

Social Life Cycle Assessment and Life Cycle Sustainability Assessment



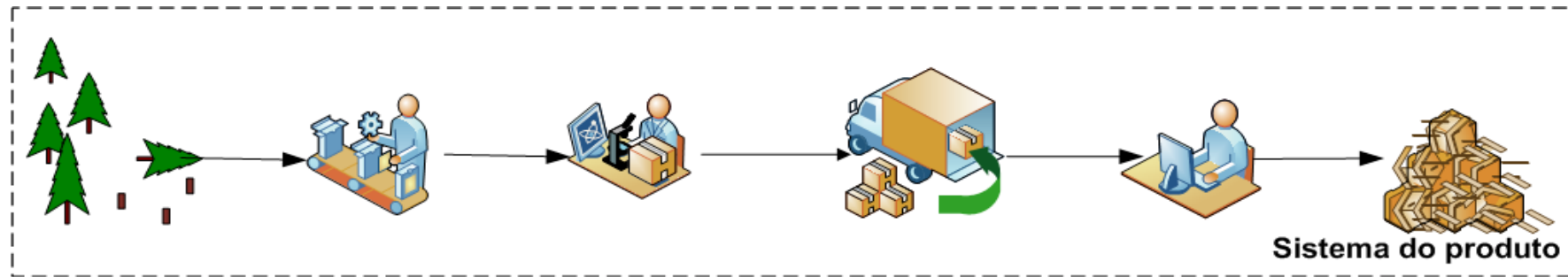
Life Cycle



Initiative

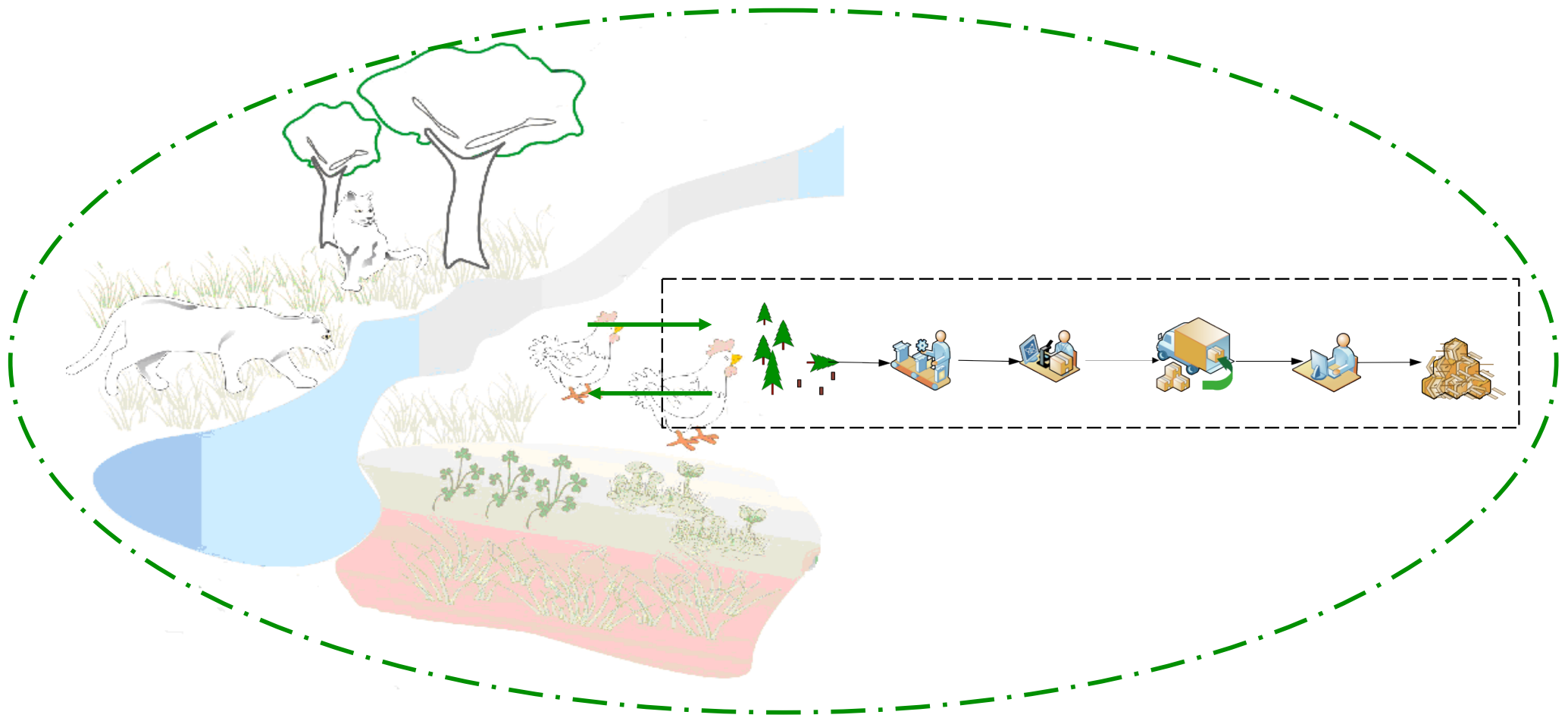
Sonia Valdivia, Cássia Maria Lie Ugaya.

Product Life Cycle



Life cycle of a product begins in the extraction of natural resources and ends when the product is finally disposed off, considering all processes, including material production, manufacturing, assembly, use, recycling and transportation

Environmental Life Cycle Assessment



Organizations do not want to be related to negative social impacts



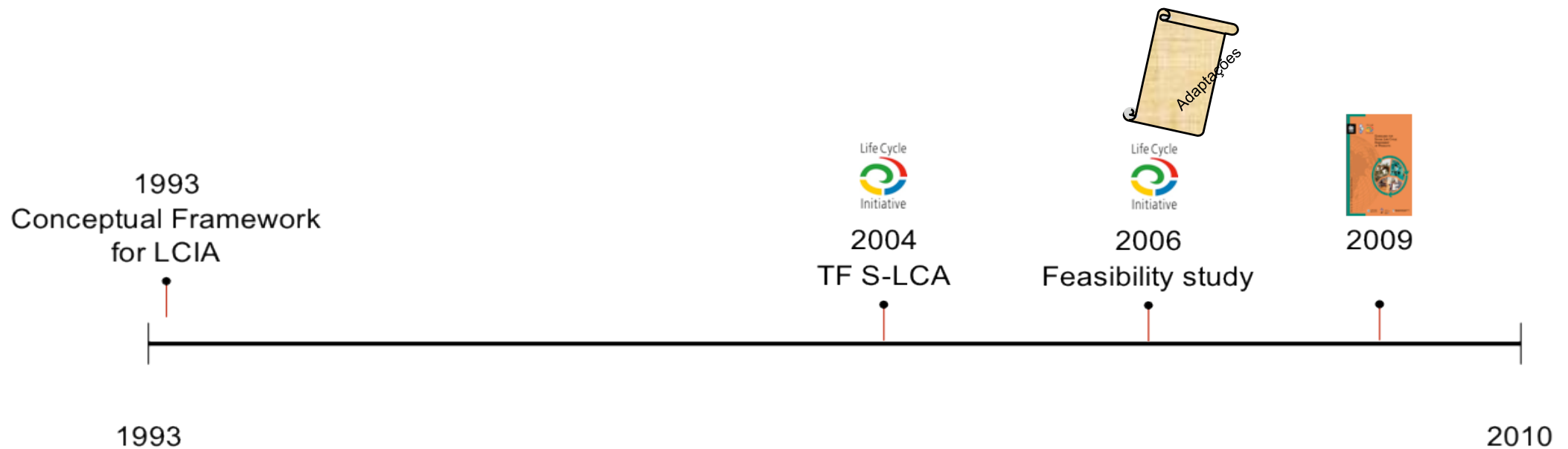
Social Life Cycle Assessment (S-LCA)



•S-LCA is a technique to evaluate positive and negative social impacts of a product along the life cycle

•*UNEP, 2009*

History



Social LCA (S-LCA) Goals

- Purpose of using S-LCA:
 - Provide social information for decision making,
 - Social information between production and consumption
 - Provide information for social improvement.
- Aims
 - To go beyond the legislation
 - To achieve benefic impacts

(environmental) LCA x S-LCA

- Commonalities

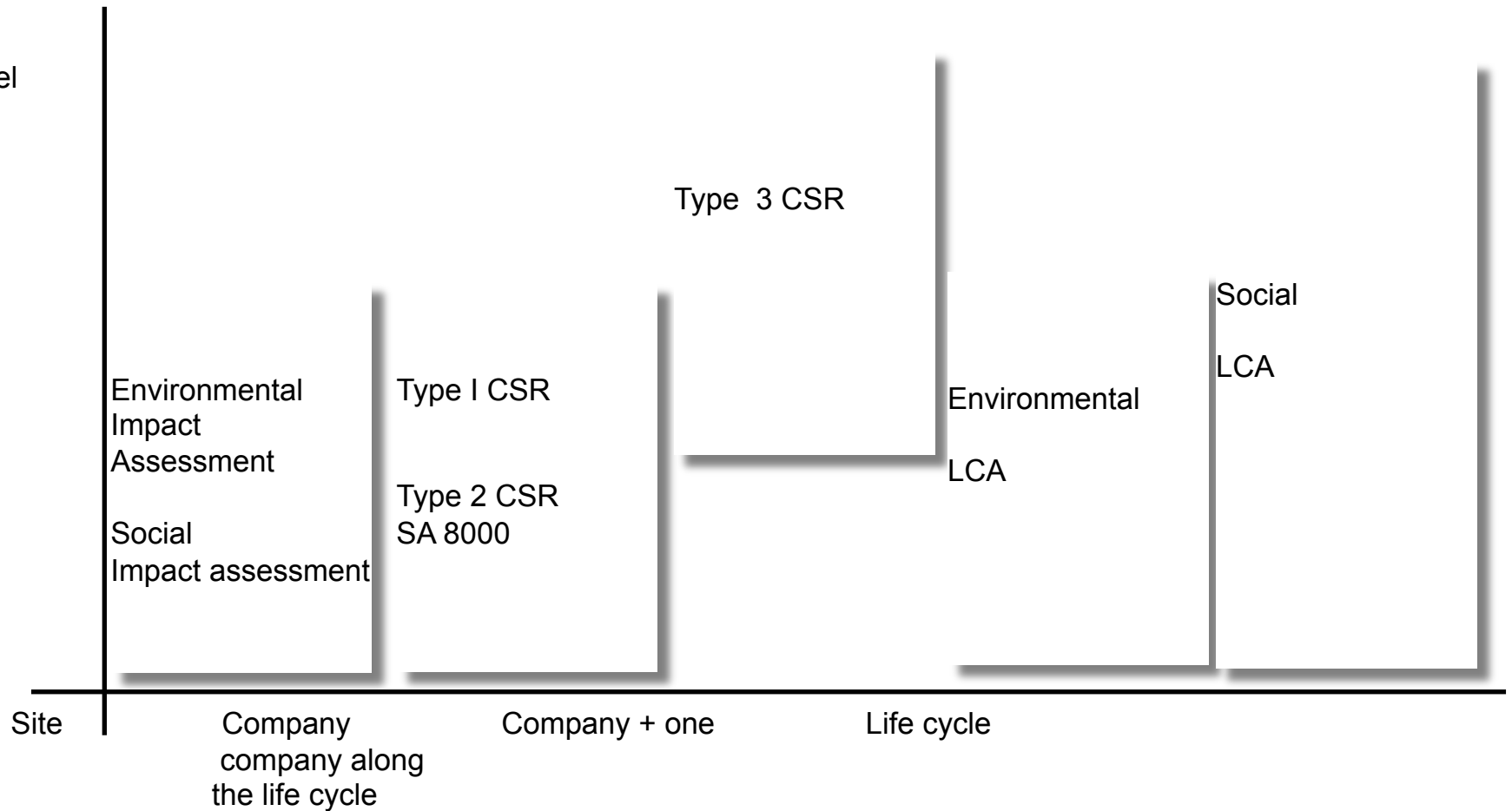
- Extensive data demand
- Iterative
- Provide information for decision makers
- Average or generic data gives the potential and not necessarily the real impact
- Based on functional unit

Differences

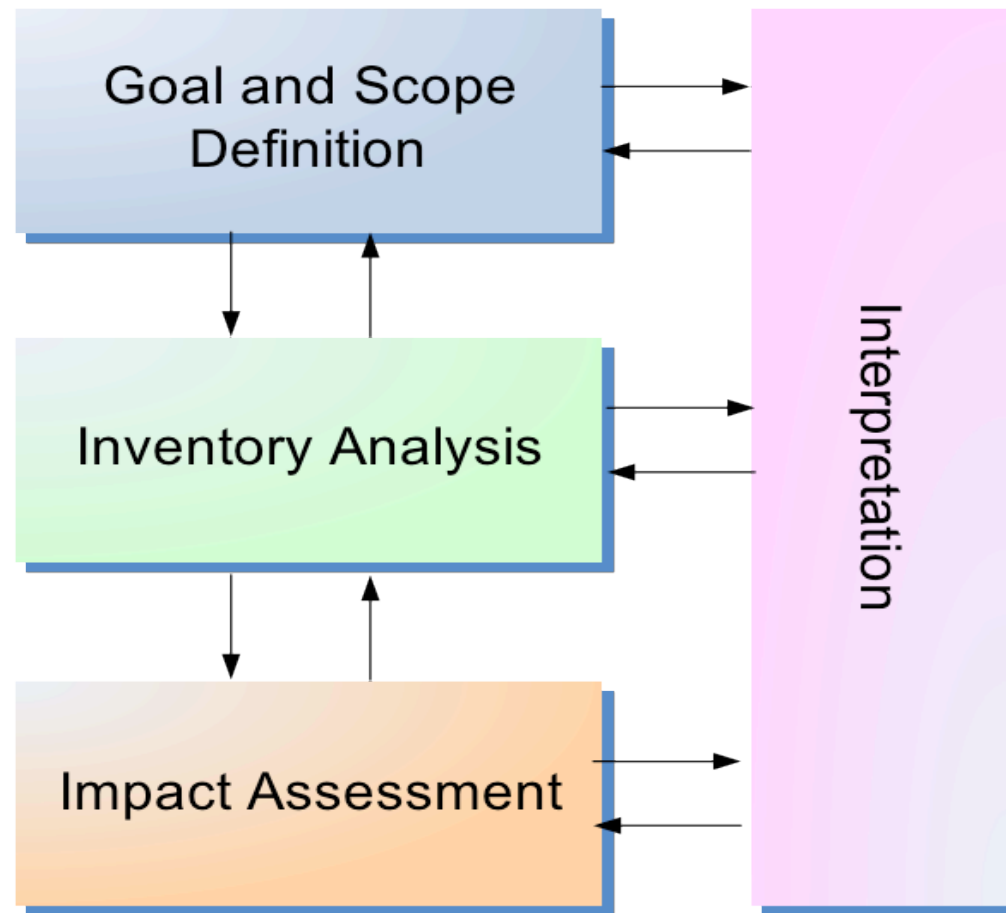
In S-LCA the stakeholders perspective is relevant

Subjective data is used in S-LCA

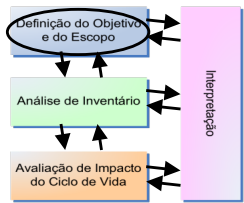
Data collection comparison



S-LCA follows ISO with adaptations



Limits of the study



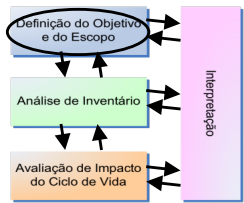
Goal and Scope Definition Functional Unit

- Spongebob and steel spongebob?
- Washing machine and Washing service?

Why are them comparable?

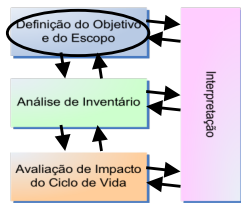
Same function

Functional Unit is the amount of function required!



Functional unit

- Additionally, a better description of the product can be added (product utility)
 - Funcionality
 - Technical quality
 - Adittional services
 - Aesthetic
 - Product Image
 - Costs
 - Environmental and social characteristics

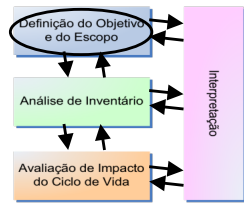


Functional unit

- Product utility example:

- Functionality: cover the body
- Technical quality: without buttons, short sleeves, durable, washable
- Additional services: cloth to clean the floor
- Aesthetic: fashion
- Product Image: known brand
- Costs: medium class
- Environmental and social characteristics: organic cotton from small communities

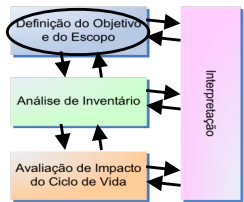
Functional unit is not the product!



Reference flow

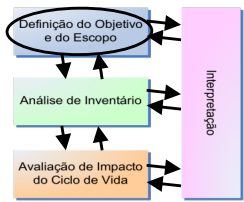
- Which product and **how many** of the product is needed to supply the functional unit?
- **One** red or a green T-shirt



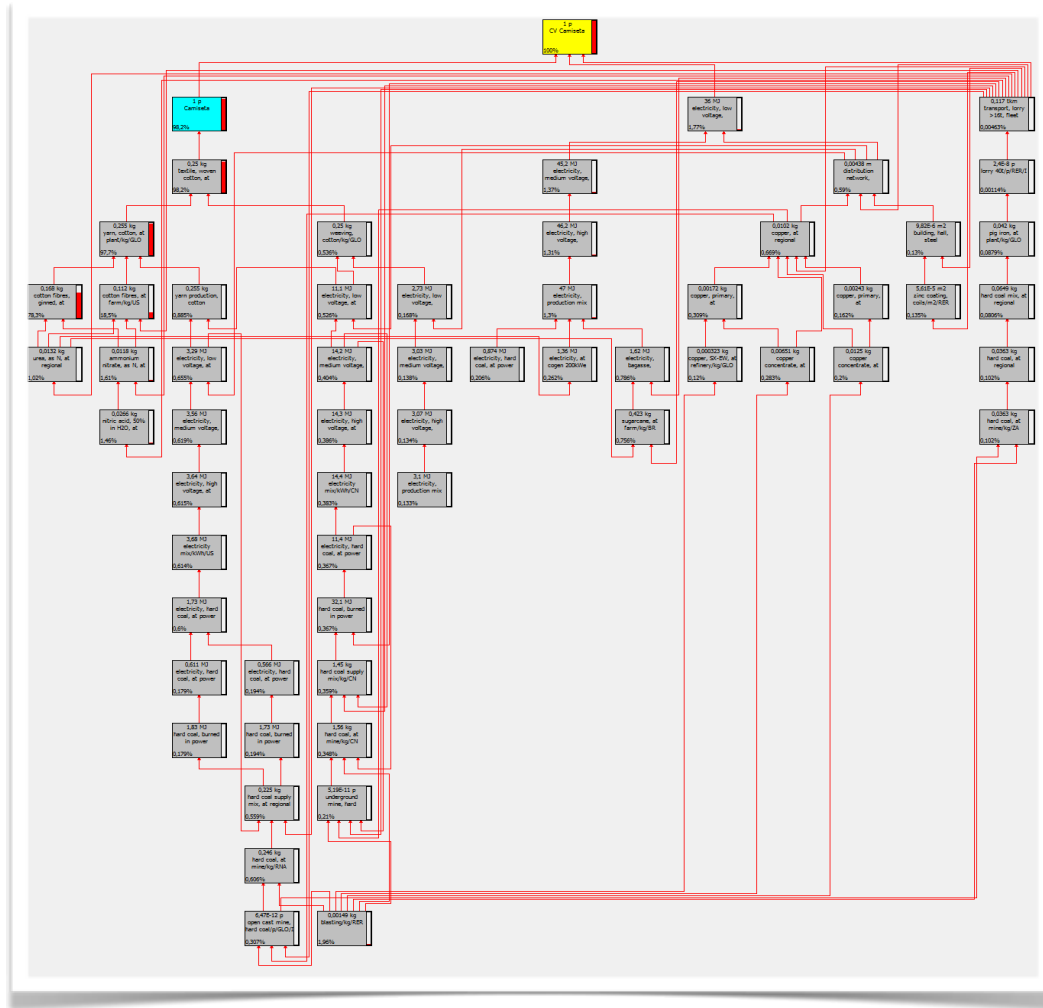


Hands on!

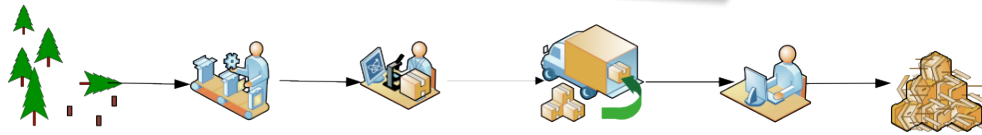
- Define the reference flow for the functional unit 'ONE relevant communication'



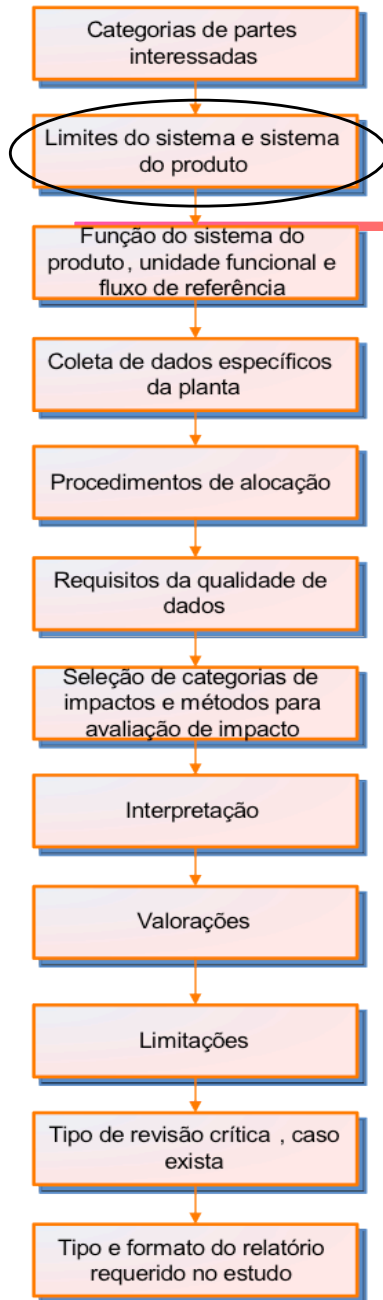
Product system



Cut-off criteria: working hours

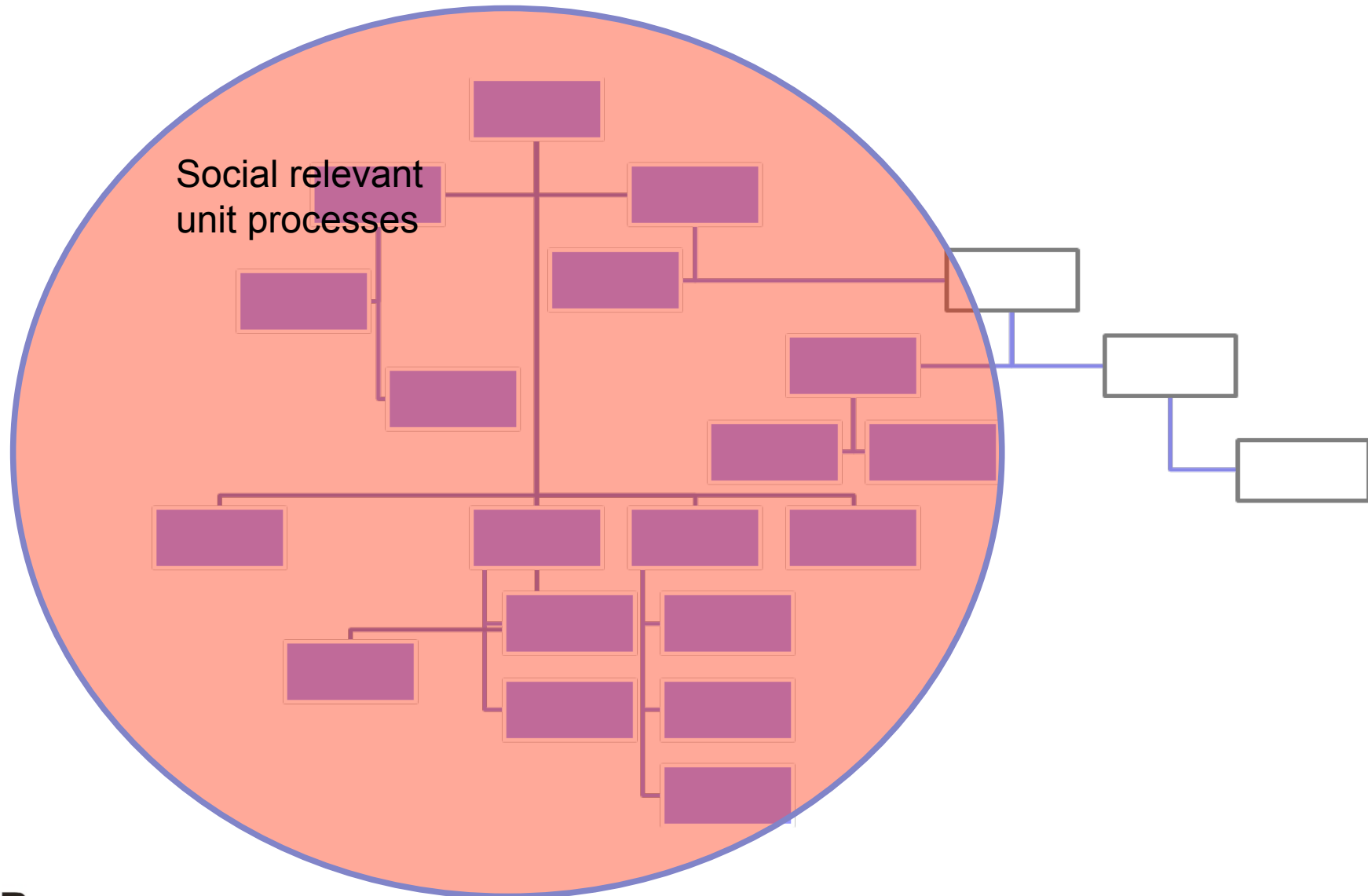


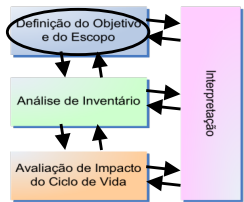
System boundaries and the Product system



- To be considered:
 - Life cycle stages: cradle to gate, cradle to grave, gate to grave, gate to gate
 - Infrastructure
 - Services
 - Advertising
 - Engineer
 - Designers
 - Overhead
 - Employees transportation
 - Maintenance
- Recommendation: begin simple

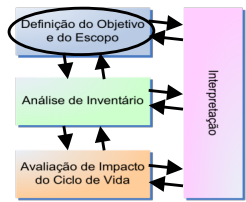
Cut-off criteria in S-LCA: working hours





Hands on!

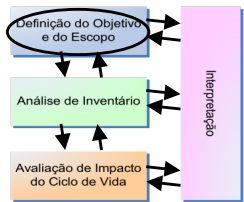
- Establish a product system for the reference flow for a 'relevant communication'



Definition of relevant issues based on stakeholder perspective



Stakeholder / Impact	Subcategory	Inventory indicator	Inventory data



Hands on!

- Think of relevant stakeholders for the reference flow for a 'relevant communication' defined and why did you choose them

Stakeholders



Life Cycle
Initiative



Workers

Trabalhadores



Consumers

Consumidores



Local community

Comunidade local



Society

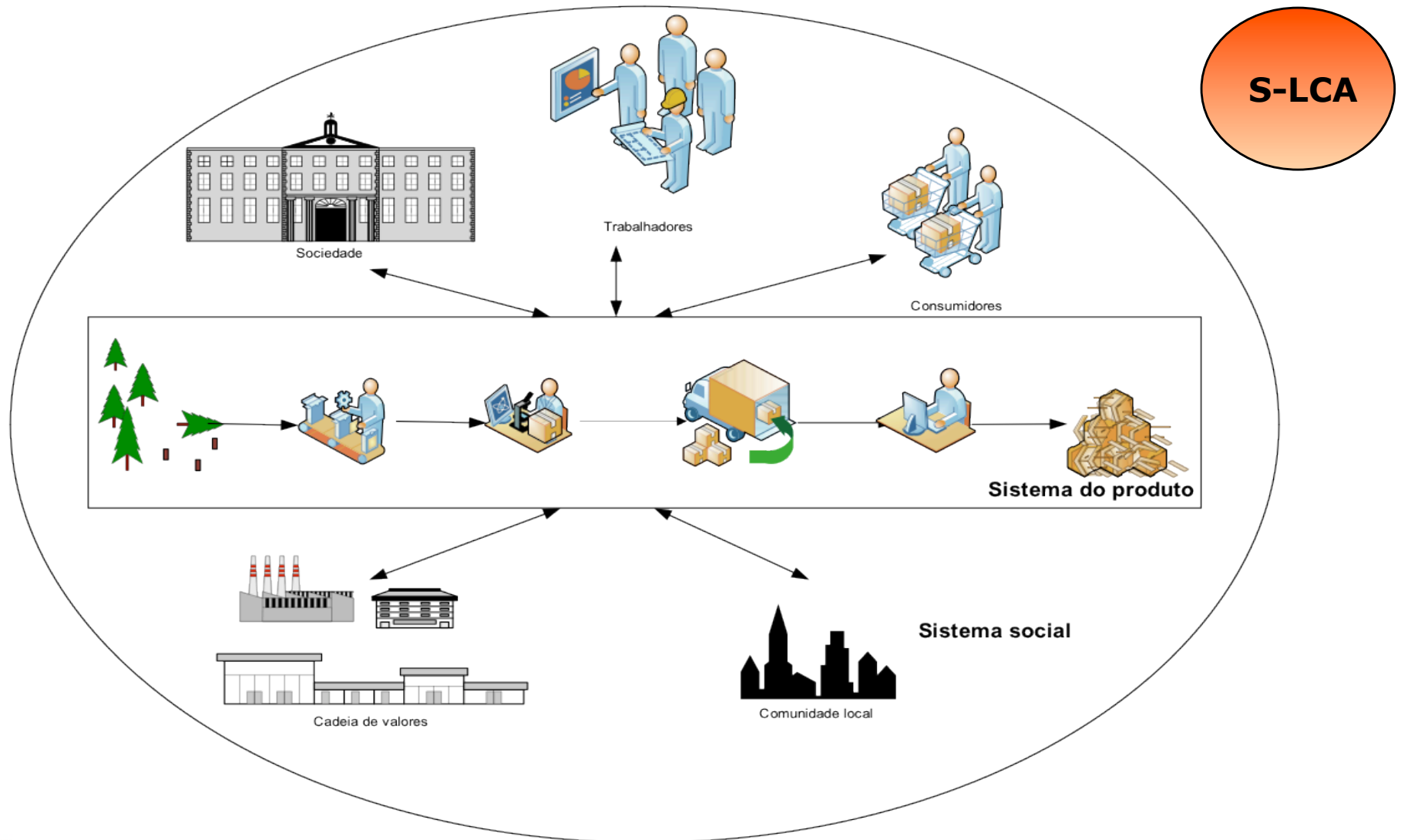
Sociedade



Value chain

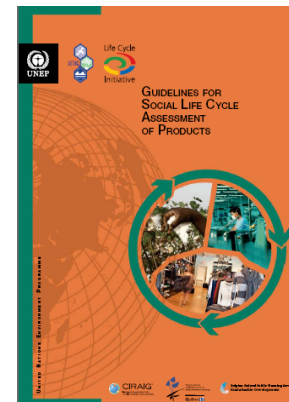
Cadeia de valores

Social Life Cycle Assessment



UNEP/SETAC subcategories

- *Top-down*
 - Internationally recognised
 - OIT
 - GRI
 - ISO 26000
 - PROSA



Working subcategories



Workers

- Freedom of association and collective bargaining
- Child labour
- Forced labour
- Fair salary
- Working hours
- Equal opportunities and discrimination
- Health and safety
- Social benefits and social security

Consumers subcategories



Consumidores

Health and safety
Feedback mechanism
Consumer privacy
Transparency
Responsibility along the life cycle

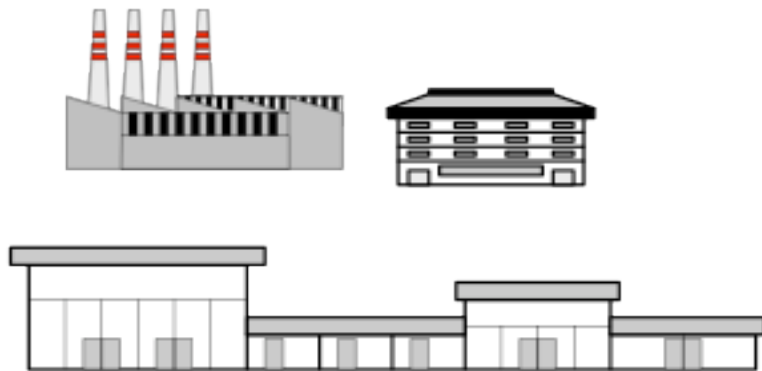
Subcategorias de impacto



Comunidade local

Material resources access
Immaterial resources access
Delocation and migration
Cultural heritage
Healthy and safety condition
Respect to indigenous rights
Community engagement
Local employment
Assuring Life condition

Value chain subcategories



Cadeia de valores

Fair competition
Promotion of social responsibility
Supply relationship
Respect to intellectual property rights

Society subcategories



Sociedade

Public commitment with sustainability
Contribution to the economic development
Prevent and mitigation of armed conflicts
Technological development
Corruption

Partes interessadas



Trabalhadores



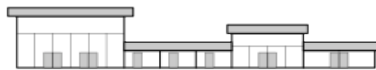
Consumidores



Comunidade local



Sociedade



Cadeia de valores

Subcategorias de impacto

Liberdade de associação e negociação coletiva
Trabalho infantil
Salário justo
Horas trabalhadas
Trabalho forçado
Oportunidades iguais e discriminação
Saúde e segurança
Benefícios sociais e seguridade social

Saúde e segurança
Mecanismo de retorno
Privacidade do consumidor
Transparência
Responsabilidade no ciclo de vida

Acesso ao recurso material
Acesso ao recurso não material
Deslocamento e migração
Herança cultural
Condições de vida saudáveis e seguras
Respeito dos direitos indígenas
Engajamento da comunidade
Trabalho local
Assegurar condições de vida

Compromisso público com a sustentabilidade
Contribuição ao desenvolvimento econômico
Prevenção e mitigação de conflitos armados
Desenvolvimento tecnológico
Corrupção

Competição justa
Promoção da responsabilidade social
Relação com os fornecedores
Respeito aos direitos de propriedade intelectual

31 subcategories

Non restrictive list
Exclusions must be justified

Subcategory methodological sheet

- **Subcategory**

- Name
- Definition
- Measurement unit
- Monitoring

- **Political relevance**

- Purpose
- Relevance to sustainable development
- International convention and agreements
- International target or recommended standards

- **Method description**

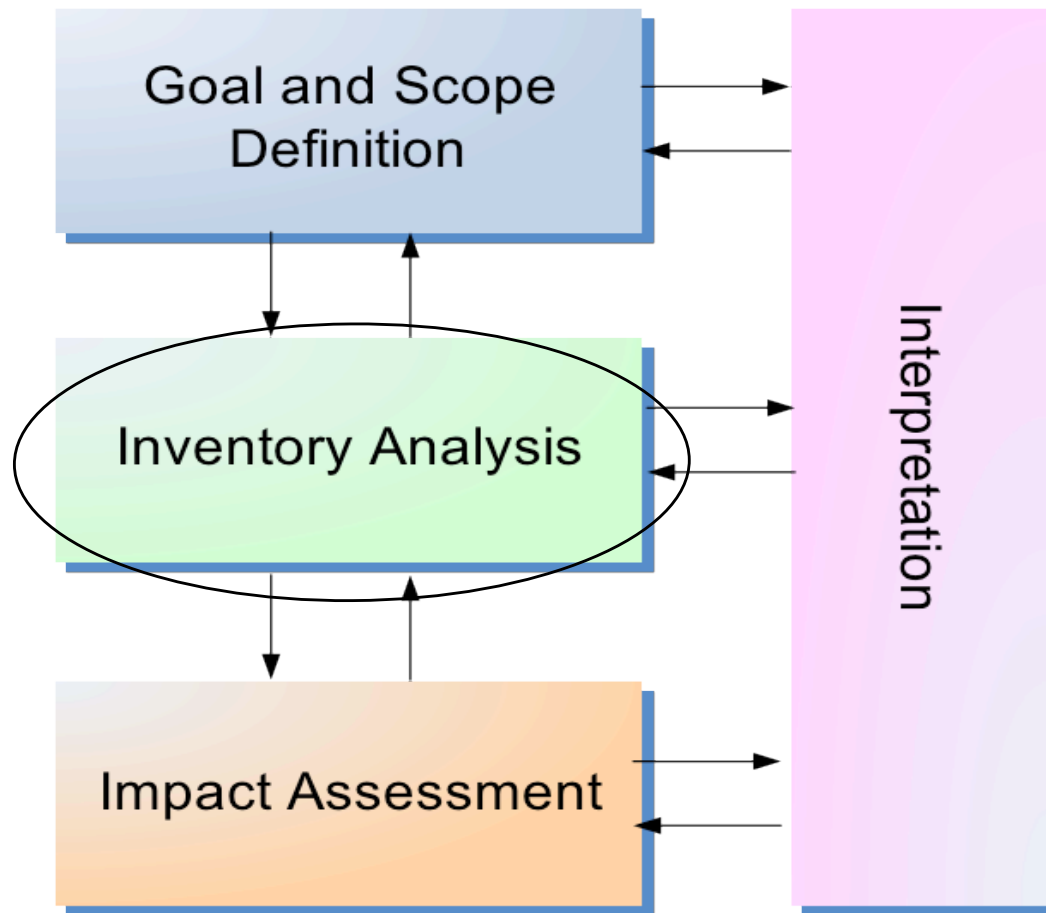
- Concept and definition
- Measurement method
- Indicator limitation
- Methodological status
- Other subcategory definition

- **Data evaluation**

- **Reference**

<http://lcinitiative.unep.fr>

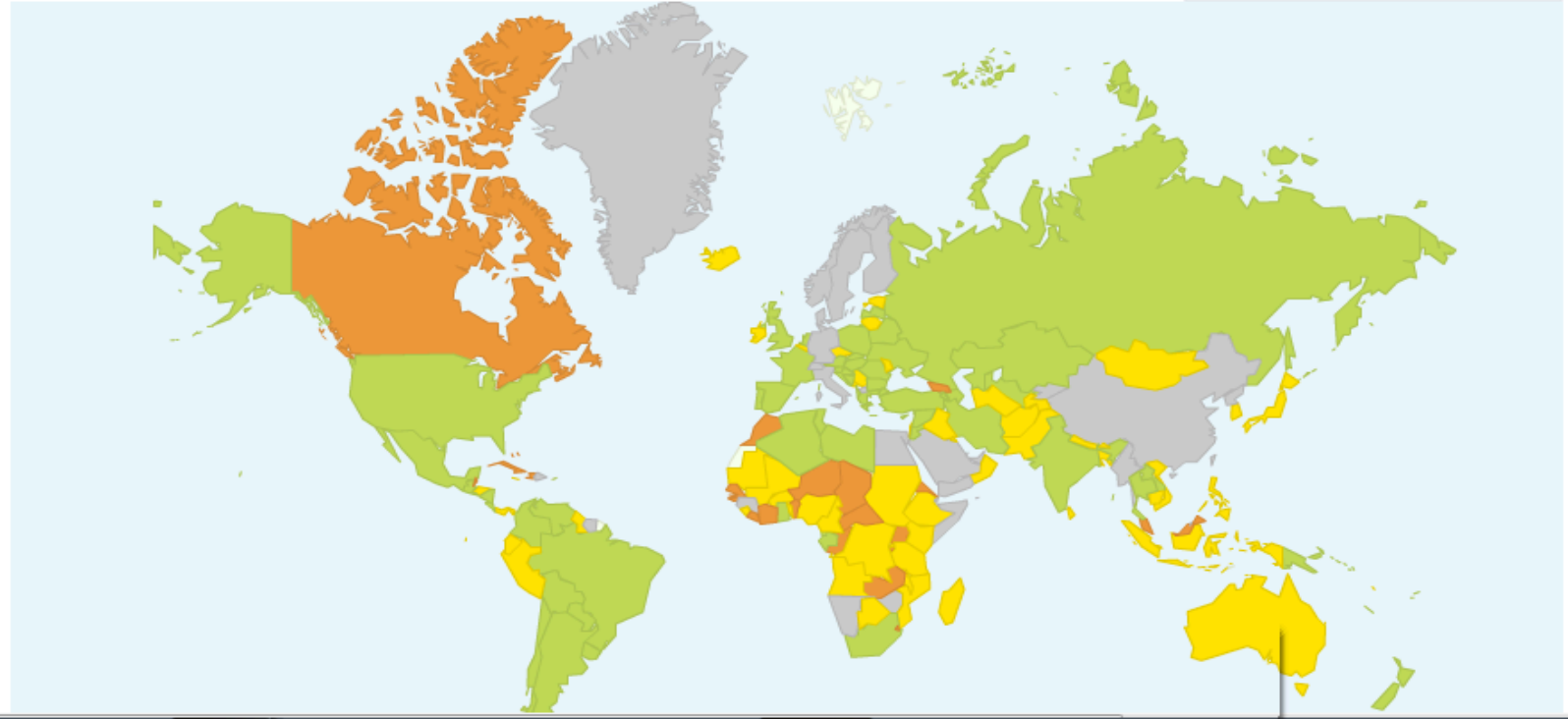
Specific issues in S-LCA



Data collection along the life cycle is as demanding as in (environmental) LCA

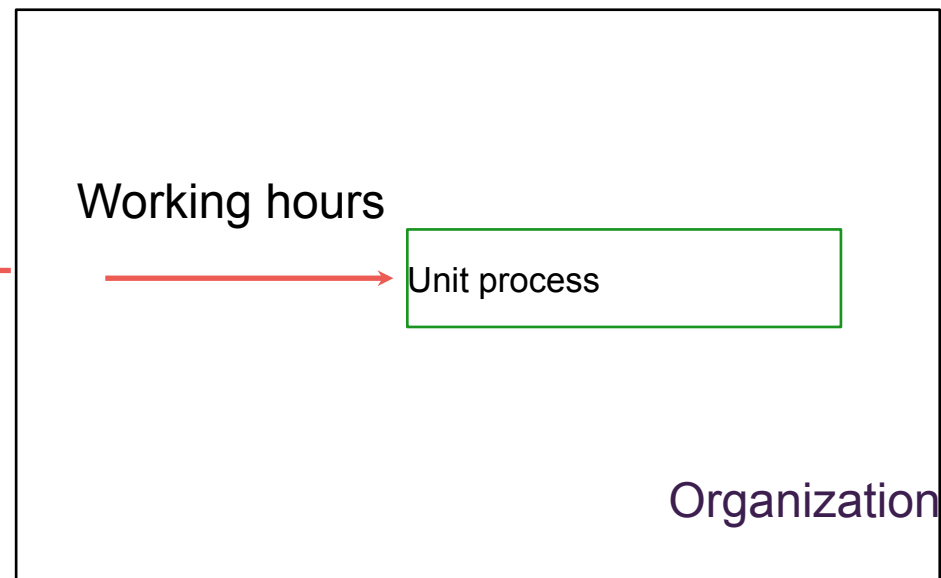
How to identify a hotspot?

1. Choose Category: Labor Rights & Decent Work
2. Choose Theme: Labor Laws and Conventions
3. Choose Issue: Potential of Minimum Wage not being updated
Risk Levels World View
Country Search:



Data collection

Certification of
management systems



Life Cycle Inventory: data collection

- Data collection
 - Specific
 - Interviews
 - Questionnaires
 - Data from the company
 - Generic
 - National statistics
 - Data from the region

Life Cycle Inventory: verifying data

- Data triangulation
 - Comparison of data providers:
 - Example: Manager, worker, employee, NGOs, union

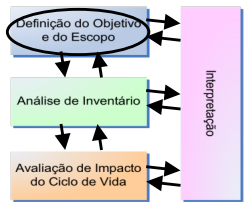
How to express a non
quantitative indicator?

Hands on

- Give examples of social inventory indicators for a 'relevant communication'

Marble case

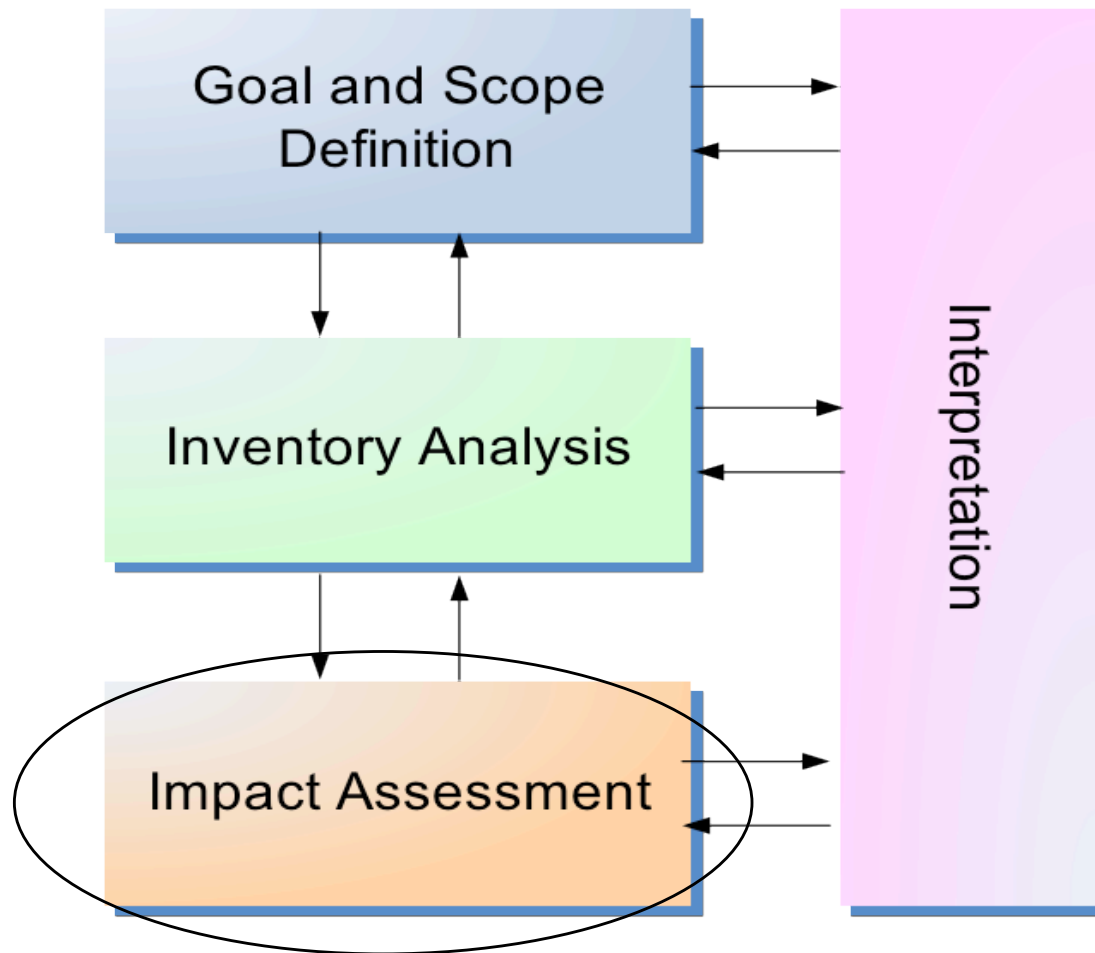
	SLCA								
	S01	S02	S03	S04	S06	S07	S08	S09	S10
IND_NAME	Total number of employees	Female employees	Employees with unlimited contract	Employees with limited contract	Child labour	working hours	Wage for working hour	Workers with health insurance	Workers with health insurance
IND_UNIT	n/m3	n/m3	n/m3	n/m3	n/m3	n/m3	€/h	n/m3	n/m3
Perlato di Sicilia A	0.0053	0.000154	0.00071	0.0000615	0	8.243077	0.000633	0.000769231	0.000769231
Perlato di Sicilia B	0.00278	0.000652	0.0019569	0	0	1.548237	0.000184	0.001956947	0.001956947
Bianco Carrara C	0.00796	0.00317		0.0002228	0				
Bianco Carrara D	0	0		0	0				



Hands on!

- Define a functional unit and a reference flow for a 'relevant communication'

Third LCA Phase

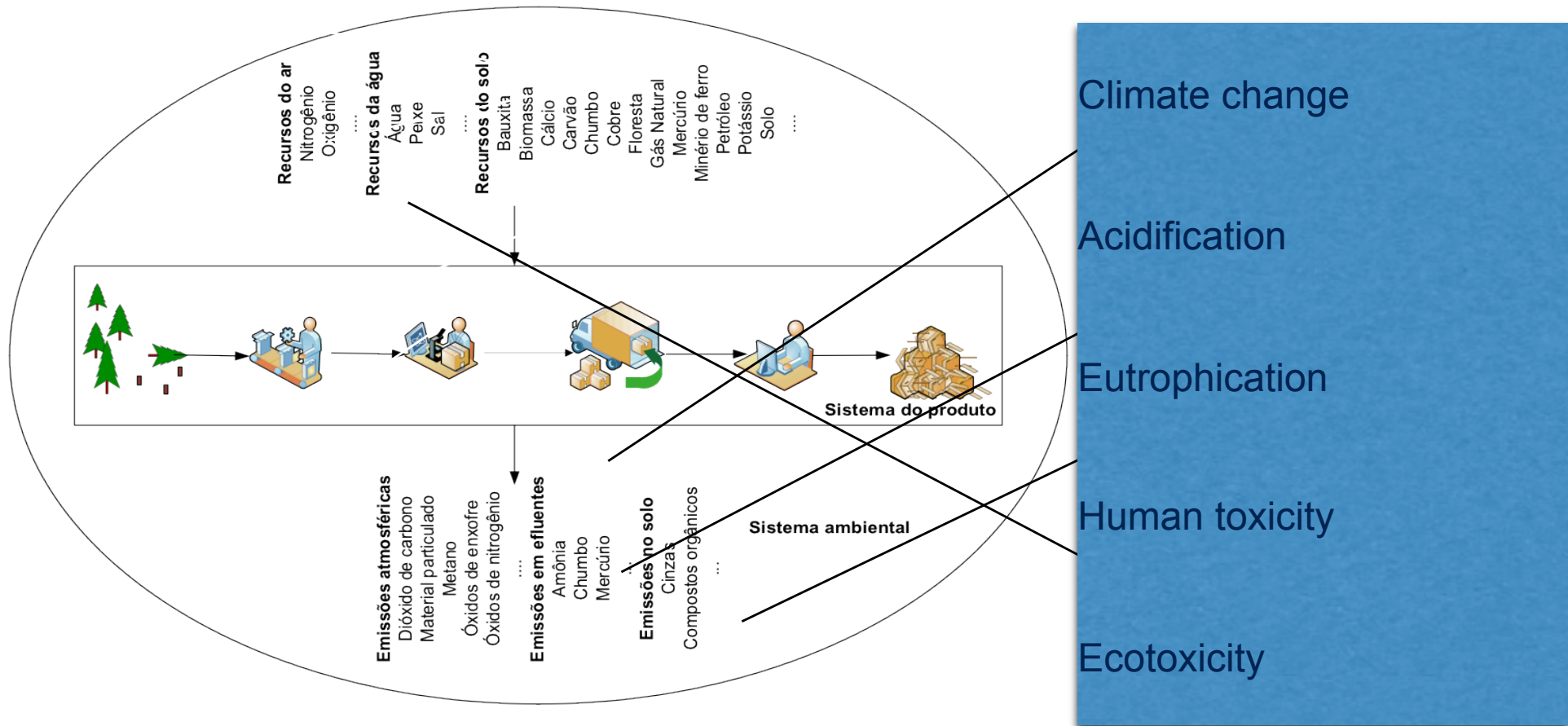


To evaluate the social impacts

Environmental LCA

Elementary flows

Impact categories



From inventory data to stakeholder



Stakeholder	Subcategory	Inventory indicator	Inventory data

From inventory data to impact through subcategories



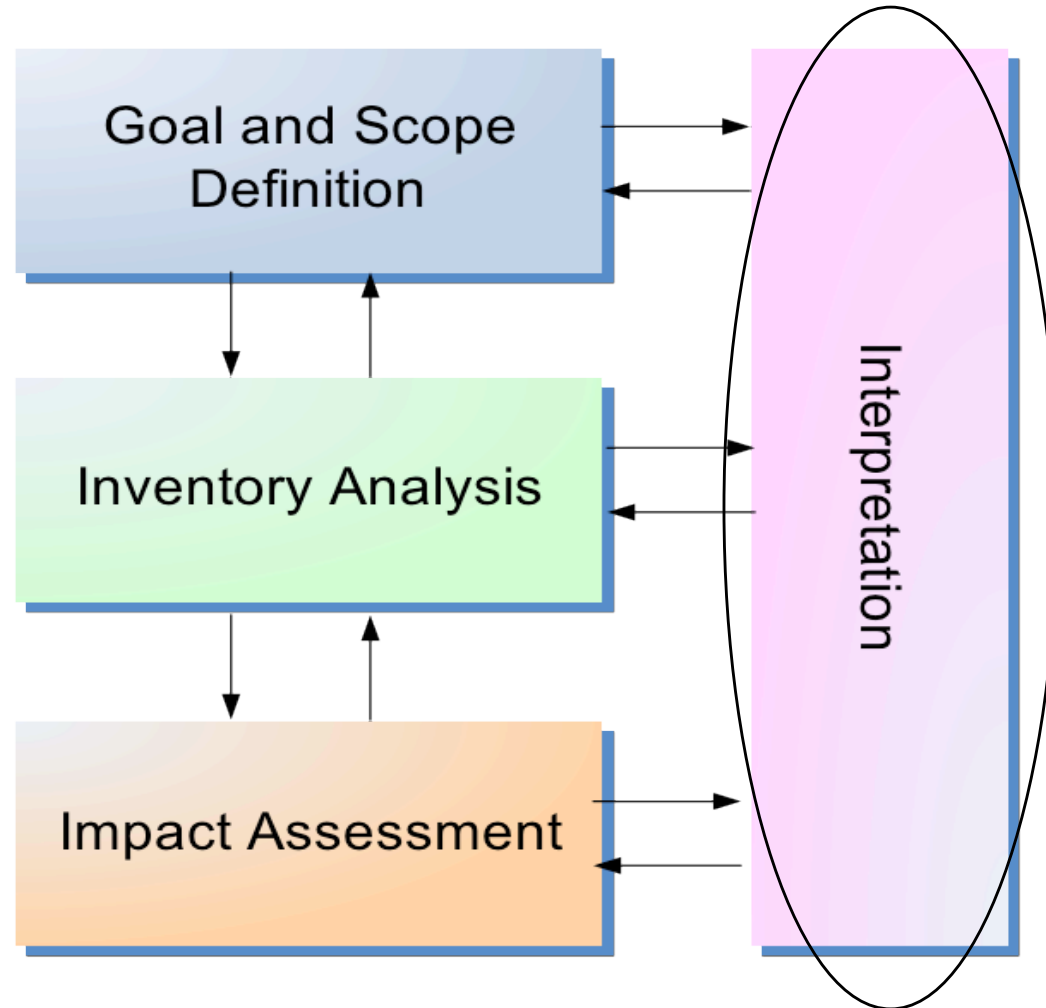
Impact	Subcategory	Inventory indicator	Inventory data

From inventory data to impact through pathways



Impact	Inventory indicator	Inventory data

Fourth LCA Phase



**Evaluating the results
according to the Goal and Scope**

Discussion

- Consider the red and green T-shirt (A and B)
- The life cycle of A presented 2 children working and in B, 5.
- Which option has a better social condition?



Qualitative x quantitative

Discussion

- Product A: half of the work force is women
- Product B: Women workers represent 20% of the working force
- One if the women in A feels she has no opportunities
- Which is the product with better social life cycle?



Subjective x objective

Future steps in S-LCA

- Case studies
 - **Application**
 - Review
- Dissemination
 - Capacity building
 - Data and tools
 - Communication
- Models



Introduction

What is an LCSA?

Life cycle sustainability assessment (LCSA) refers to the evaluation of all environmental, social and economic negative impacts and benefits in decision-making processes towards more sustainable products throughout their life cycle.

sustainable development, that of the Brundtland Commission of the United Nations (UN) in 1987:

‘Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’



Conclusions

It is **feasible** worldwide

It is NOT re-inventing the wheel



It is our contribution to the upcoming United Nation Conference on Sustainable Development Rio +20

Benefits

Clarifying trade-offs

Achieving sustainability by considering all three pillars

Promotes sustainability along the value chain

Support identification of weakness to promote improvement along the life cycle

Benefits

Support prioritization of actions with chances of positive impacts

Stimulates innovation in enterprises and suppliers

Support sustainable consumption

Potentially inform labeling initiatives

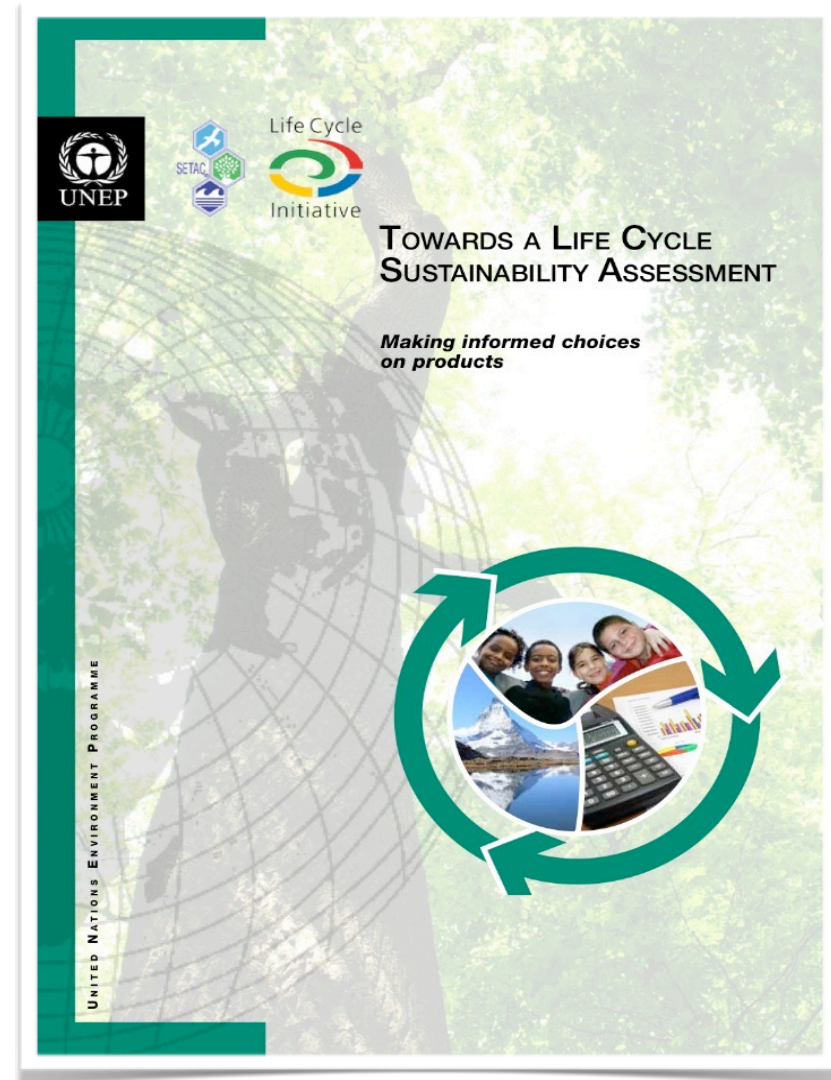
Credibility of enterprises

Guiding principles to achieve SCP

•How to arrange a common scope for the 3 techniques?



Life Cycle
Initiative



Towards a Life Cycle Sustainability Assessment

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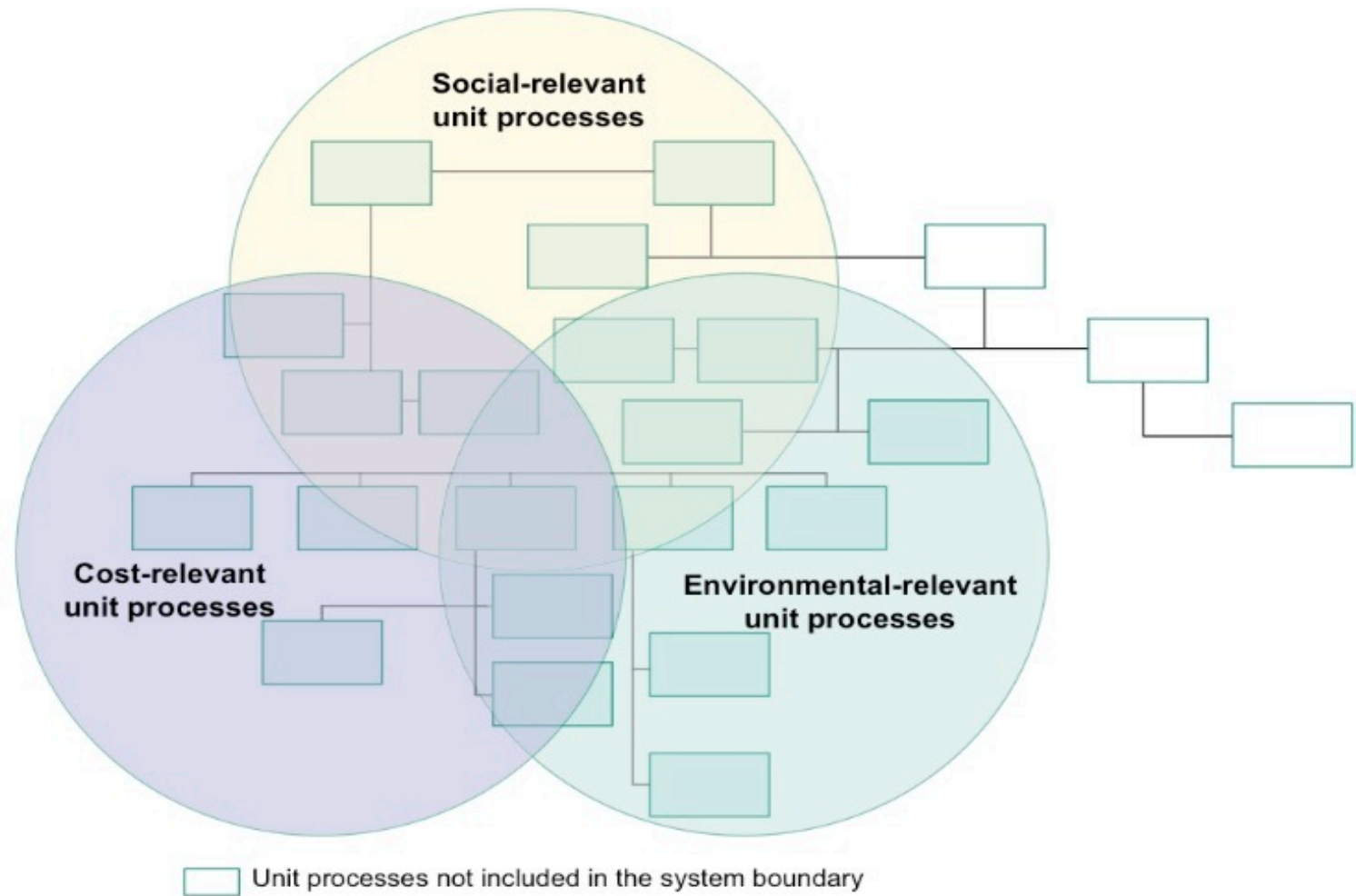
(Technological Federal University of Parana
and ACV Brasil)

**Reviewers: 20 stakeholders and
reviewers worldwide**

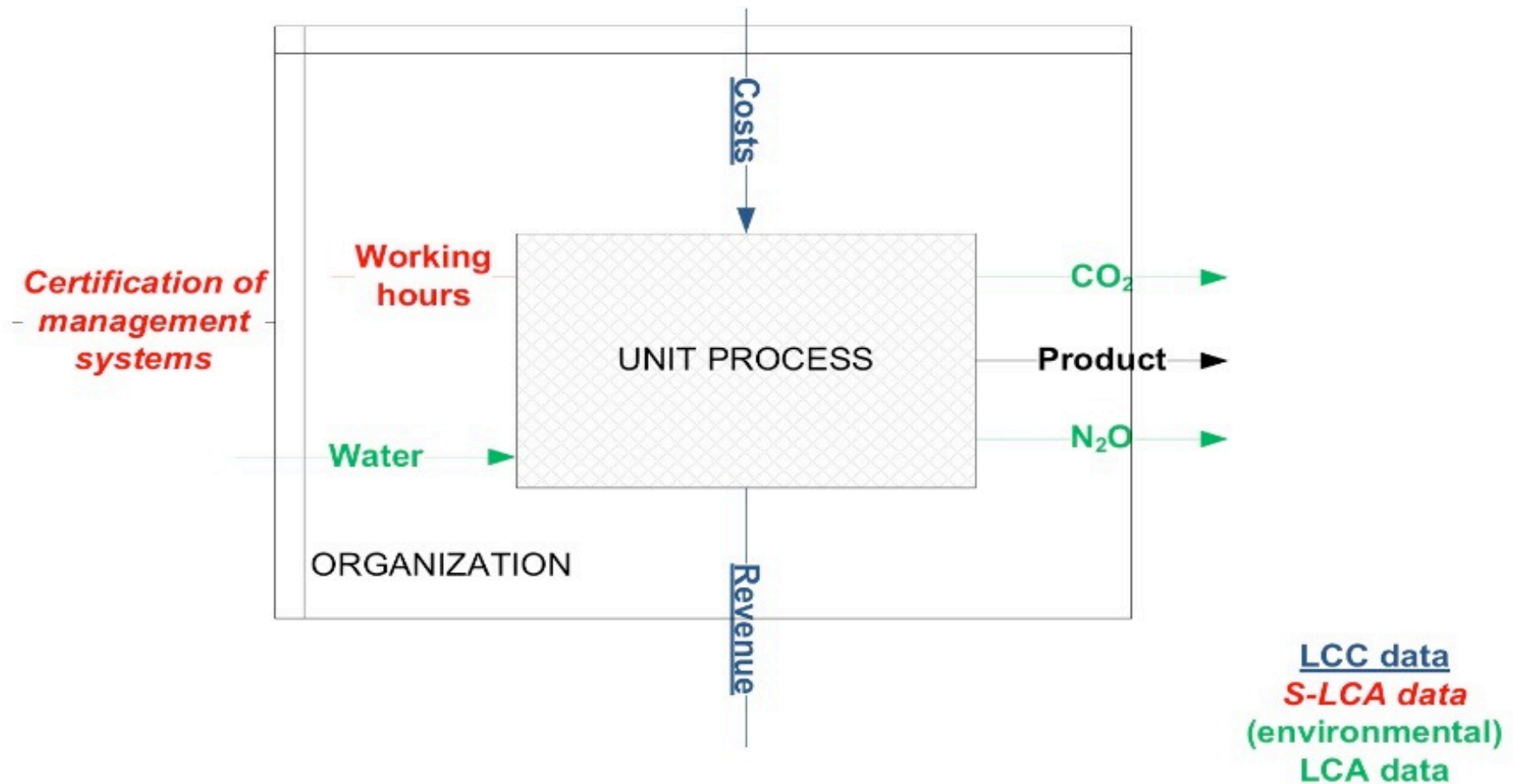
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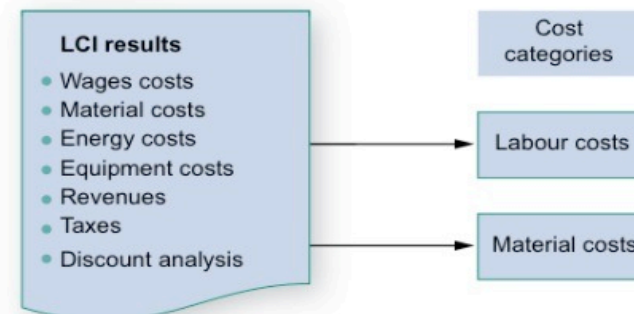
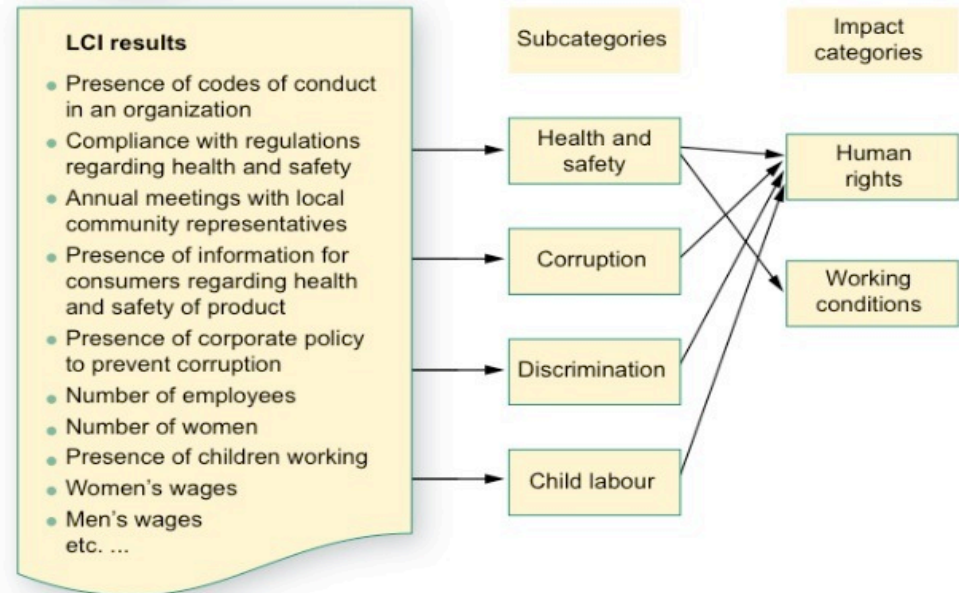
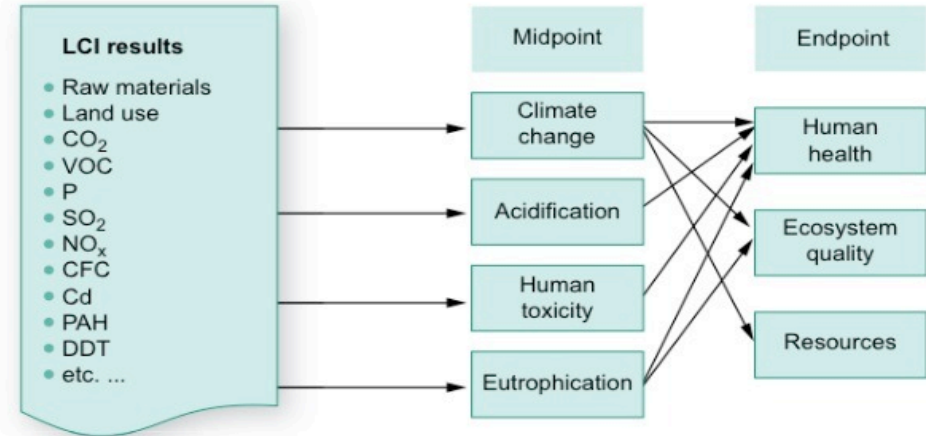
System boundaries



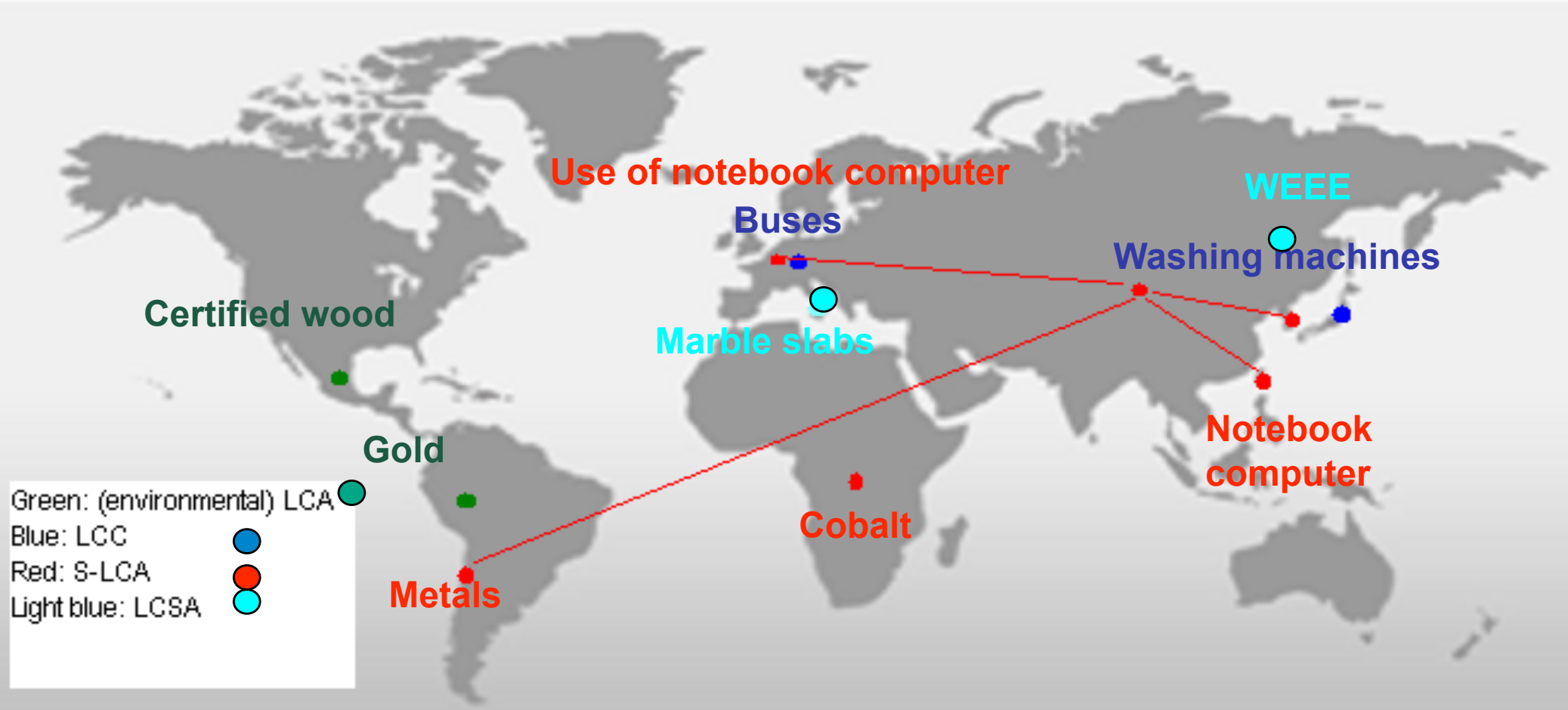
Data collection



Impact assessment



Examples



Marble case

(Environmental LCA data)		LCC							
SLCA		S01	S02	S03	S04	S06	S07	S08	S09
IND_NAME		Total number of employees	Female employees	Employees with unlimited contract	Employees with limited contract	Child labour	working hours	Wage for working hour	Workers with health insurance
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Bianco Carrara D		0	0		0	0			

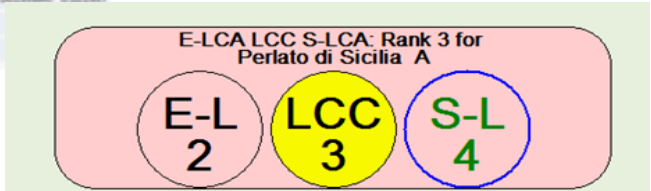
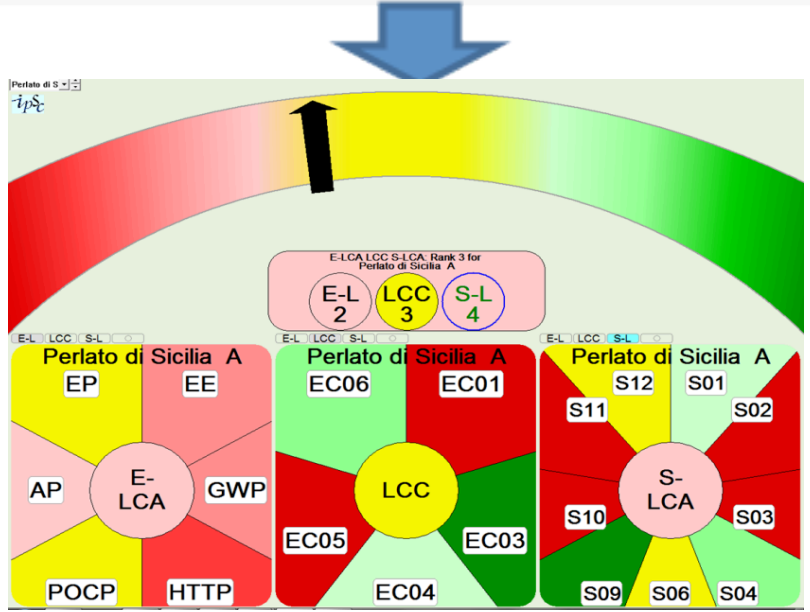
Hands on!

- Define few environmental LCA indicators and Life Cycle Costing indicators for a 'relevant communication' as functional unit

Presenting results

Inventory results

IND_NO	LCA						LCC						S-LCA							
	EE	GW	HTTP	POCP	AP	EP	EC05	EC03	EC04	EC06	EC01	S10	S09	S06	S04	S02	S03	S01		
Perlato di Sicilia marble	1224.35	186.51	0.93	0.03	0.75	0.07	251.02	18.58	0.51	39.17	412.59	0.0053	0.000154	0.000075	0.0000625	0	8.243077	0.000683	0.00076823	0.000768
Perlato di Sicilia marble	1470.52	257.49	1.01	0.0575	0.9774	0.0625	213.75	27.61	0.25	28.80	0	0.002780	0.000652	0.0018649	0	0.00	1.548227	0.000284	0.00094807	0.001987
Bianco Carrara marble	698.66	109.8	0.37	0.015	0.425	0.037	89	n.a.	1	2	590.00	0.00796	0.00017	0.0001228	0.00	0.00	0.00	0.00	0.00	0.00
Bianco Carrara marble	1414.77	57.4	0.96	0.025	0.789	0.098	20.00	n.a.	n.a.	0.96	590.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



Life Cycle Sustainability Dashboard was introduced by Traverso & Finkbeiner, (Traverso M. and Finkbeiner M., 2009. Life Cycle Sustainability Dashboard. Proceeding of the 4th International Conference on Life Cycle Management, 6-9 September 2009. Cape Town, South Africa)

Interpretation



Hands on!

- Where do you see the trade offs among the three sustainability pillars for the reference flows defined before?

Conclusions

It is **feasible** worldwide

It is NOT re-inventing the wheel



It is our contribution to the upcoming United Nation Conference on Sustainable Development Rio +20

What is next?

Applications

Develop technical expertise

Discuss LCSEA principles and criteria

Explore how to read the results of the LCSEAs for each technique

- Considering the 'trade-off' analysis
- Avoiding double counting

More research on the assessment of product utility and sustainability to avoid the unethical use of the tools

Address the perspective of the future generation

What is next?

Common understanding and consensus of the areas of protection (endpoints) within an LCSA

Software and databases businesses are asked to facilitate user friendlier and low cost techniques to promote more LCSAs

Provide more guidance and examples of stakeholder involvement in LCSAs and review processes

Validate a clearer communication format of LCSA results to decision-makers to support better informed choices on sustainable products

References and Bibliography

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Gracias!

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