



# Exploring the Landscape of Contemporary Sustainability Philosophies: Origins, Synergies and Corporate Applications

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## Abstract

Recent decades have seen substantial increase in efforts to appease environmental challenges and to foster sustainability in business and society. As a direct result, numerous philosophies for sustainability have emerged, including Circular Economy, Sustainable Development Goals, Natural Capitalism, amongst many others. All of these are movements set to inspire, set goals, and guide towards improved sustainability performance, and as such, they can be described as a sustainability philosophy. Whilst each has its own origins and reason for emergence, plus its own target group(s), it is becoming increasingly difficult to tell the philosophies apart and, therefore understand their nuanced differences. The chosen philosophies influence strategies, tools, and initiatives chosen by organisations. Particularly when these are seen from a corporate perspective, it is often difficult to know which one(s) to adopt and how to relate a company's efforts to a particular sustainability philosophy. This study sets out to identify and review the current sustainability philosophies in an attempt to understand their origins, the similarities, and synergies between and across them and to identify gaps. By performing a systematic literature review divided into three phases, this study systematises fifteen sustainability philosophies based upon their key characteristics, such as the dominance and prevalence of sustainability dimensions, fulfilment of societal needs and integration of philosophy elements into company business processes. Additionally, it identifies patterns of geography, industry sector, and general application area to provide an overview and question the extent to which the philosophies can guide the transition to sustainability.

**Keywords** Sustainability philosophies · Systematic review · Sustainability origins · Sustainability applications

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## Introduction

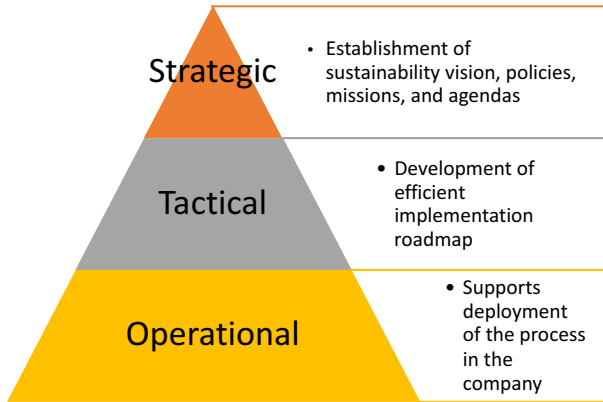
Global efforts to limit global warming below 2°C and achieve environmental sustainability have reached unprecedented levels [1]. These endeavours encompass a broad spectrum of activities, including: climate mitigation and adaptation strategies [2, 3]; the development of innovative digital technologies, such as big data analytics, cloud computing, and additive manufacturing [4]; business model innovation by changing the way organisations deliver and capture value [5, 6]; and the establishment of national pledges on emission reduction targets, such as the National Determine Contribution, which are countries' *self-determined national climate pledges under the Paris Agreement* [7]. These activities strive to enact a similar notion of sustainability, which is the balanced use of natural resources, adequate response to climate change, and focus on social justice [8]. Other studies define 'sustainability' as not increasing the concentration of human-made substances from Earth's crust and planet degradation by physical means [6] or achieving stability among economic activities, environmental preservation, and social goods provision [9]. As explained by [10], the definition of sustainability has changed over time and can also be different between and within cultures. However, the most common definition for sustainable development is meeting the needs of present generations without compromising the ability of future generations to meet their own needs from the Brundtland Report [11].

To support and achieve this definition in industry, myriads of strategies and philosophies exist. While sustainability strategies are comprised of activities deployed to achieve integral conservation of the environment and contribute to both long- and short-term human welfare [12], sustainability philosophies are emerging *schools of thoughts or movements* that strive to guide societies, governments, and organisations towards sustainable development. These inform regulators and consequently influence organisations [13]. Each philosophy possesses a sustainability vision and contains specific principles that must be integrated to achieve this vision. Examples of philosophies include The Natural Step (TNS), Circular Economy (CE), and the Sustainable Development Goals (SDGs).

Despite the broad availability and diversity of sustainability philosophies, the sustainability targets of companies and organisations still have not been met [1, 14]. One of the reasons is that the successful implementation of a sustainability philosophy requires a deeper level of understanding for the strategic implementation at all relevant corporate levels [6]. As explained by [15], decision-makers inside organisations are subject to different sustainability conceptions, resulting in different potential objectives for sustainability management. Additionally, these philosophies may conflict with each other, be applicable only to a limited extent, or present difficulties when systematising [16], hence it is necessary to provide an exhaustive assessment of what is available for managers and decision-makers and what influences the adoption of these philosophies [15].

This research addresses the hitherto scarce systematisation of existing sustainability philosophies, which has led to a limited understanding of their differences, similarities, strengths, and gaps concerning each other, as well as their potential application areas. Building upon previous research, [17–19] it is necessary to explore the use, application, and limitations of these philosophies [17–19]. Other researchers have also encouraged research on the processes of incorporating sustainability in different forms of organisations and their systems [20].

To understand how these philosophies are interpreted and used within any form of organisation, a typical organisational structure, as depicted in Fig. 1, can be employed. The three layers: strategic, tactical, and operational [21, 22] describe the levels and complexities within organisations, each of which have their own potentials and needs for interpretation. The strategic level builds the mission and vision of an organisation,



**Fig. 1** Organisational structure [21, 22] illustrated by the authors

as well as its organisational culture. As mentioned in the introduction, decision-makers are subject to different sustainability conceptions that may contradict each other. Additionally, there is no exhaustive assessment of what is available for managers [15]. Hence, this study focuses on those concepts integrated at the strategic level of an organisation, that consequently, influence the tactical and operational levels. The integration of these concepts translates into the development of strategies and activities to accomplish the mission and vision stated at the strategic level.

The first aim of this paper is to identify and categorise existing sustainability philosophies whilst shedding light on both consolidated and emerging philosophies. This paper provides a glimpse into existing sustainability philosophies, including their emergence, areas of application, and more. The study's second aim is to determine which societal needs the philosophies predominantly address, which sustainability pillars they emphasise, and how they are integrated into various aspects of business operations. Finally, the third aim is to describe the reviewed sustainability philosophies' orientation and application, with respect to relative vs. absolute sustainability goals.

This study contributes to the literature by providing an analysis of those concepts specific to strategic level of an organisation. The paper presents a wide range of sustainability philosophies, serving as a reference for decision-makers, academics, and practitioners curious to know more about current sustainability trajectories. Of particular interest in this study has been to understand how one particular type of organisation – namely industrial companies – can potentially gain from the systematisation of the studied sustainability philosophies, to achieve higher success with the implementation of their sustainability goals.

The paper is structured as follows: “[Research Methodology](#)” explains the research methodology. “[Results and Discussion](#)” provides an interpretation and discussion of the findings. “[Conclusion](#)” contains the conclusion, and “[Limitations](#)” includes the study's limitations.

## Research Methodology

This study was structured around a Systematic Literature Review (SLR), following the standard protocol of [23], to consolidate and systematise existing sustainability philosophies. The SLR was divided into three phases: (1) planning of the review process; (2) execution of the

SLR; and (3) analysis of results. The SLR was guided by the following research question: “How do the existing sustainability philosophies support corporate sustainability strategies?”

During step (1), the authors defined a *sustainability philosophy*, which is a concept or movement that has emerged in society to assist the successful achievement of sustainable development. Sustainability philosophies are often adopted at the strategic level of an organisation, where the mission, values, and organisational culture are built [24]. The term *philosophy* was chosen as a meta-abstraction of the identified approaches to sustainability, and characterised as possessing principles, which are fundamental bases for decision-making or behaviour regarding sustainability [25], and where the principles serve as building blocks that must be respected for successful sustainability integration.

For the phase (2), literature on defining organisational sustainability, strategic planning, and corporate sustainability strategy was studied [20, 26–28]. This phase consisted of two search strings, detailed in “[First Search String](#)” and “[Second Search String](#)”.

### First Search String

To identify the state-of-the-art of sustainability philosophies, the review included the most representative keywords associated with sustainability at a corporate level. The first refined search string (Fig. 2) was used in the Scopus database, due to its high relevance to the sustainability field. To ensure a broad yield from the search (also including new and emerging sustainability philosophies) journal articles, conference papers, book chapters and books from any year up to 2023, were considered. The search excluded articles solely focused on practices, strategies, actions, monitoring or benchmarking tools, certifications, and standards (such as ISO, GRI, Global Compact, and EMS) without any link to a philosophy.

The initial search string resulted in 5213 studies, which consisted of general terms and keywords to identify as many philosophies as possible, irrespective of the year, disciplines, and regions. Studies on practices, strategies, actions, and tools that are not based on a philosophy or do not indicate the integration of such were excluded. Additionally, studies that were part of strict disciplines, and where the focus was not on sustainable development, were not included. Exclusion criteria were effectuated via subsequent filters: Filter 1 consisted of reading the titles; Filter 2 the abstracts; and Filter 3 the introduction and conclusion. Whenever necessary, the full text was read (Table 1). As a result, 90 articles were selected, of which 19 potential philosophies were identified. The articles complied with the inclusion criteria of: (1) describing a sustainability philosophy; and (2) targeting a company or organisation regardless of sector. All data were recorded in a spreadsheet (see Supplementary Material). Appendix B contains the data for each of the aspects.

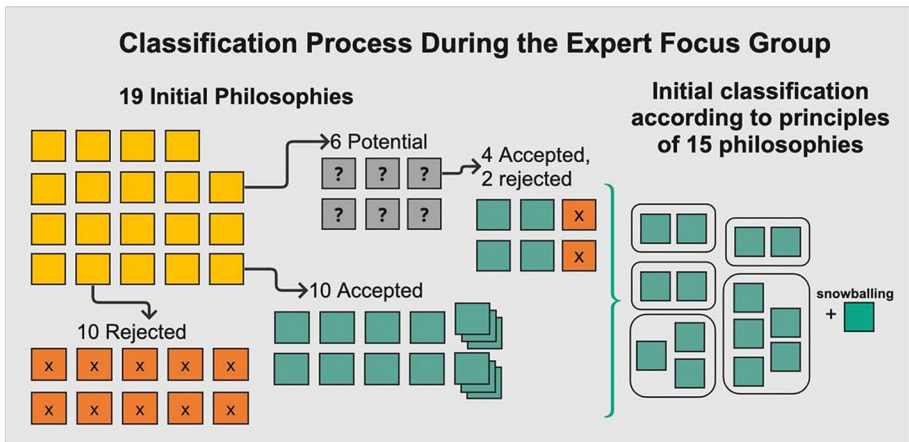
#### Search String:

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(( (( TITLE ( ( sustainab* OR degrowth OR sufficiency OR "triple bottom line" ) ) AND
TITLE ( compan* OR industr* OR firm* OR business* OR sector* OR organi?ation* OR
corporat* OR management OR leader* OR "decision-making" OR strateg* ) AND TITLE-
ABS-KEY ( philosoph* OR program* OR method* OR mechanism* OR initiative* OR
agreement* OR narrative* OR approach* OR action* OR practic* OR concept* OR
framework ) AND ALL ( manuf* OR product* ) ) ) ) ) )
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**Fig. 2** Initial Search String for Systematic Literature Review

**Table 1** Systematic Literature Review Process

Systemic Literature Review Process		
☑	<b>Inclusion Criteria for SLR #1:</b> 1) Description of sustainability philosophies. 2) Targeted at the company or organisational level. 3) Strategic integration of a philosophy. 4) In English or Spanish.	<b>For SLR #2:</b> 5) Most cited and most recent. 6) Contains the name of the philosophy in the title.
☒	<b>Exclusion Criteria:</b> 1) Publications from disciplines outside the main field of study, such as mathematics, medicine, veterinary sciences, and psychology. 2) Focus on tools and methods.	
⌋	<b>Filters:</b> F1: Titles F2: Abstracts	F3: Introduction and Conclusion F4: Full Body



**Fig. 3** Classification process of the philosophies

After the preliminary identification of sustainability philosophies, an expert focus group was held to consolidate the identified sustainability philosophies. During this meeting, some of the identified philosophies were merged (e.g., Circular Economy includes both the Sharing Economy and the Bioeconomy [29]). In contrast, others were considered to be initiatives (such as the Science Based Target Initiatives [30–32], or methods such as the Corporate Social Responsibility [17, 33]—the final list comprised ten accepted and six potential philosophies. Lastly, potential philosophies that did not arise in the SLR were listed. The process is illustrated in Fig. 3.

Search Strings:

Option 1: (TITLE (“Philosophy Name”) AND ABS (defin\*))  
OR  
Option 2: (TITLE (“Philosophy Name”) AND (compan\* OR business\* OR industr\* OR organi?ation\* OR enterpris\* OR corporat\*))

**Fig. 4** Second Search String

## Second Search String

To enable the identification of more in-depth information about these six potential philosophies, specific search strings were defined (see Fig. 4). The studies selected had to comply with being the (1) most cited, (2) most recent, (3) defining the philosophies, and (4) containing the name of the philosophy in the title. These strict criteria were chosen to obtain a piece of consistent and similar information among all philosophies. This second review resulted in 87 studies, which, after applying the defined exclusion criteria, resulted in 64 articles. Two philosophies were deleted from the list of six potential philosophies (i.e., Zero Emissions and Earth Charter) and one more, Foundational Economics, was identified through snowballing.

## Data Analysis

The third phase (3) result analysis consisted of classifying the philosophies based on three main categories: (a) sustainability pillars; (b) societal needs; and (c) business processes.

**Table 2** Three Pillars

A. Environmental sustainability aspects [34, pp42-47]	
<b>Pollution prevention</b>	<p>An organisation can improve its environmental performance by preventing:</p> <ul style="list-style-type: none"> <li>• Emissions to air</li> <li>• Discharges to water</li> <li>• Waste management</li> <li>• Use and disposal of toxic and hazardous chemicals, other identifiable forms of pollution</li> </ul>
<b>Sustainable resource use</b>	<p>An organisation can improve efficiency by:</p> <ul style="list-style-type: none"> <li>• Energy efficiency</li> <li>• Water conservation</li> <li>• Use and access to water</li> <li>• Materials use efficiency</li> <li>• Minimise resource requirements of a product</li> </ul>
<b>Climate change mitigation and adaptation</b>	<p>Every organisation emits GHG emissions directly or indirectly; therefore, it can minimise emissions and plan for a climate change adaptation. For mitigation, organisations should:</p> <ul style="list-style-type: none"> <li>• Identify sources of direct and direct GHG emissions</li> <li>• Measure, record, and report them</li> <li>• Implement measures to reduce and minimise them</li> <li>• Prevent or reduce the release of GHG emissions</li> <li>• Realise energy saving wherever possible</li> </ul>
	<p>For adaptation, organisations should:</p> <ul style="list-style-type: none"> <li>• Implement measures to respond to existing or anticipated impacts</li> <li>• Consider future global and local climate projections</li> <li>• Identify opportunities to avoid or minimise damages</li> </ul>
<b>Protection of the environment, biodiversity, and restoration of natural habitats</b>	<p>An organisation can be more socially responsible by</p> <ul style="list-style-type: none"> <li>• Valuing and protecting biodiversity</li> <li>• Valuing, protecting, and restoring ecosystem services</li> <li>• Using land and natural resources sustainably</li> <li>• Advancing environmentally sound urban and rural development</li> </ul>

(a) Sustainability pillars

Sustainability is regularly explained as being a combination of three pillars: environmental, social, and economic, as further detailed in Table 2. For the environmental and social pillars, we chose the widely used core subject areas for ISO 26000 [34]. For the economic pillar, instead of examining aspects like liquidity, profitability, and other

Table 2 (continued)

B. Social sustainability aspects [34, p19]	
<b>Organisational governance</b>	Decisions are to be made considering society’s expectations. Accountability, transparency, ethics, and stakeholders should be factors in the organisation’s decision-making process.
<b>Human rights</b>	All humans have the right to fair treatment and the elimination of discrimination, torture, and exploitation: <ul style="list-style-type: none"> <li>• Due diligence</li> <li>• Human rights risk situations</li> <li>• Avoidance of complicity</li> <li>• Resolving grievances</li> <li>• Discrimination and vulnerable groups</li> <li>• Civil and political rights</li> <li>• Economic, social, and cultural rights</li> <li>• Fundamental principles and rights at work</li> </ul>
<b>Labour practices</b>	Those working on behalf of the organisation are not a commodity. The goal is to prevent unfair competition based on exploitation and abuse: <ul style="list-style-type: none"> <li>• Employment and employment relationships</li> <li>• Conditions of work and social protection</li> <li>• Social dialogue</li> <li>• Health and safety at work</li> <li>• Human development and training in the workplace</li> </ul>
<b>Fair operating spaces</b>	Building systems of fair competition, preventing corruption, encouraging fair competition, and promoting the reliability of fair business practices help to build sustainable social systems: <ul style="list-style-type: none"> <li>• Anti-corruption</li> <li>• Responsible political involvement</li> <li>• Fair competition</li> <li>• Promoting social responsibility in the value chain</li> <li>• Respect for property rights</li> </ul>
<b>Consumer issues</b>	The organisation's responsibility is to promote just, sustainable, and equitable economic and social development for consumer health, safety, and access: <ul style="list-style-type: none"> <li>• Fair marketing, factual and unbiased information, and fair contractual practices</li> <li>• Protecting consumers’ health and safety</li> <li>• Sustainable consumption</li> <li>• Education and awareness</li> <li>• Consumer service, support, and complaint and dispute resolution</li> <li>• Consumer data protection and privacy</li> <li>• Access to essential services</li> </ul>
<b>Community involvement and development</b>	The organisation should be involved in creating sustainable social structures where increasing levels of education and well-being can exist: <ul style="list-style-type: none"> <li>• Community involvement</li> <li>• Education and culture</li> <li>• Employment creation and skills development</li> <li>• Technology development and access</li> <li>• Wealth and income creation</li> <li>• Health</li> <li>• Social investment</li> </ul>

Table 2 (continued)








C. Economic sustainability aspects [24, p84]	
<b>Innovation and Technology</b>	Efforts made in sustainability-related R&D to reduce the environmental impacts of new products and business activities. Use Best Available Techniques and integrated environmental technologies, concentrating on cleaner production and zero-emission technologies.
<b>Collaboration</b>	Good cooperation and active collaboration with various partners (e.g., suppliers, R&D institutions, universities). Working in shared programmes and networks on the development of innovative products and technologies. Exchange of information and knowledge.
<b>Knowledge Management</b>	Activities and approaches that keep knowledge related to sustainability in the organisation. Methods to plan, develop, organise, maintain, transfer, apply and measure specific knowledge and improve the organisational knowledge base
<b>Process</b>	Clear processes and roles are defined so that business activities are efficiently conducted, and employees know what the organisation expects from them (also for sustainability). Process management adaptation to achieve sustainability necessitates the systematic implementation of corporate sustainability. Integration of sustainability into daily business life.
<b>Purchase</b>	Consideration of issues related to sustainability in purchasing. Awareness and consideration of issues related to sustainability in the organisation, as well as throughout the supply chain. Relationships with suppliers, with a focus also placed on sustainability.
<b>Sustainability Reporting</b>	Inclusion of issues related to sustainability in company reports, either in individual sustainability reports or integrated in corporate reports.

financial benefits, this study chose to embrace other relevant aspects for corporate sustainability following the framework of [24].

#### (b) Societal needs

This study examined the seven societal needs of [1] (see Table 3), whose authors state examined the global resource and emissions footprint behind meeting key societal

Table 3 Seven Societal Needs [1]

	<b>Communication:</b> Includes equipment and technology ranging from mobile devices to data centres.		<b>Nutrition:</b> Includes agricultural products such as crops and livestock.
	<b>Housing:</b> Includes construction and maintenance of residential houses.		<b>Services:</b> These include education, public services, and commercial services like banking and insurance.
	<b>Healthcare:</b> Includes capital equipment such as x-ray machines, pharmaceuticals, hospital outfitting, disposables, and homecare equipment.		<b>Mobility:</b> Includes materials to build transport technologies and vehicles like cars, trains, and aeroplanes.
	<b>Consumables:</b> Includes refrigerators, clothing, cleaning agents and paints, textiles, synthetic materials like polyester, dye pigments, and chemicals.		



needs. Understanding societal needs is essential to obtain a complete view of what the extraction of natural resources ultimately provides, which comes into embodied goods and services, ultimately satisfying societal needs. For this reason, this study examined the connection between the 15 sustainability philosophies and the seven societal needs.

(c) Business processes

The final category in the study covered Business Processes (BPs), as listed in Table 4. Changes in business processes within an organisation broadly affect transformation; therefore, it is crucial to see where change is being created the most [35]. This study used the various business processes affected when strategies and tools connected to the implementation of a philosophy [36]. For a more granular assessment, this study includes the “Supply chain”, “Research & Development (R&D)”, and “Marketing” processes.

## Results and Discussion

Sustainability has taken different forms through multiple discourses influenced by historical events and conceptions about nature, resources, and well-being. These, in turn, become principles and shape a sustainable societal vision by those who disseminate the philosophy.

The study revealed 15 sustainability philosophies, which were subsequently systematised. Table 5 provides a brief description of each philosophy, listed alphabetically. Appendix D contains a list of associations, policies, and partnerships connected to each philosophy.

**Table 4** Business process categories and respective aspects

Business model [37]	Logic with which the business explores value creation, capture, and delivery opportunities for all its stakeholders through its entire value network
Production and operations [37]	Manufacturing of goods involves sourcing materials, material processing, component manufacture, product assembly, packaging, and logistics
Product development [37]	Design of products and supporting services, including material selection, product architecture, assembly processes, and planning sales
After-sale services [37]	Services that offer operating, upgrading, repairing, and maintenance of products
End-of-Life (EoL) operations [37]	Management of a product at the end of its use cycle (reuse, remanufacturing, refurbishing, repurposing) or at the end of its life (recycling, energy recovery, or nutrient recovery)
Supply chain [38]	Consists of the sourcing of raw materials and ends with the use of the product by the final customer
Marketing [39]	Process that establishes and maintains an ongoing relationship with customers
Research and development [40]	Responsible department for directing research on new product development, processes, and technologies

**Table 5** Identified philosophies with acronyms and descriptions

Philosophy Name	Acronym	Description
Absolute Sustainability	AS	Encourages governments and industries to reduce their environmental sustainability activities in absolute terms and with this benchmark such activities [11]
Blue Economy	BE	Complements the Green Economy (GE) by calling for better coordination of management across scales and time and protecting oceans' cultural and natural integrity [41]
Circular Economy	CE	Envisions a self-regenerating economy [42], where resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops [43, 44]
Conscious Capitalism	CC	Targets scholars and practitioners to (1) lead organisations beyond profit maximisation, (2) manage for the benefit of all ecosystem stakeholders, (3) to be led by spiritually evolved and self-effacing servant leaders [45–47]
Degrowth	DET	Promotes increasing human well-being, reducing inequality, enhancing ecologic conditions, and bringing the economy into balance with the living worlds [48, 49]
Doughnut Economics	DE	Envisions a society that operates between the social dimensions of the Sustainable Development Goals (SDGs) and the PB's ecological dimensions [50]
Foundational Economics	FE	Focuses on the part of the economy that supports everyday life by creating goods and services consumed by all [51]
Green Economy	GE	Promotes committing to (1) low carbon, (2) resource efficiency, and (3) socially inclusive by both fostering development and economic growth and ensuring natural assets continue to provide the services and resources our society depends on [52]
Natural Capitalism	NC	Envisions the possibility of a new industrial system with different values compared to traditional capitalism [53]
Solidarity Economy	SSE	Promotes economic redistribution to reduce inequalities and combat poverty through the implementation of both state policies and market mechanisms [54, 55]
Sufficiency Economy	SuE	Aims to achieve a balance between profitability and ethical considerations society [49]
Sustainable Development Goals	SDGs	Presents 17 goals to be addressed internationally, to achieve sustainable societal growth [44, 56], whilst safeguarding the environment, conserving natural resources, and improving humanity's living conditions [57]
Triple Bottom Line	TBL	Organisations act sustainably through the holistic implementation of (1) consuming natural resources that can be reproduced from nature, (2) preserving and developing human and social capital of communities, and (3) creating value and balancing costs in the production and distribution of goods and services [4]
The Natural Step	TNS	Provides a strategic approach by determining boundary conditions within which society can continue to function and evolve [58]
Planetary Boundaries	PB	Proposes a set of eight safe and just Earth system boundaries that govern the Earth system and are necessary to maintain its resilience and stability [59, 60]

## Description of Philosophies

### Absolute Sustainability (AS)

Introduced by Bjørn and Hauschild in 2013 for product assessments [61]. This philosophy has recently more precisely been described as Absolute Environmental Sustainability (AES) [32, 62], delimiting the scope of current achievements to the environmental focus. AS is the maximum sustained environmental intervention a natural system can resist without experiencing negative changes in its structure or function, which would otherwise be difficult or impossible to reverse [11]. AS strives to make advancements to respect the planetary boundaries (PB) more operational. The principles are: (1) all human activities and actors their total environmental impact collectively should stay within Earth's safe operating space (SOS); (2) to avoid this exceedance whilst making operational for a company, the share of the carrying capacity of the SOS can be either to an individual company or sector; (3) the carrying capacities must be comprehensive and consider all potential environmental issues relevant for sustainability, both biotic and abiotic resources. One limitation of AS regards meeting principle (2) since various allocation principles can be used. The Science Based Targets Initiative is one initiative that was created to support companies in these calculations, to set reduction targets aligned with the latest climate science. The biggest barrier encountered with such calculations is incorporating the so-called "Scope 3 emissions" (from up- and downstream actors in the value chain) into their assessments [63].

### Blue Economy (BE)

The BE emerged to complement the Green Economy (GE) during Rio+20's Green Economy theme in 2012 by calling for ocean governance through the sustainable use of ocean resources, the better coordination of management across scales and time, and the protection of oceans' cultural and natural integrity [41]. BE reiterates the importance of sustainable use of ocean resources for economic growth without harming the health of marine ecosystems [64]. The author explains that the ocean should be seen as natural capital, livelihoods, good business, and a driver for innovation. Its five components are: ecosystem resilience; economic sustainability; community engagement; institutional integration; and technical capacity [41]. According to [65, 66], it is a platform for participatory, integrated, and strategic coastal and ocean development and protection that promotes a low-carbon economy, ecosystem approach and human well-being by advancing regional industries, services, and activities. The vision for BE includes maintaining a healthy marine and land ecosystem, solving pollution such as marine transport waste, plastic litter, and microplastic, mitigating the global change effects, and constructing a sustainable blue economy management model based on maintaining a healthy ecosystem [67]. BE targets the aquaculture, fishing, tourism, and mining sectors, especially for implementing national policies and building associations & alliances [68, 69]. It has a significant potential to reduce GHG emissions and mitigate climate change impacts, and community development projects have focused more on economic viability, ecological sustainability, and technological innovation, leaving the social equity aspect somewhat behind [70]. Additionally, carbon sequestration amounts and rates need more quantification (ibid). Nevertheless, BE risks being poorly developed if (1) highly polluted developments continue to undermine human rights and healthy oceans, (2) agreements between international or multilateral institutions did give sufficient attention to social sustainability and social equity, (3) private sector is not committed to upholding

human rights and improving social conditions by ensuring transparency and accountability, and lastly (4) strategies, development models, and opportunities do not involve women, small-scale fishers, coastal communities, and others [71].

### **Circular Economy (CE)**

As the most persistently prominent voice, the Ellen MacArthur Foundation disseminated CE in 2013, redefining growth by decoupling economic growth from the consumption of Earth's finite resources [72]. However, its principle of using waste as a resource can be traced back to Simmonds in 1862 [73], before later developing into the concept of cradle-to-cradle [11]. The three main principles of CE are: (1) designing out waste and pollution; (2) keeping products and materials in use; and (3) regenerating natural systems [74, 75]. These new models should focus on restoring the value of used resources [76]. It envisions a self-regenerating economy [42] in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops [43, 44, 77]. The transition towards this new economy requires developing new production and consumption models and involving stakeholders at all levels [78]. According to this study, sectors most actively implementing CE include automotive manufacturers; textiles & apparel; plastics; and others [5, 72, 78]. Findings show that, in essence, CE prioritises the environmental and economic sustainability pillars [75]. Other studies found a low share of reports addressing the social dimension when implementing CE [78]. Additionally, for CE to be successful, global demand for products should be stabilised, which contradicts our growth-driven economic system [79].

### **Conscious Capitalism (CC)**

CC was disseminated by John Mackey, the founder of the U.S. multinational supermarket chain Whole Foods Supermarket [46, 80]. With its principles, it encourages organisations to give meaning to their work [47]. Its principles were structured through the Conscious Capitalism Institute at Bentley University in Boston [80]. According to [80], it is oriented towards the fullest extent of the development of human virtue in all its forms. Everyone should be able to: enjoy a reasonable level of well-being; establish organisational conditions that allow human freedom, justice, and solidarity; experience that human dignity and human rights are socio-cultural values shared in a community; and actively respect the environmental conditions that help maintain appropriate living conditions for present and future generations (ibid). CC's principles guide companies towards *progressive business practices by stressing the profit-making potential of responsible, ethical, and sustainable corporate behavior* [81, 45–47]. Other studies (4) that ethics, social responsibility, and sustainability practices are ethically integrated into their core business strategies [82]. Some well-known companies incorporating CC include Southwest Airlines; Google; Costco; Nordstrom; UPS (ibid); Disney; and Patagonia [47].

### **Degrowth (DET)**

'The Limits to Growth', a 1972 report by the Club of Rome, a nonprofit informal organisation, warned that Earth's resources will not be able to sustain our old, current rates of

economic and population growth [83]. During the same decade, the notion of growth became criticised, and other alternatives were discussed. DET presents itself as a socio-economic alternative to our traditional economic system [48] and promotes a planned economic contraction by an equitable downscaling of production and consumption to increase human well-being, reduce inequality, enhance ecological conditions, and bring the economy into balance with the living worlds [48, 49]. DET requires both a change in economic practice, a reorientation of social values, and prioritising shared goals over individual profit. On the social side, it requires not only focusing on restructuring the economy away from a capitalist focus on profitability and economic growth, but also on reorientating values, relationships, and livelihood practices [84]. According to [64, 85] the three key elements are: i) enabling greater efficiency and access; ii) decentralising and disrupting the established economic structure; and iii) empowering citizens and communities [49]. DET has gained momentum in recent years, especially after the first international degrowth conference in Paris 2008 [86]. However, it requires shifting to other forms of business models like cooperatives and being careful with the application scale. The author of [85] explained during a conversation that DET strategies risk collapsing into traditional business systems when applied in large-scale applications. This can occur when these strategies are implemented by for-profit organisations for egalitarian purposes only [85].

### Doughnut Economics (DE)

Developed by Kate Raworth in 2012 and later reviewed in 2017, DE emerged as a new economic mindset tailored for the twenty-first century and its challenges, since it holistically considers a combination of the planetary boundaries and societal needs [87]. In 2019 the Doughnut Economics Action Lab was founded to put DE ideas into practice [88]. DE envisions a society that operates within “safe and just space”, where people’s basic needs are met, using twelve social dimensions that derive from the SDGs and within the means of the planet, nine ecological dimensions that derive from the PB [50, 62, 89–93]. Some criticisms of DE include the other philosophies it is based upon, which consequently create social and ecological ceilings. For instance, CE’s regenerative economy should be one of the elements for businesses to enter the doughnut, not the sole way [94]. For the successful integration of DE, drastic changes to our economic system must occur; similar to other philosophies, it will require shifting from a profit-making mindset [94]. This results in uncertainties since no country has met all societal needs withing ecological boundaries [94].

### Foundational Economics or Everyday Economy (FE)

First outlined in 2013, FE *focuses on the part of the economy that creates and distributes goods and services consumed by all (regardless of income and status) because they support everyday life* [51, p171]. Examples of such goods and services include general infrastructure (roads, cables, broadband), banking, food production, agriculture, tourism, energy, systems, sewage systems and welfare services like health, elderly care, and education [51, 95]. Examples of such goods and services include general infrastructure (such as roads, cables, broadband); banking; food production; agriculture; tourism; energy systems; sewage systems; and welfare services (such as health, elderly care, and education) [51, 95]. According to [97, p68], during post-World War II, the classic model was to build an export-oriented basic economy of primary activities, such as the automotive industry,

which supported secondary service activities related to local consumption. Later, in 1955, society opposed this view and reiterated that essential services cannot be substituted (ibid). The sectors addressed by the FE are characterised by low wages, precarious forms of employment, poor labour conditions, poor regulations, and inappropriate business models. These sectors are overlooked when measuring the economy. For this reason, a group of researchers from the University of Manchester is looking to explore ways to regulate and improve the provision of these foundational services [51]. FE's principles are: (1) shifting from exogenous to foundational sectors; (2) providing access and quality foundational services to everyone; (3) ensuring good working conditions for everyone; and (4) focusing on economic development policy on foundational activities [51]. Despite having strong social foundations and acknowledging environmental aspects, the literature did not explicitly show the consideration of this aspect in the FE principles.

### Green Economy (GE)

The outcome of the 1992 UNCED Earth Summit was that we must fundamentally change our consumption and production patterns. Later, in 2012, at the UNCTAD, the Green Economy became the theme pursued by the OECD, the EU, and other nations [97]. However, it was first mentioned by Pearce et al. in 1989 due to *the undervaluation of environmental and social costs in the current price system* [52, p362]. GE depicts a transformation of the economic development model [67]. The three principles of GE are committing to: (1) low carbon; (2) resource efficiency; and (3) socially inclusive, by both fostering development and economic growth and ensuring natural assets continue to provide the services and resources our society relies on [52]. It is also known as the green transformation. This entails the “*greening*” of the whole [product] cycle, where manufacturing companies are resource-saving and environmentally friendly, with a focus on resource conservation, reducing emissions, improving efficiency, and pursuing the harmonisation of environmental and economic benefits [99, p1]. It encompasses growth and environmental concerns [69] and employment generation [42]. Some researchers argue it is often linked only to concepts such as energy efficiency or pollution control, which do not require profound societal transformation [52]. From the evidence in the literature, GE is used mainly by the manufacturing industry [98]. Despite strongly promoting GE as a means for sustainable growth during the 1992 UNCED summit, no references were made to integrate monitoring and accounting systems and remove economic incentives; moreover, it was not catalysed or accelerated after this event [99].

### Natural Capitalism (NC)

NC was first documented in 1999 by [100] in a book by the same name. Strongly linked to the notion of ecosystem services [101], it envisions the possibility of a new industrial system with different values compared to traditional capitalism [53]. NC seeks to define and describe a means to connect human institutions, including businesses, within the flow of natural cycles, including ecosystem services, whilst still following a market-based system of production and consumption if all forms of capital (human, financial, manufactured, and natural) are valued [102]. It promotes integrating the well-being of global ecosystems and long-term quality of life for everyone (ibid). It promotes: (1) increasing the productivity of natural resources; (2) shifting to biologically inspired production models; (3) moving to a

solutions-based business model; (4) reinvesting in natural capital; and (5) adopting innovative technologies [100, 103]. The Capitals Coalition, which contains the Natural Capital Protocol Coalition and the Social & Human Capital Protocol, was developed as a unique collaborative effort between 38 organisations [104]. It emerged as a decision-making framework to support organisations in identifying, measuring, and valuing their direct and indirect impacts and dependencies on natural capital (ibid). Presently, it is chiefly used by pharmaceutical companies, construction companies, automotive companies, and the tourism sector [102, 104].

### Planetary Boundaries (PB)

The PB is a bottom-up approach developed by Rockström in 2009 from the Stockholm Resilience Centre [11]. In 2023, Rockström et al. updated the framework and proposed a set of eight safe and just Earth system boundaries that govern the Earth system in the Anthropocene period [62]. These are necessary to maintain the resilience and stability of the Earth system [59, 60]. The PB key argument is the existence of tipping points, which regulate the planet's functioning state, where small perturbations can trigger self-reinforcing changes that undermine the resilience of the Earth system [60]. At the time of writing, mankind has already transgressed the tipping points of climate change, nitrogen and phosphorus loading, land conversion, and biodiversity [62, 90]. For this reason, all collective human activities must be brought within the detailed biophysical limits to ensure Earth's viability for humans in the long term [105]. Setting these thresholds brings environmental harm into a global perspective, also giving more responsibility to firms at local and regional levels [106]. However, it accounts for neither regional impact distribution nor societal aspects [107]. Nevertheless, PB emphasised that staying below these boundaries is essential not to harm the self-regulation of our planetary system and ensure stable environmental conditions that have persisted throughout the Holocene [11, 60].

### Social and Solidarity Economy or Solidarity Economy (SSE)

SSE historically appears to have been connected to the first cooperatives of the late 18th century and the beginning of the 19th century in response to the problems that arose after the Industrial Revolution in England [54]. This movement was highly influenced by Robert Owen, who, together with 28 workers, created the Rochdale Cooperative in 1844. SSE gained momentum in Europe in the late 20th century and 21st century *due to a low level of trust in institutional politics*, consequently creating *spaces of deliberative and participatory democracy* [107, p.1]. It questions the logic behind extractive-dependent economic growth [55] and presents itself as an alternate economy to capitalism [54]. As pillars, it has: (1) to respect both social well-being and the environment; (2) to establish democracy; (3) to promote labour rights and coherence [109]; and (4) move beyond profit maximisation [55]. It is characterised by self-organised initiatives [110]. It envisions social inclusion aligned with a commitment to economic redistribution to reduce inequalities and combat poverty through the implementation of both state policies and market mechanisms [54, 55]. It is strongly implemented by non-profit organisations, agriculture, agroforestry, permaculture enterprises [109, 110], family enterprises, cooperatives, and trusts providing support services to small-scale productive activities, among others [55]. Its goal is to meet both individuals' and communities' needs instead of trying to maximise profits or financial

gains [55]. It is also known as social solidarity economy, feminist economy, commons, agroecology, and food sovereignty [108]. SSE brings development issues to the surface and can be better positioned to influence policy; however, structural selectivity prevents many relevant societal issues from reaching governance spaces [55]. Additionally, it targets political discourses. A successful and extensive implementation requires political support and corporations' shifting from profit-making to cooperative schemes [108].

### Sufficiency Economy (SuE)

The late King Bhumibol Adulyadej of Thailand initiated the SuE in 1974, associated with Buddhism's middle-path principle. It encourages a way of living for individuals, families, organisations, communities, societies, and countries adapted to Thai society [49]. SuE aims to achieve a balance between profitability and ethical considerations, stipulating firms must abide by three principles: i) being moderate, referring to sustainability in terms of economics; ii) being reasonable or careful in terms of the environment; and iii) being prudent or mindful towards society [111]. Moderation, resilience, and perseverance are the virtuous foundations of SuE [112]. Firms are responsible for reducing "*people-hidden cost and the highest quality of products and services and bring about innovation not in products but throughout the entire organisation*" [114, p23]. Individuals and companies should focus more on needs rather than wants [79]. The majority of the articles were on Thai sectors like state-owned enterprises, transportation, utilities, media and communication, commercial services, agriculture, aquaculture, fishing, financial services, information, and technology [49]. Nevertheless, scholars target fast fashion trends, sales, and product design [79]. The barriers to SuE are the current focus on short-term shareholder value, our classic business model on repeated sales that often requires built-in obsolescence, and intense price competition (ibid). This is because firms' main goal is to maximise short-term profitability and SuE incentivises a long-term view of prosperity [112].

### Sustainable Development Goals (SDGs)

Established by the United Nations (UN) in 2012, the SDGs are an ambitious plan to make the world more inclusive and sustainable by 2030 [33]. The SDGs are central to the 2030 Agenda [93], outlining 17 actions to be taken internationally to achieve sustainable growth [44, 56]. The SDGs use the definition of the Triple Bottom Line (TBL) for sustainable development [114], which is to follow the Millennium Development Goals (MDGs) and provide a set of reference goals for the development of the global community between 2015 and 2030 [57]. These goals were meant to safeguard the environment, conserve natural resources, and improve humanity's living conditions [57]. The goals aim to end poverty, implement strategies that aim to improve health and education, reduce inequality, and spur economic growth while tackling climate change and preserving our oceans and forests [90, 115]. The reference goals are translated into 169 targets [33]. They can be split according to the three pillars of the TBL: environment (SDGs 6, 13, 14, 15); society (SDGs 1, 2, 3, 4, 5, 7, 11, 16); and economy (SDGs 8, 9, 10, 12) [33, 116]. Some significant limitations of the SDGs are that by promoting increased growth, consumption, and production, they arguably counter the limits to our planet [90]. Second, companies may contribute positively to one goal, while negatively impacting another [117].



## Triple Bottom Line (TBL)

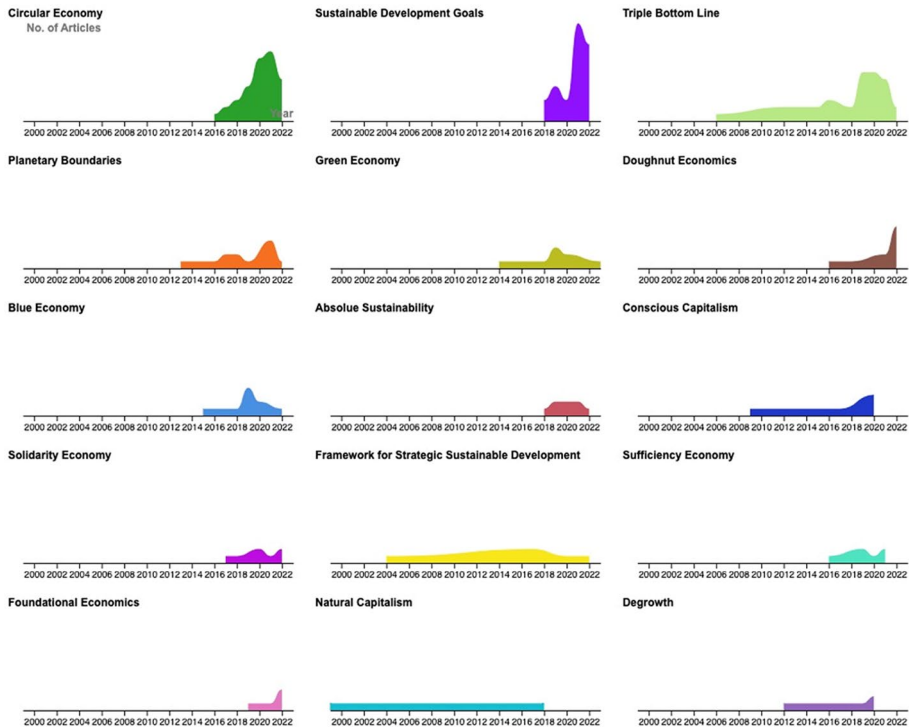
The TBL philosophy was developed by Elkington in 1998 and is also known as the 3P philosophy, standing for “people, planet, and profit” [118]. It was designed for companies to set sustainability goals and corresponding measures to develop the world’s economy, support social welfare, and protect the global environment [119]. Sustainability depends on the interrelated dimensions: economic prosperity, social equity, and environmental integrity [33]. Firms are encouraged to establish profit measures that can benefit both the firm and the economy whilst ensuring that future generations can enjoy both a healthy economy and continuous growth [118, 119]. The philosophy suggests specific social responsibility measures for firms [119] where human dignity is respected and protected in various forms and contexts [120]. Environmental sustainability strives to preserve and protect natural resources [121]. Despite bringing to notion the existence of the three pillars, TBL uptake has resulted in alternatives, or ‘trade-offs’ among these three. Twenty-five years after TBL’s introduction, Elkington acknowledged that just considering the three pillars is insufficient if PB are not considered [122].

## The Natural Step (TNS)

In 2002, K.H. Robert of the Blekinge Institute of Technology (BTH) in Sweden published a holistic model for strategic sustainable development using four system conditions [2]. The TNS, also known as The Natural Step, provides a strategic perspective [24] by changing the perception from downstream environmental problems to upstream ones [17]. It provides a strategic approach by determining boundary conditions within which society can continue to function and evolve [58]. Its principles for the environmental dimension are in a social system; these are trust, common meaning, diversity, learning capacity and self-organisation [6]. TNS’s eight principles depict a society where nature is not subject to systematically increasing: (1) concentrations of substances from the Earth’s crust; (2) concentrations of substances produced by society; and (3) systematic physical degradation of nature [2, 26]. In a socially sustainable society, people are not subject to structural obstacles to: (4) health; (5) influence; (6) competence; (7) impartiality; and (8) meaning making [6]. It can also enable the achievement of other philosophies, such as the SDGs. The studies were “not specific” for the sector; however, during an expert interview with educators and researchers at Blekinge Institute of Technology, they explained that the Natural Step organisation has worked with companies of various sectors and sizes, mainly in Sweden. It is used largely in educational programmes (many offered by BTH) and in practical application fields, via The Natural Step organisation in both Sweden and Canada. Otherwise, the philosophy’s reach seems to be limited.

## Emergence of Sustainability Philosophies

Figure 5 illustrates the time range of the selected SLR studies for each of the philosophies. As we approach 2030 and realise that we still have a long way to go to meet our climate pledges, sustainability philosophies criticising our traditional economic system (implicitly or explicitly based on consumption and growth) gain more traction. This can explain the increase of publications on philosophies taking a macro-perspective (AS, SuE, DE, SSE, DET, and FE). On the other hand, literature of AS and PB revolves around improving product development processes and other life cycle engineering processes. Another reason that



**Fig. 5** Distribution of articles part of the SLR

could explain the trends is that philosophies that organisations can use, such as NC and CC, do not result in as many scientific publications. GE and TBL are used the most as public discourses, and strategies and tools for integration are not as widespread as those of CE, SDGs, and emerging philosophies like AS, DE, and PB. Finally, several articles were on the relationship between Industry 4.0 and CE, SDGs, and TBL.

## Origins of the Philosophies

As seen in “[Description of Philosophies](#)”, the desire to improve our current modus operandi has existed for over a century. In some cases, public upheaval and distress led to the birth of some philosophies, as is the case, for example, with SSE and FE [54, 96] and DET to challenge our institutions and our prioritisation of monetary indicators as reflections of success [123]. Similarly, NC and CC arose to question our economic mindsets [53, 80], whereas the foundations of CE proposed optimising our waste management operations. As environmental emergencies have become more common, we see the most substantial notion of sustainability be elaborated through the TBL. This philosophy has served as a foundation for other philosophies created by academics, such as TNS [17], PB [124], AS [11], and other global campaigns, such as GE, BE, and the SDGs. Other academics like Raworth have strived to bring these notions together in DE [125]. SuE seems to be the only philosophy born from politics and is more engrained in a country’s culture; nevertheless, its principles are being incorporated into a more product-based philosophy like CE [79, 112, 126].

**Table 6** List of philosophies with their principles

<i>No</i>	<i>PHILOSOPHY and PRINCIPLES</i>
<b>1</b>	<b>ABSOLUTE SUSTAINABILITY (AS) [92]</b>
1.1	The total environmental impacts of all human activities and actors should stay within the planet's safe operating space (SOS)
1.2	The share of the carrying capacity of the SOS can be either to an individual company or sector
1.3	The carrying capacities must be comprehensive and consider all potential environmental issues relevant for sustainability
<b>2</b>	<b>BLUE ECONOMY (BE) [41]</b>
2.1	Marine ecosystem's resilience is maintained
2.2	Revenues are generated sustainably
2.3	Local communities' knowledge, traditions, and cultural values are valued and used
2.4	Equilibrium is maintained between multiple governance bodies
2.5	Technology safeguards the marine environment and human resources
<b>3</b>	<b>CIRCULAR ECONOMY (CE) [28]</b>
3.1	Natural resources are conserved
3.2	Materials and products are kept in use
3.3	Economy is naturally restorative and regenerative
<b>4</b>	<b>CONSCIOUS CAPITALISM (CC) [82]</b>
4.1	Possess a higher purpose or one that transcends profit maximisation
4.2	Stakeholders are committed to meeting the legitimate needs of all the organisations' stakeholders
4.3	A strong sense of community is manifested in the organisation
4.4	All organisational systems and structures are consistent with ethical and sustainable behaviours, practices, and products
4.5	Leaders are spiritually evolved, self-effacing servants
<b>5</b>	<b>DEGROWTH (DET) [86]</b>
5.1	Dignified standard of economic security is ensured
5.2	Care, solidarity, and autonomy are shared values
5.3	Possess welfare-enhancing objectives like eliminating poverty, lessening inequalities, and protecting the environment
5.4	Privilege leisure over consumption
5.5	Promote societies that are energy-efficient and less energy-intensive
5.6	Satisfy local/regional demands
5.7	Consume and produce responsibly
<b>6</b>	<b>DOUGHNUT ECONOMICS (DE) [51]</b>
6.1	The total environmental impacts of all human activities and actors should stay within the planet's safe operating space (SOS)
6.2	Inequalities are reduced
6.3	Commons are managed and shared collectively rather than privately
6.4	Designed to distribute
6.5	Regenerative by design
<b>7</b>	<b>FOUNDATIONAL ECONOMICS (FE) [51]</b>
7.1	Limit growth within foundational sectors
7.2	Access and quality of foundational provision to all residents
<b>8</b>	<b>GREEN ECONOMY (GE) [99]</b>
8.1	Human well-being and social equity are ensured
8.2	Resource efficient growth

**Table 6** (continued)

<i>No</i>	<i>PHILOSOPHY and PRINCIPLES</i>
8.3	Marine and terrestrial ecosystems' resilience is maintained
8.4	Consume and produce responsibly
<b>9</b>	<b>NATURAL CAPITALISM (NC) [53, 100]</b>
9.1	High productivity of natural resources is ensured
9.2	Solutions are systems-based
9.3	Work with nature instead of against it
9.4	Eliminate pressure on natural capital
9.5	The total environmental impacts of all human activities and actors should stay within the planet's safe operating space (SOS)
<b>10</b>	<b>PLANETARY BOUNDARIES (PBs) [105]</b>
10.1	The total environmental impacts of all human activities and actors should stay within the planet's safe operating space (SOS)
<b>11</b>	<b>SOLIDARITY ECONOMY (SSE) [55]</b>
11.1	Respect both social well-being and the environment
11.2	Democracy, collective governance, and social inclusion are ensured
11.3	Move beyond profit maximisation and promote cooperative approaches to production and consumption
11.4	Labour rights and coherence are promoted
<b>12</b>	<b>SUFFICIENCY ECONOMY (SuE) [111]</b>
12.1	Be ethically profitable
12.2	Be reasonable and careful in terms of the environment
12.3	Be prudent or mindful towards society
<b>13</b>	<b>SUSTAINABLE DEVELOPMENT GOALS (SDGs) [33]</b>
13.1	Poverty is eradicated
13.2	Food security and sustainable agriculture are ensured
13.3	Healthy lives and wellbeing of all are ensured
13.4	Inclusive and equitable quality education is ensured
13.5	Promote peace and justice in societies
13.6	Inequalities are reduced
13.7	Access to water for all is ensured
13.8	Affordable and clean energy for all is ensured
13.9	Decent work and economic growth are ensured
13.10	Cities and communities are inclusive, safe, resilient, and sustainable
13.11	Consume and produce responsibly
13.12	Marine ecosystems' resilience is maintained
13.13	Terrestrial ecosystems' resilience is maintained
<b>14</b>	<b>THE NATURAL STEP (TNS or FSSD) [6, 26]</b>
14.1	A society where nature is not subject to systematically increasing concentrations of substances from Earth's crust
14.2	A society where nature is not subject to systematically increasing systematic physical degradation by society
14.3	A society where nature is not subject to systematically increasing systematic physical degradation of nature
14.4	People are not subject to structural obstacles to health
14.5	People are not subject to structural obstacles to influence
14.6	People are not subject to structural obstacles to competence

**Table 6** (continued)

No	<i>PHILOSOPHY and PRINCIPLES</i>
14.7	People are not subject to structural obstacles to impartiality
14.8	People are not subject to structural obstacles to meaning making
15	<b>TRIPLE BOTTOM LINE (TBL)</b> [121]
15.1	Economic prosperity is ensured
15.2	Social equity is ensured
15.3	Environmental integrity is ensured

### Principles and Philosophies

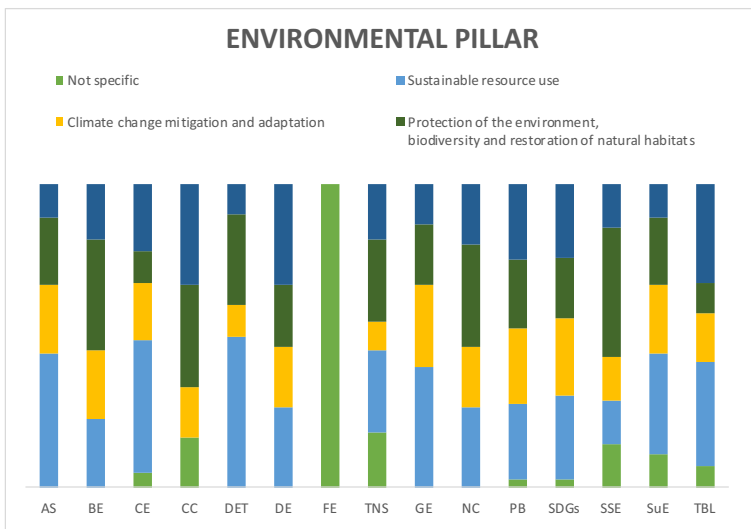
Philosophies, understood as schools of thought or movements, possess principles that shape each respective philosophy’s interpretation of sustainability and set conditions that must be met to abide by the philosophy successfully. The SLR identified 71 principles among the 15 philosophies. Some of these have principles in common because they evoke the same aspects. On the other hand, some principles were very general or could be considered a potential outcome of other principles. Table 6 lists the identified philosophies, together with their principles.

### Environmental, Social, and Economic Pillars

Through the SLR, the principles of each philosophy were identified and mapped in Figs. 6, 7, 8, 9, and 10 to identify similarities.

### Environmental Dimension

“Sustainable Resource Use” is covered by those philosophies that give a lot of weight to the environmental pillar; this includes AS, CE, DET, TNS, PB, GE, SDGs, SuE, and



**Fig. 6** Distribution of philosophies covering the environmental sustainability pillar

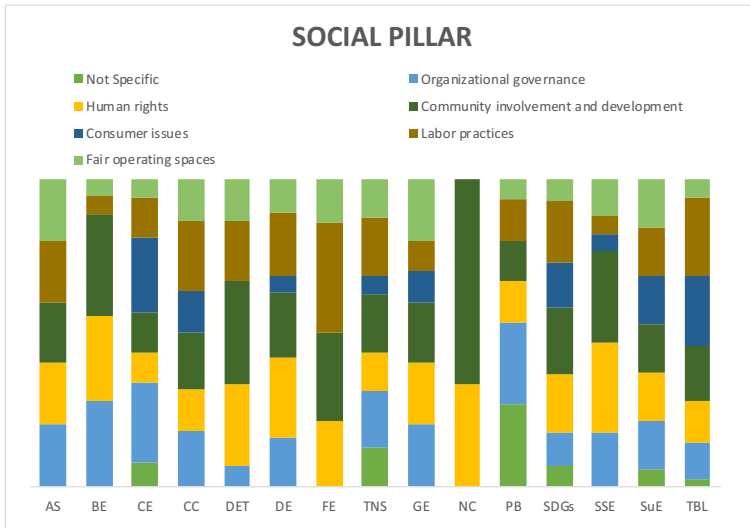
TBL (see Fig. 6). These philosophies possess at least one principle related to safeguarding nature's resources. AS promotes the use of tools, such as LCA and measuring environmental footprints [32] similarly, PB and GE articles promoted the use of LCA [52, 59, 127] and following standards like ISO [11, 64], One Planet Thinking Model [30, 127]. Several of the CE articles reviewed revolve around improving product development processes [3, 75, 119] and implementing strategies like industrial symbiosis [77, 128]. One of DET's fundamental principles is to protect nature's resources, and a strategy to achieve this is through the sharing economy [64]. Similar to CE, TNS's strategies also include improved BMs since these can aid in increasing the efficiency of existing processes and products [24] and implementing environmental management tools like ISO [2, 26]. Similarly, SuE also promoted the use of ISO and the Dow Jones Sustainability Index (DJSI) [113], as well as strategies that maximise material and energy efficiency [79].

SDGs and TBL are two of the most well-known philosophies; therefore, they provide a myriad of strategies and tools to ensure sustainable resource use. Among these are implementing CE [129], digitalising supply chain [44], corporate green innovation [57], and more. On the other hand, BE, NC, and SSE target "Protection of the Environment" more, since they reiterate the importance of natural capital [41, 102, 103, 130] and protection of ecologically and culturally significant sites [41]. DE and PB philosophy cover "Pollution Prevention" most predominantly, since the former promotes the CE model to design out waste [94, 131] and the latter prevents chemical pollution [62, 132], but it was covered equally alongside the other aspects by CC, TNS, SDGs, SuE, and TBL. Several strategies for "Sustainable Resource Use" above were listed for "Pollution Prevention." NC explains that improving local biodiversity and ecological services benefits society. For instance, reintroducing traditional agroforestry practices to restore soils can provide locals with more autonomy [103]. FE articles uncovered in this SLR did not cover any of the environmental aspects of the study.

## Social Dimension

Compared to the environmental and economic sustainability dimensions, the social sustainability dimension showed more variance. This could be since it also possessed more aspects compared to the ecological dimension and to the fact that more philosophies incorporate social elements in their principles. For philosophies like SSE, CC, and FE, society is the main stakeholder. As seen in Fig. 7, "Community Development" and "Human Rights" represented the majority among all philosophies. Especially for philosophies like SSE, since it promotes initiatives and tools that provide both internal and external benefits for shareholders [55, 108]; BE, since it promotes bringing development in fishery towns, creating new aquaculture projects, and such [133]. DET studies, similar to DE ones, particularly addressed "Community Development" and "Human Rights". The former focuses explicitly on developing nations that require economic growth and social development [48]. DET overall states that developed nations' economic growth objectives should turn into welfare-enhancing objectives [48]. The latter makes clear that cities and organisations should operate within ecological and social limits.

SDG-related articles' high percentage on "Community Development" and "Labour Practices" stems from the fact that many strategies to achieve some of the social goals of the SDGs incentivise companies to situate factories in remote locations and involve communities in the process [134]. Also, most enterprises or organisations implementing the SDGs often have operations in "host countries" that demand them to abide by regulations



**Fig. 7** Distribution of philosophies covering the social sustainability pillar

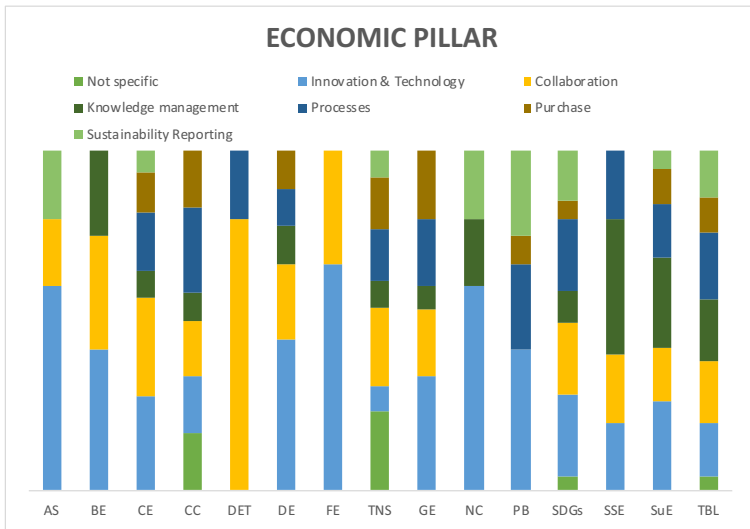
and benefit specific populations [135]. For CE, articles targeted mainly “Organisational Governance” and “Consumer Issues”. Still, some studies reported companies struggle to collect data on the social aspect, either because of unavailability or uncertainty regarding the diffusion of this philosophy in the company [74].

FE emphasised the importance of improving working conditions, which explains why “Labour Practices” was the highest. This aspect was targeted by mentioning improvements in policies or other types of BMs [51, 95, 136]. Similarly, CC covered this aspect the most by ensuring all stakeholders’ well-being [45]. SuE had a thorough coverage of all aspects. Like GE, many articles were on how implementing CE, eco-innovation, or sustainable entrepreneurship can contribute to GE on societal levels [42, 137]. The TNS also covered all aspects exhaustively. This is not surprising since TNS presents clear principles and methods to improve performance and societal value of corporate sustainability management [24].

Despite covering all but one of the aspects, the majority of PB articles were either “Not Specific” or “Organisational Governance”. This is due to the natural science focus of PB, delimiting both economic and social sustainability considerations. Nevertheless, the authors recognised the importance of incorporating social studies into this thinking. On the contrary, AS articles in the same realm as PB did not mention social aspects. TBL covered all aspects, but contrary to previous philosophies, “Consumer Issues” and “Labour Practices” represented the majority. Studies on this philosophy repeatedly mentioned ensuring health and safety both internally and externally, improving working conditions for employees [138, 139], other forms of consumer education [140], and rediscovering ethical values [120].

## Economic Dimension

As explained in section 2 “Research Methodology”, the aspects chosen for the economic dimension are strongly linked to ensuring competitiveness [24]. As seen in Fig. 8, I&T represented the majority for AS, NC, FE, CE, and BE. These philosophies include technology as a resource-saving solution [141], transforming sectors, and



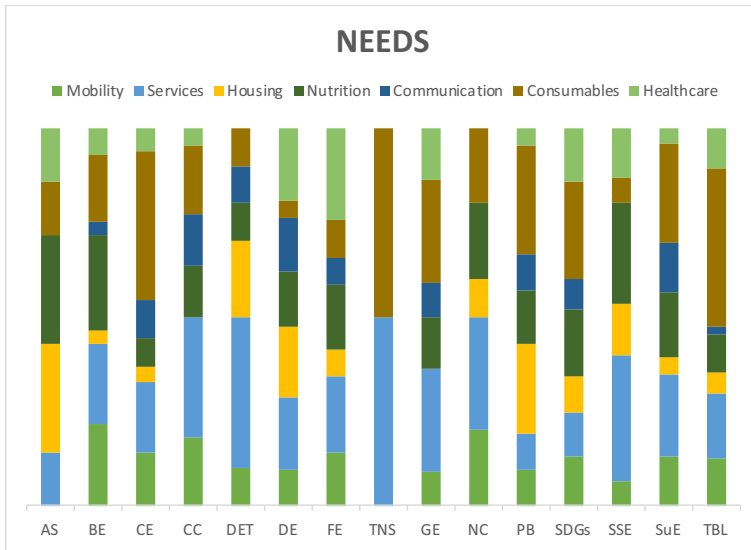
**Fig. 8** Distribution of philosophies covering the economic sustainability pillar

technology-specific policies for sustainability transitions [142]. The aspect covered the least by the philosophies was “Purchasing”, which entails considering sustainability during purchasing operations. The philosophies with stronger social foundations, SSE and SuE, focused the most on “Knowledge Management,” which entails creating and ensuring members in an organisation are familiar with and knowledgeable on sustainability. This aspect is also strongly linked to “Processes”, which entails incorporating sustainability throughout an organisation. This aspect was highly covered in CC, PB, and SDGs. “Innovation and Technology” and “Collaboration” covered more than half of CE and DE papers and were also the only ones covered by FE articles, for instance, building partnerships between different organisations [143]. PB had the highest coverage of “Sustainability Reporting” by mentioning reporting organisations like WRI and CDP, aligned with PB [101].

## Societal Needs

Figure 9 shows how much each societal need is covered by each philosophy, according to the needs described in Table 5. Every philosophy contributes to “Services” and “Consumables”, followed by “Nutrition”, whereas “Communication” is covered the least, followed by “Healthcare” and “Mobility”. Human needs are the same globally, and shifting from a product delivery mindset to a satisfaction of needs mindset requires both behavioural and systemic transformation [1]. Philosophies like AS and PB reiterated the importance of improving infrastructures for “Housing”. Additionally, both articles promote implementing top-down approaches [11, 144]. Both listed more tools than strategies like AES metrics indicators, LCA, ISO 1405, Life Cycle Engineering, One Planet Thinking Model [30, 31, 62] and following the Science-based Target Initiative [31, 32, 145]. PB also strongly addressed the provision of “Consumables” like household durables, automotive, and electronics; on the other hand, AS studies were on providing nutrition through the agriculture and food-producing sectors.





**Fig. 9** Distribution of philosophies covering societal needs

DET, DE, TNS, and NC visualise sustainability within the embeddedness of the pillars. These four promote the provision of “Services.” For instance, DET promotes approaches like Sharing Economy [64], which is part of CE, and DE fosters the implementation of the CE model, regulations, taxation, and redistributive policies [51, 131]. TNS, aside from possessing set principles, also provides a methodology and tools following a back-casting approach; this eases organisations’ development, implementation, and assessment of strategies [6]. Even though “Services” and “Consumables” only showed up in the results, an expert interview with two researchers from BTH explained that backcasting can also be used to meet other needs. With TNS, companies can visualise and map better how to meet these needs. Some strategies listed included creating circular business models, industrial ecology [2], implementing product-service systems, increasing processes and product efficiencies, and considering working conditions throughout the supply chain [24]. However, TNS articles listed more tools like the ABCD method, ISO 14001, EU’S EMAS, CSR management, and Regional Environmental Management Systems [2, 26].

NC targeted mainly “Services” and “Consumables”, followed by “Mobility”, “Nutrition”, and “Housing”. For “Services” and “Consumables”, strategies included creating green infrastructure and industrial ecology [100, 102, 146]. For “Nutrition”, strategies included restoring forests for wood production, restoring fields for agriculture, using trees to reduce salinisation in wheat fields, and reintroducing traditional agricultural practices [103]. Not many tools were provided, but NC covers diverse sectors, and the philosophy provides a framework with different stages for its implementation [104].

“Services” and “Nutrition” were covered more by SSE articles over various regions and sectors. Some initiatives mentioned were Buen Vivir [55], Sharing Economy initiatives, part of CE [109], and the creation of B Corps [108]. SuE promotes the creation of bottom-up initiatives [55]. The deployment of SuE in strategies is promoted in Thailand’s National Economic and Social Development Plan and government policy. Strategies include environmentally-conscious production management, self-reliance, expense reduction for social immunity, and employee training [147].

CE and GE interpret sustainable resource use can be achieved by improving the production and delivery of “Consumables”. Their articles promote shifting focus from providing products to providing “Services”; however, BE, whose studies on this philosophy covered “Nutrition” more followed by “Mobility” and “Services,” through the improvement of different sectors like shipping, aquaculture, maritime transportation, and renewable energy. On a smaller scale, BE projects can facilitate cooperative management and community-led initiatives since carbon sequestration projects are usually located in developing regions [70].

CE provided several strategies and was also mentioned as a strategy of several philosophies. Some strategies for “Consumables” and “Services” of CE include business model innovation [5, 148], the Sharing Economy [149], the creation of networks [150], and value chain redesign [151]. GE strategies for consumables include bioeconomy and eco-innovation, which are also promoted by CE [29, 137]. Similar to CE, TBL covered “Consumables” the most. This can be because many articles were on how Industry 4.0 can incorporate CE and TBL to become sustainable, especially in the manufacturing sector [4, 76, 121, 152–154].

Most of CC articles covered “Services” followed by “Mobility” and “Consumables.” The high coverage of the three needs can be because the strategies mentioned in the articles target stakeholder orientation [82] and humanistic management [80]. On the other hand, the majority were on “Healthcare” followed by “Services.” Researchers in this area call for policy [155], digitalisation, I4.0, inclusive growth initiatives [95], and partnerships among organisations to meet these societal needs [143]. These two philosophies belong to the group prioritising societal aspects. “Consumables” represented the most for SDGs. Many of the strategies for this philosophy include the same strategies as other philosophies or deploying those philosophies as strategies themselves.

## Business Processes

Organisational strategies ensure the creation, setting, planning and execution of goals, including their deployment in the relevant parts of the organisation [156] – and this is no different for sustainability strategies.

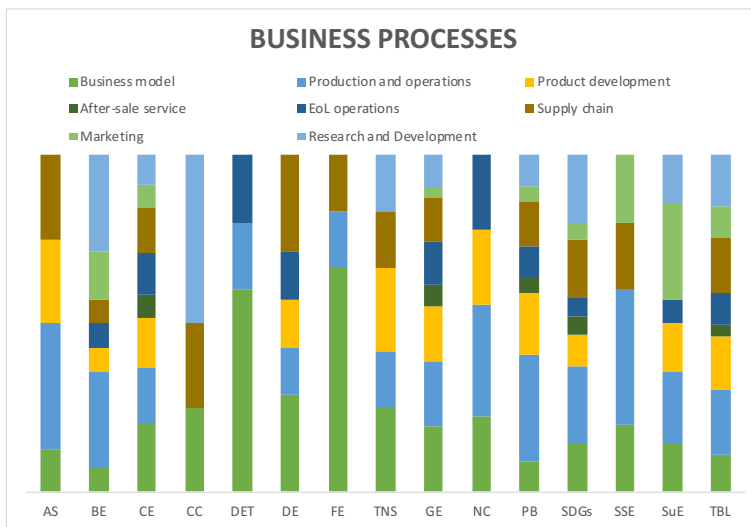


Fig. 10 Distribution of philosophies covering the selected business processes

In “Business Model (BM)”, development organisations address how to identify and create value for customers and realise how to capture value as its profit [156]. This can explain why it represented the majority for CE, CC, DET, DE, FE, and TNS (see Fig. 10). Nevertheless, the philosophies do not target BM changes in the same way. For instance, CE has been portrayed as a successful BM tool development for manufacturing companies. CC specifically targets CEOs and how they can create BM by following CC’s principles and framework. The TNS provides a framework for the strategic development of BMs. DE, FE, and DET criticise how organisations currently provide social foundations and promote the implementation of cooperatives or other business structures [51]. Similarly, SSE also promotes cooperatives but does not specifically target BMs.

For AS, BE, NC, PB, SDGs, SSE, and SuE, “Production and Operation” represented the majority. AS and PB articles encourage organisations to incorporate ecological limits into their operations. To become more operational, PB requires more collaborative work among scholars from different disciplines to integrate its principles into corporate sustainability strategies [124]. Governments and organisations should also be more aware of the existence of these boundaries [157]. NC articles were on implementing industrial ecology and green infrastructure, demanding companies change their production and operation practices. SuE was the only one to cover “Marketing” the most because it reiterated how organisations present themselves, their values, and how customer sales are made [79].

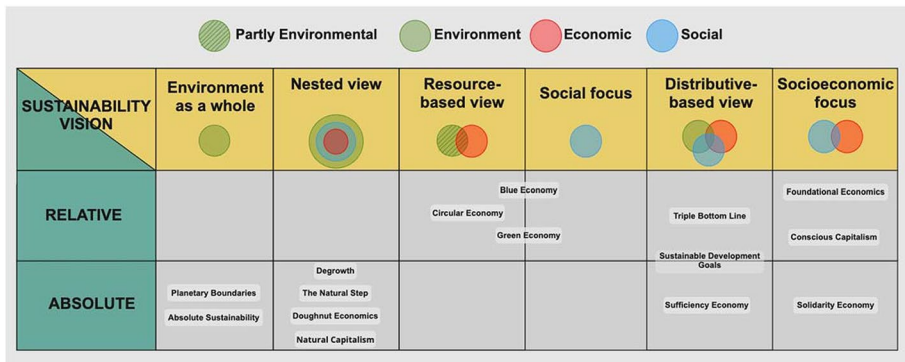
BE is promoting better ways to expand new areas, which is why most of the articles targeted “R&D” and “Production and Operation.” Finally, GE and TBL presented a thorough coverage of all business processes. This could be due to using these two as campaigns to promote sustainable development throughout the organisation. In contrast, the other philosophies seem more prominent for specific areas. Comparably, the SDGs cover all aspects but “Production and Operation” the most.

“Product development” was covered thoroughly by almost all philosophies except for CC, DET, FE, and SSE, solely because these philosophies do not target the manufacturing industry. On the other hand, the other philosophies do so by promoting strategies like bioeconomy [52], biomimicry [29], eco-design [72], Design for Disassembly [144], and material selection by improving ensuring suitable suppliers [3, 158, 159]. This study considered including “Supply Chain” as a separate activity since many articles focused solely on it. It was the third aspect covered the most by all articles, especially by AS, CC, and DE. “After-sale Services” was covered only by CE, GE, SDGs, and TBL.

## Being Absolute Sustainable Versus Being Relative Sustainable

For a more thorough analysis of the essence of the philosophies, these were divided as either absolute or relative sustainable. The former visualises a functional society within Earth’s carrying capacity and limits, whereas the latter provides good approaches that, unfortunately, leave space for misuse and misinterpretation. While relative sustainability focuses on doing ‘less bad’, absolute sustainability targets doing ‘good enough’ [11].

Aside from these two main categories, the philosophies were also classified according to how they interpret sustainability according to the environmental, social, and economic pillars (depicted in the columns of Fig. 11). The SLR showed a clear distinction among them and some clear similarities. Philosophies with principles of one specific pillar are PB and AS. Their principles do not include economic or social aspects; for this reason, they were classified as strictly environmental. There is recent literature on incorporating the social element into AS [160], but this was not part of the SLR sample.



**Fig. 11** Distribution of the sustainability philosophies according to (1) absolute and relative philosophies and (2) range of the three sustainability pillars

Historically – also within the literature reviewed in this study – sustainability was depicted as achieving a balance between the three TBL pillars, but without any absolute perspective. Later, this understanding developed into a ‘nested view’ that sees economic sustainability embedded within social sustainability, which in turn is embedded within environmental sustainability. The SDGs also reflect this nested view, with SDGs 8–10 and 12 representing economic sustainability, 1–5, 7, and 11, societal sustainability, and 6, 13–15, environmental sustainability. The SDGs are placed, in this study’s mapping, in between absolute and relative sustainability, due to a number of the 17 targets and 169 indexes being either, or. Philosophies incorporating this also possess an absolute perspective; these are DET, DE, TNS, and NC.

As mentioned earlier, the 1992 UNCED conference presented GE in the context of sustainable development and poverty eradication by improving the institutional framework for sustainable development [99]. Even though it was reiterated that the healthy functioning of Earth’s ecosystems is one of the purposes of GE, no reference was made to the monitoring or accounting systems for integrating GE. There were no concrete actions or timelines on this theme. Additionally, the UNCED conference focused on *sustainable growth* instead of *sustainable development*. For this reason, GE and BE were classified as relative.

Balancing the social and economic pillars on the absolute side, SSE, CC and SuE engrain ethical considerations and changing human values. These philosophies like DET promote neither overproducing nor overconsuming. Additionally, the BMs and strategies mentioned have a clear goal of benefitting organisations themselves and the communities surrounding them within ecological limits. Absolute philosophies give a stronger sense of urgency than relative philosophies. Relative philosophies promote doing better, so some or all of their principles are easier to implement, and multiple tools and methodologies that ease their implementation have been developed, envisioning a society that prioritises resource preservation, although with no absolute limits.

## Conclusion

Efforts and interest to pursue sustainability have never been as noticeable as they are today. This study has identified how envisioning a sustainable society goes back to the 1840s; and since which, it has taken different forms and focus. Together, various historical and

social events have birthed several philosophies. Today, we realise that we need more than an incremental improvement of discrete products and activities; we need an overall transformation of our society. Fortunately, many philosophies acknowledge this notion. Nevertheless, there is currently no consensus on how to correctly go about this – neither at a societal nor a corporate level.

As shown throughout “[Results and Discussion](#)”, sustainable development has been and is still interpreted differently by various actors, resulting in diverse prioritisations of either economic, environmental, or social aspects when developing strategies. The content of this section provides an overview of the emergence and areas of application of each philosophy. To go further in-depth on environmental, social, or economic sustainability pillars, this study has delved into several aspects for readers interested in gathering knowledge in these areas. “[Environmental, Social, and Economic Pillars](#)” and “[Societal Needs](#)” have described this by examining the relationship between integrating these philosophies to meet key societal needs and contribute to the three sustainability pillars. “[Business Processes](#)” examined where, inside organisations, change is promoted to incorporate these philosophies.

As seen in “[Being Absolute Sustainable Versus Being Relative Sustainable](#)”, sustainable development visions range from a sole focus on the earth’s capacity with philosophies like PB, AS, and DE. In fact, PB becomes the first philosophy to mention a ‘safe operating space’ and ‘thresholds for humanity’. Those philosophies (DET, TNS, DE, and NC) promote an embeddedness view where the economic sustainability lies within social sustainability, which lies within environmental sustainability. Others (CE, BE, and GE) visualise sustainable development as maximising and optimising natural resources for economic benefits. Additionally, the long-standing view of sustainability as a balance between the three pillars is promoted by TBL, SDGs, and SuE. Finally, SSE and FE strive to prioritise society for economic returns.

Nevertheless, the most striking differences among the 15 philosophies are their principles. Some philosophies promote behavioural changes not only at the strategic level of an organisation but also at the societal level. Moreover, some possess principles emphasizing the importance of systemic change, making these principles more suitable for governments instead of corporations. The philosophy, and consequently the principles, corporations and organisation choose to build their organisational culture, beliefs, judgments, and behaviours will tremendously impact future sustainable development trajectories.

The main contributions of this study are: (1) the creation of a definition of “sustainability philosophy” for those schools of thought and sustainability-oriented movements; (2) comprehensive identification and description of sustainability philosophies with historical data on their emergence, essence, application, and limitations; (3) identification and comparison of key principles across the identified philosophies; (4) examination on how they differ over three categories with their respective aspects (a) sustainability pillars, (b) societal needs, and (c) business processes; and (5) analysis of the identified philosophies about relative versus absolute sustainability.

The findings of this research provide a brief overview of where sustainability philosophies point towards. Readers can obtain a general view of sustainability throughout time and potential research areas and applications. The absolute versus relative also reiterates the importance of acknowledging limiting resources in all societal areas. The study highlights various philosophies supporting sustainable development, emphasising the need for guidance in selecting a philosophy tailored to organisational characteristics. The findings aim to contribute to a strategic methodology for organisations. This study is part of a PhD project that will develop and test a tool that guides and supports the implementation of sustainability philosophies by industry.

## Limitations

The current study does have limitations, which further research could address. Additional analysis could delve into existing policies that promote corporate sustainability. A future similar analysis could compare these philosophies with other sustainability discourses linked to policy discourses like the EU Taxonomy or 2030 Agenda. Additionally, using the terms “absolute and relative sustainability” is new compared to the strong and weak sustainability discourse. The analysis in this study could be enhanced by using other theories and models of sustainability. Since this work focuses on the strategic level of an organisation, future research could examine the implications of the uptake of these philosophies at this level using organisational behaviour and sociology frameworks.

Similarly, some philosophies call for policy changes and examining the link between these philosophies and policies could another point of analysis. Lastly, this SLR only includes the 15 philosophies that met the inclusion criteria described in the methodology. It is possible that other philosophies from other disciplines, regions, and sectors exist but did not appear in the SLR.

Further research could also focus on specific products, services, or regions and observe during case studies how these philosophies translate into internal business practices. Similarly, future research could also examine how companies use these philosophies and principles to elaborate strategies to fulfil one or more key societal needs. This, in turn, will provide a further analysis of what makes some philosophies more attractive than others.

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## Declarations

**Consent to Participate** Verbal informed consent was obtained from experts cited in the text prior to the interview.

**Consent to Publish** All participants gave informed consent for research utilizing their responses to be published. Identifying information was excluded from this article.

**Competing Interest** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the elaboration of this work.

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