

# Lezione 11

# Frugal Innovations

Specific type of innovation that is often connected with the BoP

“good-enough, affordable products that meet the needs of resource-constrained consumers”  
(Zeschky et al., 2011)

Typical Traits:

- Cost-effective raw materials and low operation cost
- Local sourcing and production: to enhance local value creation and reduce imports
- Limitation to core features and less automation: to build on minimalist features and intuitive functionality
- High ease of use: to have an intuitive design not requiring prior knowledge or training
- Tailored for BoP environments: to be capable of coping with harsh physical environments and poor infrastructure

# 5 Questions\* on Topic 12



[https://bit.ly/SM23\\_t12](https://bit.ly/SM23_t12)

*\* These questions are just an example of True/False question on this topic. They are not taken from any “question database” for the written test!*

## Topic 13

### Sustainability Accounting



## Sustainability accounting:

- information for transparency and decision-making purposes

## Sustainability management control:

- management tools to influence sustainability-related organizational behavior
- Aim: integrating sustainability information into management decision making to foster sustainable behavior

## Sustainability reporting:

- Disclosure of sustainability-related information to internal and external stakeholders



# Sustainability Accounting

Sustainability-related information is relevant on various levels

- Product level: Help inform customers about sustainable choices, foster sustainable consumer behavior, or help product designers improving sustainability performance
- Process level: Help companies include sustainability considerations into daily business
- Organizational level: Can support sustainability management at the company level and beyond

Many elements of sustainability management depend on reliable information Sustainability accounting is a vast topic

Here: Focus on exemplary tools and areas of application

- Life cycle assessment
- Carbon accounting

# Life cycle sustainability assessment

Useful tool for information gathering in sustainability accounting

LCSA wants to gain an holistic understanding of the entire production value chain

The focus of LCSA is to help in collecting and assessing information about environmental, economic, and social resources used during the life span of a product

Product life cycle

- Physical life cycle describing all stages through which a product passes
- Often starts with mining and extraction of raw materials, then design and production processes, shipping and transportation, use process until the end of the product life and corresponding disposal or reuse or recycling of the products or materials

Recognizing and modeling trade-offs between...

- different dimensions of sustainability
- different steps of the life cycle

Identifying “hot spots”: areas with most severe or relevant impact on sustainability performance

- Can help companies to get an idea of where to start with improving their sustainability efforts
- Necessary step as LCSA cannot address all impacts in life cycle of a product (too complex!)

It is useful to engage stakeholders

*The scope of an LCSA is usually quite large, and it is nearly impossible to truly assess the entire life cycle of a product*

# Example: The red t-shirt

LCSA covers data on sustainability impacts for full life cycles of all relevant materials used in production

- Includes impacts from **raw materials**:
  - Procurement, shipping, refinement, shipment to point of sale, usage, and disposal
  - Do the same for: *Dyes, fabrics, threads* and all *other parts*
- Different life cycle steps cause different sustainability impacts
  - Potential **environmental** impacts: high water consumption of growing cotton, greenhouse gas emissions in various steps of value chain, environmental hazard when using potentially toxic chemicals for coloring or bleaching
  - Potential **social** impacts: poor working conditions, cases of child labor, or health and safety issues in the various steps of production process

## Life Cycle Sustainability Analysis (LCSA)

### Environmental Life Cycle Assessment (ELCA)

*Ecological aspects*

E.g., emissions (land, water, air)  
resource consumption, toxicity,  
biodiversity impacts

### Life Cycle Costing (LCC)

*Economic aspects*

E.g., cost of production,  
transportation, use, post-use

### Social Life Cycle Analysis (SLCA)

*Social aspects*

E.g., accidents, working  
conditions, payment, equal  
opportunities

# Environmental Life Cycle Assessment

ELCA is a method of compiling and assessing inputs, outputs, and potential environmental impacts of a product system throughout its life cycle From cradle to grave

Any product or service can be subject of ELCA

Method is standardized by standard family on environmental management, including ISO 14040 and ISO 14044 as part of the standard family on environmental management (ISO, 2006a; ISO, 2006b).

## 7 Principles of ELCA

- Life cycle perspective
- Environmental focus
- Relative approach and functional unit
- Iterative approach
- Transparency
- Comprehensiveness
- Priority of scientific approach

# ELCA for the ISO 14040 and the ISO 14044

According to ISO 14040 and ISO 14044, an ELCA is carried out in four consecutive but interrelated steps building on an iterative approach within and between phases to make sure data is comprehensive

- Definition of goals and scope of assessment
- Compilation of life cycle inventory
- Life cycle impact assessment
- Life cycle interpretation

# Phases 1: Definition of goals and scope

- Objective: select appropriate functional unit and clearly define goal and scope of study
- Specify functional unit using a Five steps approach to define a valuable functional unit
  1. Describe product by its properties including its social utility
  2. Determine relevant market segment
  3. Determine relevant product alternatives
  4. Define and quantify functional unit in terms of obligatory product properties required by relevant market segment
  5. Determine reference flow (i.e., the output from processes in a given product system necessary to achieve the functional unit) for each product system
- Define system boundaries
  - Define which processes should be covered in the assessment
  - Decide required data, assumptions used, life cycle stages to assess
- Define product system