Kennis voor Klimaat

Knowledge for Climate
Workshop report
7th of April 2010

Inhoudsopgave

1 Introduction

This report contains the results of the discussion during the workshop Water and Transport (Knowledge for Climate) on April 7th 2010. This workshop was organized by the members of the consortium in close cooperation with LEF Futurecentre of Rijkswaterstaat. The report contains a summary of the interesting discussion participants had during the day. If you require further information, please do contact the other members of the consortium.

- Alice Krekt/Thijs van der Laan (ARCADIS)
- Rinske van der Meer (Port of Rotterdam)
- Bas Turpijn (Rijkswaterstaat)
- Ad van der Toorn (TUD)
- Erik Mosselman (Deltares)
- Jaco van Meijeren/Tsjitske Groen (TNO)
- Olaf Jonkeren (VU)

1.1 Opening by the Port of Rotterdam and Rijkswaterstaat (Rinske van der Meer, Bas Turpijn)

The day starts with an introduction on the Knowledge for Climate project "Water and Transport". The introduction contains:

- Introduction of the consortium: Port of Rotterdam, Ministry of Transport, Public works and Water management, ARCADIS, Deltares, VU Amsterdam University, TNO and TU Delft.
- Aim of the study: reducing the impact of climate change (high and low river discharges and sea level rise) on barge transport through the Dutch seaports.
- Research steps: problem description, system boundaries, identify possible solutions, analysis of possible measures in relation to the zero-option, conclusions.
- The schedule of the day: morning presentations on the problem description and afternoon workshops on the solutions.

2 Information carousel

The morning continues with exchange of information and discussion on the problem analyzing phase of the research. During an information carrousel the researchers present their conclusions in small groups, in order to give plenty of room for discussion. In all presentations a summary of threats, opportunities and possible solutions are discussed. The feedback from participants is summed up for every topic below.

2.1 Transport costs and shipper and carrier behaviour (VU, Amsterdam University, Olaf Jonkeren)

- Literature survey on the effect of climate change on transport costs, reliability and mode share of the inland waterway transport.
- Interview based report on shippers and carrier behavior in response to changes in transport costs and reliability.

Threats: Transport costs increase during low water periods. However, transport costs of bulk transport are a very small part (1-2%) of the total production costs.

Opportunities: Climate change will increase the use of multimodal transport. This type of transport is promoted by (European) governments for years. An alternative way of transport (mode) will be used on that part of the trip where a barge is not able to navigate.

Solutions:

- 24-hours exploitation of (all) ships: which part of the fleet can be used 24-hours a day and how much capacity is needed?
- Canalize waterways: guarantee of a minimum draught.
- Security of supply: adaptation of storage and production facilities so that they are accessible by the modes barge, train and truck.

2.2 Impact on water level, routing and costs of transport (TNO, Jaco van Meijeren and Tsjitske Groen)

Presentation on the impact of low water levels in rivers on feasibility of inland waterways transport, route choice and level-of-service (transport cost).

Conclusion: For a whole year, on a large part of the volume (+/- 80%) there is no impact. The other part of the volume accepts higher transport costs or switches to other transport modes.

Threats:

- Irrational choice for other modes;
- Reliability of inland shipping;
- Limited free capacity of other modes of transport;
- Availability of rail transport;
- Costs of shifting to other transport modes;
- Damage to the image of inland waterways;
- Reliability of the data and results of the BIVAS model;
- Competitive position of the Port of Rotterdam;
- Competitive position of inland waterways transport;

- People react different on more than x low water periods; very difficult to predict;
- Problems with water levels also on small waterways/canals.

Opportunities:

- Better communication about frequency of shipping;
- Moving of industry that depends on transport by barge to seaports;
- Join economy forces other sectors;
- Better organization of overcapacity of inland waterways transport;
- More focus on CO2 emissions;
- Increase in rail transport;
- Development of inland waterways vessels with less draught.

Solutions:

- Development of new generation inland vessels with less draught;
- Invest in storage capacity for machinery and crude oil;
- Technical modifications to inland waterways vessels;
- Improved cooperation between transport modes (rail-iwt);
- Flexible transport capacity for container (more trips with less containers);
- Create space to stock freight;
- Cooperation between transport modes, parallel (co-modality) or serial (multimodal);
- Better and real-time information and predictions about water levels;
- Definition of trip priorities (by government).

Questions that rose during the presentation:

- Do the transport costs increase due to an increased demand for inland waterway vessels during low water? In many cases the price for vessels on dedicated routes is arranged in contracts and fixed for medium to long term periods.
- When do shippers and transport operators accept or react to the impact incidentally or on structural basis?
- What is the impact of low water levels on smaller rivers and canals?

2.3 River morphology (Deltares, Erik Mosselman)

Presentation on river morphology.

Conclusion: the increased occurrence of shoals due to river incision, overall bed degradation and implementation of the Room for the River programme will have a larger effect on navigability than climate change, at least within the next five to ten years.

Threats: Bed degradation and the Room for the River program are identified as threats for navigation, involving higher costs for maintenance and inland water transport.

Opportunities:

- Smart combination of dredging and sediment nourishment.
- Replacement of hydraulic structures: adapting to the present needs, rather than conserving the existing situation.

Solutions:

- Improving the navigability of the waterway by constructing longitudinal dams, modification of groynes, river canalization by weirs with the possibility of changing the distribution of discharges.
- ICT: better information on present and forecasted navigability to improve operational decisions on the loading of cargo on ships.

3 Promising solutions

During the afternoon the group discussed in smaller groups about possible solutions and selected the most promising solutions.

3.1 Types of ships (Ad van der Toorn, TU Delft)

- ✓ Extra buoyancy: technical knowledge needed, yearly costs, connection with shipping design (Schuttevaer, CBRB, EICB);
- ✓ Light weighted ships: different materials, less ballast (TNO, DSM, TU Delft);
- ✓ Combination of light and heavy loads inside containers, ships or between different modes;
- ✓ Shape of the ship: wider, longer, smaller ships.
- ✓ Cranes or camelvessel (lift the vessel over the sand bank)
- ✓ Amphibian ships (Overtoom), hoovercrafts, cranes.

3.2 Smart Solution (Rinske van der Meer, Port of Rotterdam)

- ✓ Sharing cargo information to improve planning (elaborate)
- ✓ Improve the use of the fleet and storage capacity (elaborate)
- ✓ Information system on optimal routes and departure times
- ✓ Connection between transport modes
- ✓ Improvement waterlevel forecast systems: reliability predictions & number of days ahead
- ✓ International exchange of information about solutions)
- ✓ Sensor under each ship, giving depth soundings (river morphology): daily dredging strategy
- ✓ Ship lifting
- ✓ Use of additional carriage capacity
- ✓ Relocation of plants/factories: avoid bottlenecks

3.3 Logistics and transport (Olaf Jonkeren, VU Amsterdam University)

- ✓ Storage solutions: accessible for all modes, increase storage capacity by flexible storage facilities, increase the stock (long) before a low/high water level event (early warning system);
- ✓ Solution on alternative/ intermodal transport: transshipment of cargo to rail or road, structural shift and/or cooperation between transport modes.
- ✓ Solutions on alternative locations for sourcing of materials and alternative locations for production: is reliability more important than the transport price when choosing a location for sourcing or production?

- ✓ Better utilization of the fleet: 24 hours exploitation, better cooperation with (un)loading sites.
- ✓ Combining these solutions: Optimize logistical chain with all links. Make a plan, do not improvise: put this in contracts.

3.4 Technical innovative solutions (Erik Mosselman, Deltares)

- ✓ Use of pipelines to transport bulk cargo.
- ✓ Create buffer wetlands in Germany to store water in dry periods.
- ✓ Participate more prominently in the Dutch Delta Program: analysis of stakeholders and politics and joint analysis of a business case.

4 Research on solutions in 2010

After the workshop the members of the consortium have discussed what solutions should be subject of research in 2010. The group decided to focus on the next topics:

- ✓ 24-hour operation (VU)
- ✓ Canalization of the Rijn (VU+TUD)
- ✓ Additional storage capacity (VU)
- ✓ Resilience – flexible logistic solutions build in the supply chain (TNO)
- ✓ Use of ICT in the waterway (Deltares)
- ✓ ICT logistics (to be defined)
- ✓ Waterway improvement (Deltares)
- ✓ Ship types (TUD)

All valuable and interesting results that were gathered during the workshop will be used in the final phase of the research. Results will be shared with the participants of the workshop and others involved).

5 List of participants

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