From Crisis to Circularity: Advancing Sustainable Sludge Management in Jordan

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What is Fecal Sludge?

It's a byproduct of wastewater treatment plants and contains a mix of organic matter, nutrients, and potential contaminants

Sludge Management Practices in Jordan

1

Sludge Drying in
Open Drying Beds

Stockpiling the Sludge
inside the WWTPs

2

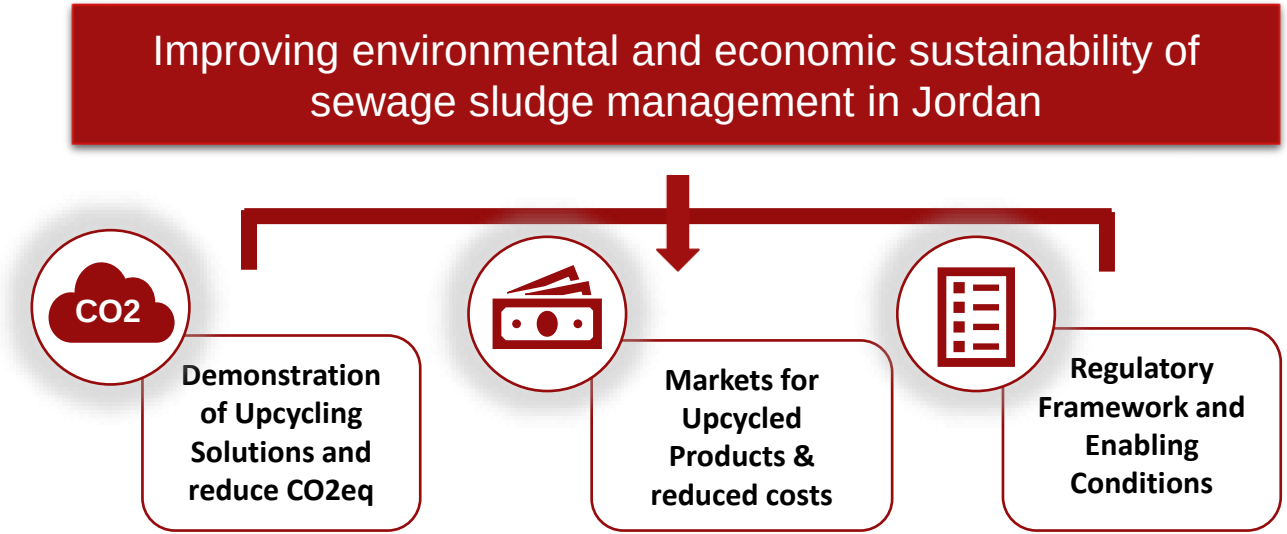
Dewatered Sludge

Damping the Sludge in
sites

Sludge Management ISSUE in Jordan

- Quality and quantity of sludge are not identified.
- Environmental impact from stockpiling and non engineering disposal of sludge.
- Sludge reuse opportunities are not identified.
- No legal framework for sludge reuse.
- There is currently no sustainable final disposal solution for sludge in Jordan.

What is required?



Demonstration of Upcycling Solutions and Reduce CO2eq

- Mapping of sludge product (quality and quantity) & site selection for implementation was determined.
  - 105K tons of dry sludge was produced in Jordan in 2020.
  - The heavy metals concentration is below the national guidelines' limitations.
  - There is calorific value and nutrient concentration in the sludge produced.
- Sludge quality profile was created & Dashboard & mobile application for sludge mapping is created.

Demonstration of Upcycling Solutions and Reduce CO2eq

- Technology matrix was developed and Technologies were selected (Pyrolysis, Pelleting and SDGH).
- Feasibilities were conducted to identify (CAPEX, OPEX, Unit Cost).
- Technical Visit was conducted for sludge upcycling technologies in Germany

Demonstration of Upcycling Solutions and reduced CO2eq

Install the first of its kind solar sludge drying greenhouse in Mutah WWTP

Installing a pelleting machine in Mutah WWTP

Markets for Upcycled Products & reduced costs

- Using a Pyrolysis Prototype to produce Biochar (Biochar meets IBI and WBC Guidelines).
- Samples of Sludge Pellets were produced and pellets quality identified.
- Market Assessment Study has been prepared:
  1. Using of sludge products in industry.
  2. Using of sludge product in agriculture.
  3. Export the biochar.

Markets for Upcycled Products & reduced costs

- Promoting sales in the national market, especially of sewage sludge pellets.
- 10 tons of sludge pellets was used in an Industrial Experiment as an energy carrier.
- Support R&D on reuse sludge products:
    1. 20 Kg of Biochar were sent to UJ.
    2. 80 Kg Biochar will be provided to NARC for further research of Biochar reuse in land application.

Regulatory Framework and Enabling Conditions

- Draft standards for using Biochar and sludge pellets for Industrial Reuse was developed experts and approved by Steering Committee and submitted to JSMO
- Draft Standard Recommendations for sludge and biochar reuse in land application was developed by experts and hold Steering Committee.
- Supporting WAJ Labs in developing SOPs and procurement of laboratories equipment.
- Initial Carbon Market assessment for sludge project in Jordan was developed.
- Arab Water Week – Regional Dialogue

What is the next?

- Deploy the sludge upcycling technology to make the sludge reusable.

- Expression of interest for the use of sludge as an energy carrier was launched.
- Pilot project for using the sludge in agriculture will be implemented.
- Develop a carbon market for the sludge.

- Produce guidelines/SOPs for using the sludge in agriculture.
- Accreditation the SOPs for using the sludge in industrial sector by JSMO.

Q & A

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