

## Executive summary of the research ‘Economische impact laagwater’

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### The research

Commissioned by the ‘Centraal Bureau Rijn en Binnenvaart’ (CBRB) and Koninklijke BLN-Schuttevaer, Erasmus UPT conducted a research in the period August 2019 - April 2020 into the financial and economic impact of the period of low water in the second half of 2018. This research is not just about the effect for the inland shipping sector, but analyses the financial and economic impact for shippers and society as well. In addition to the effect on rates, we also looked at the effect on shippers production volumes and transport decisions in the short and long term. The analysis was performed for the Netherlands and Germany.

### Main research question

The main question answered in this study is:

*What is the magnitude of the financial and economic effects of low water on the Rhine in 2018, both for the inland shipping sector and for the shipping industry and society in the Netherlands and Germany?*

The following sub-questions have been answered:

- How did the turnover of inland shipping develop in 2018?
- Have there been substitution effects towards other modalities?
- Did companies have to reduce production due to low water levels in the Rhine?
- What was the economic impact of low water for the Netherlands and Germany in 2018?
- Did the extreme low water in 2018 lead to a shift in production locations?

### Research design

Several sources were consulted to answer the research questions. Sixteen interviews with shippers, inland shipping operators, industry and government organizations form the basis of the research, with an emphasis on shippers.<sup>1</sup> The interviews have been carried out in sectors where the strongest effects of low water have occurred and serve as the basis for the translation to the wider economy. In addition, they help to form a picture of strategies that parties deploy towards extreme low water periods in the future. The results of these interviews have been combined with information from annual reports, national and regional statistics, news reports and previous studies to ultimately arrive at an overall picture of the economic effects per sector. A distinction has been made in the following sectors: construction, agriculture & food, steel, chemical & petroleum industry and inland shipping.

### Main conclusion

The low water period did have a substantial financial impact in the Netherlands and Germany. The research focuses exclusively on the direct effects. It is clear that there is an indirect effect – in amongst less backward purchasing - as a result of the low water, but because no accurate estimate could be made for both countries, we have opted not to report indirect effects.

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<sup>1</sup> The interview partners remain confidential due to the sensitivity of company information. When referring to figures, they are always supported by publicly available news articles and statistics. The number of interview partners per sector is stated at the back of the report.

For the direct effects, a distinction is made between three types of impact:

1. the financial impact for the inland shipping sector
2. the financial impact for shippers
3. the economic impact on society. This economic effect has not been quantified; we only focus on the financial effects.

Table 1: financial impact Netherlands and Germany of low water

		Nederland	Duitsland	Totaal
<b>Financial impact inland shipping sector</b>	Net revenue	+ 378 million euro	+ 95 million euro	+ 473 million euro
	Additional costs	- 302 million euro	- 76 million euro	- 378 million euro
	<i>Net profit</i>	<i>+ 76 million euro</i>	<i>+ 19 million euro</i>	<i>+ 95 million euro</i>
<b>Financial impact shippers</b>	Transport costs	- 245 million euro	- 243 million euro	- 488 million euro
	Production reduction	- 60 million euro	- 2.1 billion euro	- 2.2 billion euro
	Strategic stocks	- 66 million euro	- 65 million euro	- 131 million euro
	<i>Total negative impact</i>	<i>- 371 million euro</i>	<i>- 2.4 billion euro</i>	<i>- 2.8 billion euro</i>
<b>Total financial impact</b>		<b>- 295 million euro</b>	<b>- 2.4 billion euro</b>	<b>- 2.7 billion euro</b>

The overall financial impact for both countries is negative; the impact for the Netherlands is almost 300 million euros, while the impact for Germany is almost 2.4 billion euros. The total impact for the Netherlands and Germany is approximately 2.7 billion euros. Two sides are considered to determine the financial impact for the inland shipping sector. On the one hand, the low water generated extra turnover through higher rates and low water surcharges. For the Netherlands this was an amount of 378 million euros; 95 million euros for Germany. On the other hand, there are the extra factor costs that the sector has had to incur - think of labour or fuel. The result of these revenues minus costs is a net profit for inland shipping of 76 million euros for the Netherlands and a net profit of 19 million euros in Germany.

The financial impact for shippers consists of three components: 1) the higher transport costs that shippers have to pay, 2) the costs associated with a reduction in production that shippers have had to implement because the raw materials could no longer be supplied and production in a number of cases had to be shut down and 3) the cost of replenishment because strategic stocks were empty. The higher transport costs are equal to the increase in turnover of inland shipping plus an assumed margin of 10% for additional costs. These additional costs that shippers have had to incur consist of paid low water surcharges, costs for the deployment of other modalities and associated transaction costs and for adjusted stock strategies. Transaction costs include for example contract costs, costs for shifting cargo flows, costs for the use of pre- and post-transport, extra insurance costs and coordination costs.

The production reduction that shippers have had to make due to low water results in a substantial cost and economic effect. For the Netherlands this item consists of approximately 60 million euros, but for Germany the impact in this area is much greater; no less than 2.1 billion euros as a result of a reduction in production. The costs for replenishing the strategic stocks were determined on the basis of the turnover of inland shipping and the share of the Netherlands and Germany in total Rhine transport. For both countries, this cost item for shippers amounts to approximately 65 million euros. Collectively, the negative financial impact of the low tide for shippers is approximately 2.8 billion euros. In addition to financial

effects for carriers and shippers, the low water has also had wider economic effects on society. These effects – think of negative externalities such as congestion or emission and the loss of economic value at factor prices - have been recognized but not quantified in this study. The economic impact for society depends, among other things, on the extent to which chain parties pass on costs to each other and ultimately to society.

Companies in various sectors have responded in a number of ways to the past and possibly future low water periods. Some companies - for example in the steel or chemical sector - have cut production. A number of companies - for example in the construction or agriculture and food industry - indicate that they have actually used other modalities; in addition, it is also often indicated that the use of alternative modes of transport is actively investigated. Companies in various sectors indicate that there is (temporary) provision of additional storage points and / or the holding of a larger strategic stock, whereby the larger stock is a strategic option especially towards the future.

The 2018 low water period had a substantial financial impact on the Dutch and German economies. Cargo has shifted from inland shipping to other modes such as road and rail. On the Rhine, the decline in the volume transported by inland shipping is substantial and even stronger than during the financial crisis in 2008-2009. Long periods of low water such as in 2018 have a negative effect on the reliability and competitive position of inland shipping. Water transport is an important location requirement for the process industry. No direct shifts of production locations have been observed. But with the occurrence of serious low water, the importance of this location factor decreases. Concrete decisions by shippers are also influenced; this primarily concerns the transport decisions of shippers which modality to use, but it may even go as far as investment decisions regarding location at a certain location, as was shown by BASF's decision to invest 400 to 500 million euros in a chemical factory in India rather than in Germany.