ETH zürich

Transdisciplinary Case Study (tdCS) 2018

«Sustainability in Small Island Developing States (SIDS): Waste management in the Seychelles»

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Why the Seychelles as a case study?

Institutional

- Continuation of a long lasting (research) collaboration between ETH Zürich and (Ministry of Environment) the Seychelles
- Continuation of a MoU based collaboration with Uni Seychelles

Study object

- Example of a Small Island Developing States (SIDS)
- Size and accessibility to stakeholders
- Vulnerability and sustainable development as key challenges
- State in transition phase

Learning lab

- Sustainability Learning Lab incl. tdCS, MSc (BSc) theses, internships, local course

The Seychelles – *Key features*

Location: 4° -11° South; 46° -58° East

Land mass: 455 km^2 (115 islands; main island Mahe 148 km^2)

Sea area: 1.4 million km^2 (EEZ)

Geology: (most) inner island granitic (43); outer island like Aldabra coralline; highest elevation Morne Seychellois (Mahe, 905 m.a.s.l)

Climate: Average temp. 28° C; rainfall: 2300mm/a; average humidity 80%;

Population: 93'000; approx. 86% on Mahé; descendants of slaves/s.-holders

Religion: 76% Roman Catholic

Political system: Republic

Economy: Tourism and fishery

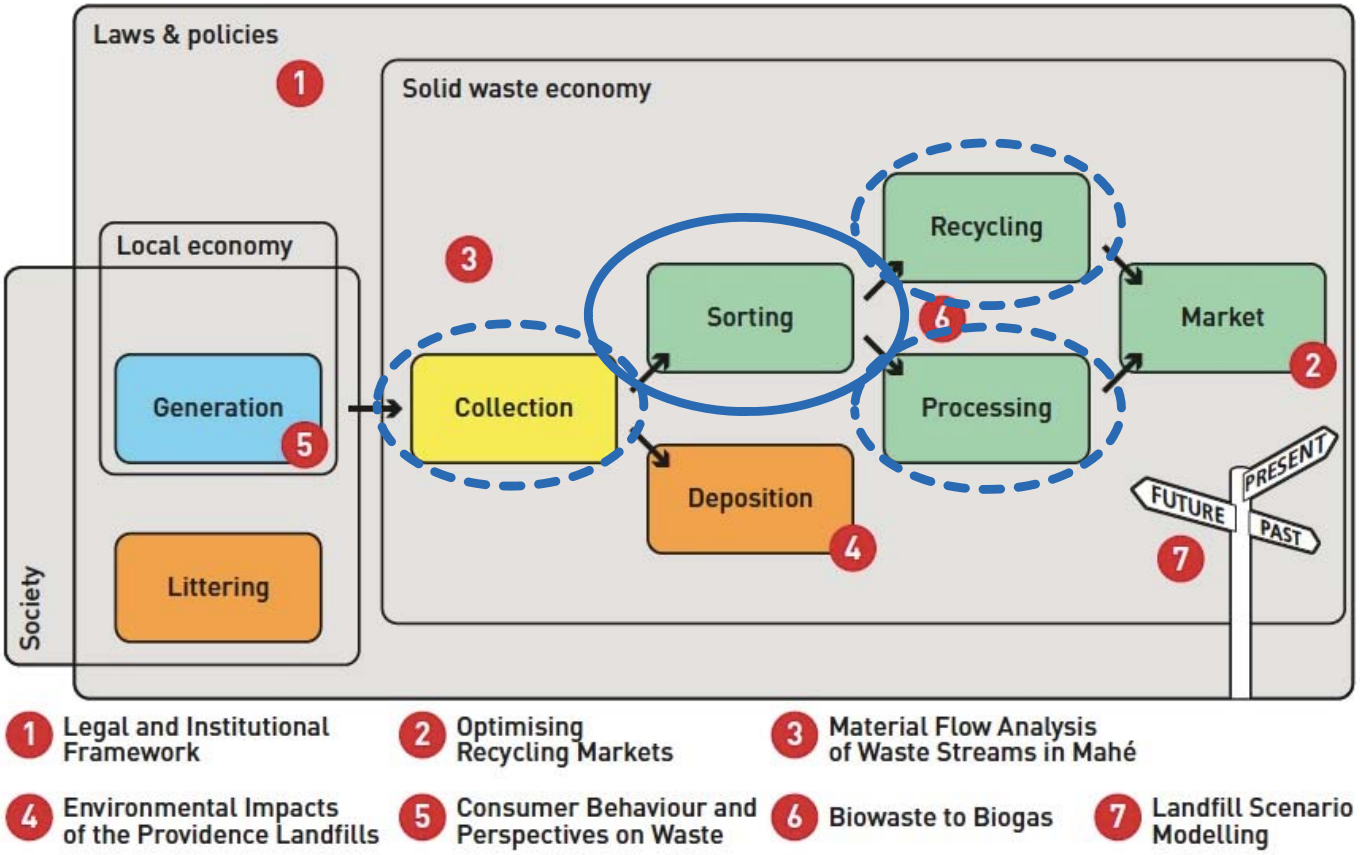
Nature: 50% of land mass is protected; 2 world heritages: Vallée de Mai; Aldabra Atoll

(Source: Lai et al., 2017)

The Seychelles – *Key challenges*

- Vulnerability by external disturbances
- Scarce land resources
- Waste management
- Water pollution
- Water shortage
- Invasive species
- Law enforcement
- Obesity
- Drugs
- Traffic
- Education
- …

Starting point:
tdCS 2016 "Solid Waste Management in the Seychelles"



(Source: Lai et al., 2017)

The current waste situation in the Seychelles (1/2)

- Most commodities and food need to be imported
- Almost 100% increase of waste dumped during the last 15 years
- >2kg waste/person/day dumped
- Approx. 50% of total waste is organic
- Current sanitary landfill Providence II (Mahé) fills up much faster than planned
- Landfill is on (scarce) reclaimed land

The current waste situation in the Seychelles (2/2)

- Daily collection of waste by a contracted private company
- All waste types dumped in the same landfill
- No sorting system at the source
- Levy system on PET bottles and aluminium cans – mostly collected by the informal sector
- PET, aluminium cans and scrap metals enter international waste stream

Key findings of tdCS 2016

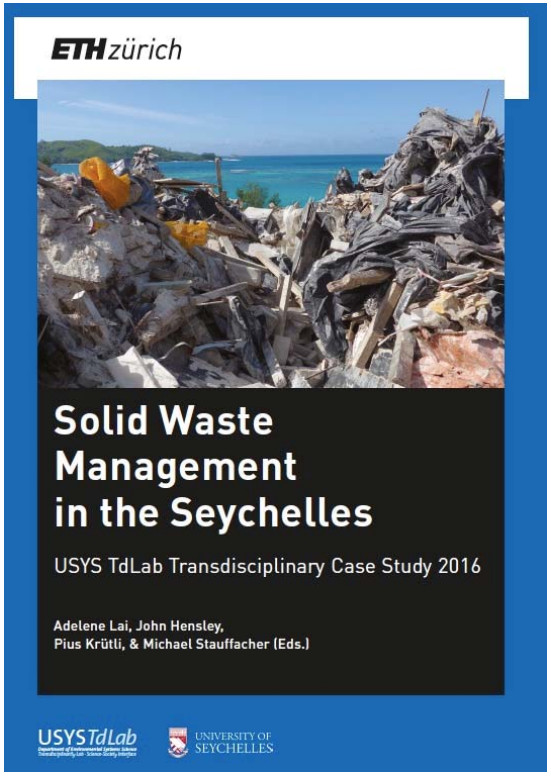
- **Legal system:** Unclear distribution of responsibility within the ministry
- **Material flow:** to landfill go: PET <3%; glass >97%; scrap metal 60%; paper 100%
- **Leaching landfills:** Potentially severe environmental impacts on surrounding area of landfill
- **Biodegradable waste to energy:** Trade-off between econ. feasibility and reduction of amount of waste going to landfill
- **Optimizing recycling:** levy system for glass; formalized collecting system for PET, aluminium … needed; paper and card board??
- **Consumer perspective:** waste perceived as problem
- **Scenario modelling:** up to 10 new landfills by 2040 needed if…

(Source: Lai et al., 2017)

Output of tdCS 2016

- Report for the waste managers (particularly the Ministry of Env.)
- Newspaper supplement to inform the broad public
- Movie to inform students about the tdCS

→ see: http://www.tdlab.usys.ethz.ch/education/tdforsd/tdcs/former/cs2016.html



the transdisciplinary
Case Study

http://www.tdlab.usys.ethz.ch/education/tdforsd/tdcs.html

Case study 2018 – *Potential working modules*

- Waste sorting at the source:
  - Private sector (e.g., big hotels)
  - Private households

- Post sorting activities
  - Recycling (e.g., glass)
  - (Engineered) processing:
    - Biodegradable waste (e.g., energy production, food waste to protein, composting)
    - Incineration options (e.g., local, abroad)

Case study 2018 – Tentative guiding question

- *“What (1) types of waste sorting at the source and (2) post-sorting options are technically feasible, economically viable, environmentally friendly and accepted by the users?”*

Case study 2018 – Schedule

- The course starts on 21 February, 2018 and **meets every Wednesday 13-17** (Zürich)
- **Two block days** during the semester, Fri/Sat April 20-21, 2018 (Zurich)
- Three (four) interim weeks between end of Spring semester and field work in the Seychelles
- **Three weeks fieldwork** in the Seychelles: Mon June 25 – Fri July 13 2018 (tentative, may be postponed by one week)
- **Students from UniSey join** in person the teaching activities on June 25 2018, but will be involved already earlier in the Semester

Case study 2018 – Organisation

- Lead: TdLab (P. Krütli and M. Stauffacher), with strong involvement of UniSey and partners from Ministry of Environment, Energy and Climate Change; Seychelles Sustainable Tourism Foundation; NGO S4S; private sector
- Teaching team: TdLab (P. Krütli, M. Stauffacher, D. Nef, N.N.) & UniSey (N.N.)
- Joint teams of ETH/UniSey students
- Advisory Board of local experts
- ETH experts involvement according to the needs of the project (e.g. from the group of Prof. Hellweg: Mélanie Haupt)

Case study 2018 – Learning objectives

General learning objectives of the transdisciplinary case study

- Understanding a case in its context
- Knowledge application in the real world
- Independence in managing research activities
- Use of transdisciplinary (and other) methods
- Engage with stakeholders

And especially for the case study in the Seychelles

- Working in intercultural teams
- Adapting to foreign social, economic, cultural and political settings

→ *getting trained for research and/or practical work in the global South*

Case study 2018 – Expected output/outcome

- (Research) report (→ publication) in which results are documented
- Documentation of the results intended for the participants and a wider circle of interested people, e.g. newspaper supplement

Furthermore

- Contribution to solving the waste problem in the Seychelles
- Potential research questions for (BSc) MSc theses
- Capacity building – both for ETH students and local students, experts
- A further step to establish a Sustainability Learning Lab in the Seychelles

Eligibility

Additionally please enrol via mystudies. Note that all students are put on the waiting list and that your current position on the waiting list is irrelevant, as places will be assigned on the basis of your motivation letter.

Important: for students of Agricultural Sciences, the case study can replace the compulsory course 751-1000-00L Interdisciplinary Project Work!

- MSc students from D-USYS (priority) and other ETH-Dept. like BAUG
- Limited number of students
- Send a letter of motivation (2 pages) referring to:
  - why are you interested?
  - what do you want to learn?
  - what would you be able to contribute to group work and the project setting?

- **By January 10, 2018, send your letter of motivation to both pius.kruetli@usys.ethz.ch and michael.stauffacher@usys.ethz.ch**

- Criteria of selection: letter of motivation; student‘s background/expertise; mix of MSc/major background; gender mix
- Costs: 600-800 CHF incl. transport

Further information you can find on the web

- General info on tdCS

http://www.tdlab.usys.ethz.ch/education/tdforsd/tdcs.html

- First info on the CS2018

http://www.tdlab.usys.ethz.ch/education/tdforsd/tdcs/current.html

- Info on the former CS2016 in the Seychelles

http://www.tdlab.usys.ethz.ch/education/tdforsd/tdcs/former/cs2016.html