

Full scale implementation of a novel P-recovery technology in a WWTP

Doctorando: M. Roldán. Dirección: R. Barat.
Programa de Doctorado en Ingeniería del Agua y Medioambiental

CALAGUA Unidad Mixta UV-UPV, Institut Universitari d'Enginyeria de l'Aigua i Mediambient-IIAMA, Universitat Politècnica de València. Camí de Vera s/n, 46022 València.

Why to recover P from WWTP?

1- Avoiding degradation of aquatic ecosystems.

La Albufera de Valencia sigue sin recuperarse casi tres décadas después de ser declarada humedal Ramsar (seo.org, 29/05/2017)



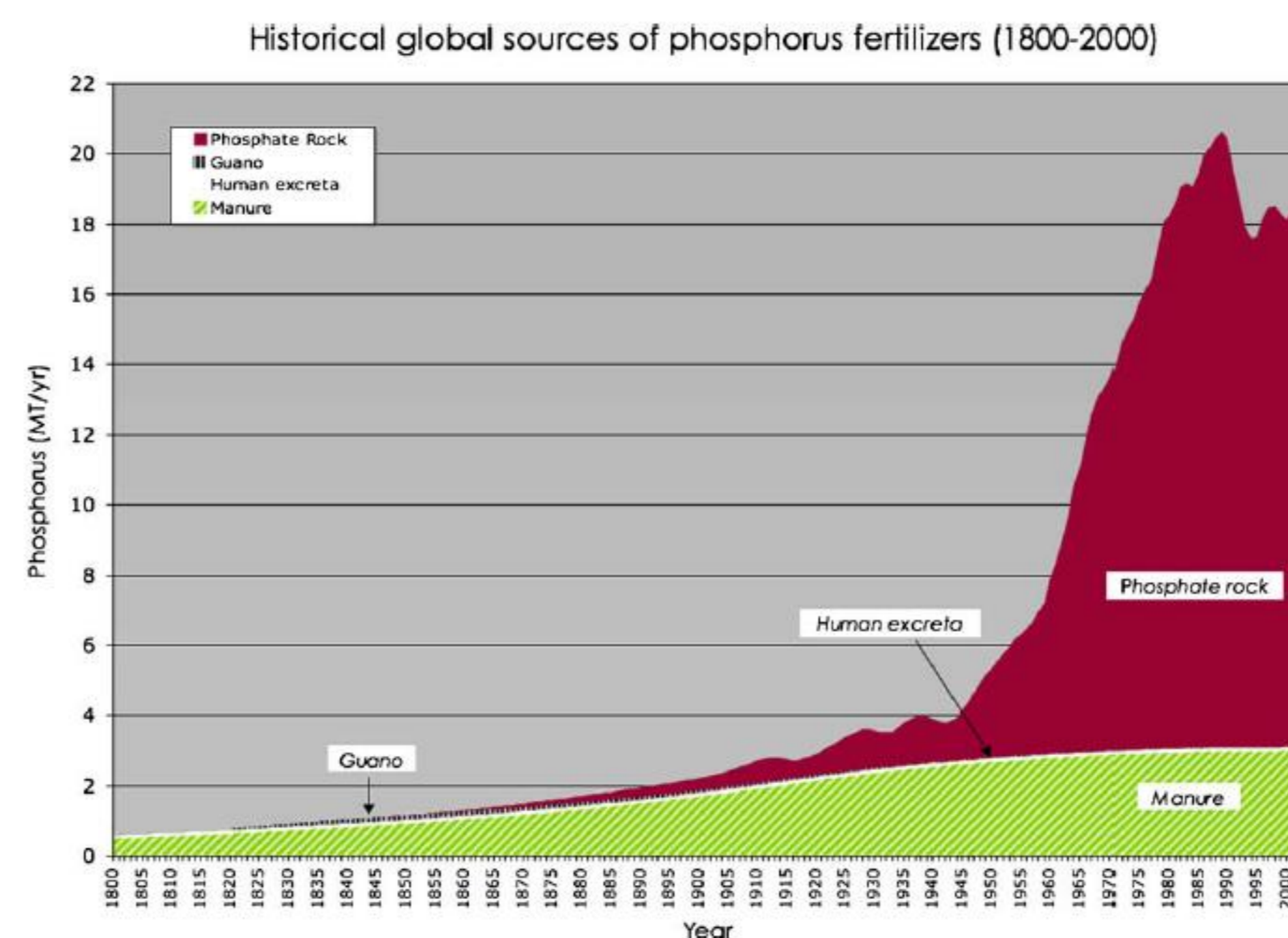
2- Production of slow release fertilizer → **STRUVITE** ($\text{NH}_4\text{MgPO}_4 \cdot 6\text{H}_2\text{O}$, MAP)

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Phosphorus Famine: The Threat to Our Food Supply

This underappreciated resource—a key component of fertilizers—is still decades from running out. But we must act now to conserve it, or future agriculture could collapse

By David A. Vaccari



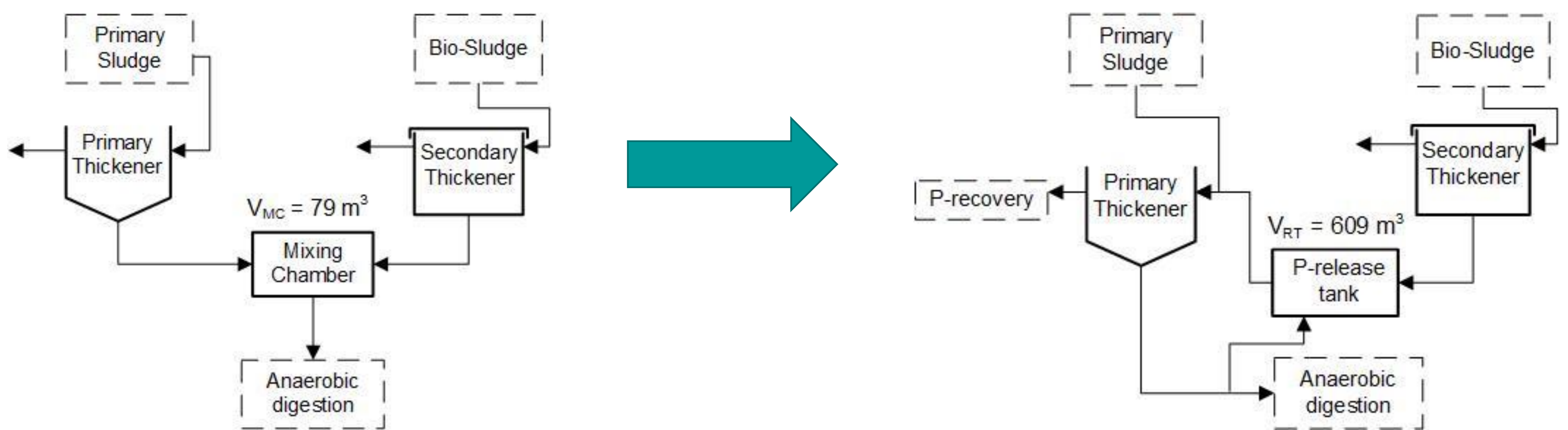
3- Improvement in WWTP operation: reduction in the uncontrolled P-precipitation in & downstream anaerobic digestion.



Material & Methods

Implementation of the new sludge line configuration employing as many elements currently built as possible:

- Characterization of the current plant
- Development of the biological model
- Simulations
- Life cycle assessment (LCA)
- Life cycle costs (LCC)
- Full-scale implementation & operation in the Murcia-Este WWTP



Results

Simulation results:

- Reduction in the uncontrolled P-precipitation from the 65 to the 30% of the influent P load.
- Increase in the available P for recovery from the 7 to the >45% of the influent .
- MAP production > 1,000 t year⁻¹
- MAP production cost < market price
- Return of the investment < 5 years

Conclusions

Beforehand, this technology appears to be economically feasible as minimizes the investment & operation costs by employing only currently built elements and reduces substantially the P uncontrolled precipitation with a high MAP production.

Acknowledgements

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