

Fertilizer Researcher

Phosphogypsum: From Industrial Liability to Untapped Opportunity

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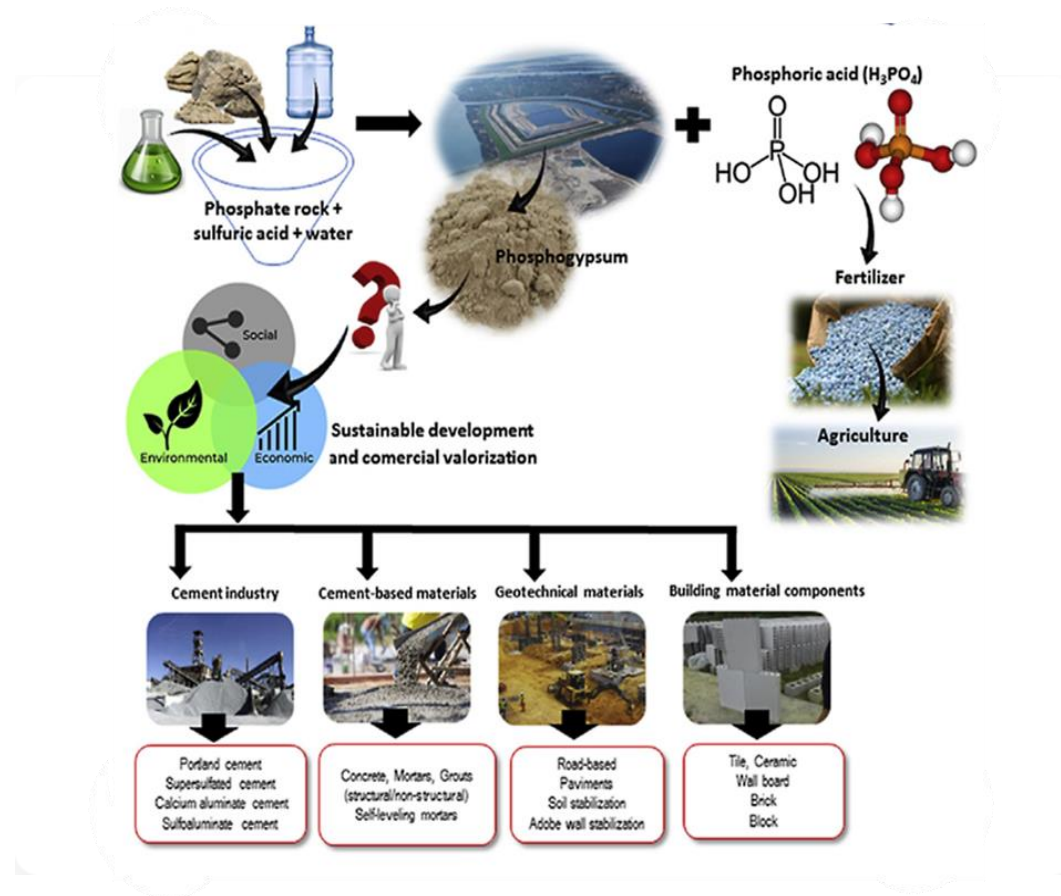
Global Industrial Liability

- ✓ 1 ton of phosphoric acid creates ~5 tons of phosphogypsum
- ✓ Billions of tons have accumulated worldwide
- ✓ **Key Locations:**
 - Huelva (Spain)
 - Wiślinka, Police, Wizów (Poland)
 - Siilinjärvi (Finland)
 - Zgropolci (Macedonia)
- ✓ No scalable solution exists currently
- ✓ Environmental, regulatory, and financial risks
- ✓ **A structural problem for the phosphate value chain**



A phosphogypsum heap in Wiślinka, Poland. **Wędrychowicz et al. SN appl. sci. 2019.**

Major Problem Despite Decades of Effort



Calderón-Morales et al. *J. Build. Eng.* 2021.

Existing limitations:

- Low-value applications
- Cannot treat meaningful volumes
- Regulatory and public resistance
- Costly, complex, and hard to scale
- No solution is truly circular

Novel Process: From Waste to Common Products

- ✓ A simple, streamlined process
- ✓ Cost-effective implementation
- ✓ Value-added products output
- ✓ Standardized materials for industry
- ✓ Established markets integration
- ✓ No regulatory barriers



Waste Management to Value Creation

- ✓ Phosphogypsum is a major unresolved industry challenge
- ✓ Existing solutions fail to scale or monetize efficiently
- ✓ Our novel process creates versatile, well-known products
- ✓ **Outcomes:** Lower risk, new revenues, and true circularity



Conclusion

Transforming an environmental liability into a strategic industrial asset.