

## **Interdisciplinary Master Thesis Topic:**

### ***Thrown away thoughtlessly: the unconsciousness of cigarette butt littering.***

#### **BACKGROUND**

Everyone sees them, during a walk in the park, at rest stops, in recreational dedicated areas, in city centers and outdoor aggregation spots: cigarette butts. Nowadays the majority of the population is used to such a scenario, but the story changes when more pristine environments are affected, such as along Alpine hiking paths and lakes. Whereas almost everyone is aware that these items disturb the idyllic picture of such pristine environments, only a minority is aware about the detrimental ecological consequences of cigarette butts in Alpine lakes.

Littered cigarette butts are harming the ecosystems on multiple levels. For example, smoked cigarette butts contain toxic compounds, have low degradation rates and are source of plastic microfibers, that have the potential to disrupt the ecologic dynamics and harm both terrestrial and aquatic species.

It is still debated what caused the ubiquitous wrong disposal of cigarette butts: from a meaningless distracted gesture, carelessness to the simple unawareness of the strong ecological effects.

It becomes clear that different scientific disciplines can synergistically contribute to the investigation of causes and effects of cigarette butt littering: an effective social information intervention through sensibilization supported by a scientific investigation of the contamination in Alpine lakes.

#### **OBJECTIVES**

To assess the extent of this presumed problem, we aim at

- (i) tracking the entity of cigarette butt litter in selected alpine lakes, including
- (ii) investigation of potential sources, hotspots and accumulation areas.

To assess the potential ecotoxicological impact, we will

- (iii) evaluate the effective leaching of cellulose acetate fibers, microfibers released in the environment during the butt's degradation.

To elucidate the behavioral base for this problem and to promote more sustainable behavior, we will

- (iv) investigate the predominant touristic behaviors inducing littering in the Alpine Lake environment,
- (v) Create and test the effectiveness of informative measures,

#### **APPROACH**

The study will start with a comprehensive litter survey for an initial quantification of the contamination of selected alpine lakes. The selection is based on the attractiveness of alpine lakes by social media calls. Afterwards, collected butts will be investigated with respect to the fiber loss, which gives indications for the extent of the ecotoxicological impact. This will be done by categorizing butts according to different weathering stages and comparison to non-weathered butts.

For studying the smokers' behavior, we will use methods such as questionnaire surveys and field observations. To investigate the effects of information provision we will apply experimental designs in the field based on a comparison between different locations (e.g. various attractive alpine lakes) with and without information campaigns.

#### **EXPECTED OUTCOME**

The outcomes will contribute to a better understanding of the (i) extent of the problem in remote areas and (ii) reasons behind such an extensive littering, and (iii) set the base to shape effective solutions to mitigate the effects of wrong disposal, including sensibilization and local waste management adaptations.