

P

The future of phosphorus

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What is P?



What is at stake?

- P essential for life:
 - one of the main nutrients for plant growth and therefore essential for food production
- But P is scarce and reserves are limited
- Inequalities: Africa is world's largest producer of phosphate rock and the continent with largest deficit in food security



Reasons to tackle management of phosphorus resources

- Finite reserves
- Security of supply
- Pollution: cadmium
- Food gap

Finite reserves

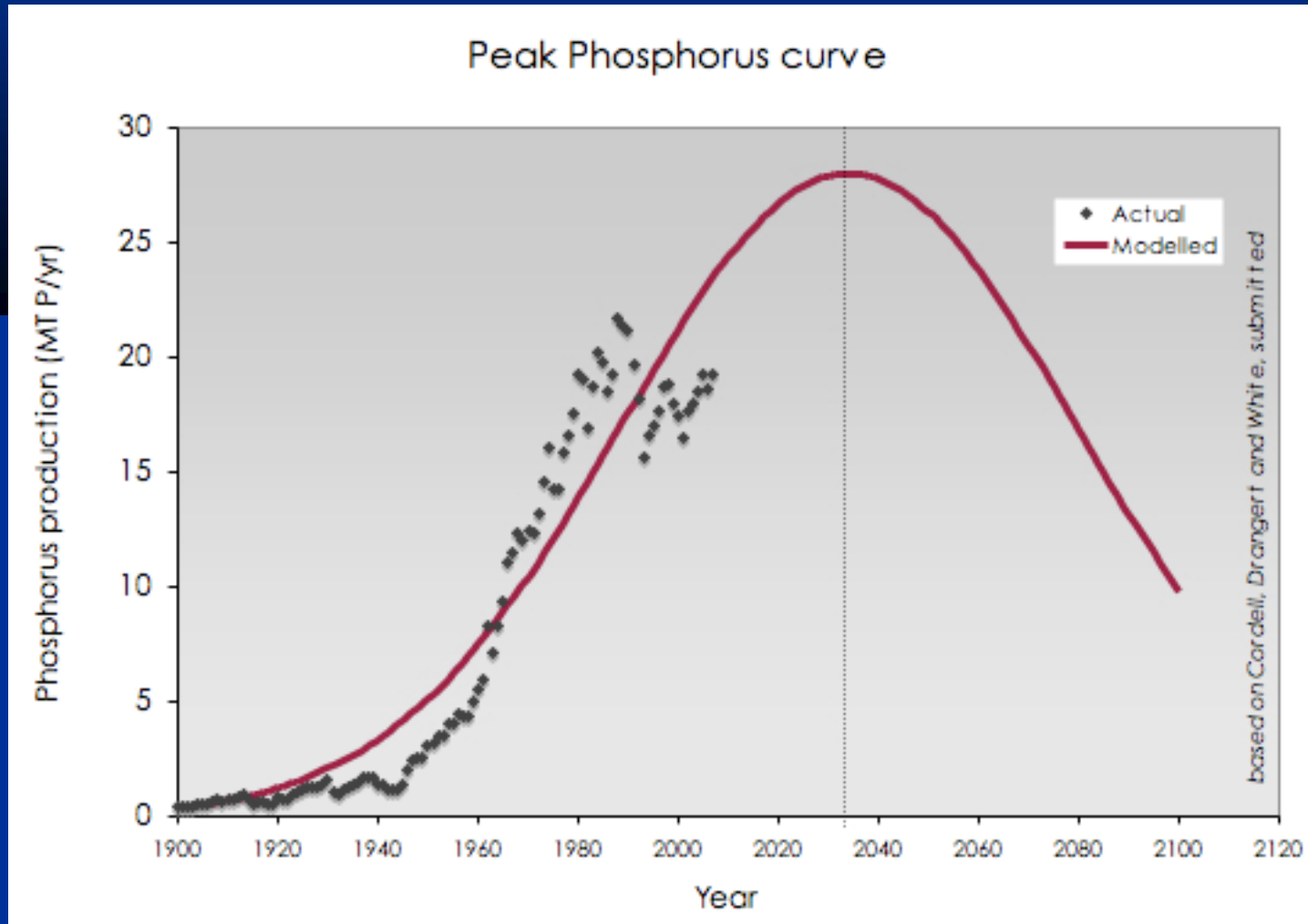




Figure 1: Peak phosphorus 'Hubbert' curve, indicating that production will eventually reach a maximum, after which it will decline (source: Cordell, Drangert and White, 2009) ¹

Security of supply

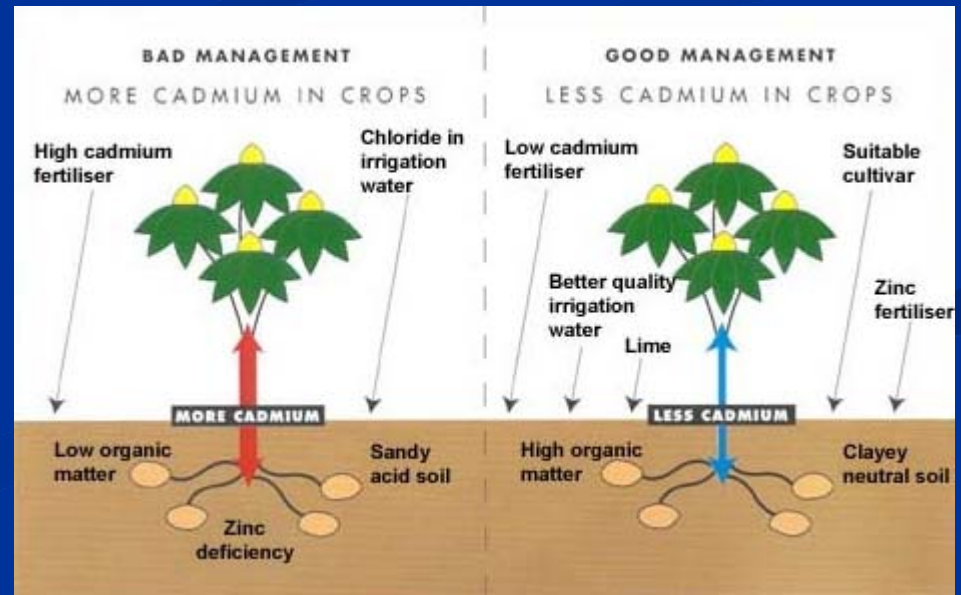


 Five countries control almost 90% of global phosphate reserves

 Eight countries account for 65% of global sulphuric acid production

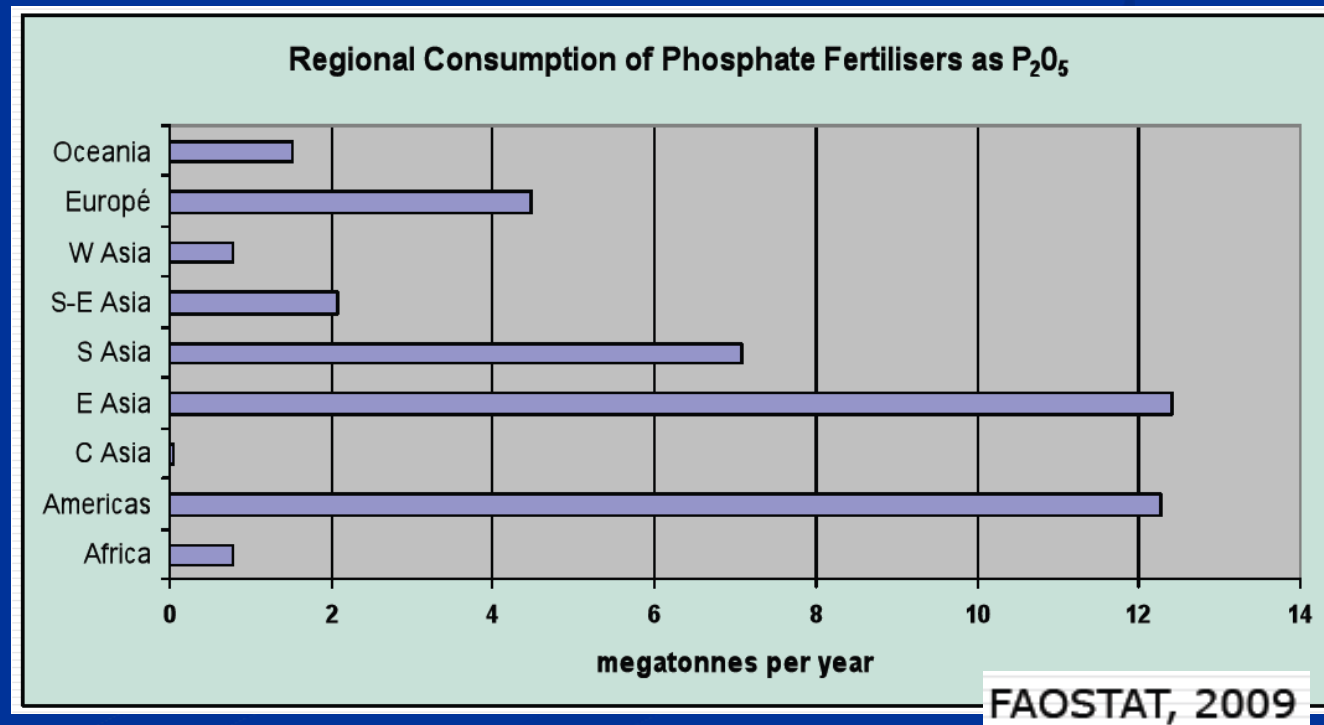
Pollution

- Cadmium pollution of soil (especially when P supplies run down)
- Content of cadmium in phosphate rock can be very high
- Expensive & energy intensive to remove
- But harmful for application in agriculture

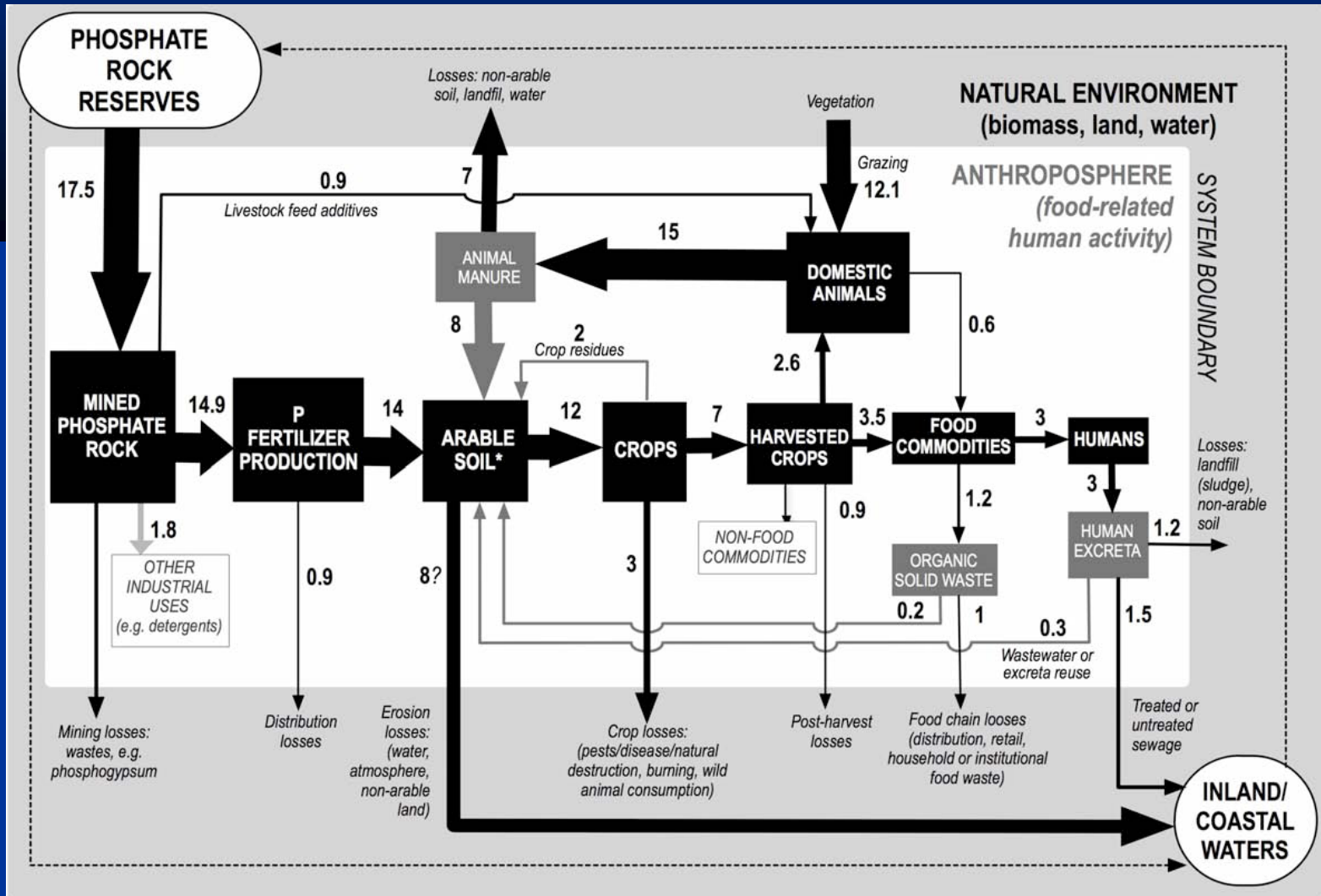


The food gap

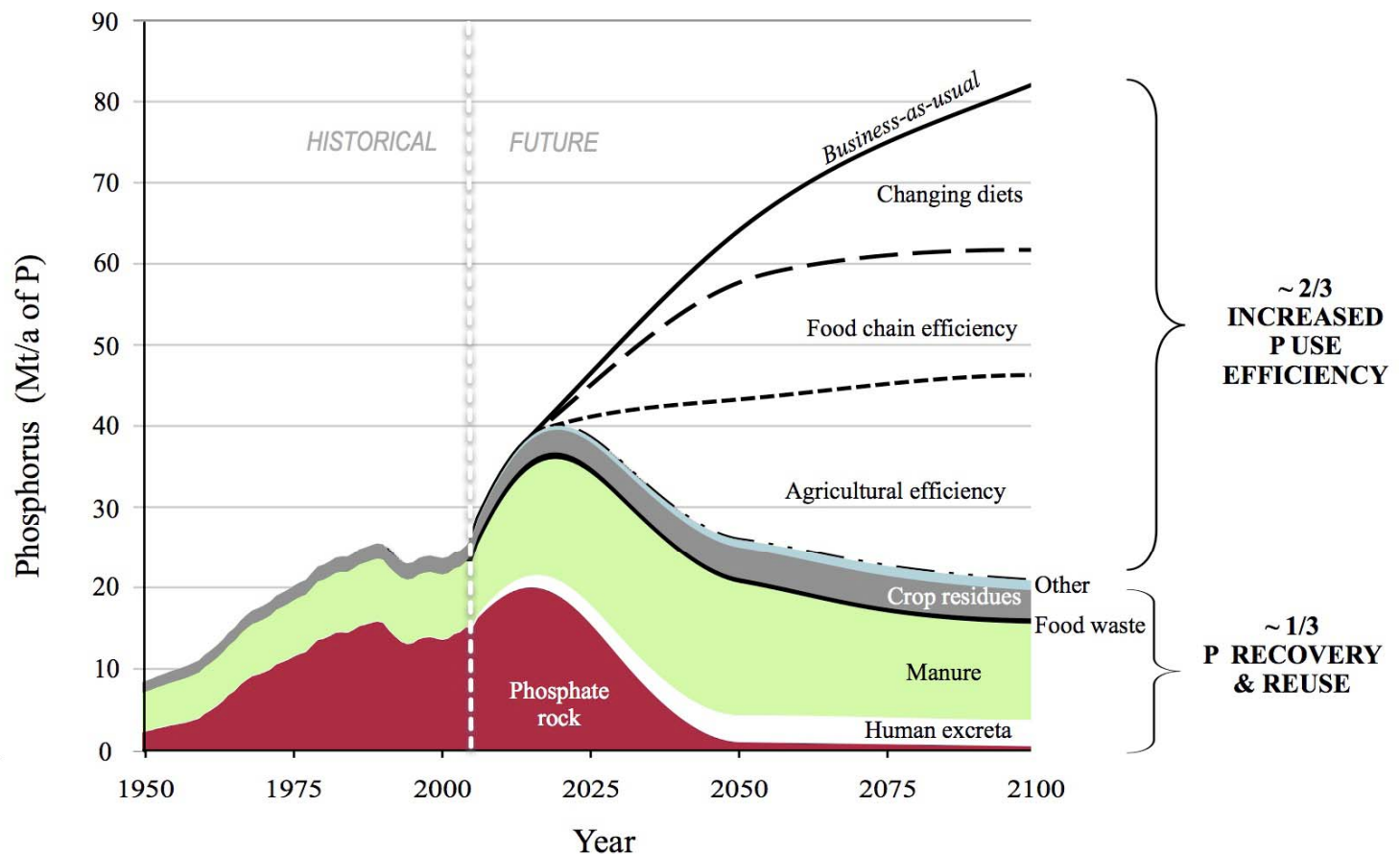
- Food production needs to double to feed 9 billion people by 2050



Currently only 20% of the P from mining gets to our mouths




The future of P: recycling, efficiency & changing behaviour



Tackle demand- as well as supply-side

- Recovery & reuse of P from organic waste sources (like human excreta): cities are P-hotspots!
- Changes in food consumption: less meat consumption
- Change in agriculture policies: reduce livestock density, reduce over-application P-fertilizers
- Increase efficiency of extraction



Human excreta (especially urine) contain all the vital nutrients (P,N,K) required for food production. According to some Swedish and Zimbabwean studies, the nutrients in one person's urine is sufficient to grow 50-100% of the food requirements of another person^{16,17}

What should the EU do?

- Incineration of biodegradable waste is wasting P resources -> better promote composting of biowaste
- Reduce livestock density and overuse of fertilizers
- Promote reduction of meat consumption
- Promote recycling of P -> priority in Resource Efficiency Roadmap

What is happening now at EU level: P-ban in detergents

- 90% of the phosphate rock extraction is for food production, the remainder is for industrial applications like detergents
- Commission proposal to ban P in laundry detergents
- EP will probably extend to automatic dishwasher detergents