning process in addition to its classical application of producing consensus. Applying the method in such a way makes it necessary to face-to-face interviews in the research process.

The Delphi-method is the most well-known method used in future research based on interviews with an expert panel. Typical features for the method is that there are two or more interview rounds and in between them a feedback summary directed to the participators in the panel as well as anonymity (e.g. Kuusi, 1999). In the method opinions can be expressed without other being capable to combine opinion and person. In this case the arguments of the answers will play a central role as the participators assess other participators' answers. This has proven to be the strength of the method.

Results

The results are mainly based on the preliminary results from the Delphi-panel´s second interview round in Murmansk . The results have partly been compared with the result from the Finland/int. panel

Most important trends

Based on the pilot interview and literature 75 different hypothetical SPT-trends (so called sub-trends) were created for the 1st round in the Delphi-panel. The sub-trends were grouped in six main categories, so called main trends. The participators in the panel were asked to choose the ten most important sub-trends having an impact on the economical development in the Murmansk Oblast area. For the 2nd interview round the 27 most emphasised sub-trends were chosen for a closer examination. In the 2nd round the sub-trends were grouped in the following five main categories:

Table 1. Suggested Delphi panel, number of interviewees per region/country and per interview round. Interviews will be mainly carried out face-to-face. Within brackets the number of persons in the 2nd round which forms the material for this article.

THE DELPHI PANEL AND REGIONAL GROUPINGS	Murmansk region	Moscow, St. Petersburg and remaining Russia	Finland and other countries	Altogether
Pilot interviews	9	-	1	10
1st round of interviews	25	-	-	25
2nd round of interviews	25 (17)	8	24 (15)	57

Technological development (4 sub-rends), Logistical flows (7 sub-trends), Globalisation (5 sub-trends), Value based trends (5 sub-trends), Social and economical development of population (5 sub-trends).

The most important main trends having an impact on the development of the Murmansk Oblast area are the main trends in the logistical flow, the technological development and globalisation main trend. The impact on the main trend social and economical development of the population is almost as important. However the impact on value-based main trends seems to be moderate. The order is based on the average value of the main trend calculated from average of the sub-trends.

According to the Murmansk panel the most important impact (big impact) from the main trend of logistical flows is at present the sub-trends: *increase flows of mineral, increase flows of container traffic, increase flows of oil transit and increase in capital/ financing flow and increase flows of coal transit.*

The most important sub-trends (big impact) of the main trend of the technological development are specially the *development of transportation technology*, but also *development of energy-technology*. The panel didn´t consider the development of ICT-technology important at this moment.

According to the Murmansk panel the most important sub-trends (big impact) of the main trend of globalisation are at present in order of importance: *increase flows of oil transit, increase in the traffic / trafficability on the Northern Sea Route, increase of the domestic price of electricity, increase in the domestic market price of oil.*

The impact of the main trend of social and economical didn´t reach the level of "big impact" based on medians, but in

practice following items will reach this level having the same value: *increase in income level, change of structure of population (ageing population) and continuation of migration to economical centres.*

The impact of the value-based main trend is at this moment the smallest in the group. Of individual sub-trends *emphasising of personal welfare would reach the level "big impact"*

The development of trends in the future

When estimating the continuation of main trends until 2025 it can be stated *that the main trend of the globalisation* will be most strengthened followed by *the main trends of logistical flows* and *technological development* which all will be strengthened or will slightly increase. *The value-based main trend* and *social and economical development of population* main trend will be least strengthened and their strength or increase measured with average values will not change.

According to the Murmansk panel of the main trend of globalisation *the increase of world marked price on oil* and *the increase of the domestic price on oil* will be strengthened considerably. Also the increase in *the traffic and trafficability of the Northern Sea Route* is considered to increase or strengthen slightly.

Of the main trend of logistical flows the panel emphasises most the strengthening *container traffic, oil transit and gas transit* (all show a slight increase).

Of the main trend of the technological development the panel is of the opinion that the sub-trend of *development of transportation technology*, which increases or strengthens considerably.

According to the panel of value-based main trend the *personal welfare* (sub-trend)
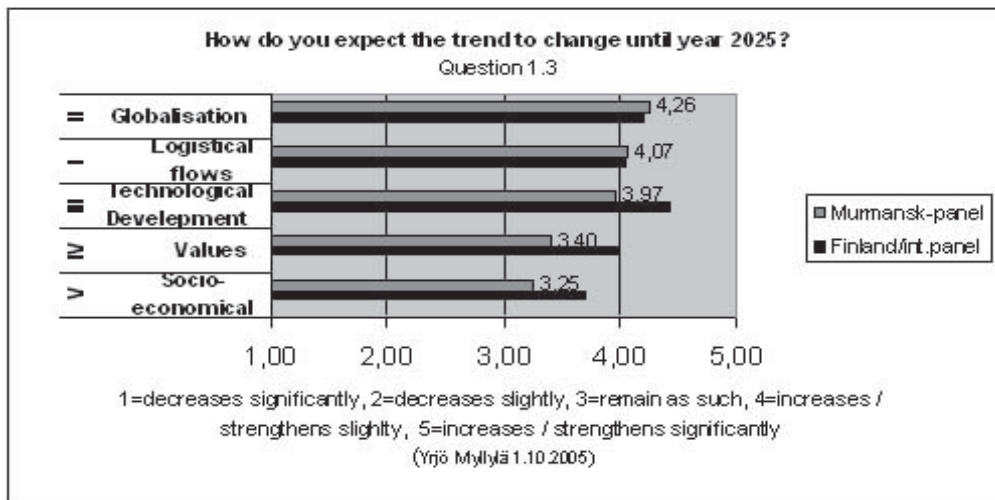
Figure 3. The distribution of main trends influencing the development of the economy in the Murmansk Oblast area. Delphi-panel 2nd interview round, preliminary summary, 17 answerers

will be emphasised (strengthens slightly). Of the social and economical main trade *the increase of income level* (sub-trend) will be strengthened.

Clusters

The impact of trends on the development of clusters

Examining the impact of trends on the development on clusters on the main trade level it can be stated that the main trends which have the highest impact are logistical flows and technological development. According to the Murmansk panel the logistical main trend has an impact specially on the development of clusters in transportation and logistics, mining and metal. The technological development has again the highest impact on the development of clusters in transportation

and logistics, information and communication technology (ICT).

According to the panel the main trend of globalisation has the highest impact on the development of clusters in metal, transportation and logistics, tourism, and information and communication technology. On the other hand the value-based main trend has the highest impact on environmental clusters and tourism (also ICT and welfare clusters)

The Murmansk panel is of the opinion that the social and economical main trend has an impact connection to the energy clusters (on the other hand based on sub-items also to the welfare clusters).

Choosing 11 sub-trends having the highest impact at present on the development of the economy in the Murmansk Oblast area (impact at least big, smallest value 3,52, biggest 4,43) it is possible to based on the research material pick those clusters of which the development the trends support at most (

12th is the gas transit of which the impact at present is not high, but seems to rise in the future).

Based on table 2 can be estimated that of the most emphasised trends a majority supports clearly the development of *clusters of transport and logistics, energy, environment and mining* and *metal refining.* The transport and logistics cluster gets 10/12 mentions, energy 9/12 mentions, environment 7/12 mentions, mining and metal 6/12 mentions security 3/12 mentions, ICT 2/12 mentions, welfare 2/12 mentions. Of these trends picked up no trend would support tourism in first place. The participators in the panel were asked for each trend to choose three clusters , the development of which the trend supports at most.

The participators in the panel were systematically asked possible but unlikely phenomena *(wild cards),* which if they would happen would question the development of the trends described above. The material has in this respect not yet been analysed systematically, but preliminarily an environmental catastrophe (in the first place oil or nuclear disaster/catastrophe), a drop in oil price and the political development in Russia being a authority state or a revolution type Ukraina.

Level of decision in the clusters

The Murmansk panel believes that the environment of the decision making concerning the development of clusters also in the future will be Moscow-based, where as well the state government as the main part of capital and the management of big enterprises are situated.

According to the Finland/int.panel the development of the SPT-trends takes power away from Moscow over to the global markets. The visions concerning the development of the functional environment of the enterprises as directing research and education were in the panels similar, even if in the area both panels saw slightly more possibilities. The panels clearly approved the statement that the clusters can be divided into such areas where there is a big decision power (e.g. tourism cluster) and into such where there is only a little decision power (e.g. energy cluster).

Logistical development needs

The transportation and logistic cluster in its entity seems to be a cluster of which the development most of all is supported by the most important trends and in this sense could perhaps rise to the most important cluster in the area. In order to develop this cluster the development of *railway connection and traffic* is the most important task followed by *the development of harbours and harbour services.* The decision making is in the first place at federal level and then at regional level.

The development of the **energy cluster** requires according to the panel most of all *the construction of an oil pipe and maintenance services,* followed by the development of *the capacity of electricity transfer.* At this moment there is a surplus of capacity to produce electricity in the Murmansk Oblast area but the transfer net for example to Finland are insufficient.

Along with the WTO-membership the pricing of the electricity in Russia will reach the market price at least over a certain

Table 2. . The most important SPT-trends influencing the development of the economy in the Murmansk Oblast area their impact on the development of clusters and the distribution of trends until 2025 according to the Murmansk panel. Delphi-panel 2nd interview round, preliminary summary, 14.9. 2005

IMPACT OF TRENDS	Impact value of trends1=very small, 2=small, 3=moderate, 4=big, 5=very big)	According to the Murmansk council Continuation of trends until 2025 1=decreases significantly, 2=decreases slightly, 3=remanis unchanged, 4=increases slightly, 5=increases significantly)	According to Murmansk council Clusters of which the development the trend has a special impact on
TREND			
1. Development of transportation technology (T)	4,43	4,57	Transportation and logistics, Energy, Mining and metal
2. Increase flows of mineral (L)	4,0	3,83	Mining and metal Transportation and logistics, Environment
3. Increase flows of container traffic (L)	3,86	4,33	Transportation and logistics ICT (Environment and Security)
4. Increase flow of oil transito (L)	3,79	4,33	Energy, Transportation and logistics, Security
5. Increase in the international market price of oil price (G)	3,79	4,5	Transportation and logistics, Energy (Mining and metal)
6. Increase in capital / financing flow	3,71	4,17	Energy, Mining and Metal processing
7. Increase flows of coal transit (L)	3,62	3,5	Transportation and logistics (Energy, Environment and Security)
8. Increase in the traffic / trafficability on the Northern Sea Route (G)	3,62	4,33	Energy, transportation and logistics, Environment

IMPACT OF TRENDS	Impact value of trends1=very small, 2=small, 3=moderate, 4=big, 5=very big)	According to the Murmansk council Continuation of trends until 2025 1=decreases significantly, 2=decreases slightly, 3=remanis unchanged, 4=increases slightly, 5=increases significantly)	According to Murmansk council Clusters of which the development the trend has a special impact on
TREND			
9. Emphaasizing of personal welfare (V)	3,6	4,0	Welfare, Security (ICT, Environment)
10. Increase of the domestic price of electricity (G)	3,58	4,17	Energy, Mining and metal, Transportation and logistics
11. Increase in the domestical price of oil (G)	3,54	4,5	Energy, Transportation and logistics (Mining and metal,Welfare)
12. Increase flows of gas transito (L)	3,14	4,33	Transportation and logistics, Energy, Environment

transition period of time. This fact may awaken the electrical enterprises in the West, for example Fortum acting in Finland to invest in the nuclear plant in Kola and in its transfer nets (Brunstad et al, 2004, p. 155).

In deciding about the development of the logistic in energy cluster both Murmansk panel and Finland/ int.panel strengthen the decision making on the Russian Federation level.

In the **environmental clusters** the most important logistic areas to be developed are
according to both panels the *oil pipe and maintenance services, the gas pipe and maintenance services*. The decision making in these logistic undertakings is above all on the Federal level and then on the regional level. The Finland/ int. panel emphasises also the international level.

In the **mining and metal refining clusters** *harbours and harbour services* as well as *railway connections and railway traffic form* according to the Murmansk panel the most important areas to be developed.

The development of **tourism** requires according to the panel the development of air traffic and *air traffic service* as well as the development of *the road traffic* and *road traffic services* and *the development of passenger traffic service*. The Finland/int.-panel also lifts up the border traffic services.

Conclusions

At this moment according to the Murmansk panel the logistical flows, the technological development and the globalisation trends have the biggest impact on the development of the area. In the future the globalisation trends will be strengthened at most, then the logistical flows and the technological development trends. When choosing among the main trends the most important 12 emphasised sub-trends and evaluate which alternative nine clusters they support at most, the conclusion can be made that most of the trends clearly support the development of the transportation and logistical cluster, the energy, the environmental and the mining and metal cluster.

The future role of the Murmansk Oblast area seems to be clearly related to logistics and transportation. For example the trends having the biggest impact supported most clearly the development of transportation and logistic cluster and energy cluster in the Murmansk Oblast area.

For example Tykkyläinen (2003) has come to the similar results in his evaluation of the future role of the Murmansk Oblast area. When the participators in the panel were asked about such a cluster which had the biggest impact on the positive development of the population in the area they mentioned more often the transportation and logistic cluster.

According to the cluster-approach the research and education system play an important role in the development of the clusters. Research and education should be directed towards the needs of new growing clusters, like development of transportation and logistic clusters and energy clusters. Co-operation in research and education with for example the universities in Northern Finland in logistics could give a versatile possibility to develop the Murmansk Oblast area and to benefit from the area development also in Northern Finland e.g. benefiting the ICT-technology in the logstical systems

However the above results and conclusions are very preliminary and in a later handling of the material the answerers should be grouped for example in representantives of existing clusters, rising clusters, and representative of independent clusters. It could be assumed

that for example the administration of the area, which gets its income from the present strong clusters thinks in other terms than for example representatives for rising clusters (e.g. tourism and ICT) or representatives for indipendent clusters (such as environmental organisations and other organisations of citizens) . By grouping the material it is possible to create different scenarios and to evaluate the impact of the trends through the scenario. In handling the material attention has to be paid not only to the average value of the trends but also to the variation and the arguments of the answerers.

For information

The author mainly works in Oy Aluekehitys RD which is specialized in Delphi research and applications and areal foresight . The research work is part of the umbrella project "Does the Geography of Russian Peripheries Really Change?". This project is administrated by the University of Joensuu and funded by the Academy of Finland. In this project are researchers from Finland,

Russia, Germany and Australia. The umbrella project and this part of the project will be done in co-operation with Barents Centre for Social Research and Dr. Oleg Andreev, who is also professor of the Baltic Institute for Ecology, Politics and Law. The implementation of the research work is part of the preparation of a doctoral thesis in human geography, which is supervised by Professor Markku Tykkyläinen. The research is mainly carried out independently. It is anticipated that the research project will be completed within four years. The completion of the subproject is planned for 2007 when the student will finalise his doctoral dissertation.

References

Andreev, O.A., Spies, M. (2005). Oil and Gas Branch of Norway: Short survey in Oil Industry. N 6, Moscow, p. 44-47.

Brunstad, Bjørn & Magnus, Eivind & Swanson, Philip & Hønneland, Geir & Øverland, Indra (2004). Big Oil Playground, Russian Bear Preserve or European Periphery? The Russian Barents Sea Region towards 2015. Eburon
Academic Publishers, the Netherlands.

Kuusi, Osmo (1999). Expertise in the Future use of generic Technologies – Epistemic and Methodological Considerations Conserning Delphi Studies. Government Institute for Economic Research. J-Paino Oy, Helsinki.

Malmberg, Anders & Maskell Peter (2002). The elusive consept of localization economies: towards a knowledge-based theory of spatial clustering. Environment and Planning A 2002, volume 34, pages 429-449.

Porter, E.M. (1990). The Competitive Advantage of Nations. Free Press, New York.

Rautio, Vesa (2003). The Potential for Community Restructuring – Mining Towns in Pechenga. Kikimora Publications A:9, Saarijärvi.

Toivonen, Marja (2004). Expertise as Business. Long Term Development and Future Prospect of Knowledge-Intensive Business Services (KIBS). Dissertation in PDF format.

Tykkyläinen Markku (2003). North-West Russia as a gateway in Russian energy geopolitics. Fennia 181 (2).