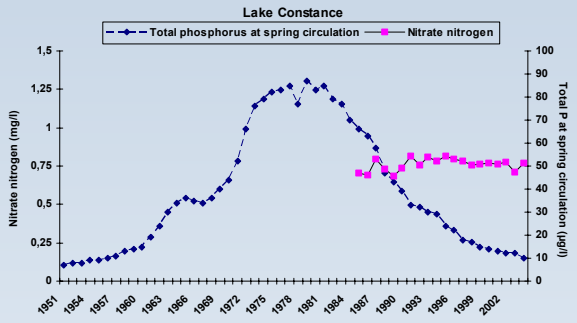
Development of P-Load in domestic sewage in Germany

	1975	1985	1987	1989/90
P from human excreta	1,6	1,6	1,6	1,6
P from left-overs of nourishment	0,3	0,3	0,3	0,3
P from washing and cleaning agents	3,0	1,6	0,9	0,45
Miscellaneous	----	----	----	0,15
Total	4,9	3,5	2,8	2,5

Example 1: Lake Constance

As a result of wastewater technology improvements and the introduction of phosphate-free detergents, there has been a marked reduction in phosphorus concentrations since 1980.



source: Water Supply and Distribution in Germany

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The present situation in Germany

- The **development of phosphate-free textile detergents halved** the water body loads from wastewater treatment plants without P-removal and emissions from combined sewage overflows (~40% of all emissions from wastewater treatment plants in DE).
- **In combination with the introduction of tertiary treatment in municipal wastewater treatment plants** with a connected load of 10,000 inhabitants or more this led to **a strong decline, by about 90%, in the total phosphate concentration in sewage** from municipal waste water treatment plants and a reduction in total phosphate concentrations in water bodies by around **75 %.**

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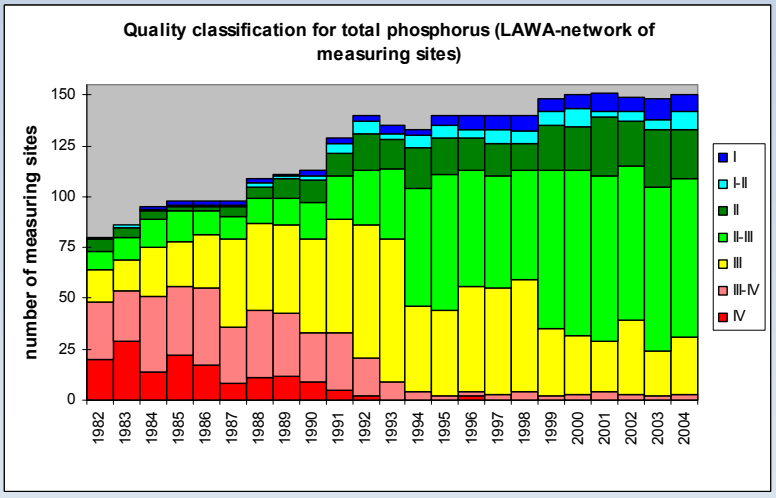

source: Water Supply and Distribution in Germany

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Phosphorus is a limited resource

worldwide useable reserves (2000): 11,5 Mrd. Mg

↓

mining in 2000: 132 Mio. Mg

↓

lifetime of reserves: 89 years

source: Wagner, M. (2004)

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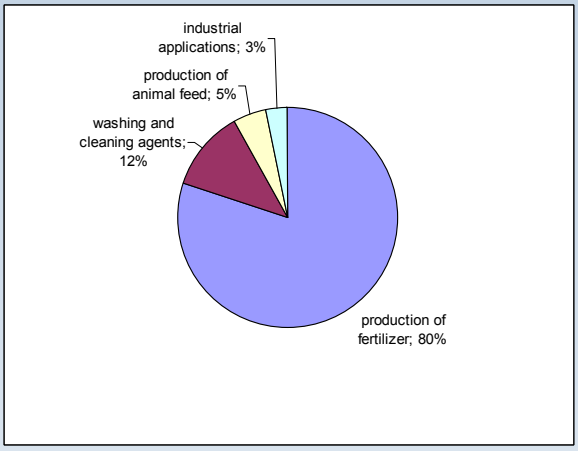

Main uses of phosphorus and their distribution (CEEP, 1997)