



**Aalto University**  
School of Chemical  
Technology

# Higher education and capacity development for sustainability and clean technologies – experiences from Mozambique

Roope Husgafvel<sup>1</sup>, Mikko Martikka<sup>1</sup>, Andrade Egas<sup>2</sup>, Natasha Ribeiro<sup>2</sup> and Olli Dahl<sup>1</sup>

<sup>1</sup> Clean Technologies Research Group, Department of Forest Products Technology, Aalto University, Finland

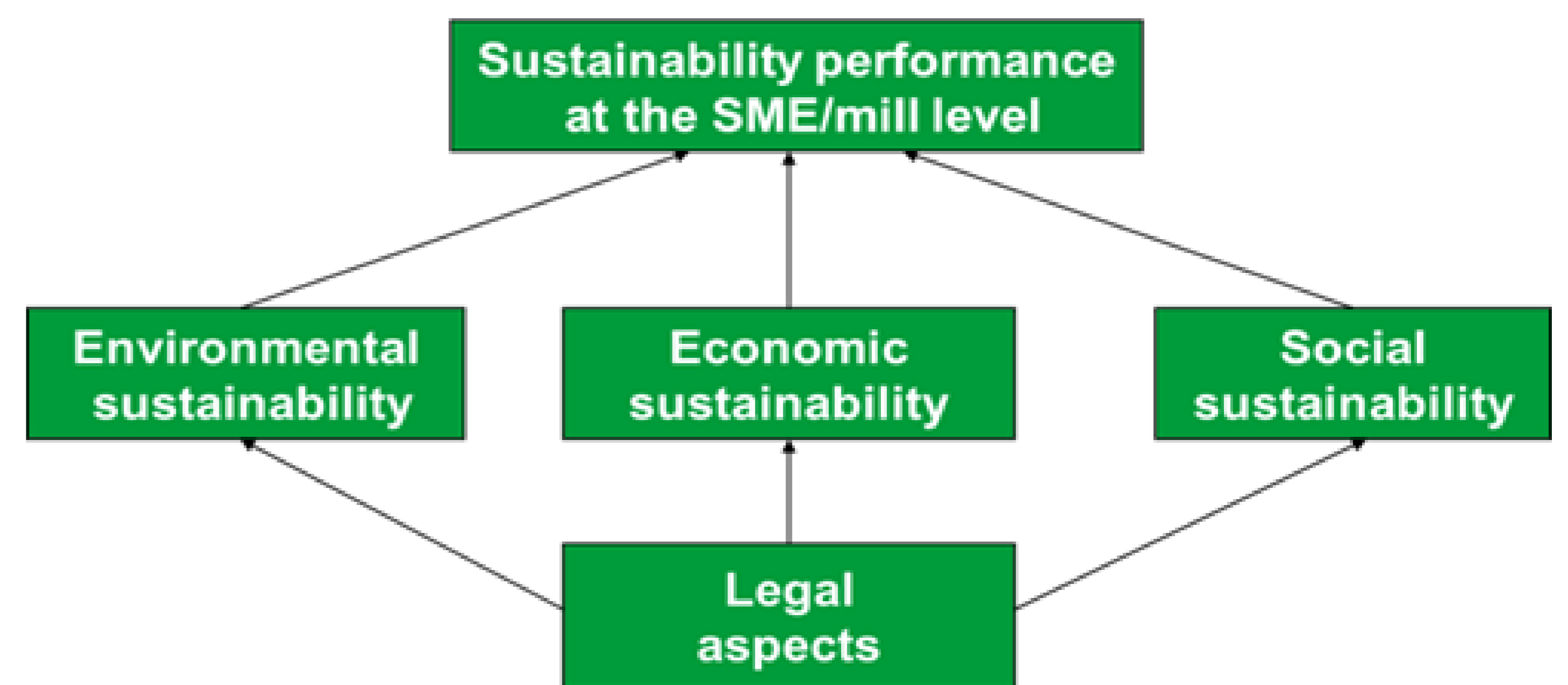
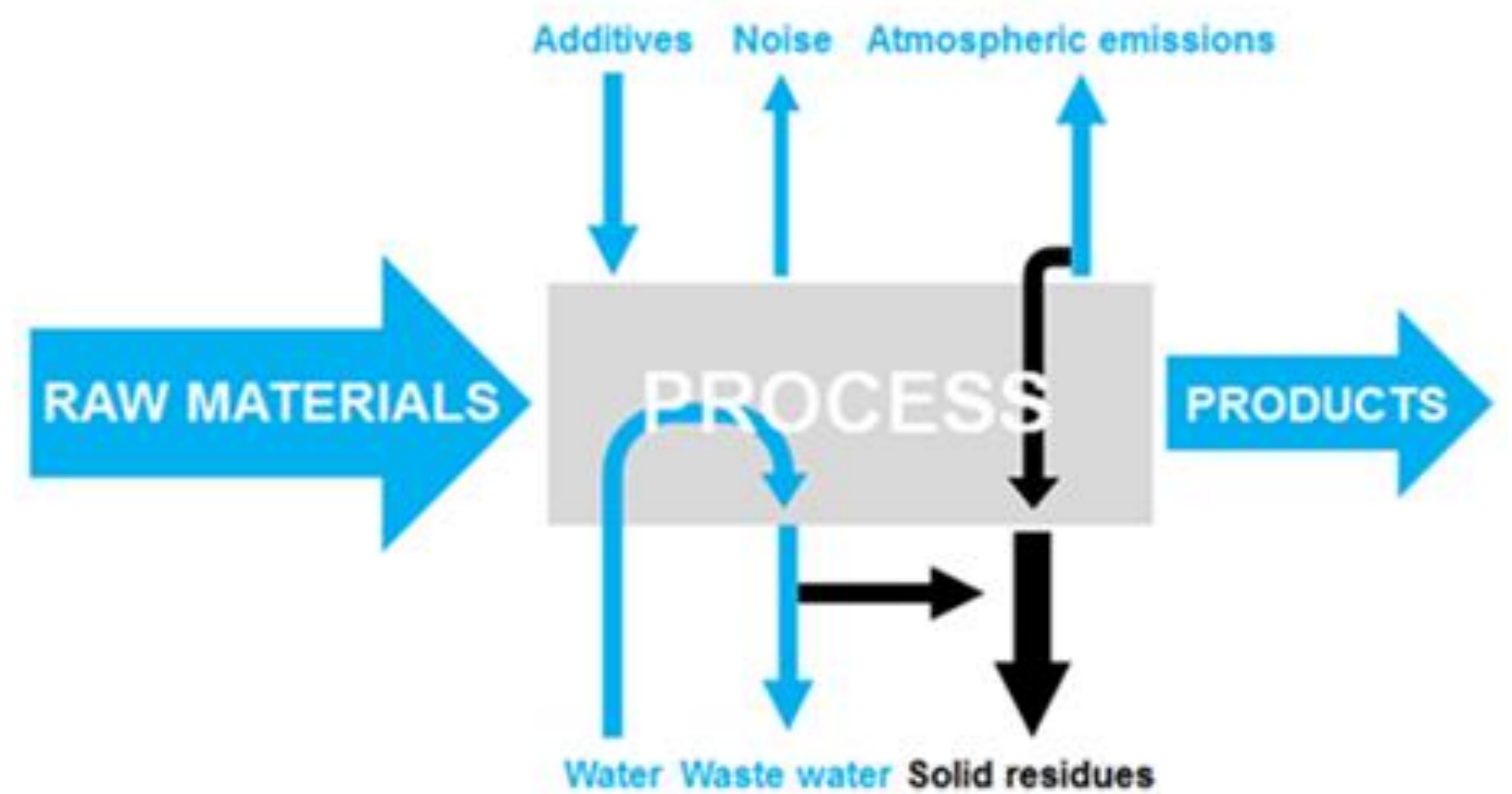
<sup>2</sup> Department of Forest Engineering, Eduardo Mondlane University, Mozambique

## Introduction

- Aalto University and Eduardo Mondlane University (UEM) collaboration.
- A project within the Higher Education Institutions Institutional Cooperation Instrument (HEI ICI).

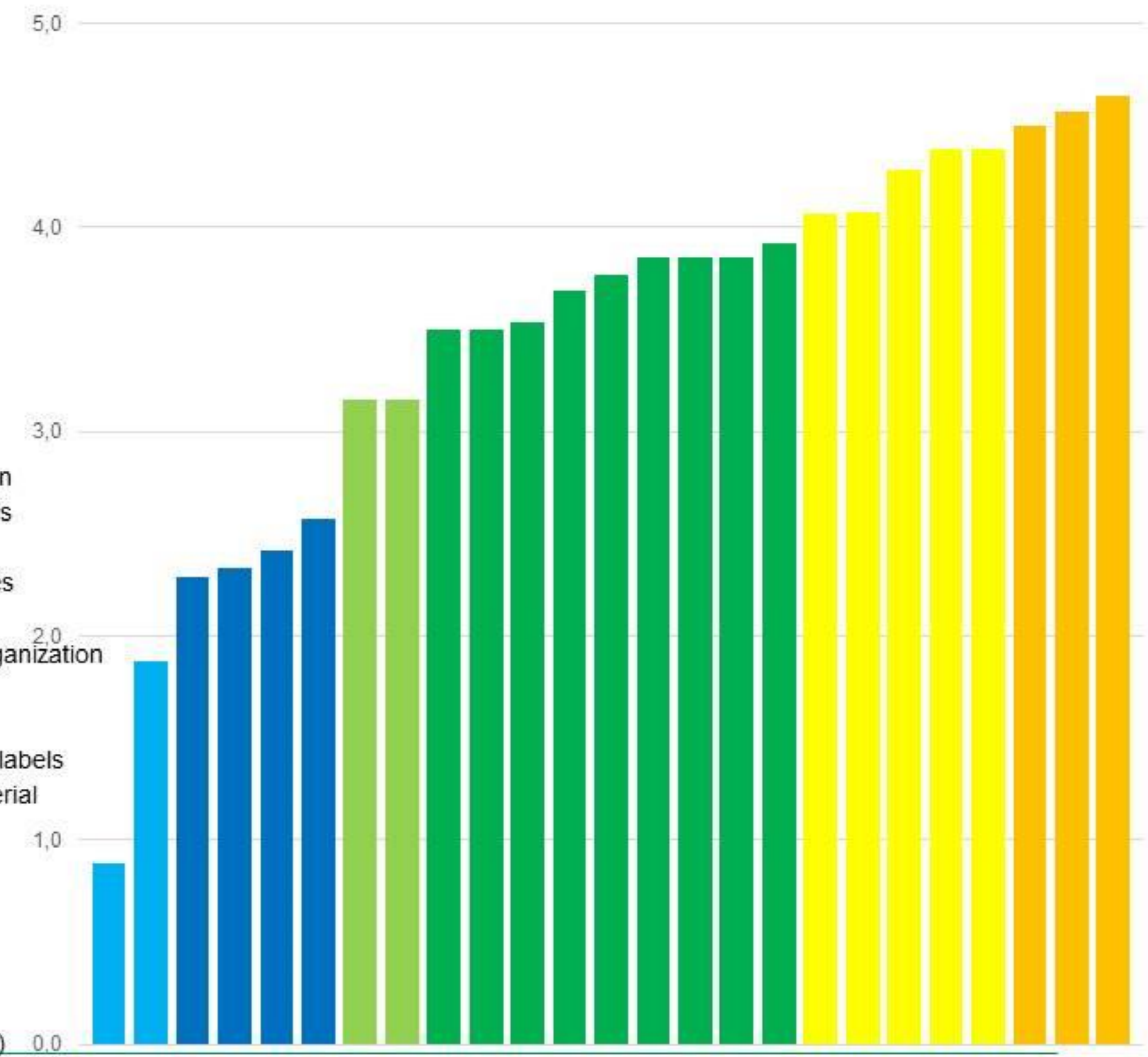
## Project activities

- Joint development and teaching of “Industrial Environmental Engineering” study module as a part MSc programme.
- Development of university-industry links and enhanced contribution to national sustainable development efforts.
- Staff/expert training and student/teacher mobility (2014-2015).
- Workshops and industry excursions (Mozambique, Finland and South Africa).



## Importance of specific topics

- Sustainable use of natural resources
- Environmental conservation, biodiversity
- Chemicals, hazardous waste, toxic pollutants
- Waste treatment techniques
- Recycling, industrial ecology and synergy
- Environmental impacts
- Waste disposal and related techniques
- Environmental management systems
- Emission calculation, estimation and observation
- Environmental aspects in choosing raw materials
- Management of environmental risks
- Environmental policies, -initiatives and objectives
- Emission abatement techniques
- Environmental legislation and administrative organization
- Sustainability studies
- Climate change and its challenges
- LCA – products and production, footprints, eco-labels
- Water supply and treatment for use as raw material
- Environmental economy
- Environmental communication
- Current regulations
- Environmental permitting procedures
- Environmental philosophy and ethics
- Material flows and balances
- Process internal solutions (principles, examples)



## Lessons learned and next steps

- Sustainable use of natural resources and appropriate environmental management/engineering are the basis of sustainable industrial development encompassing the whole supply chain.
- There is a strong demand for skilled experts both in private and public sectors (the gap between demand and supply needs to be bridged).
- The mutual synergy between sustainable and environmental engineering including life cycle thinking should be enhanced.
- This fall 7 MSc students and one professor from UEM will visit Aalto University and in 2015 Aalto students will visit UEM and there will be a joint intensive course.



## Contact information

roope.husgafvel@aalto.fi  
<https://blogs.aalto.fi/vagalhao>

