



**INTELLECTUAL PROPERTY MODELS TO
ACCELERATE SUSTAINABILITY
TRANSITIONS
(IPACST)**

Sustainability Impact Assessment Knowledge Brief

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Sustainability Impact Assessment ‘need-to-know’ for researching sustainability transitions

1. Sustainability Impact Assessment

Sustainability Impact Assessment (SIA) is a field of impact assessment, where latter is defined as an evidence-based process to evaluate effectiveness of programs, activities processes or products. This knowledge brief explains concept, approaches and framework of SIA with organization, its products or processes as the subject of assessment.

SIA is a formal process of evaluating impact on sustainable development of organizations’ performance based on three pillars of sustainable development i.e. environment, social and economic¹. Integration of these three aspects of sustainable development differentiates SIA from other forms of impact assessment i.e. Environment Impact Assessment (EIA), Strategic Environment Assessment (SEA)² and others.

SIA can be performed *ex-ante* or *ex-post*. *Ex-ante* assessment evaluates sustainability potential of a proposed processes, product, project or technology, while *ex-post* assessment measures sustainability effects of already existing programs³. *Ex-post* assessment analyses how far the subject of assessment or unit of analysis achieved the results that it was intended to.

National and international commitments to address climate change and sustainability (such as Agenda 21⁴, Agenda 30) mandated business

organisations to adopt measures for cleaner production and pollution prevention. Companies, that realized reducing waste at source and increasing production efficiency benefits not only environment but also firm’s profitability, began to voluntarily adopt environment management systems like ISO 14001, ISO 14006, ISO 14064. These standards help organizations to track their environmental performance and take measures to mitigate negative impacts of their operations. Other companies adopt these standards as obligation attributing this to increase in public interest, awareness among consumers of environment challenges, and pressure from civil society (Azapagic and Pardan, 2000).

Notably, the sustainability concept not only involves environmental consideration but also includes societal and economic aspects. Organizations with sustainable business model inculcate sustainable mindset throughout organizations’ culture, process, and behaviour. Such organizations develop strategies, considering not only environment and health but society, community and the whole economy as well (Harmon and Auseklis, 2009).

SIA, like any other impact assessment processes, involves guiding principles and decision criteria that precedes implementation of formal assessment. Further, there are different approaches of SIA that may vary depending upon the subject of assessment (unit of analysis) i.e. for-profit organization, not-for-profit

¹ <http://www.oecd.org/greengrowth/48305527.pdf>

² <http://www.oecd.org/fr/env/ouverture/eapgreen-sea-and-eia.htm>

³ <https://www.sciencedirect.com/science/article/pii/S019592551630350X>

⁴ <https://sustainabledevelopment.un.org/outcomedocuments/agenda21>

organization, product or project level assessment etc. Next section discusses SIA guiding principles followed by different approaches adopted to assess sustainable performance of for-profit organizations. It is then followed by the framework adopted for SIA to measure sustainability transition of firms.

2. SIA guiding principles

Objective of SIA is not only to assess current performance of organizations for sustainable development but also to enable them to develop more sustainable policy, programs, strategies and action plans. SIA is guided by underlying principles popularly known as BellagiosSTAMP (Sustainability Assessment and Measurement Principles) developed in 1996 and revisited by Pinter, Hardi, Martinuzzi, and Hall (2012). These principles are as follows:

- A. *Guiding Vision*: A vision helps in assessing progress by defining direction of change.
- B. *Essential consideration*: It is important to consider a sustainable system as a whole by identifying its components (environment, social and economic) and most importantly, interlinkages between them.
- C. *Adequate scope*: Effective assessment involves valuation of both short-term and long-term effects of the unit of analysis. Scope in terms of longer time duration helps to capture ecosystem change and thus to build upon historic and current trend to anticipate future effects.
- D. *Framework and indicators*: A conceptual framework involves identification of suitable indicators to measure environment, social and economic effects of given activity and assess its' progress over time.
- E. *Transparency*: This principle involves explaining all concepts, choices, assumptions adopted for assessment and making data sources, methods, indicators and results accessible to public or all stakeholders.
- F. *Effective communication*: Effective communication involves fair and objective presentation of facts and information, innovative use of graphics and visuals to help interpretation and use of clear and easy language to convey story.
- G. *Continuity and capacity*: SIA need to be continuously reviewed and revised to account for emerging trends and indicators.

3. SIA Approaches

For SIA, unit of analysis varies from product, process, or service to the organization as a whole. Selection of suitable approach for SIA depends on various factors like: objective of assessment, priority and scope of assessment, and underlying assumptions among others.

Followings are different approaches of SIA for business organizations:

- A. *Sustainable Balanced Scorecard (SBSC)*: This approach is an extension of Balanced Scorecard (BSC) approach, a strategic management tool developed by Kaplan and Norton (1997). SBSC incorporates social and environment dimensions of sustainable development in BSC framework as strategically important but non-market aspects of business management (Figge, Hahn, Schaltegger, & Wagner, 2002).
- B. *Sustainability Assessment Model (SAM)* The SAM approach studies sustainable impact of project over its' life cycle by using Full Cost Accounting (FCA) of the project. It measures external impacts under four headings i.e. environment, social, economic and resource use. These externalities are then converted into financial terms (Cavanagh, Frame, & Lennox, 2006).
- C. *Benchmarking*: Benchmarking is the process of target-setting based on best-in-class practices and measuring organizations' performance against it (Altham 2007). This approach was developed by the Global Environment Management Initiative (GEMI) as a tool for continuous environment improvement. It involves setting up potential benchmarking target areas and their ranking based on importance, identifying best-in-class companies within the targeted areas, deciding levels of data collection, estimating

resource requirements, and forming benchmarking teams.

D. **Bottomline:** It is a software tool developed by Wiedmann, Lenzen, & Barrett (2009). It integrates input-output Life Cycle Cost Accounting (LCA) with the Triple Bottom Line (TBL) accounting framework to evaluate not only company's financial but also environment and social bottom-line across its supply-chain. This tool helps to capture direct, on-site immediate effect of a company along with indirect, off-site effects of their suppliers.

4. SIA framework and indicators for sustainability transitions

SIA framework given in Figure 1 indicates guiding principles, indicator-selection criteria, and indicators to measure sustainability impact over time. This framework adopts SAM approach and Global Reporting Initiative (GRI) guidelines for indicators' selection to measure impact over time.

Environment impact is measured in terms of impact of resource use, product and process efficiency, compliance and voluntary actions of organisation to minimize its negative impact on environment. Impact of resource use is measured at the local and global level. Local impact involves measurement of company's waste discharge and its' management approach, and consumption pattern of renewable and non-renewable resources. Global impact is measured by company's emissions of Green-House Gases (GHG), Ozone Depleting Substances (ODS), deforestation rate over time.

Environment efficiency is measured in terms of consumption intensity or resource efficiency (i.e. use of less resource per unit of output), and Reduce, Recycle and Reuse (3R) of materials. Basic indicators of a successful 3R are: reduced waste generation during operations, higher ratio of recycled material through waste exchange, reduced amount of industrial waste landfilled, and reduced cost of waste treatment and

disposal borne by the society (Hotta et al., 2016).



Figure 1. Sustainable Impact Assessment

Social impact of company's operation is measured in terms of its labour practices, collaboration and stakeholder engagement, community and society practices. Stakeholders refer to people or organizations who are not formally part of the organization themselves but can contribute to, or benefit from, the value that the organization brings to the table. Examples of stakeholders are civil society organizations, other businesses, business associations, interest groups, interest group associations, local communities, policy makers, consumers, consumer groups, political authorities, and government agencies. Stakeholder engagement is measured at four levels, namely, informing, consulting, involving, and co-creating (Interreg Alpine Space, 2017).

Economic indicators assess green value a company is creating from its operation for its stakeholders (value creation). The value creation could be in terms of increased stock price, insuring availability of capital and good brand value.

References

- Azapagic, A., & Perdan, S. (2000). Indicators of sustainable development for industry: a general framework. *Process Safety and Environmental Protection*, 78(4), 243-261.
- Harmon and Auseklis, 2009
- Pintér, L., Hardi, P., Martinuzzi, A., & Hall, J. (2012). Bellagio STAMP: Principles for sustainability assessment and measurement. *Ecological Indicators*, 17, 20-28.
- Kaplan, R. S. (2009). Conceptual foundations of the balanced scorecard. *Handbooks of management accounting research*, 3, 1253-1269.
- Figge, F., Hahn, T., Schaltegger, S., & Wagner, M. (2002). The sustainability balanced scorecard—linking sustainability management to business strategy. *Business Strategy and the Environment*, 11(5), 269-284.
- Cavanagh, J. A. E., Frame, B., & Lennox, J. (2006). The sustainability assessment model (SAM): measuring sustainable development performance. *Australasian Journal of Environmental Management*, 13(3), 142-145.
- Altham, W. (2007). Benchmarking to trigger cleaner production in small businesses: drycleaning case study. *Journal of Cleaner Production*, 15(8-9), 798-813.
- Wiedmann, T. O., Lenzen, M., & Barrett, J. R. (2009). Companies on the scale: comparing and benchmarking the sustainability performance of businesses. *Journal of Industrial Ecology*, 13(3), 361-383.
- Hotta, Y., Visvanathan, C., Kojima, M., & Pariatamby, A. (2016). Developing 3R policy indicators for Asia and the Pacific region: experience from Regional 3R Forum in Asia and the Pacific. *Journal of Material Cycles and Waste Management*, 18(1), 22-37.
- Interreg Alpine Space (2017). Guidelines for stakeholder analysis. Municipality of Maribor, E Institute Slovenia, https://www.alpine-space.eu/projects/greencycle/deliverables/d.t.1.2.3_guidelines-for-stakeholder-analysis.pdf