



SECURITY OF SUPPLY IN FINLAND AND ESTONIA

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BACKGROUND / WHAT WE DID AND WHY?

What are the most vital infrastructures and assets for society and its functions? Being practically like an island Finland is dependent on maritime transportation and sea ports. Problems with supply chains can cause unavailability of raw materials and difficulties in product deliveries resulting in reductions or stoppages of production causing considerable economic losses. Therefore preparedness for emergencies and disturbances is crucial for functioning of the society.

We examined alternative ways to handle domestic supplies and raw material import in the critical industry sectors during disturbances in seaborne transport. Our main aim was to strengthen the security of supply by finding alternative routes to be better prepared for disruptions in supply chains.

METHODS / HOW WE DID IT?

Cargo flows:

Vulnerabilities associated with critical material flows of critical industries, for both imported and exported materials transported through ports were assessed. We also examined possibilities for alternative routings in case of transport disruptions and emergencies.

Economic, environmental, sociological and political perspective:

Finding ways to minimize environmental effects of transportation, to hear weak signals regarding political views of security of supply and to categorize the basic sociological factors needed for a functioning society is a crucial task.

Simulation:

High quality dynamic feedback models of port, rail and road capacity in Finland and Estonia currently and in disruption situations were developed, analyzed and combined using Vensim® and Anylogic Simulation software.

Risks and threats:

Supply chain complexity and disintegration are emerging as one of the major challenges in supply chain risk management. As logistic operations are becoming more divided between an increasing number of individual actors, the ability to identify risks decreases and the transparency of the supply chain diminishes.

USABILITY OF RESULTS / WHAT WE FOUND?

In Finland, the sea ports that are used to transport crude oil, paper and pulp, and reefer containers (i.e. food, chemicals and pharmaceuticals) are highly specialized. There are practically no alternative ports that can handle these volumes when the primarily used port is out of operation due to any kind of disturbance.

In Estonia, the volume and location of crude oil and fuel stockpiles need urgent re-evaluation to secure public safety and the functioning of the society.

Actors in the security of supply should be better prepared for supply chain disturbances to secure higher on-time delivery performance and enhanced flexibility.

Simulation of a sea port closure showed that returning to normal situation after a disturbance in a sea port or main railway arrangement yard takes a relatively long time.

When looking at the security of supply, the logistic chain should not be analyzed as an isolated system but as a part of the wider context.

FURTHER STUDIES NEEDED / WHAT NEXT?

Alternative transport modes and routes of special products should be evaluated together with the neighbouring countries.

Industry specific strategies in preparing for disturbances should be investigated further.

Ways and tools for communication between authorities, public actors and companies' should be analyzed for supply chain disturbance situations.

ACKNOWLEDGEMENTS / THANKS TO

National Emergency Supply Agency (Finland), Central Baltic INTERREG IV A Programme 2007-2013, European Union, European Research and Development Fund, Regional Council of Southwest Finland, Ministry of Employment and the Economy and City of Kotka.

The publication reflects the author's views and the Managing Authority cannot be held liable for the information published by the project partners.