



# Zero nutrient discharge and total reuse of domestic waste(water) nutrients in agriculture-Case study: St. Eustatius (Statia)

Feb 2013 - 2017

<b>Researcher</b> Indra Firmansyah	<b>Supervisors</b> Dr. Marc Spiller Dr. Bert Smit (PRI) Dr. Gerrit-Jan Carsjens (LUP)	<b>Promotor</b> Prof. dr. ir. Grietje Zeeman
---------------------------------------	--	---

## Motivation

St. Eustatius (Statia), a small island in Caribbean, is becoming an attractive place for tourism. The population and economy are predicted grow. As a consequence production of waste, wastewater will increase. This will have adverse impact on the coastal environment in Statia. The existing wastewater infrastructure is performing poorly. Seepage or discharged effluent containing nutrient from this system might loss and accumulated in aquatic ecosystem because of leaching or run-off within the island. Furthermore, the waste is dumped at an open landfill which is close to coastal ravine. During heavy rainfall waste is dispersed across coastal zone, which leads to losses of materials and nutrient that can be also the cause of eutrophication. In addition, production of more goods is also necessary to support the island that at present the agricultural products are mostly imported from outsiders. Hence, to be more sustainable in the island, the generated nutrient from domestic waste(water) can be recovered and reused for agricultural/horticulture practices.

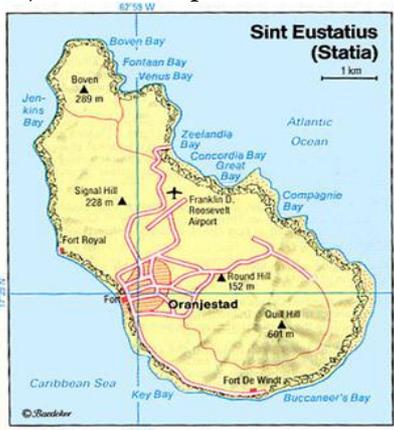


Figure 1. Map of St. Eustatius ([www. planetware.com](http://www.planetware.com))

## Research challenge

For this research, three area of expertise is combined:

- Spatial planning,
- New Sanitation, and
- Agriculture/ Horticulture.

The research will focus on multidisciplinary approach by combining scenario planning, urban-agricultural design and scientific enquiry methods, methods of mass flow analysis, application of new sanitation concept and associated agricultural practices that will be weighed by means of multi criteria assessment.

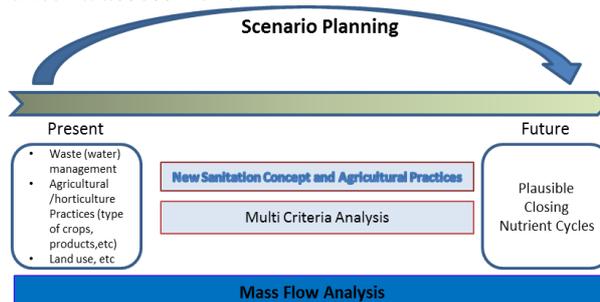


Figure 2. Methodology Scheme of Research Project in Statia  
 Implementation of waste(water) reuse system is challenging because it needs changes to waste(water) infrastructure and agricultural/ horticulture practices. It also requires investment and capacity building to achieve the objective in the future. Thus the approach taken here is to define most suitable technologies and practices based on available nutrients, types of crops, stakeholder needs and future trends to closing nutrient cycles within island.

This research is conducting as a part of TripleP@Sea Project of Wageningen University.

	CV Researcher;	Indra Firmansyah
	Graduated;	Wageningen University, Urban Environmental Management (2011)
	Hobbies;	Playing Football, Badminton
	e-mail;	indra.firmansyah@wur.nl
	tel;	0317-482020
	website;	www.ete.wur.nl