Sponsored by:

SPRING

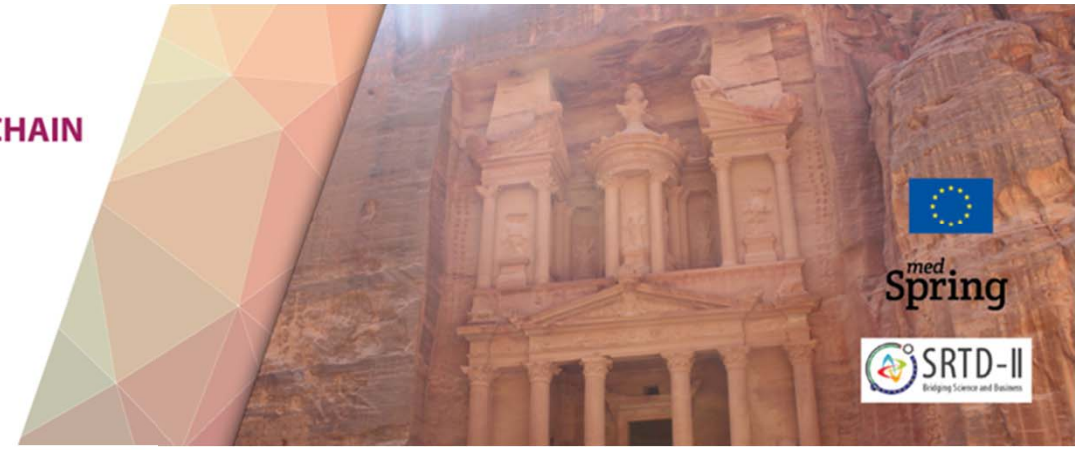
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



ODTÜ
METU

LCAgri-Food

Agri-food chain assessment with Life Cycle Approaches

Mrs. Deniz ACET
Earth System Science

Proudly Member of the Team

Prof. Dr. Hami Alpas
Department of Food Engineering

Prof.Dr. Meryem Beklioğlu
Department of Biology

Mr. Serkan NANECİ
Earth System Science

Sponsored by:

SPRING

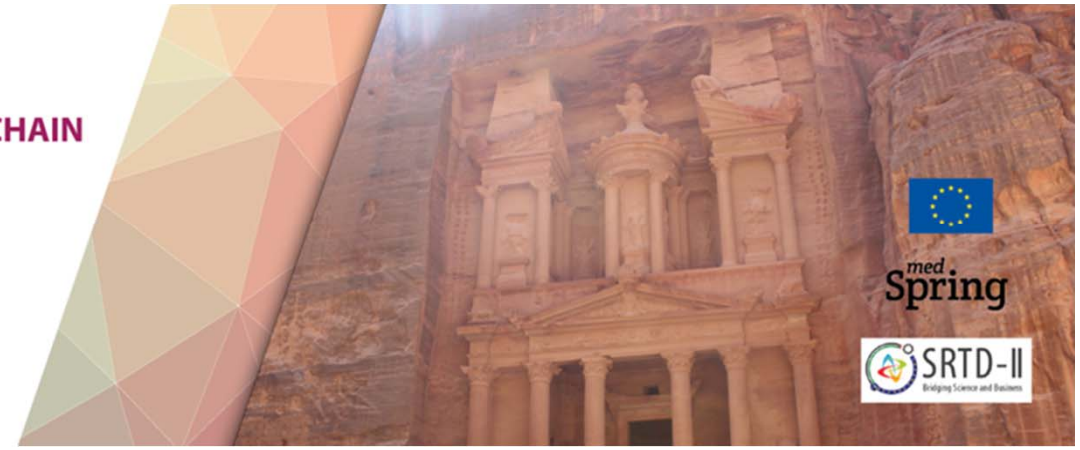
SEEDS&CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



Life Cycle Thinking is a reference approach to assess the challenges and point out the pathways to 3 pillars of sustainability in the agro-food chains in the Mediterranean Region with all the specific characteristics at every stage of the product cycle complementing with E-LCA, S-LCA & LCC and finally approaching to LCSA.

ODTÜ
METU

Sponsored by:

SPRING

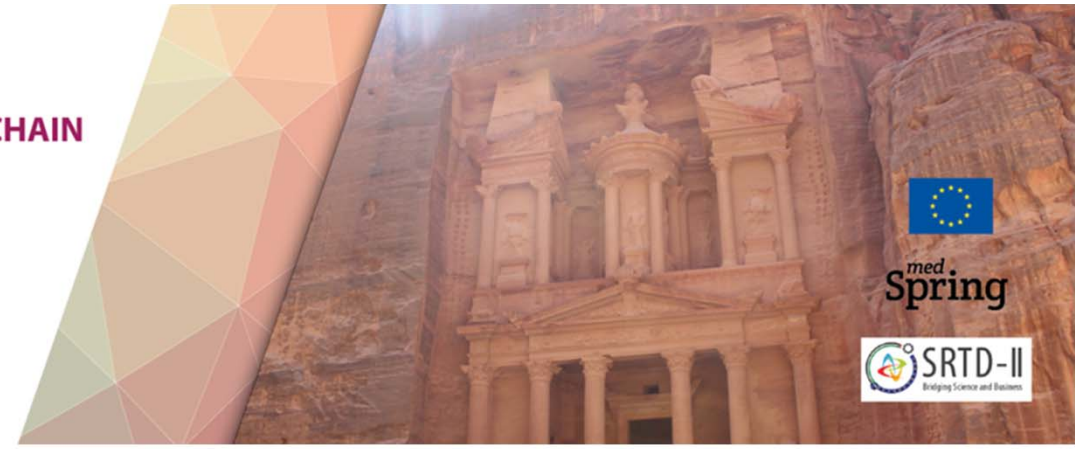
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

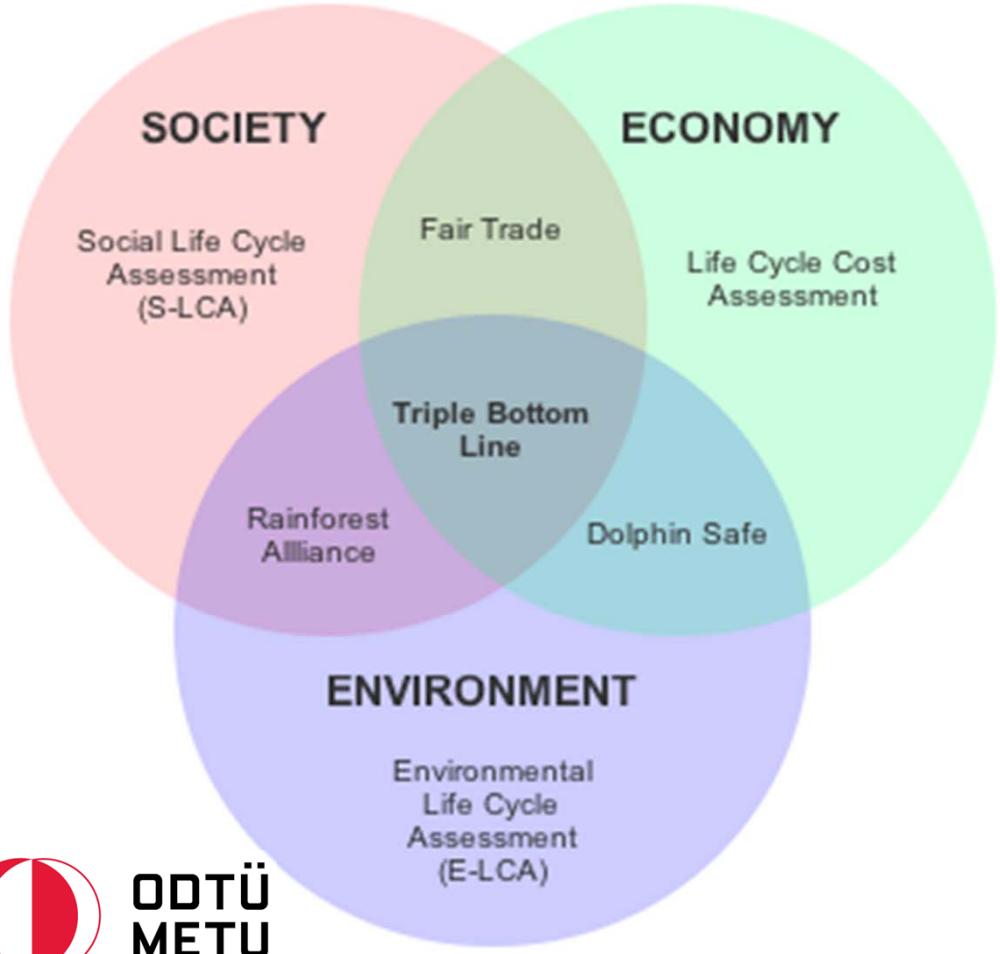
torinowireless

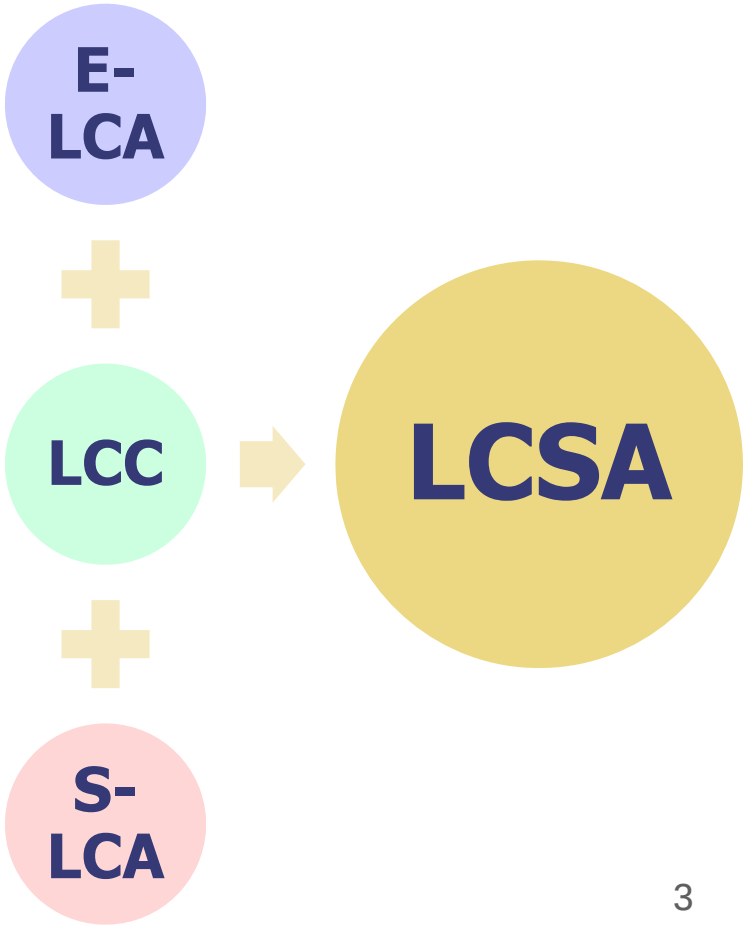
Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



DESCRIPTION OF THE METHOD



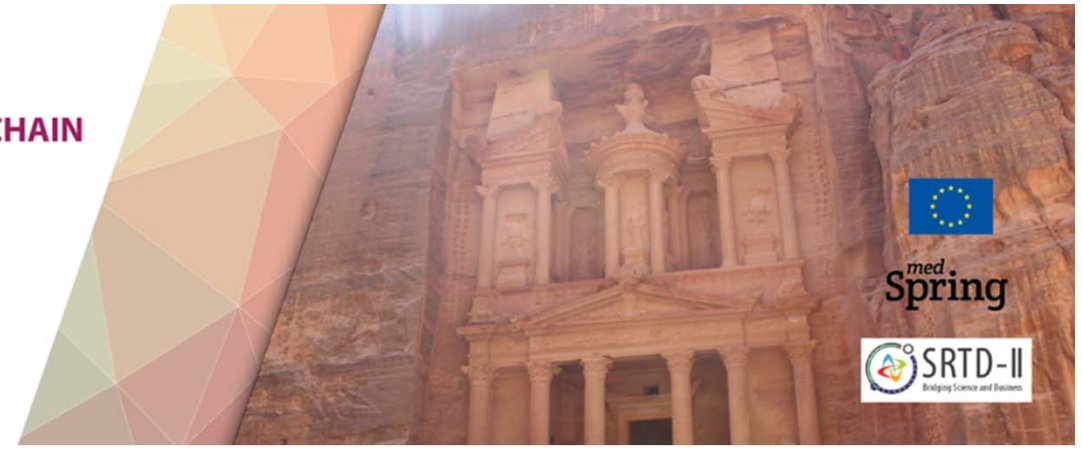


ODTÜ METU

Sponsored by:

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



DESCRIPTION OF THE METHOD

Life Cycle of agri-food products

Potential to improve environmental, economic & social performance

Regionalization of the data and the impact assessment methods

ODTÜ METU

http://www.nestle.com/csv/environmental-sustainability/product-life-cycle

Sponsored by:

SPRING

SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

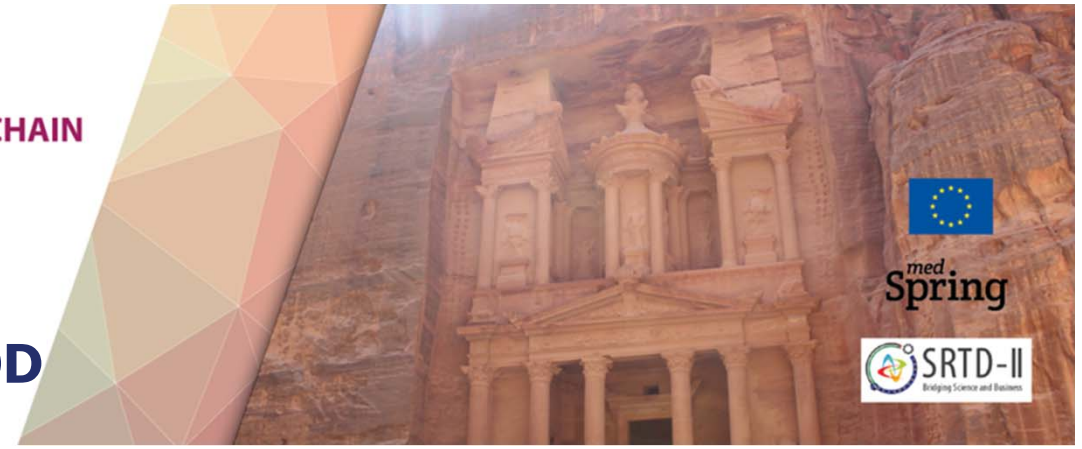
Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN

PATHWAY TO ECO-EFFICIENT AGRO-FOOD CHAIN



Sustainable (Eco-efficient) agro-food chain

Life Cycle Sustainability Assessment (LCSA)

Environmental LCA
Social LCA
Life Cycle Costing

E-LCA

S-LCA

LCC

LCA Data and Database Formation
LCA Impact Assessment Method Development

Environmental LCA Inventory (regional)

Regionally-accepted Impact Assessment

Social LCA Inventory

Social Impact Assessment

LCA Cost Inventory

Sponsored by:

SPRING

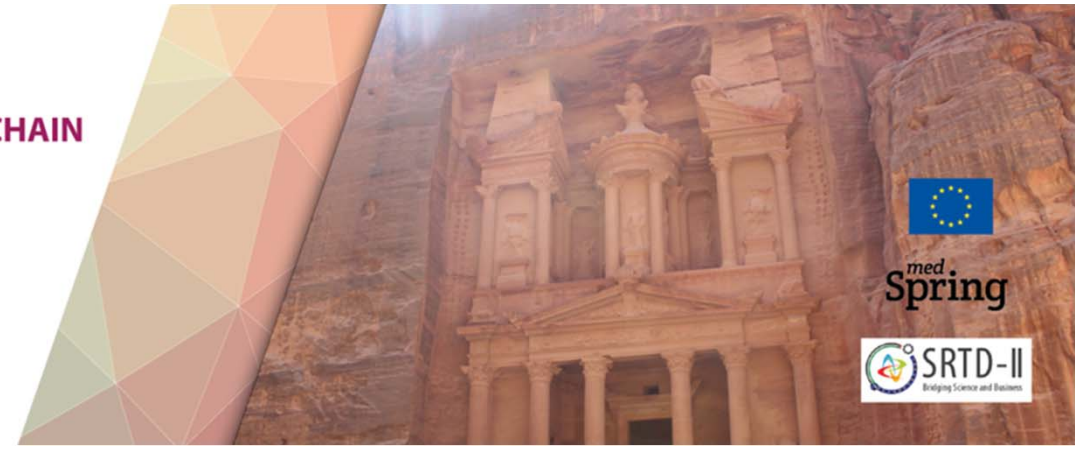
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

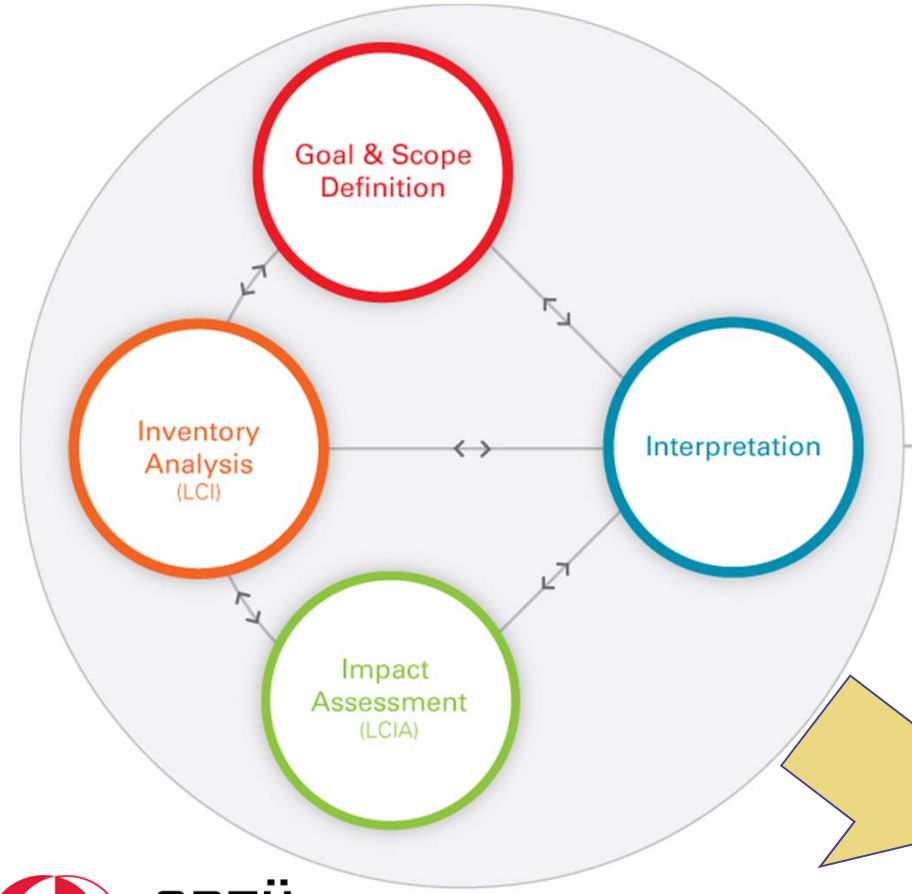
torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



TARGETS OF THE STUDY



Direct Applications

- Product Development & Improvement
- Strategic Planning
- Public Policy Making
- Marketing & Benchmarking
- Benchmarking
- Ecolabels & Product Declarations

Mediterranean Region

- Governments
- Companies
- Consumers

ODTÜ METU

http://www.lcanz.org.nz/sites/default/files/imce/ISO%2520LCA%2520Framework_0.jpg

Sponsored by:

SPRING

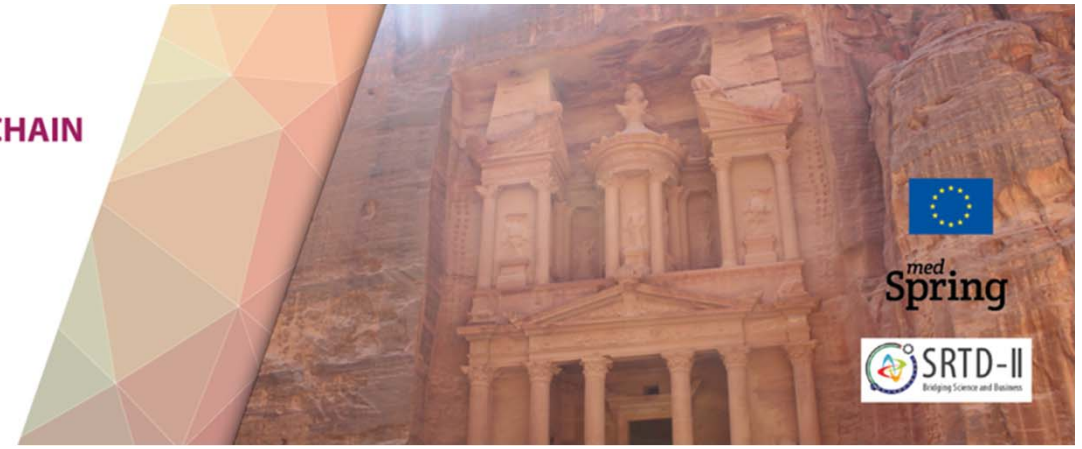
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



EVALUATION OF IMPACTS

Benefits for Governments

- ✓ Environmental benefits to society
- ✓ Global responsibility and governance

Benefits for Companies

- ✓ Environmental, occupational health and safety, risk and quality management
- ✓ Cleaner process and product options
- ✓ Brand image and value

Benefits for Consumers

- ✓ Sustainable consumption
- ✓ Information for purchasing and awareness

ODTÜ METU

Sponsored by:

SPRING

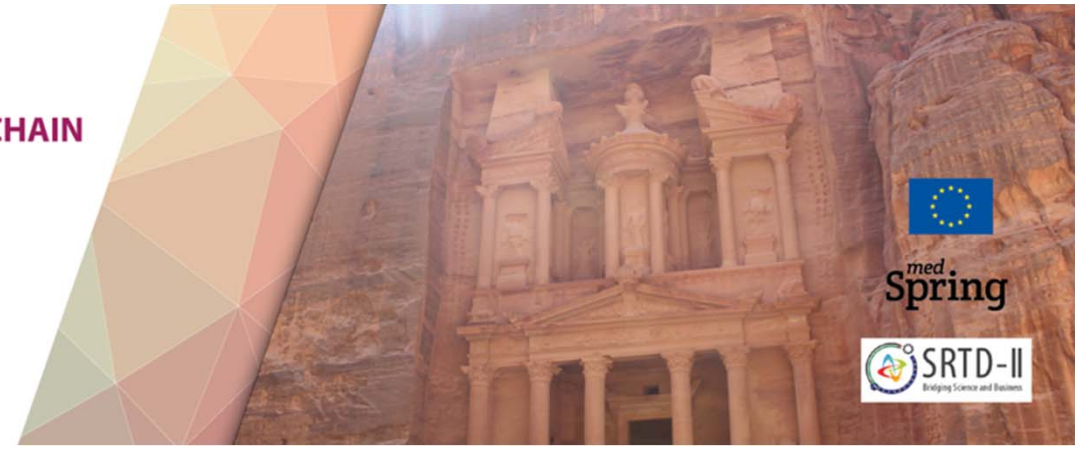
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



RELEVANCE FOR THE CHALLENGE

BENEFITS FOR THE ECO-EFFICIENCY OF AGRO-FOOD CHAIN IN MEDITERRANEAN REGION

- Energy, resource and water use efficiency
- Including social and economic assessments; 3 pillars of sustainability under consideration
- Food Waste minimization and sustainable use

ODTÜ METU

Sponsored by:

SPRING

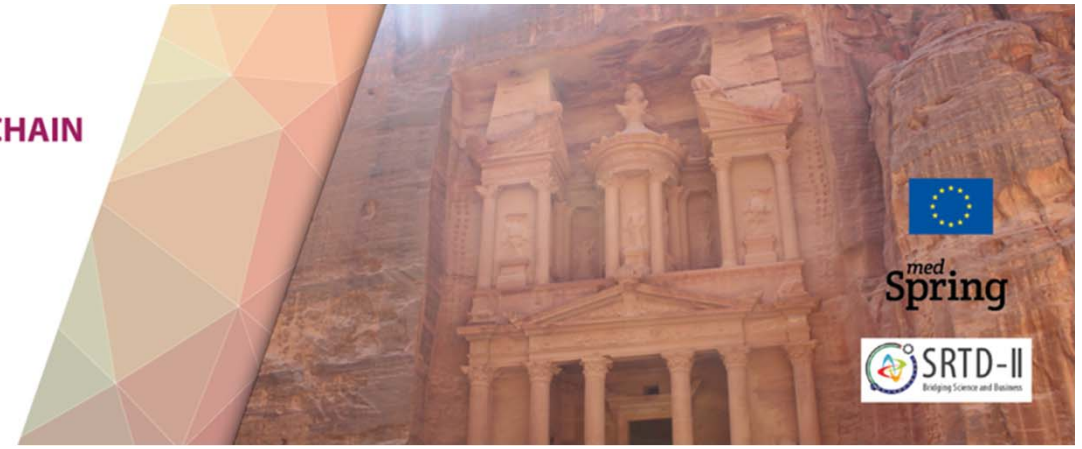
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



INNOVATIVENESS

Mediterranean Climate Conditions > 5 different Regions

•Almost 1 billion people

•Water Scarcity , Extreme Drought & Famine Conditions

Sponsored by:

SPRING

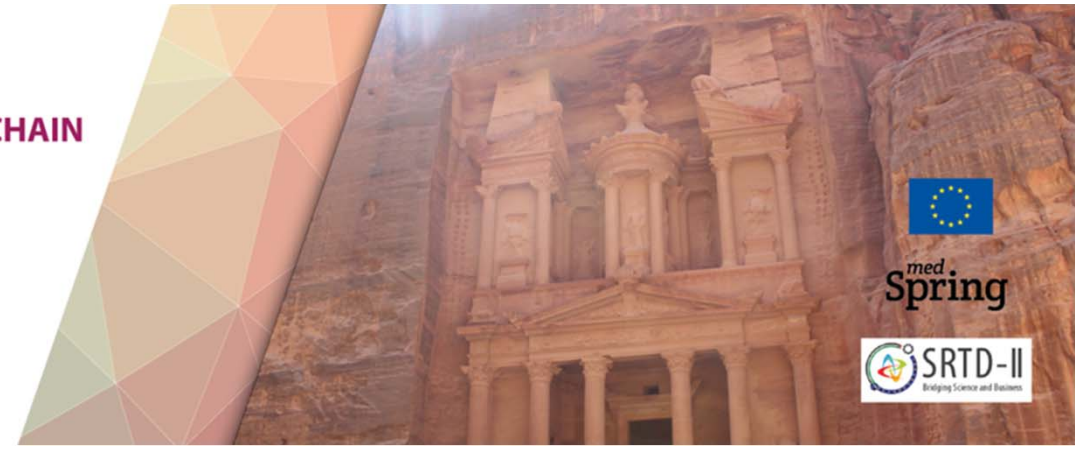
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

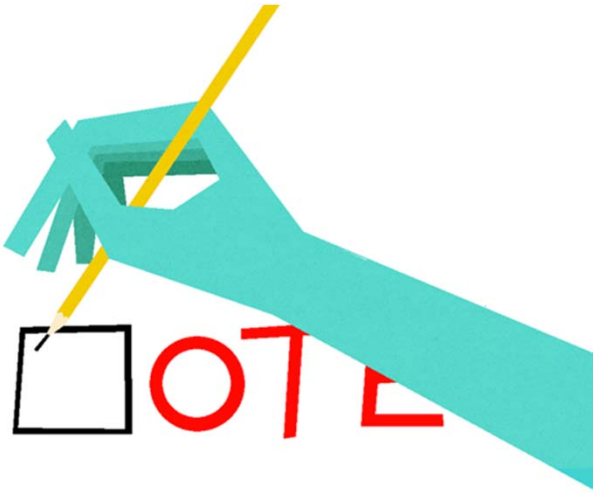
torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



PLEASE



FOR US

denizbasoglu@gmail.com

Middle East Technical University – Ankara - TR

00905326813500

Sponsored by:

SPRING

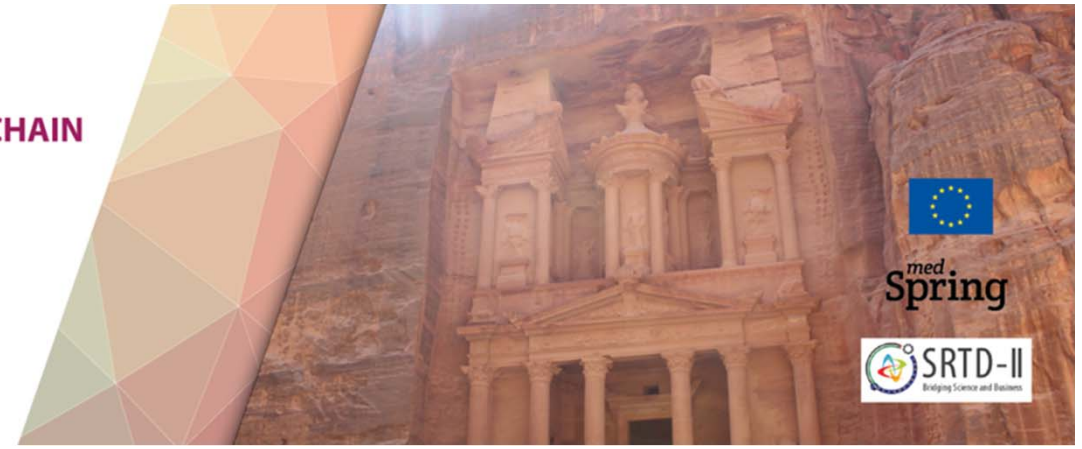
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



Sponsored by:

SPRING

SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

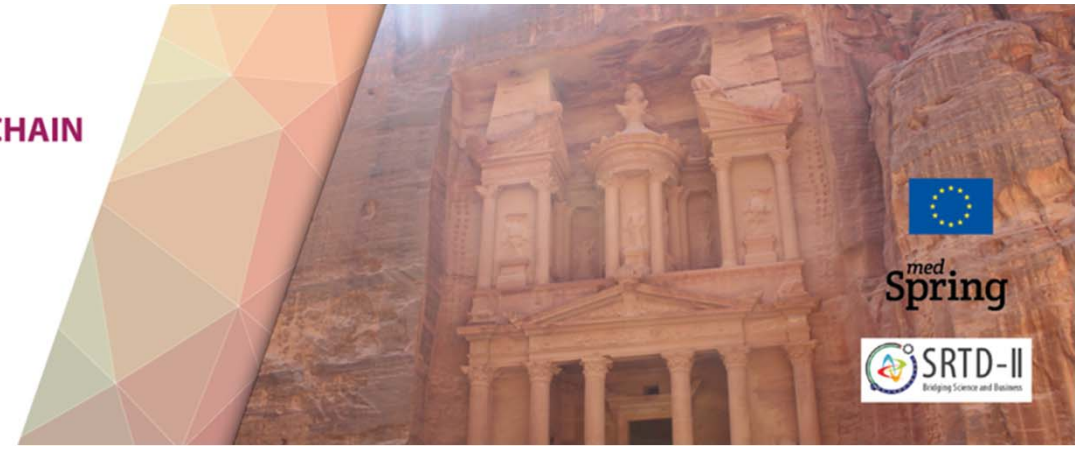
Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN

ODTÜ
METU



(MARKETABILITY)

Sponsored by:

SPRING

SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

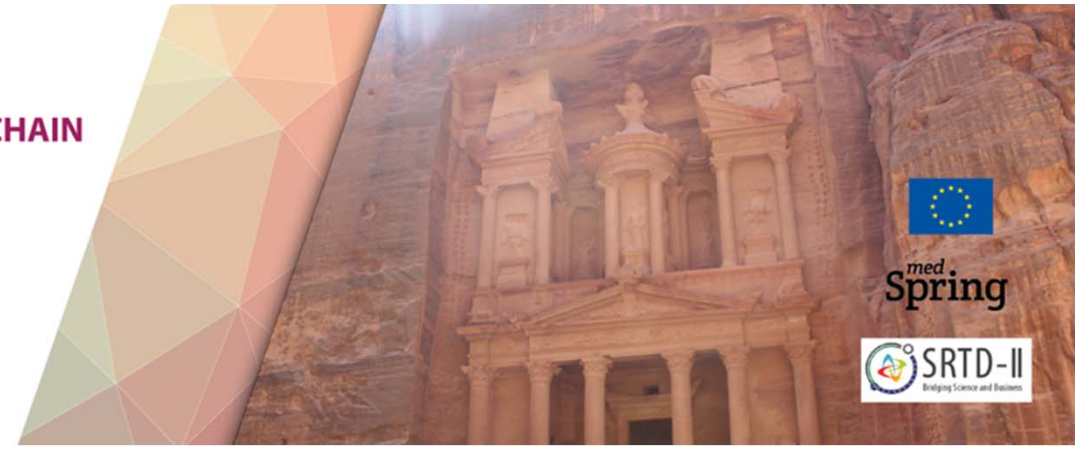
Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN

ODTÜ
METU



REFERENCES

Sponsored by:

SPRING

SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

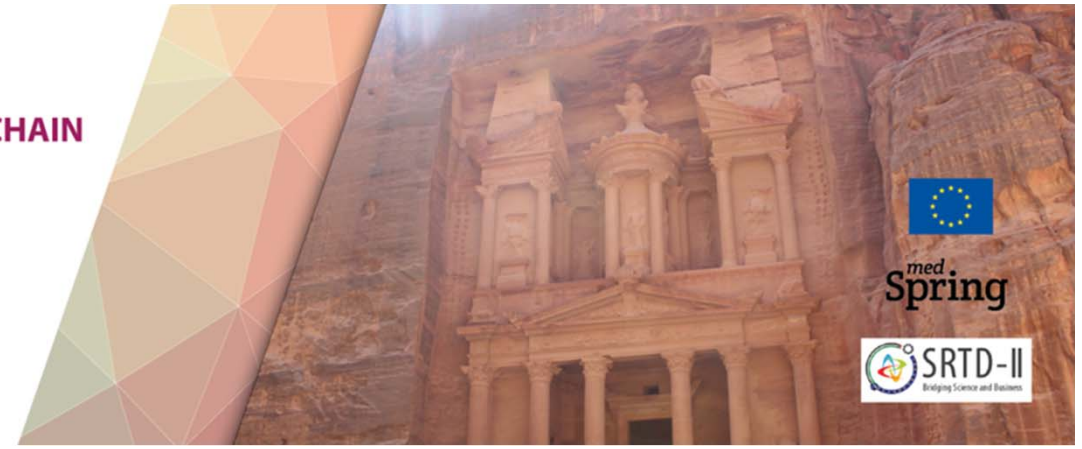
Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN

ODTÜ METU



http://www.paradigmsustain.com/life-cycle-assessment

Life Cycle Assessment (LCA) – cradle to grave evaluation of inputs and outputs & quantification of potential environmental impacts

Life Cycle Inventory (LCI) – quantification of interventions at all stages of a product' life cycle

Life Cycle Impact Assessment (LCIA) – estimation of potential contributions of LCI results to impact categories

Sponsored by:

SPRING

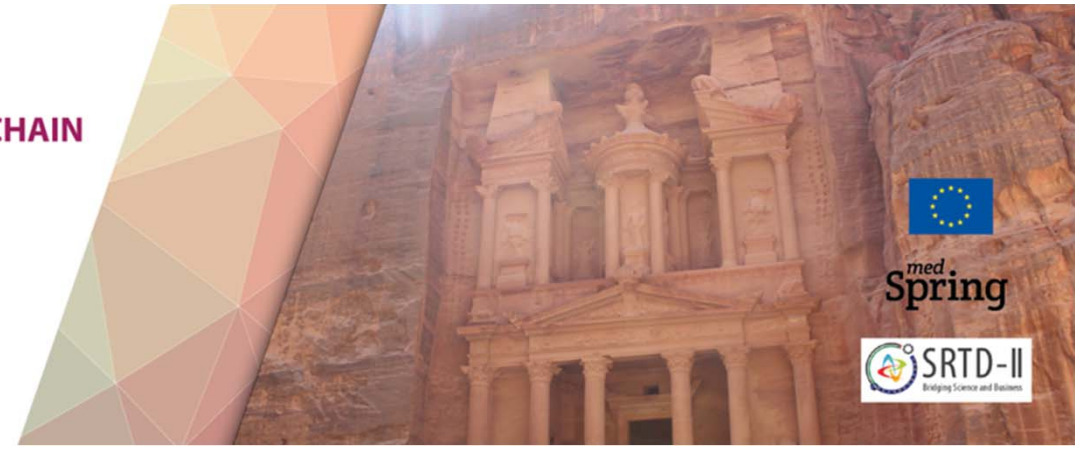
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

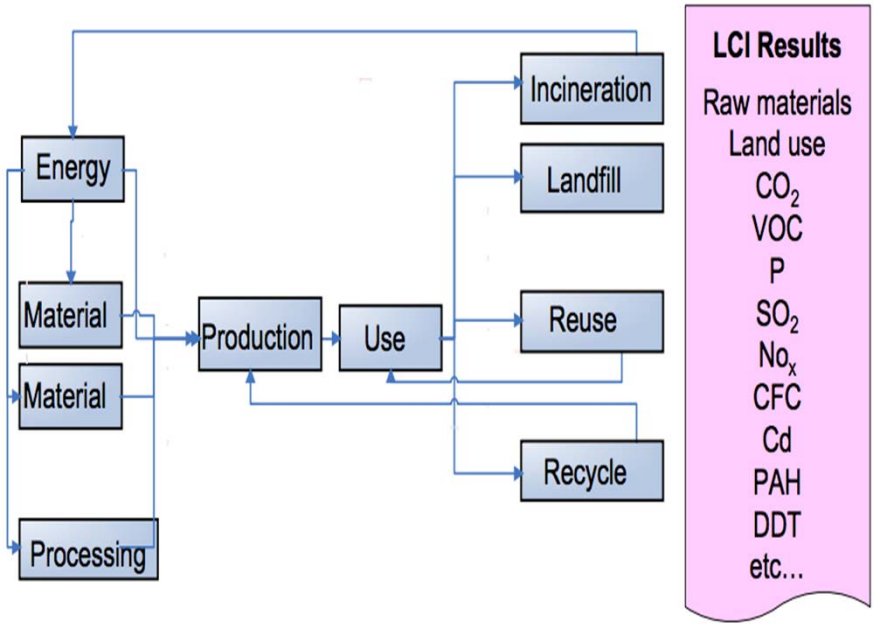
torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



Flows of information needed for a life cycle inventory



Qualitative Data

- Type of the land and the product(s)
- The common farming practices and irrigation methods
- The fertilizers and/or pesticides commonly used

Sponsored by:

SPRING

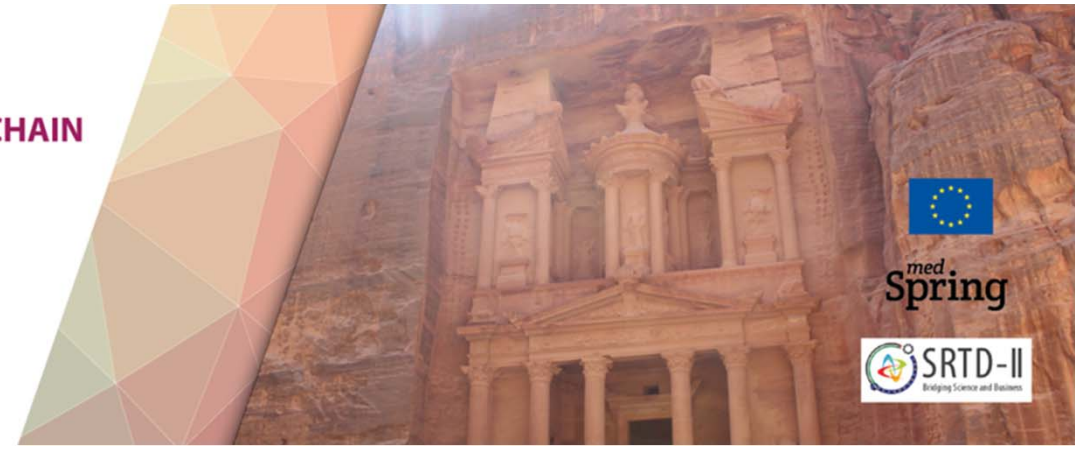
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

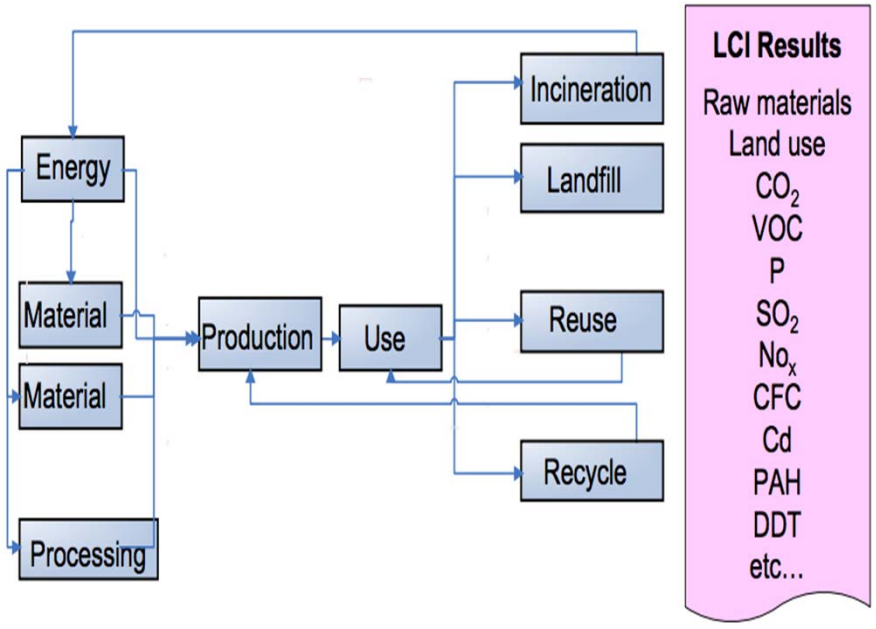
torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



Flows of information needed for a life cycle inventory



Quantiative Data

- Land use and yield
- Farming practices per ha-yield
- Amount of fertilizer & pesticide use
- Seeds per ha-yield
- «Energy» use (fuel, diesel & electricity)
- Water use

Sponsored by:

SPRING

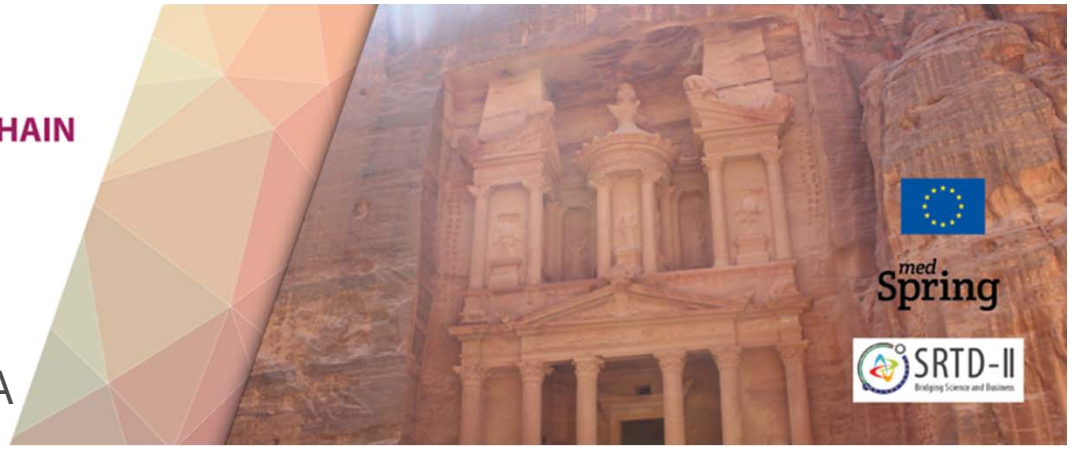
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



DESCRIPTION OF THE IDEA

- In recent years, there has been an increasing interest in Life Cycle Assessment (LCA) applied to estimate the cradle-to-grave environmental impact of agricultural products or processes.
- Widely produced and market-valued agricultural products
- THE PROJECTED ACHIEVEMENT:
  - Improvement of resources management at farm level
  - A sustainable model for agriculture for the Mediterranean community
- Environmental Impact of Agriculture due to:
  - Farmer Production Practices
  - Spatial; unpredictable and changeable factors as rainfall, temperature & soil quality (etc.)

- LCA is a technique to assess environmental issues associated with all the stages of a product's life *from-cradle-to-grave*, permitting an integral and integrated approach for measuring impacts of products and processes.

- The general aim is to “support the use of LCA methodology to the National and Mediterranean decision-makers, as a valuable decision-support tool
  - for defining the future development of agriculture
  - benchmarking actions of regional agri-food products
  - A life-cycle based agri-food production pattern design in the Mediterranean region (including all 3 pillars of sustainability; economy-society-environment)
  - promote the expansion of short and long-term sustainable practices all around the Mediterranean Region

Sponsored by:

SPRING

SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

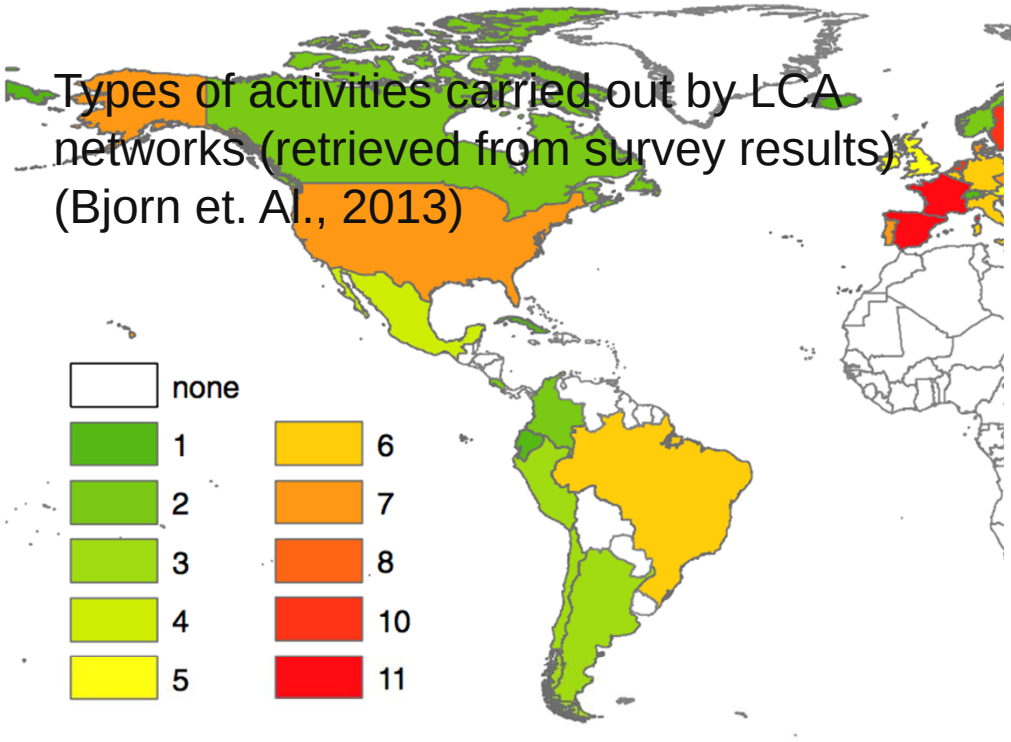
Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN

Types of activities carried out by LCA networks (retrieved from survey results) (Bjorn et. Al., 2013)



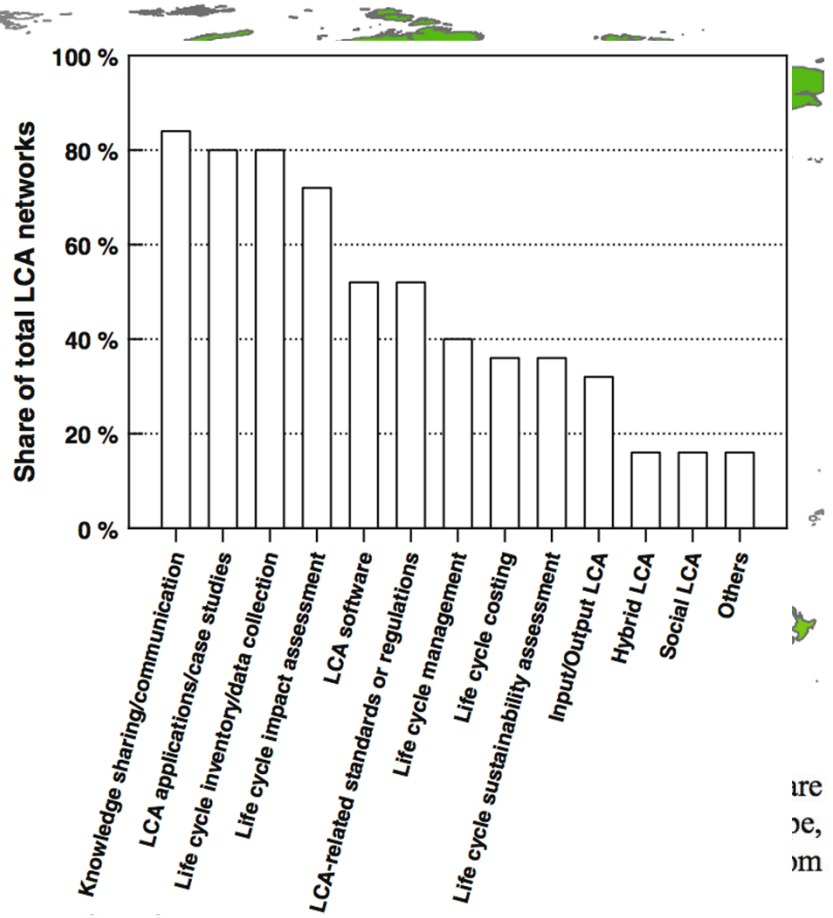


Fig. 3 Geographical distribution of LCA networks. The country score indicates the sum of local LCA networks (country level or below) and participations in regional LCA networks (above country level) per country. Global networks are excluded to make the figure more legible. East Timor and Tibet are listed as members of the South and South-

Sponsored by:

SPRING

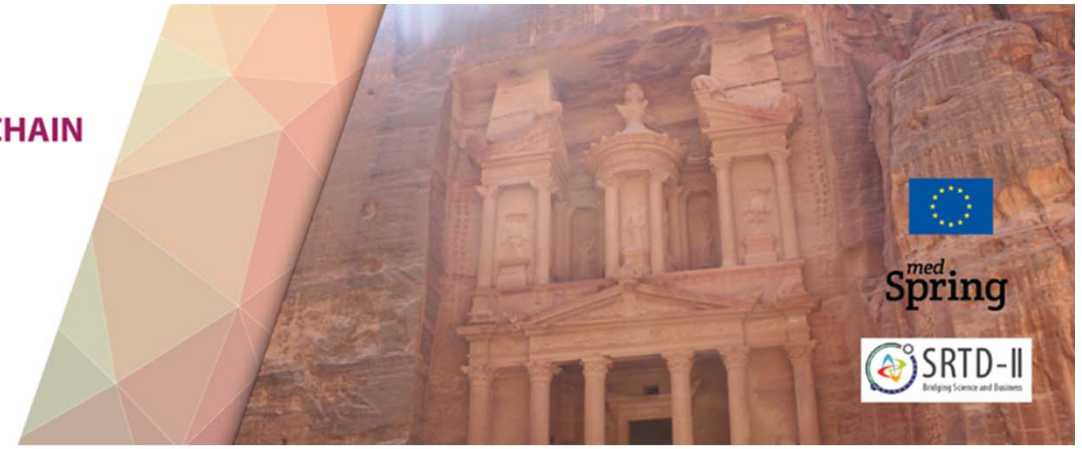
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

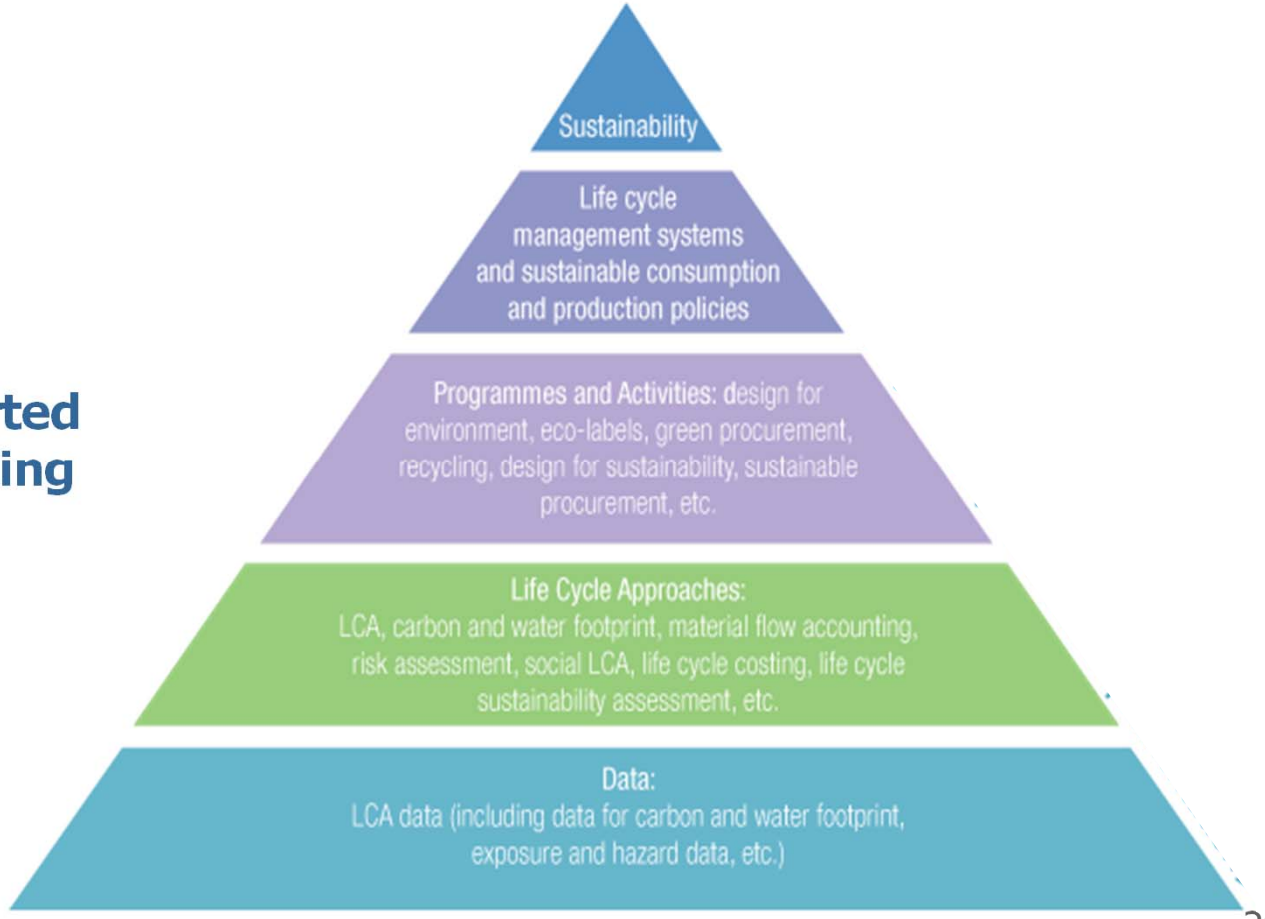
torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



Sustainability Framework supported by Life Cycle Thinking and Approaches.



Fava J. 2011. Framework for Developing Greener Products, in Iannuzzi Al. Greener Products: The Making and Marketing of Sustainable Brands. CRC Press. ch. 5, pp. 105-127.

Sponsored by:

SPRING

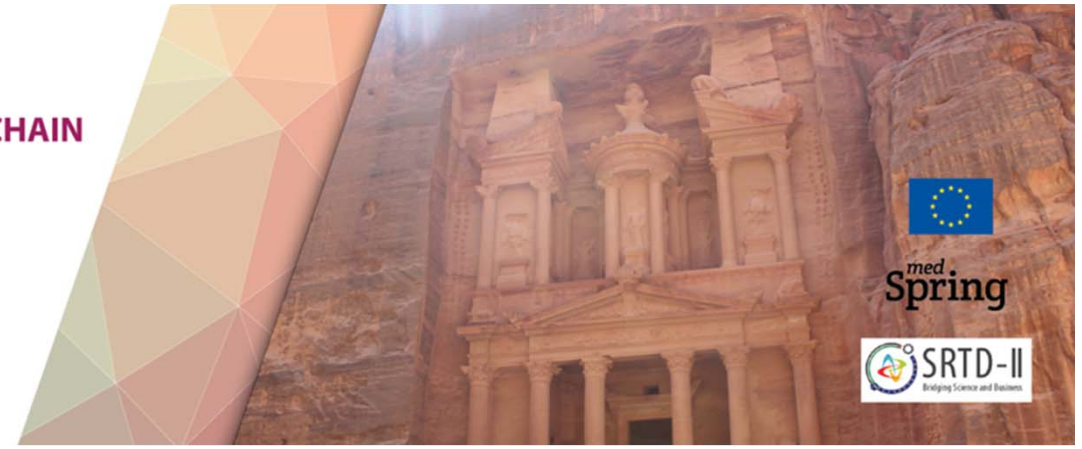
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



http://www.nationsonline.org/

End your powerpoint presentation with your contact details

Sponsored by:

SPRING

SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

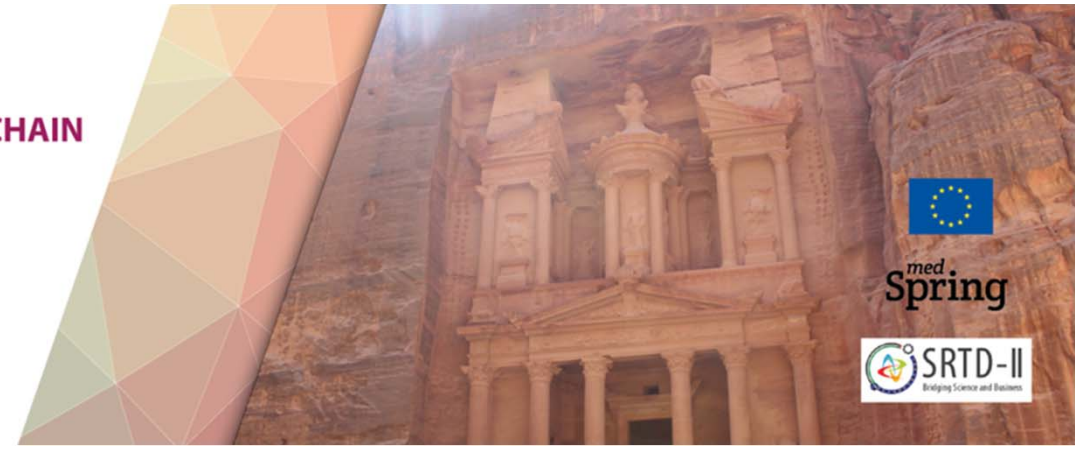
Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN

ODTÜ
METU



LCA
well-developed
internationally standardised
quantify the ecosystem,
resource use and human
health impacts of products
cradle to grave

Sponsored by:

SPRING

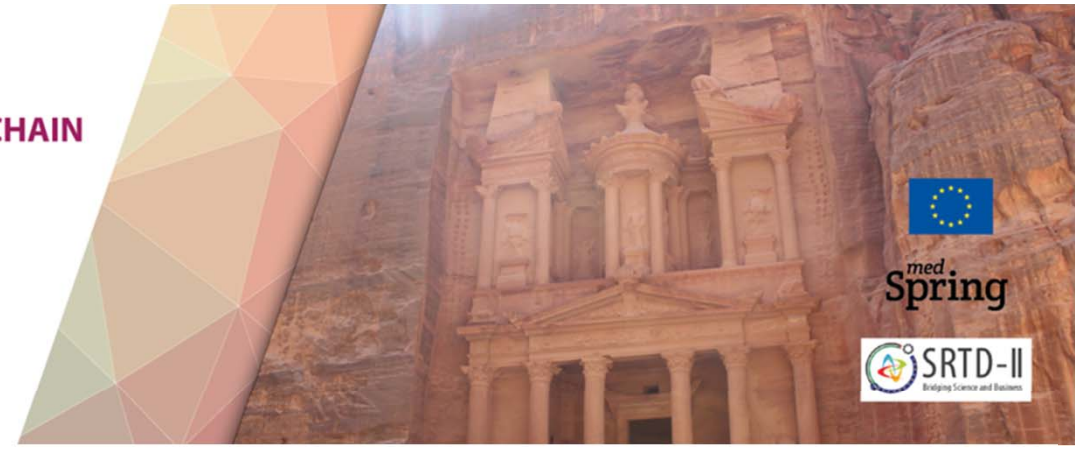
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

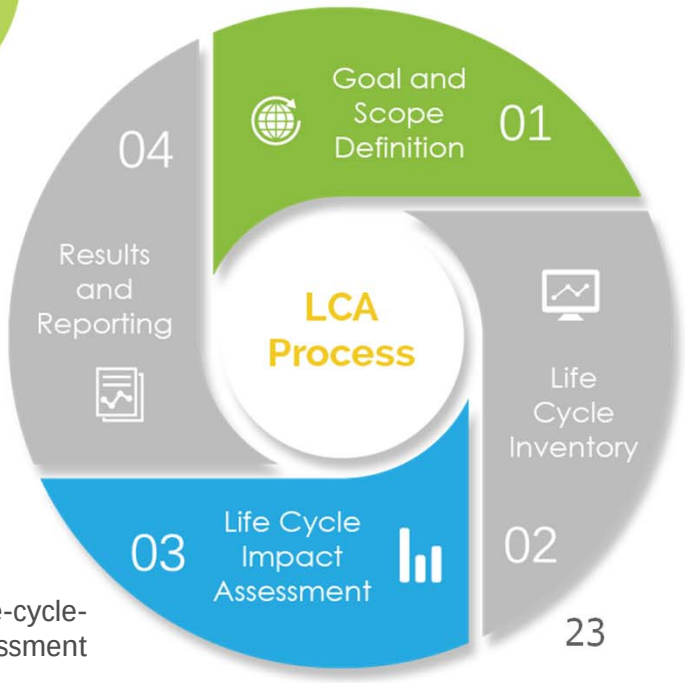
torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



http://vallalkozas.hulladekboltermek.hu/zold_vallalat/eletciklus_elemzes/



http://www.paradigmsustain.com/life-cycle-assessment

Sponsored by:

SPRING

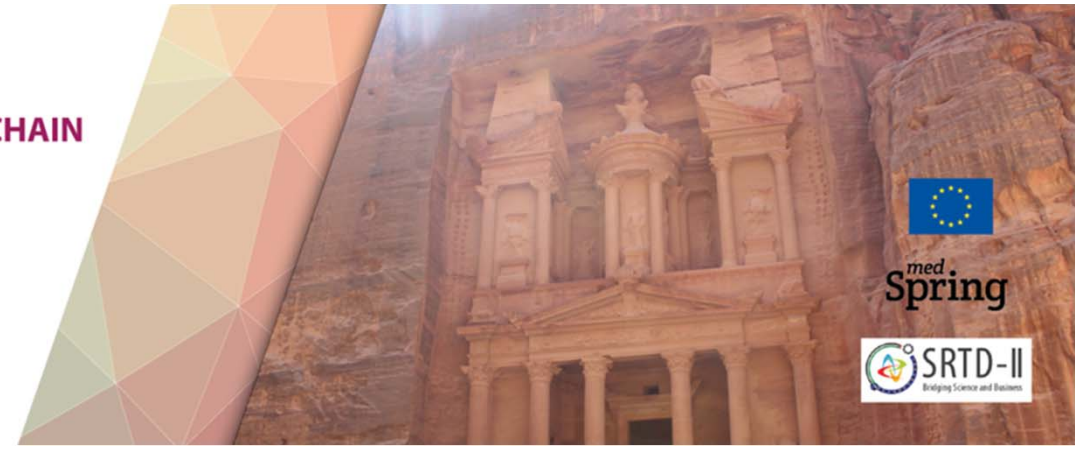
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN



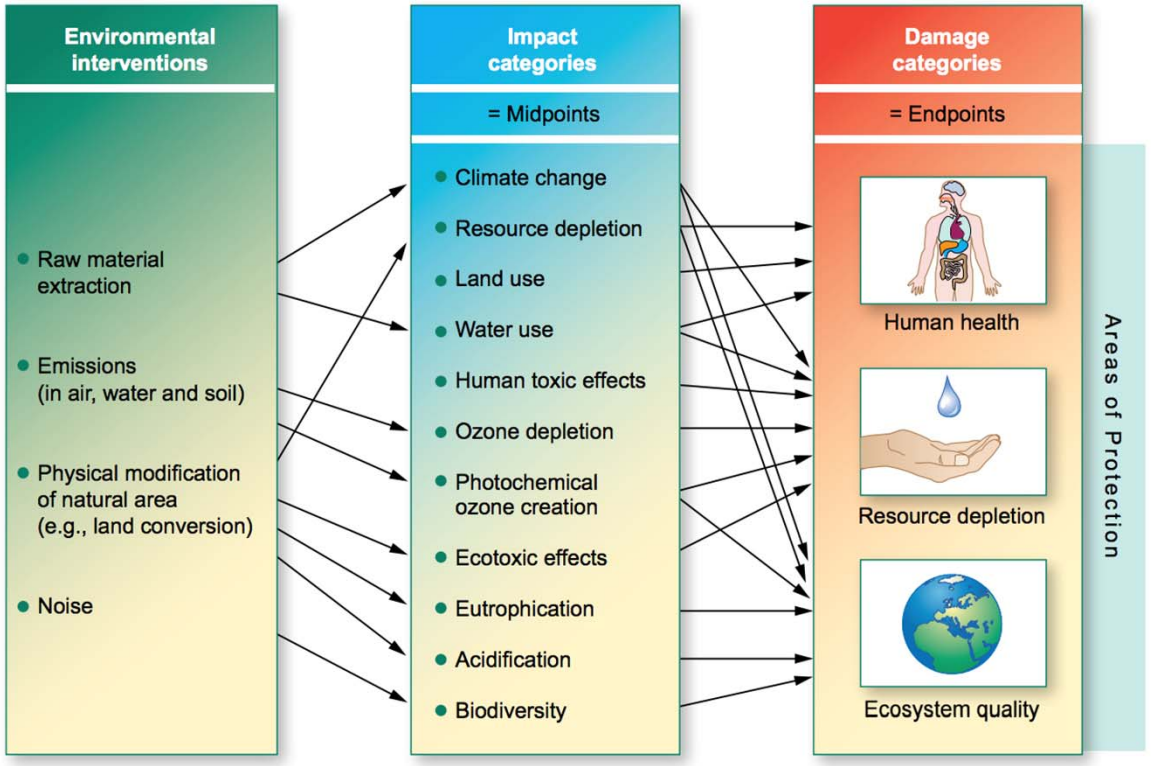
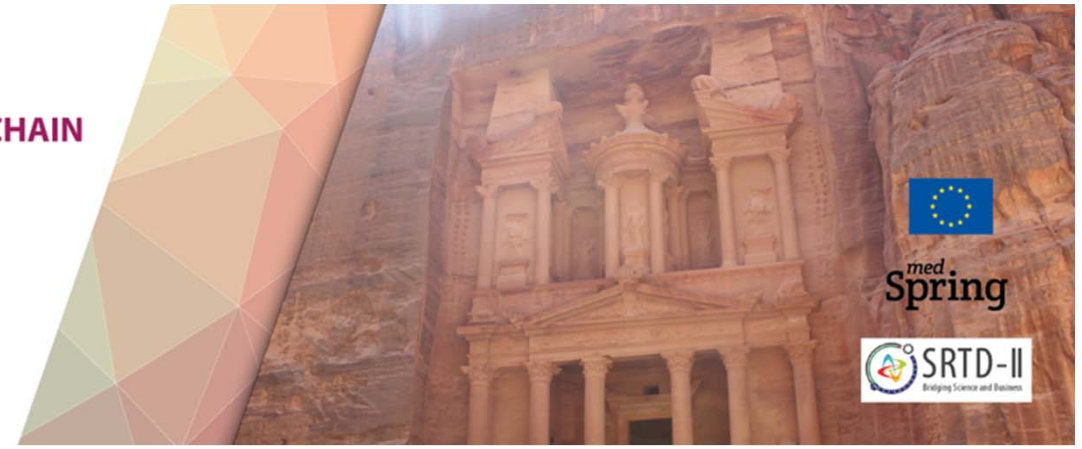
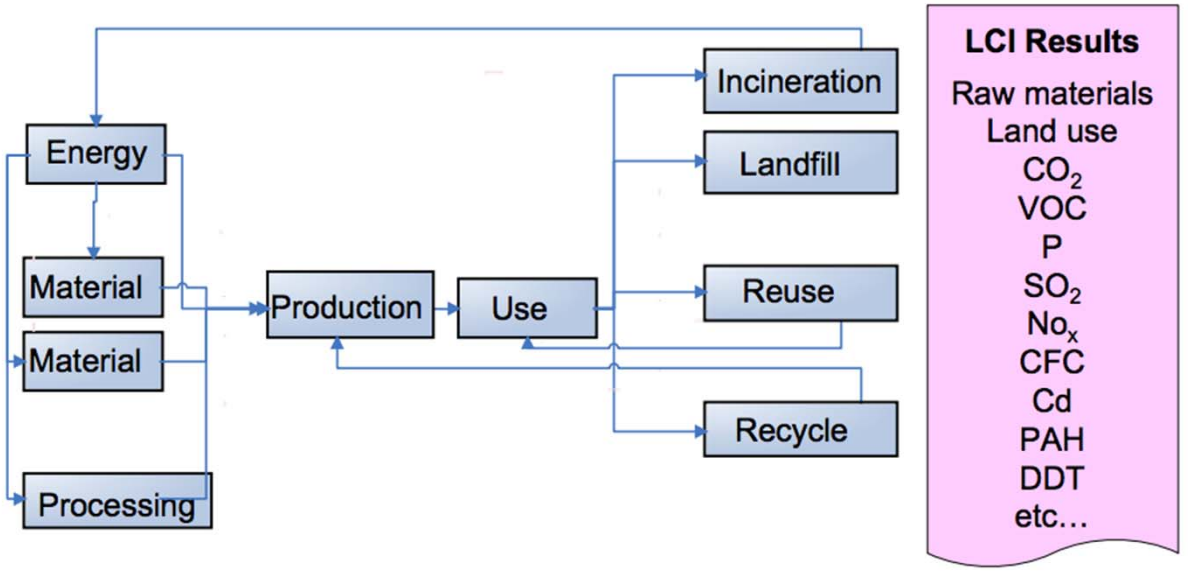
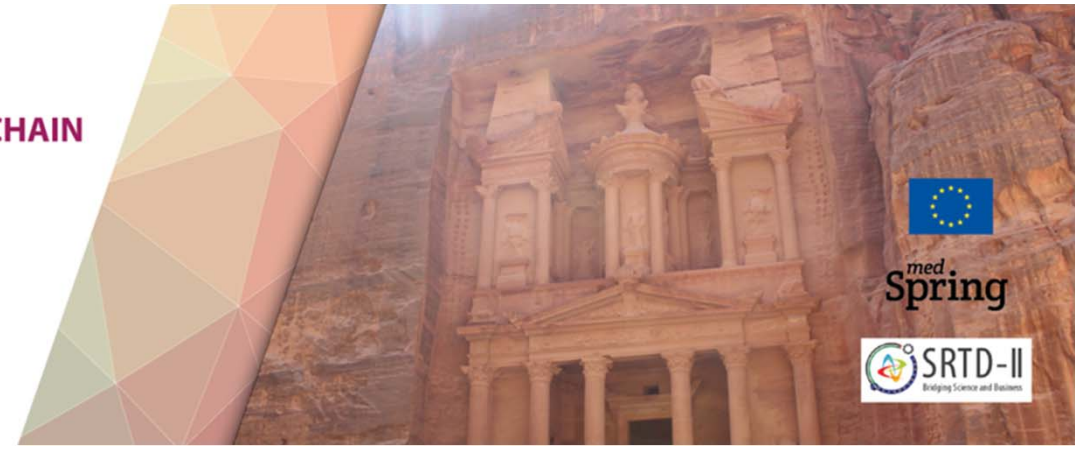


Figure 2. Overall UNEP/SETAC scheme of the environmental LCIA framework, linking LCI results via the midpoint categories to damage categories (adapted from Jolliet et al., 2003a).



Flows of information needed for a life cycle inventory





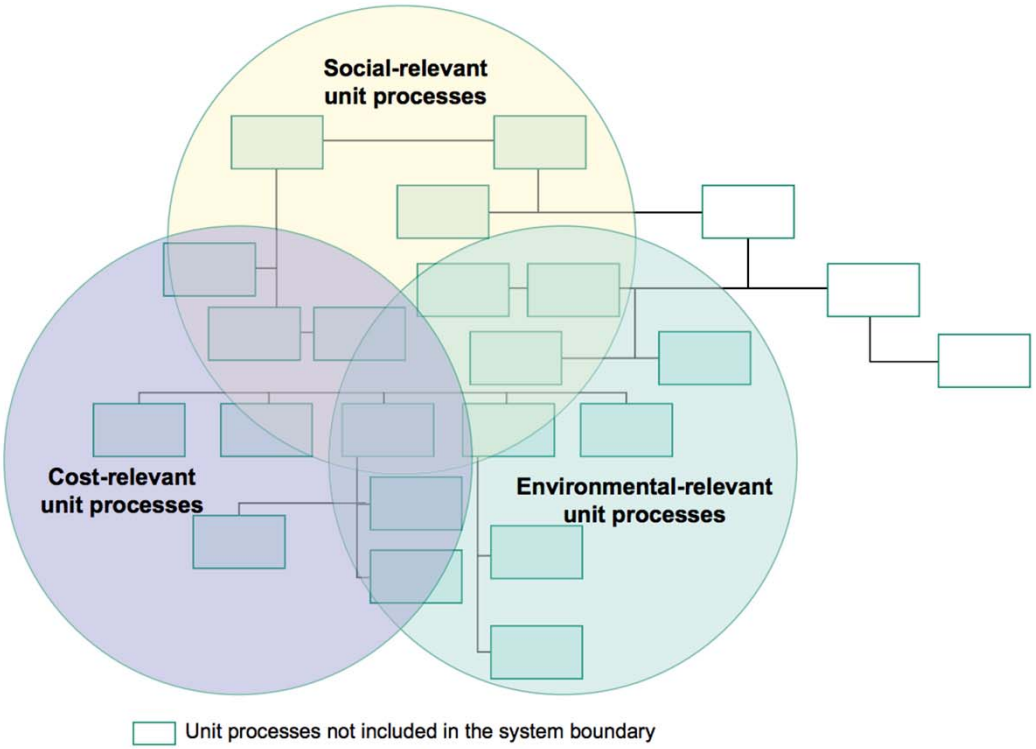


Figure 14. System boundaries of a life cycle sustainability assessment (LCSA).

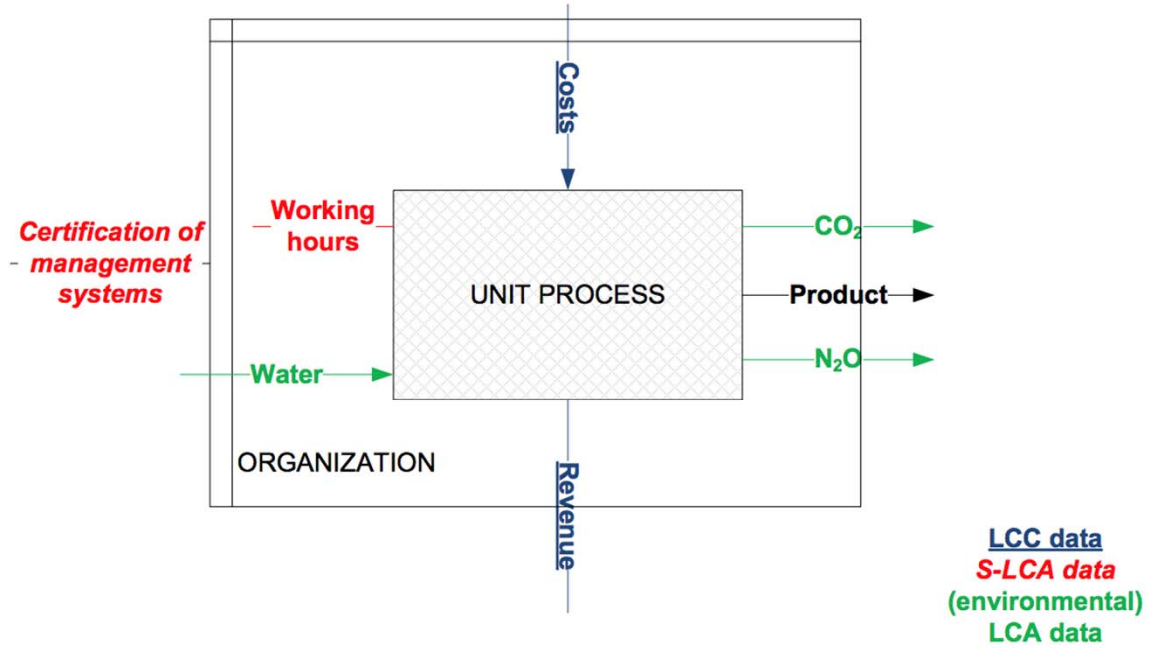


Figure 15. Example of life cycle sustainability assessment (LCSA) inventory data for unit process and organization levels.

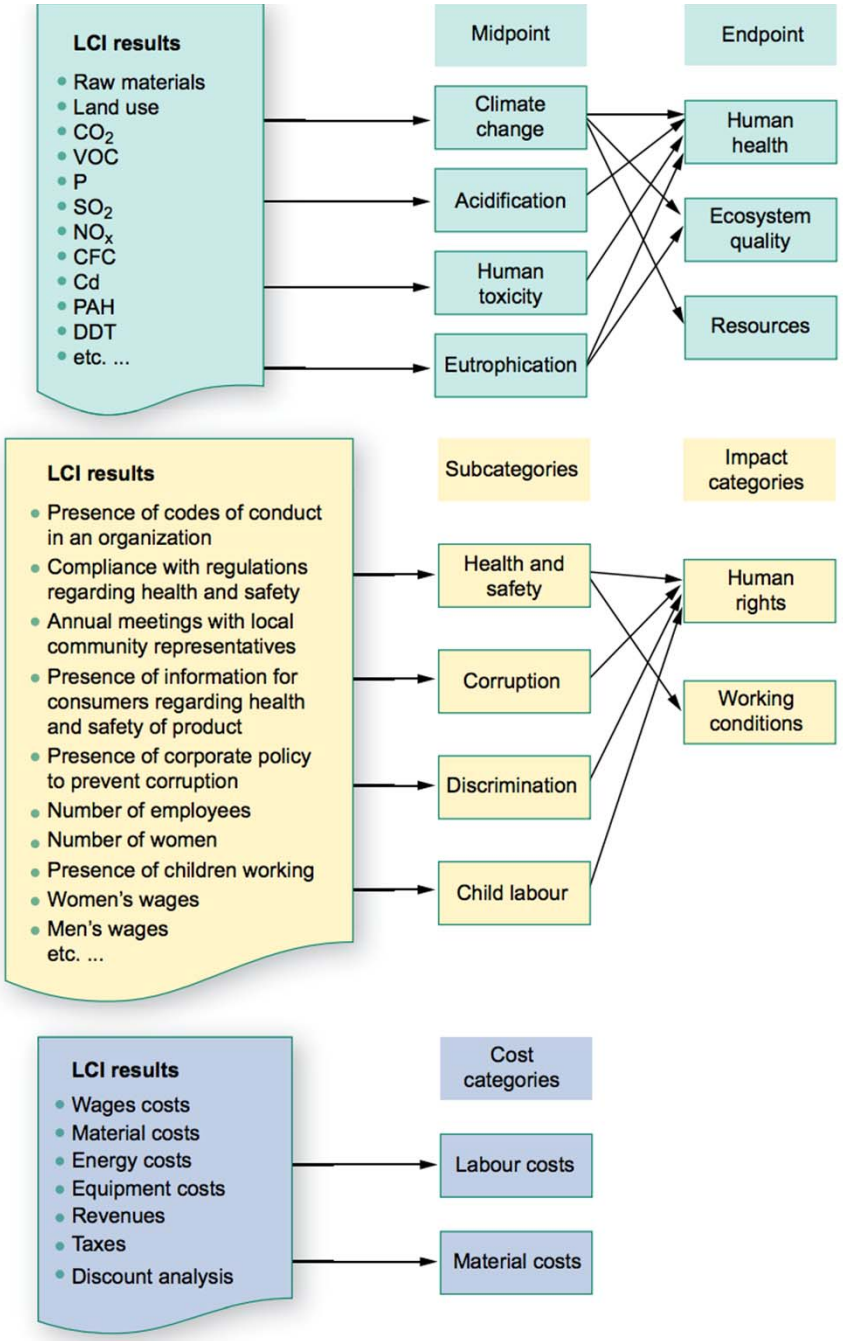
Sponsored by:

SPRING

SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

Barilla

torinowireless



igure 16. Examples of midpoint and endpoint categories, subcategories of stakeholders and cost ategories when starting a life cycle sustainability assessment (LCSA).

Sponsored by:

SPRING

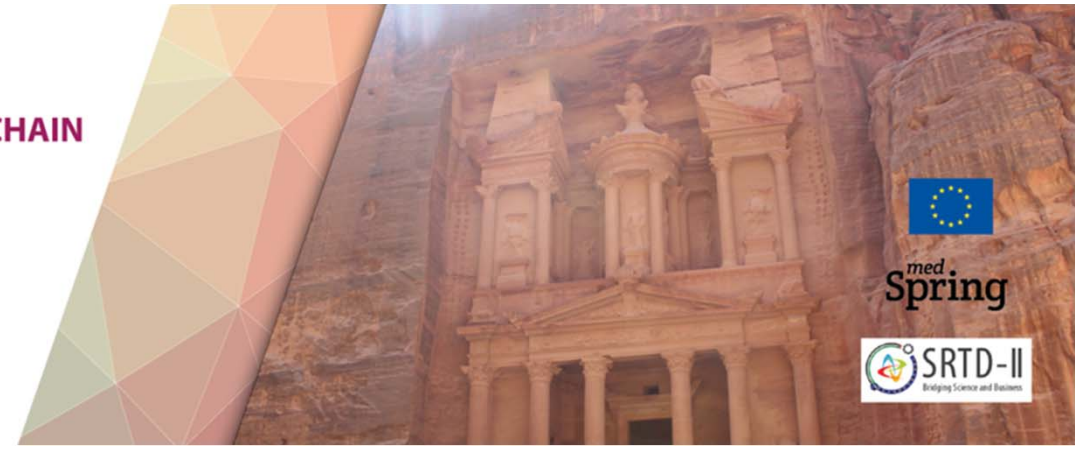
SEEDS & CHIPS
MAY 8-11, 2017 | MILANO

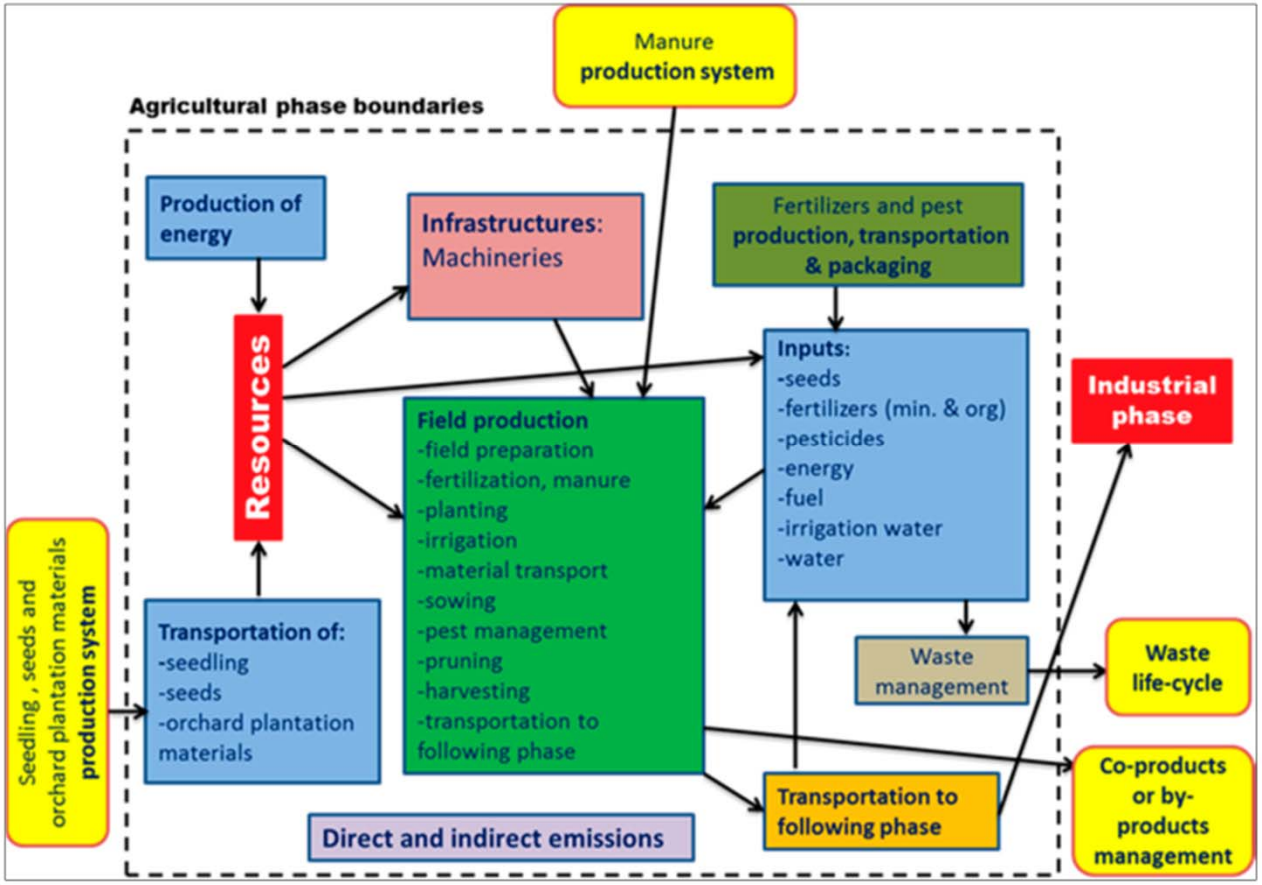
Barilla

torinowireless

Euro-MedHackathon
ECO-EFFICIENCY IN THE AGRO-FOOD CHAIN

14-15 December 2016 | AMMAN, JORDAN





System boundaries for a cradle-to-farm-gate Life Cycle Assessment (LCA) agricultural productions. The figure represents a simplified scheme of all the variables considered in the LCA calculations of agricultural productions (Tamburini et. al., 2015).