

True Cost Accounting (TCA) for sustainable livestock production

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Introduction

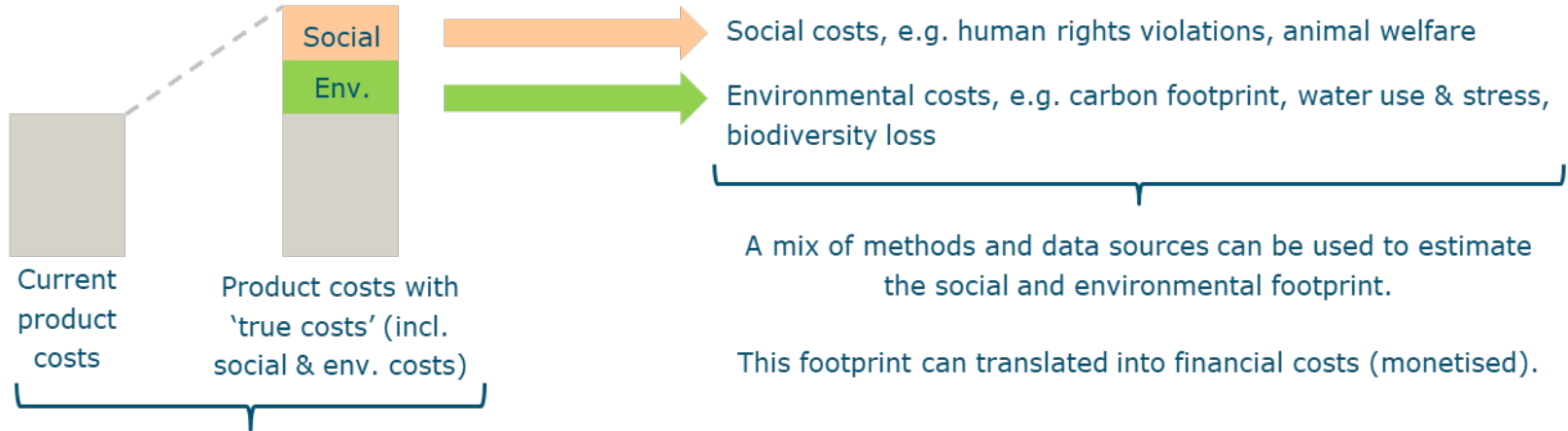
- Food systems are presently not sustainable;
 - UN Sustainability goals
 - See FAO state Food and Agriculture 2023
 - FOOD System Economics Commission: the true cost of food
 - EU: Farm to Fork
- Measuring sustainability is needed
- Aim: show the use of **TCA** for making **livestock production systems** more sustainable



TCA approach: goal and scope

- Goal : measure and value environmental, social and economic costs and benefits
- Scope: total supply chain / whole food system
- Principle is that additional (monetized) information about externalities will change behavior of decision makers for all actors in the supply chain (business actors, consumers, financial institutions and government).

TCA approach



TCA can be used in a B2B and B2C environment for internalising externalities to make food value chains more sustainable

TCA can be integrated into government policies to create appropriate conditions and incentives for sustainability

TCA Approach: externalities

Environmental	Social and human	Economic
Climate change	Labour rights and conditions	Income transfers
Acidification and eutrophication	Local community rights and wellbeing	Spillovers
Particulate matter	Equity	Effects on market and institutional structure
Water stress	Infectious diseases	
Land use and land transformation	Food safety	
Direct effects on biodiversity and ecosystems	Health effects of diets	
Toxicity	Food security	
Non-renewable resource depletion	Consumer rights	
Ozone and radiation	Animal welfare	
Noise, smell and visual disturbance		

TCA Approach: Pathways and indicators

- Relation between externalities and impact on nature and human health
- What indicators are a good proxy for the relation between the externality and human welfare e.g. CO2 equivalents for impact on climate change → nature and human health or DALYs for impact of diets on human health.
- Lot of literature for environmental capital, a bit on social capital and more or less nothing on economic capital.

TCA Approach: monetisation

- Monetisation is used to make impacts comparable. Basis is broad human welfare definition
- Three approaches:

Damage costs are the value people attach to negative externalities

Abatement costs are the marginal costs of reducing negative externalities.

Remediation costs focuses on negative effects of violations of legal requirements.

TCA approach: State of art

Steps in harmonisation:

- a. Economic perspective with social welfare theory
- b. Use damage costs or abatement costs **consistently**
- c. Use **consistently** economic monetization methodology (market prices or revealed preferences or stated preferences)
- d. No preferences how to deal with the future (depreciation or not)
Again: use it **consistently**

TCA : state of art; databases

- TCA needs a lot of data (22 externalities often > 1 indicator; for the whole supply chain).
- Especially for business decision making primary data are needed

We use:

- environmental LCA data bases,
- social LCA data bases
- data bases on costs of illness.

Still data gaps exists e.g. on indicators for animal welfare, ecosystems, biodiversity

Sustainable livestock

Capital	Impact compared to plant based products
Natural	Huge; Beef→ pork→ milk→ poultry On almost all indicators
Social and human	Negative due to overconsumption Animal welfare Risks of zoonoses & use of antibiotics
Economic	No literature available

Options to increase sustainability

Options	Expected impact from literature
Sustainable diet	Direct positive human health; indirect also less impact on natural capital with exception of scarce water use
Organic production	More of less same impact on natural capital; results sometimes positive sometimes negative Social capital positive Animal welfare, less use of antibiotics,
Circular economy	Positive impact on natural capital. Social and human: see impact of diet and organic.
Efficient production	Efficiency based on craftsmanship, and entrepreneurship goes in many cases hand in hand with economy on farm level and sustainability.
Cultured meat	Positive on natural capital if energy is sustainable, positive for social capital because far less animals are needed. No impact on diet (!/?)

Internalizing externalities

Actor	Measures
Government	Administrative based instruments (regulation, property rights, tradeable permits, quota) Market based instruments (taxes, charges, subsidies, certification and labelling)
Value chain actors	a. Product and process innovation in the value chain; b. Re-arranging the value chain c. Measurement and accreditation tools d. Consumers and market recognition and e. Innovative financing.

Discussion (1)

- Main advantage of using TCA compared to other tools:
 - broad application for natural, social& human en economic capital
 - its monetisation based on welfare theory → one unit!
 - Basis is an accounting process known in businesses
 - Good connection to cost-benefit analysis.
- Solution is needed for the huge data need. Especially if used at business level.

Discussion (2)

- It remains still unclear which (combination of) measures is the most effective and efficient to realise the transition towards a sustainable food system.
- Food prices may increase by the instruments that facilitate the internalization of externalities. But externalities also have a cost for society and money will be saved if they are reduced.
- TCA is not aiming for increasing all food prices but be a starting point for internalizing externalities e.g. in food labelling (see present EU initiatives Framework for Sustainable Food Systems)

Conclusions (1)

- TCA can be applied to measure sustainability of food products
- Still some harmonisation is needed and methodology is not complete at this moment.
- Primary data are needed e.g. for measuring impacts of different livestock production systems in EU.
- Livestock production does have a huge impact on sustainability not only on natural capital but also on social capital;
- Technical options are available to reduces these impacts on farm level but also interventions by governments and within supply chains can be expected;

Conclusions (2)

- Collaboration among scientific disciplines is needed to address the complexity of TCA. E.g. agronomists, veterinarians , environmental sciences and economists;

Questions ?

