Waste to Food – Great model, challenging reality

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Safi Sana Ghana Ltd.: Feecal + organic waste to make Electricity, Compost and Waste Water

Is circular waste-management economically viable?

Lessons Learned: A multi-faceted income model with partly commercial and partly institutional partners makes sustainable, circular waste treatment possible. A business case is based on Levy on environmental impact (like tipping fees) together with sales of compost en energy. Differing price levels per country and region require local feasibility studies to calculate the business case.

Can seedling production strengthen the business case?

Value addition to compost by using it as growing medium.

Production costs of seedling cost are 7 ct (EUR) per seedling, while growers are willing to pay 4-5 ct. Willingness to pay more is likely to increase when added value of professional seedlings is well understood by growers.

Lessons Learned: Yes, value addition is possible, but the market for seedlings is under-developed in Ghana.

Can re-use of waste-water strengthen the business case?

<table>
<thead>
<tr>
<th>pH</th>
<th>EC [mS/cm]</th>
<th>NH4 [mmol/l]</th>
<th>K</th>
<th>Na</th>
<th>Ca</th>
<th>Mg</th>
<th>NO3</th>
<th>Cl</th>
<th>SO4</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>target solution</td>
<td>7.3</td>
<td>2.6</td>
<td>1.0</td>
<td>5.4</td>
<td>4.0</td>
<td>3.1</td>
<td>5.4</td>
<td>16.5</td>
<td>3.1</td>
<td>2.0</td>
</tr>
<tr>
<td>waste water</td>
<td>8.0</td>
<td>2.0</td>
<td>1.9</td>
<td>5.4</td>
<td>10.9</td>
<td>0.4</td>
<td>0.5</td>
<td>0.0</td>
<td>6.6</td>
<td>0.3</td>
</tr>
<tr>
<td>shortage (*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Compost 1 kg/m²</td>
<td>141</td>
<td>52</td>
<td>334</td>
<td>157</td>
<td>1347</td>
<td>77</td>
<td>173</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Net additional requirement (mmol/l)</td>
<td>1.3</td>
<td>3.4</td>
<td>10.2</td>
<td>1.1</td>
<td></td>
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</tbody>
</table>

*given 5-month cultivation @ 4 liter irrigation/m2/day

Lessons Learned: Technically, Yes. Economic evaluation still under way. Additional N, Ca, Mg and S is required (compost is rich in micro-nutrients). High Na-levels require occasional kation exchange in the soil.

Partners:

VIA Water
Vitol Foundation
Ministry of Foreign Affairs of the Netherlands
The Stone Family Foundation
Aqua for All
Wageningen University & Research
NWO Netherlands Organisation for Scientific Research
WOTRO Science for Global Development