

Low water and the climate risk

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The navigability of the Rhine depends on the level of the river, which in turn depends on precipitation and on the melting of snow and glaciers in the Alps. In normal years, the Alpine contribution keeps the water level relatively stable in summer, which distinguishes the Rhine from rivers fed mainly by rain. Climate change threatens this balance. Smaller glaciers and a shorter snow season mean that the river may carry less water in late summer and autumn, precisely when dry periods also reduce the contribution of the tributaries.¹

The critical point for navigation lies at Kaub on the Middle Rhine, between Mainz and Koblenz, where the shallow channel limits the draught of vessels sailing to the upper river. The gauge at Kaub has become a benchmark watched by traders in energy and commodities. In the autumn of 2018, the gauge fell to a record low of about twenty-five centimetres, while the drought of the summer of 2022 again brought it to levels around thirty centimetres.² At such levels, vessels can carry only a fraction of their normal load, freight rates rise sharply with low-water surcharges, and some shippers stop using the waterway altogether.

The low water of 2018 had tangible consequences for Switzerland. Supplies of mineral oil products to the Basel ports fell sharply, which led to local shortages and price increases for heating oil and fuel in parts of the country. The federal government released parts of the compulsory stocks of mineral oil products to bridge the gap, an instrument designed for crises of supply that had rarely been used in peacetime.³ The episode showed how a hydrological event several hundred kilometres downstream can affect the economy of a landlocked country.

Low water creates legal as well as economic questions. Contracts of carriage and charter parties usually contain low-water clauses that allow the carrier to reduce the load or charge surcharges when the gauge falls below a defined level. Supply contracts for energy and commodities may

treat extreme low water as an event of force majeure, which raises the question of whether a foreseeable climatic risk can still be regarded as unforeseeable. Logistics companies have responded by investing in vessels with lower draught, while the German government has planned to deepen the channel on the Middle Rhine to stabilise navigation during dry periods.⁴

1 Notes

1. On the projected effects of climate change on the discharge of the Rhine, see the reports of the International Commission for the Hydrology of the Rhine Basin (CHR) and the ICPR studies on climate change scenarios for the Rhine. To be verified. ↩
2. On the low-water levels at the Kaub gauge in October 2018 (around 25 cm, a record low) and August 2022 (around 30–35 cm), see the data of the German Federal Waterways and Shipping Administration (WSV) and the CCNR market observation reports. Figures to be verified. ↩
3. On the release of compulsory stocks of mineral oil products by the Federal Office for National Economic Supply in autumn 2018 because of the low water level of the Rhine, see the press releases of FONES and the Federal Department of Economic Affairs, Education and Research of 2018. To be verified. ↩
4. On the project to deepen the navigation channel of the Middle Rhine between Mainz/Wiesbaden and St. Goar (Abladeoptimierung Mittelrhein), listed in the German Federal Transport Infrastructure Plan 2030, see the publications of the German Federal Ministry for Digital and Transport. Status to be verified. ↩

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