MSc Thesis Project Idea

20 years later: Are Basel's city dwellers still littering 69% of waste by the Rhine?

Background

Environmental pollution with plastics has attracted considerable interest from the research community as well as the wider public. This interest has resulted in a dedicated effort to examine, and quantify the occurrence of plastic pollution, with the aim of reducing it. The main sources of environmental plastic pollution are mismanaged waste, including environmental littering, and estimates suggest that about 55% of all plastics ever made have suffer that fate (Geyer et al., 2017). Plastics which are littered by a river, such as the Rhine, may enter it and be transported further downstream. Stemming this plastic leakage from an otherwise functioning waste management system in Switzerland can for instance be tackled with policy interventions. The latter however require a better understanding of the problematic scenarios.

Twenty years ago, MGU conducted a littering survey in Basel Stadt (but also in other cities) with exactly the questions of providing data for such an intervention (fig. 1). Results showed that littering at sites where people would primarily frequent for a picknick, such as the Rhine border, was up to 69% of the waste from that zone. As rubbish bins were present in the area, and still had capacity, the problem did not appear related to a lack of disposal possibilities.

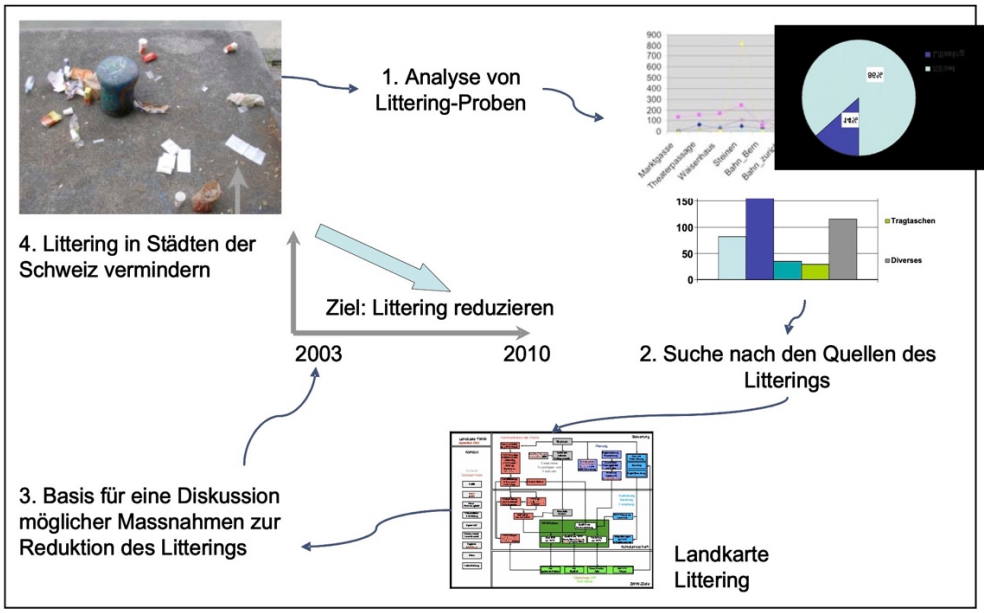

Figure 1. Problem analysis and procedure of littering study conducted in Basel. Source: Littering – Ein Schweizer Problem? Eine Vergleichsstudie Schweiz-Europa.

Aims

The aim of the project is to update the littering assessment in key areas of Basel, but with a stronger focus on plastic pollution. Based on data from 20 years ago, has there been any change? Which policies have been implemented in the last years and how may they be tweaked?

Possible research questions:

- Did the composition of litter change over the past 20 years?
- What are sources and acteurs of littering?
- What are reasons and impacts of littering in Basel?
- Which interventions were successful, which would be necessary to adapt?

Procedures and Methods

Depending on the exact design of the study (there will be plenty of room for creativity), involved procedures and methods can encompass litter surveys and interviews, but could also involve collecting littered material for analysis in the laboratory via Fourier-transform infrared spectroscopy (FTIR) to ascertain the polymeric identity of littered material. The latter is a commonly used technique to identify chemical substances in a variety of fields.

What we offer

To fulfill the proposed project, the prospective student is offered close mentoring and inclusion into an interdisciplinary team. The team has a track record in working with plastic pollution (see further research: https://mgu.unibas.ch/en/research/anthropogenic-pollution-of-the-environment/). Access to necessary facilities, including office space and computer, as well as laboratory will be provided. For the questions and methods of social science, a collaboration with Prof. Aya Kachi (University of Basel) is planned. With a successful completion of the project, we also strongly support the student to publish their research in an academic journal, thus bolstering the student's career prospects in academia.

Your profile

Ideally you speak German, since the publications from the previous littering study are in German, and the project would require communication with waste management authorities in Basel. You should further enjoy working systematically and carefully, and display eagerness to explore the scientific literature on the topic. The littering study report is available online:
https://www.littering-toolbox.ch/fileadmin/Media/Downloads/D22_Littering_Vergleichsstudie_Schweiz_Europa.pdf

If your interest is peaked, please contact:

Prof. Dr. Patricia Holm (patricia.holm@unibas.ch)