

A novel approach to promoting sustainable consumption and production patterns–Introducing the ‘womb approach’

Molla Ehsanul Majid ^{1*} , Dora Marinova ² , Amzad Hossain ² , Muhammad E. H. Chowdhury ³ ,
Farah Rummani ⁴ 

¹ Computer Applications Department, Academic Bridge Program, Qatar Foundation, Doha, QATAR

² Curtin University Sustainable Policy Institute (CUSP), Curtin University, AUSTRALIA

³ Department of Electrical Engineering, Qatar University, Doha, QATAR

⁴ Environmental and Public Health Promotion, Shire of Serpentine-Jarrahdale, Western Australia, AUSTRALIA

*Corresponding Author: mollamajid@gmail.com

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ABSTRACT

Achieving sustainable consumption and production (SCP) patterns is crucial for realizing sustainable development, aligning with the sustainable development goals 2030. However, the absence of comprehensive and unified metrics detailing SCP strategies poses a challenge, and current literature often lacks SCP-specific dimensions, merging them with broader sustainability concepts. Furthermore, existing sustainability models lack clarity on responsible actors and their role in balancing these dimensions. This research addresses these gaps by scrutinizing current sustainability and sustainable development models. It introduces the ‘womb approach,’ proposing distinct dimensions for sustainable development and SCP patterns. The study also formulates a unified strategy list adaptable to organizations of varying sizes and types, facilitating SCP pattern implementation.

Keywords: sustainability, sustainable development, sustainable consumption and production patterns, sustainable development goals 2030

INTRODUCTION

Multiple scholars have adopted the triple bottom line (TBL) approach, first introduced by Elkington (1994) in the mid-1990s to define the pillars and dimensions of sustainability (Blackburn 2012; Elkington, 2013; Frajman et al., 2014; Kordej-De Villa, 1999; Srivasta et al., 2021). Some scholars represent them in the form of ‘Venn diagram’ whereas some use a ‘nested circles’ approach to define the interactions between these dimensions. The ‘circles of sustainability’ approach, adopted by many global organizations, uses four dimensions e.g., economy, ecology, politics and culture (James, 2015). The UN General Assembly (2005) recognizes the economy, society and environment as the three major pillars of sustainable development. However, a major gap in the available models is, they fail to define an instrument to blend the dimensions. More specifically, majority of these models do not specify how and at what extent these elements should be used so that one element does not unproportionally dominate others, and a balanced sustainability model is achieved. Therefore, the first objective of this research is to close this gap by analyzing the dimensions and elements of sustainability, and proposing an amended model of sustainable development, and sustainable consumption and

production (SCP) patterns. Furthermore, the literature shows a gap in the areas of SCP patterns in terms of a structured list of factors that can be used to promote them. Although multiple studies list multiple factors to implement and promote sustainability strategies, no study has been identified that proposes a unified and structured list of strategies to promote SCP patterns, regardless of the type or size of an organization. This paper, as its second objective, therefore, attempts to close this gap by proposing a list of strategies that can help to promote SCP patterns in any organization.

SUSTAINABILITY, SUSTAINABLE DEVELOPMENT VS SUSTAINABLE CONSUMPTION AND PRODUCTION (SCP)– A CRITICAL ANALYSIS

The concept of sustainability found its official base after the release of the Brundtland (1987) commission’s report that introduced the term ‘sustainable development’ for the first time (Ministry for Europe and Foreign Affairs, 2022). Since then, the movement by scholars and UN bodies have encouraged governments and organizations around the globe

to adopt sustainability measures into their operations. Many organizations around the globe are taking measures to moving in that direction. Although there are debates on whether these moves are merely 'eye wash' to comply with regulations or truly honest intentions, 'green economy' along with 'sustainable business practices' are rooting into the private sectors of both developed and developing countries (Bochen & Geradts, 2020; Potney 2015). Creating sustainable organizations is regarded as the first step of creating a sustainable society (Dunphy, 2015). However, the process is complex and often an organization goes through multiple phases, including "rejection", "non responsiveness", "compliance", "efficiency", "strategic proactivity" and, finally, "the sustainable corporation" (Ben et al., 2007; Dunphy, 2015; Dunphy et al., 2007; Goni et al., 2021). Sustainable development, therefore, is not a straightforward process. It requires technological and institutional change as well as change in our patterns of consumption and investments in order to make them in line with the process of sustainable development (Brundtland, 1987). Achieving sustainable development is a long-term process and there are many paths and ways of attaining it. This long-term goal of achieving sustainable development is often referred to as 'sustainability' (UNESCO, 2022). Although 'sustainability' and 'sustainable development' are two separate terms, they are often used interchangeably and destined for the same purpose of improving society and the environment.

SCP was defined as "the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations" (Oslo Symposium, 1994). Ensuring SCP patterns is part of a transition to sustainable development. According to UNEP (2023), changing unsustainable consumption and production to sustainable SCP is essential for ensuring sustainable development.

Sustainable consumption (SC) is generally relevant to the consumer or retailer end of the supply chain and refers to consumer behavior related to food, housing, clothing, working, leisure and mobility that contribute towards improved lifestyles and livelihood without compromising the natural and social environment (UNEP, 2022). Human values, awareness and willingness, policymaking and enforcement are all equally required to implement SC patterns. Sustainable production (SP), on the other hand, is associated with suppliers or producers in the supply chain. The objectives of SP patterns refer to sustained and responsible use of natural resources, such as, water, air, land, materials and energy, and factors of production, including machinery and people, along with waste minimization and reduction of pollution (UNEP, 2022). In order to achieve SDG12-responsible consumption and production, it is important that the production and consumption ends of the supply-chain are simultaneously (convergence) analyzed and acted on, rather than dealing with them in a separate manner. Previously, place-, product-, sector-, and consumer-oriented approaches were adapted to enhance sustainability outcomes (Hickel, 2019; Lebel, 2004; Pan et al., 2018; Princen et al., 2002). These approaches were

limited by their narrow focus, causing imbalance, confusion, and the transfer of unsustainable practices geographically and within national economies, instead of eliminating them. Production-consumption systems (PCS) overcome these limitations by connecting the environment, humans, organizations, and the state through energy, material flows, and relationships using money, information, power, influence, and negotiation (Lebel & Lorek, 2008). Lebel and Lorek (2008) state 11 (eleven) strategies to implement SP-consumption system, these are: efficient production, green supply chains, involving consumers in the design process, extended producer responsibility, being service-oriented, green labelling, fair trading, ethical marketing, campaigns to inform consumers, using less and responsibly, and improving consumption wisely. The challenges for these mechanisms in achieving sustainable PCS include a disconnect between knowledge and action (Label & Lorek, 2010; Pan et al., 2018). These gaps arise because, firstly, the relevant actor may not know what actions to take due to unavailable or non-existent knowledge; secondly, the actor might lack the power to act on the knowledge even if they have it; thirdly, other factors often outweigh sustainability knowledge in decision-making (Hickel, 2019; Lebel & Lorek, 2010). To bridge this gap, effective communication is recommended. Some suggest that issues like differing priorities, political agendas, and corruption perpetuate these gaps and need to be addressed to achieve SCP patterns (Hickel 2019; van Kerkhoff & Lebel, 200). Promoting SCP patterns is a practice of doing good, as well as not harming the society the environment. In all cases, willingness and proper governance are essential for any PCS to operate smoothly and facilitate a transition to more sustainable behavior. Availability of meaningful information, such as structured organizational list with SCP implementation guidelines, is equally important in this regard. Although multiple literature mention SCP strategies applicable in relevant contexts, a unified and structured list or matrix that applies to all types of organizations was not identified.

ELEMENTS OF SUSTAINABILITY AND SCP-CURRENT APPROACHES, CRITICISMS, AND GAPS

When Elkington (1994) introduced the TBL theory for sustainable development in the mid-1990s, many researchers, environmentalists and global leaders agreed that, to achieve sustainable development, it is compulsory to attain economic development along with social progress and environmental protection. These three dimensions are meant to be interdependent and integrated and cannot be separated if we are to achieve the desired goal of human and environmental wellbeing (Elkington, 2013, 2018). Other dimensions, pillars and strategies of sustainability have also been mentioned by the United Nations at different forums and general assemblies. These include poverty elimination, human rights, equal opportunity, access to fresh drinking water, gender equality, access to education, elimination of diseases, reduction of carbon footprint, elimination of greenhouse gas emission, good governance etc. However, as of outcome 48 of the UN

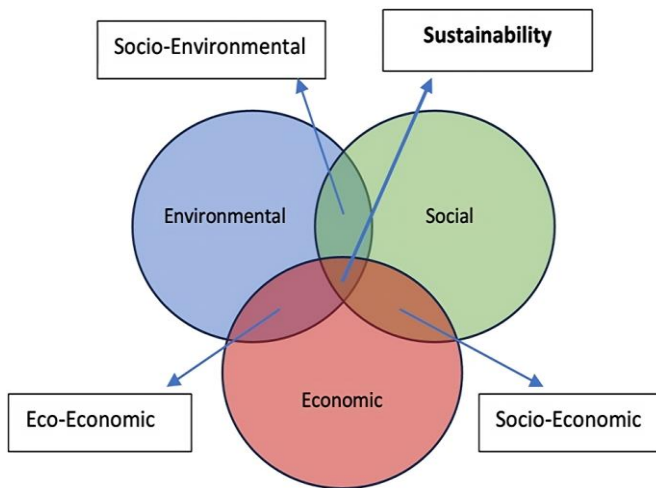


Figure 1. Pillars and elements of sustainable development (Lozano, 2008)

General Assembly Resolution 2005 (General Assembly, 2005) three major dimensions (economic, social, and environmental) have been stated as the reinforcing and interdependent pillars of sustainable development. Therefore, these three elements can be considered as the basis of sustainable development (Frajman et al., 2014). This approach to sustainability, also known as the holistic approach, believes that all the three major elements must be sustainable together or simultaneously in order to attain true sustainable development. Based on the TBL theory, **Figure 1** shows the three major elements or pillars as a Venn diagram with circles intersecting each other.

The intersecting areas are categorized as socio-economic, ecological economic and socio-environmental elements of sustainable development (Frajman et al., 2014; Kordej-De Villa, 1999; Lozano, 2008). The elements and sub-elements of sustainable development, as shown in **Figure 1**, are suggested to be applicable to any organizations, regardless of its size, type or geographic location. The three pillars along with other elements and sub-elements hold together simultaneously to build the concept of and enable sustainable development (Frajman et al., 2014). However, in a practical scenario it is quite difficult to achieve progress simultaneously throughout all dimensions or elements. Sometimes one or more elements may develop slower than the others or may be achieved at the expense of the others. For example, achievements in the areas of economic progress and social cohesion may be hampered by the lack of fresh air or drinking water, and thus making sustainable development difficult to achieve. This approach therefore does not specify how, at what degree and who would blend these elements so that the state of sustainability is achieved in the long run.

Another criticism of the three-dimension based TBL approach is that its social dimension incorporates any social issues even those that are not relevant to the economic and environmental dimensions. Although not intentional, this may, in the long run, contribute to an unbalanced or unsustainable development due to the existing power-structure or its misinterpretation (James, 2015; Srivasta et al., 2021). This issue may also create confusions in generating sustainability related reports. For example, an illegitimate or

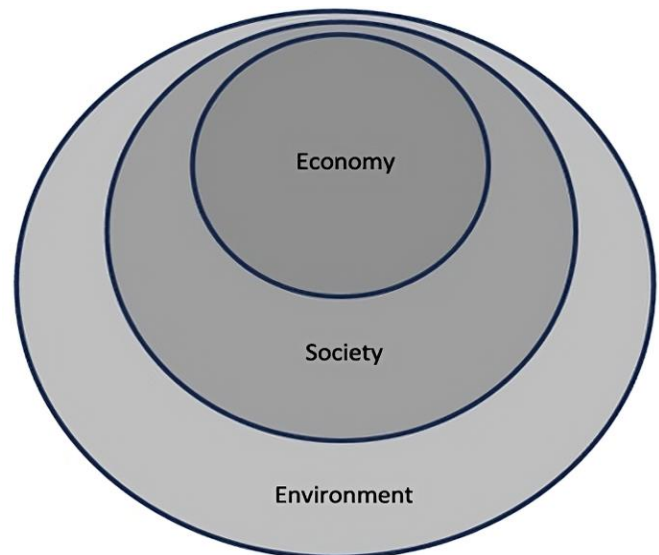


Figure 2. Elements of sustainable development–Nested circles approach (James, 2015, p. 46)

unfair policy or culture may not help to attain sustainable development even though matrices relating to economic or environmental dimensions, such as reduction of pollution or protection of natural resources or minimizing production costs, are met. Critics also say that the ideological assumptions of the TBL concept may lead to disorganized practices. For example, the TBL approach may suggest economic growth in a world which is already endangered by environmental degradation caused by intensive economic growth. This kind of incoherent practices causes confusion even to its proponents (Elkington, 2018; James, 2015; Srivasta et al., 2021). Even Elkington (2020), in his latest book, “Green swans” criticizes his own TBL approach by saying that he wants to do “a product recall” as it was faulty. He talks about “miracles on demand” and innovation that achieves all of these changes synergistically. The TBL divides the three aspects and does not deliver meaningful change.

The TBL approach is displayed as ‘nested circles’ by some other researchers. As shown in **Figure 2**, the center of the nested circles approach is the economy, encircled by society and then the environment. A problem with this approach is, it centers the economy and, this way, overemphasizes the economic dimension over the other two dimensions. This also gives rise to the problem that the economy may expand to such an extent that society and the environment may be dominated and regulated by it. However, James (2015) suggests this should not be considered a big problem as the concept of sustainable development has been built on the ideology that economic development should be balanced not to dominate the society or environment, and the nested circle approach reflects this ideology correctly. Critics of the Venn diagram approach argue that sustainability represented by the three overlapping circles leaves a very small room for it at the center (James, 2015). This also raises the same question as to who would take the responsibility to ensure that the elements are balanced.

Due to the above limitations, some researchers have proposed a fourth or fifth major dimension along with the three popular dimensions of the TBL approach. These include politics, culture, technology, knowledge etc. A four-domain

model named as “circles of sustainability” has been adopted by multiple global organizations, especially by those working in the areas of smart cities (James, 2015; Srivasta et al., 2021). In the circles approach, economy, ecology, politics and culture are proposed as the four primary dimensions or domains of sustainable development. Some scholars suggest that these four domains together are able to provide completeness to the complexity of social life. The set of four domains are compatible to each other and to nature in providing the necessary solution of sustainability and sustainable development (de Alencar et al., 2020; James, 2015). Although, the concept of a smart city highly priorities knowledge as an important domain in social life, the current trend of smart cities is basically focused towards making profits, and therefore knowledge is used as a tool (Trindade et al., 2017). The circles of sustainability approach, therefore, considers infrastructure, knowledge and technology as important tools of social life and places them as sub-category to the four domains, instead of introducing them as separate domains. Another major drawback of this model is that its domains and subdomains highlight sustainability from an area or city or locality’s point of view. Therefore, it is not clear how much of its application in the context of an organization would be appropriate. Nevertheless, none of these models have little to no explanation of who would be responsible actors for ensuring proportionate blend of the dimensions.

UN bodies, at different times, have also proposed multiple elements and dimensions of sustainability and sustainable development. As of the 2015 UN sustainable development summit, five elements underpinning sustainable development goals (SDGs) are stated. These are people, planet, prosperity, peace and partnership (United Nations Information Centre Canberra, 2015). Although UN has long been discussing and incorporating the TBL approach as its areas of interest, and developing action plans accordingly, in the 2015 summit there were clear talks about these five elements. United Nations proposed to implement action plans on these elements, in the form of SDGs, over the term 2015 to 2030 with the expectation to bring poverty level down to zero and ensuring healthy lifestyle along with clean environment. The goals expect that all countries, leaders, government and non-government organizations work in harmony and solidarity in achieving them (United Nations Information Centre Canberra, 2015).

Apart from the above domains and elements, many other elements have been proposed by researchers and global leaders. These include agriculture, energy, manufacturing, transport, business, education etc. However, a close analysis of these elements reveal that the majority of them can be categorized within the capacities of the three or four major domains. Also, it is apparent from the above discussions that the very same dimensions of sustainability and sustainable development are often represented as elements, pillars or domains by different researchers and governing bodies in different occasions. To mitigate this confusion and for the purpose of this research, the major aspects of sustainability would be called ‘dimensions’ and anything contributing to the dimensions would be regarded as ‘elements’ or ‘factors’. For example, society, economy, politics, organization, or environment would be called dimensions as these concepts are broader in terms of their scope. In order to specify the scope of

these dimensions, we need to identify the elements on which these dimensions will work to attain sustainable development. Such as ‘climate change’ would be an element under the ‘environmental’ dimension and ‘energy efficiency’ would be an element under the ‘economic’ dimension, as well as ‘gender equity’ would be an element under the ‘social’ dimension. The reason for choosing this convention is to differentiate between the main and subcategories or components of sustainability, and to eliminate the confusion of using the terms dimensions and elements. This would also help in the development of a unified strategies to promote SCP patterns, in the coming sections.

THE WOMB APPROACH TO SUSTAINABILITY AND SCP

Throughout the above discussions, it is evident that the current models of sustainability do not specify how to ensure a proper blend of the dimensions so that the state of sustainability is attained. It is also clear that a unified strategies to promote SCP patterns is also missing in the literature. This section, therefore, proposes a new approach to define the dimensions of sustainable development and SCP, as well as identifies the responsible actor to blend them so that optimal output is achieved. The approach would be called as ‘womb approach to the elements of sustainability’ and ‘womb approach to the elements of SCP’. Justification of the name and relevant dimensions is discussed in the following paragraphs. A unified strategy to promote SCP patterns, in the light of womb approach, has also been introduced in this section.

Womb Approach to Sustainability

Although various literature mention society, economy, politics, ecology, organization, environment as well as people, planet, peace, partnership and prosperity as dimensions and elements of sustainability, some of them seem to be overlapping and sometimes ambiguous. For example, people, society, partnership relate to social activities of people therefore can be placed under one ‘social’ dimension. Similarly, environment, planet and prosperity – all relate humans with the surrounding environment and therefore can be placed under a common ‘ecology’ dimension. On the other hand, economic activities can be placed under the ‘economy’ dimension, and political and organizational activities can be placed under a ‘governmental’ dimension. Therefore, in the light of the above discussions and limitations of different models and approaches of defining the dimensions of sustainable development, a ‘womb’ approach is put forward. **Figure 3** displays this approach.

As shown in **Figure 3**, the dimensions of sustainable development can be compared to a mother’s womb. In the womb, a baby grows and receives the necessary nutrients for its health. The womb protects and controls a balanced growth of the baby and ensures its wellbeing. In the same way, sustainable development can be achieved if the economic, social and ecological dimensions can grow in a balanced way. This balanced growth is not possible without a good governance and honest intention of the management to

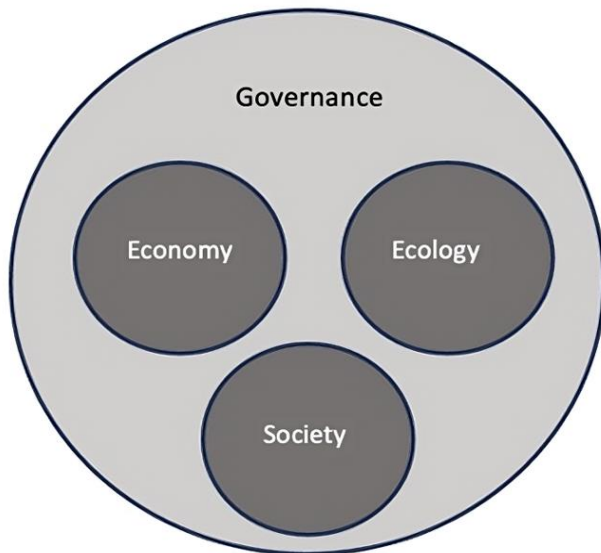


Figure 3. Dimensions of sustainable development–Womb approach (Source: Authors' own elaboration)

implement sustainability within the organization. Adopting sustainability just for public attention or to comply with regulations, without any good intention, may bring disaster instead of sustainability (Dunphy, 2015). Therefore, the womb approach proposed here, the 'governance' dimension is compared to a mother's womb. Decision and policy making by good governance can only ensure healthy and balanced growth of the other three dimensions of sustainable development.

Womb Approach to Sustainable Consumption and Production

The 'womb approach' to the dimensions of sustainable development, considers 'governance', 'economy', 'environment' and 'society' as the four major dimensions of sustainability. This model believes that an effective governance can nurture the economy, society and ecology to ensure that they grow in a balanced way - the way nutrients in a mother's womb nurture a baby towards its balanced growth. However, sustainability principles and definitions embrace 'not harming' the society and the environment, and thus, they relate to people's moral obligations. The SCP patterns, as discussed earlier, fall into the ethical spectrum of human nature, which is not only to avoid doing harm rather also proactively doing good, such as using less water, eating less meat products, using public transports or procure sustainably etc. (Fisher & Lovell, 2012; Lashley, 2016). When it comes to realizing SCP patterns, it is important that people's individual behavior pattern is modified so that consumption practices become sustainable. Although there are many factors and interventional strategies available, as discussed in the previous sections, to influence this behavior pattern socially and politically, the consumption pattern is not likely to be fully sustainable unless people embrace it voluntarily out of their own ethics. As consumption practices influence production patterns and vice-versa, the same applies in the case of the businesses and organizations. Although governmental and other external pressures can enforce an organization to undertake sustainability measures, SP patterns cannot be fully implemented unless organizations embrace them out of their

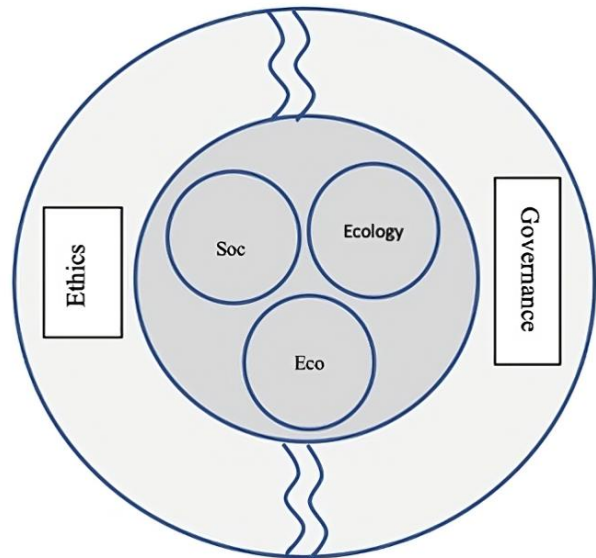


Figure 4. Dimensions of SCP–Womb approach (Source: Authors' own elaboration)

moral and ethical obligations. Sustainability measures without ethical obligations may either end up in strategies focused to bypassing political consequences or result in 'greenwashing' just to realize the incentives and competitive advantages (Fisher & Lovell, 2012). Therefore, in order to fully realize SCP patterns, 'ethics' must be considered as one of the most important dimensions along with the dimensions of sustainable development, e.g., governance, economy, society and ecology. This research, therefore, considers society, economy, ecology, ethics, and governance as the major dimensions or elements of SCP patterns. **Figure 4** displays the elements of SCP patterns, which is based on the womb approach to the dimensions of sustainability.

In this approach, governance and ethics have been considered equally important in nurturing the economy, society and ecology so that SCP is successfully implemented. Governance, along with policies, can influence human and organizational behavior to some extent. However, ethical obligation is essential in fully realizing them. Individual and organizational ethics and behavior can send strong messages to the governance and policymakers to come up with better strategies. Thus, the shifting boundary between ethics and governance, as displayed in **Figure 4**, can adjust with each other and nurture 'economy, society and ecology' in fully implementing SCP patterns, the way nutrients inside the mother's womb nurture an embryo towards a balanced grown.

Factors and Strategies to Promote SCP Patterns in the Light of Womb Approach

In the light of the above womb approach, this paper would like to propose a unified strategies to promote SCP patters. As mentioned earlier, such a unified list of strategies has not been identified in the relevant literature. Therefore, a thorough review was conducted to unify the following 56 strategies (**Table 1**) that can be used to promote SCP patterns within any organization regardless of their size or type. These 56 strategies are categorized under the 5 major dimensions (economy-society-ecology, governance, and ethics) of the 'womb approach to the elements of SCP'.

Table 1. Strategies to promote SCP patterns–Womb approach

Elements	Factors and strategies to promote SCP patterns
Economy, society, and ecology	<p>(1) Social campaigns, advertisements, boycotts by environmental groups to promote socially and environmentally superior products and services (Fuchs, 2013; Luchs & Mooradin, 2012; Vermeir & Verbeke, 2006)</p> <p>(2) Proper eco-labelling/certification to ensure consumers receive proper information about a product (Bonroy & Constantos, 2013; GEN, 2020; Kaufmann et al., 2012)</p> <p>(3) Reduction in domestic consumption of energy (gas and electricity) and water (Mortensen, 2006; Usman et al., 2022)</p> <p>(4) Promote locally grown food products (Mortensen, 2006; Stein & Santini, 2022)</p> <p>(5) Reduced use of transportation for food and other products (Fuchs, 2013)</p> <p>(6) Use of energy efficient vehicles for food and products transportation (Fuchs, 2013)</p> <p>(7) Reduced production of meat products (Wahlen et al., 2012)</p> <p>(8) Carbon labelling of food products (Bertz et al., 2022; Vanclay et al., 2011)</p> <p>(9) Reduced food wastage by producers (rotting of food) (Fuchs, 2013; Stuart, 2009)</p> <p>(10) Producing (or using) energy efficient heating/cooling devices (EUPOP, 2011)</p> <p>(11) Facilitating and supplying of recycled water for washing, cleaning and gardening (Portney, 2015)</p> <p>(12) Producing fuel efficient, clean and electric vehicles (Schuitema et al., 2013)</p> <p>(13) Campaigns, awareness programs and promotions to use bicycles and public transports (Garling & Friman, 2015)</p> <p>(14) Establishing green products as ‘cool’, ‘sexy’, ‘smart’ and symbol of social status (Charter et al., 2008; Vogey-Kleschin et al., 2015)</p> <p>(15) Turning production facilities (machine, tools, lighting, heating, cooling and building) fuel and energy efficient (Energy Star, 2014; Johnson et al., 2016)</p> <p>(16) Implementing the 4 ‘R’ strategy (recycle, reuse, reduce and remanufacture) (Islam et al., 2023; Swisher, 2006)</p> <p>(17) Continual assessment of business/production facilities against ‘in-house’ sustainability indicators (Biller & Biller, 2017)</p> <p>(18) Installation of smart grids (Brundage et al., 2015)</p> <p>(19) Additive manufacturing/3D printing to produce parts (Biller & Biller, 2017; Hardcastle, 2015)</p> <p>(20) Implementing industrial ecology (Babkin et al., 2023; Mont & Heiskanen, 2015)</p> <p>(21) Implementing circular economy (Babkin et al., 2023; Mont & Heiskanen, 2015)</p> <p>(22) Ensuring life-cycle approach to product design, manufacturing, distribution and after-life assessment for carbon footprint and socio-environmental costs (Mont & Heiskanen, 2015)</p> <p>(23) Adopting sustainable marketing practices and increasing consumer awareness (Anuradha et al., 2023)</p> <p>(24) Implementing green supply chain (Al-Awamleh et al., 2022)</p> <p>(25) Implementing green logistics and transportation (Al-Awamleh et al., 2022)</p> <p>(26) Adopting sustainable procurement (Opoku et al., 2022)</p> <p>(27) Implementing production-consumption systems (Lebel & Lorek, 2010)</p> <p>(28) Adopting sustainable-innovation and eco-innovation (Zulkiffli et al., 2022)</p>
Governance	<p>(29) Incentives to promote production and sale of green products (Fuchs, 2013; Luchs & Mooradin, 2012; Vermeir & Verbeke, 2006)</p> <p>(30) Incentive/subsidy to install home solar systems connected to national grid (EUPOP, 2011)</p> <p>(31) Disincentives and tariffs on using unsustainable products (Danish Ministry of Environment, 2012)</p> <p>(32) Regulations/standards on manufacturing of products to eliminate socio-environmental impacts (Fuchs, 2013)</p> <p>(33) Regulation to reduce food wastage (Danish Ministry of Environment, 2012)</p> <p>(34) Progressive taxes/capping on energy and water usage (Rehfeld et al., 2007)</p> <p>(35) Standards set by local chamber of commerce to promote green businesses, manufacturing and products (Fuchs, 2013)</p> <p>(36) Regulation to use recycled water for cleaning, washing, gardening purposes (Portney, 2015)</p> <p>(37) Incentives to produce energy efficient, clean and electric vehicles (Garling & Thogersen, 2001)</p> <p>(38) Disincentives for private vehicles purchase and registration (Garling & Friman, 2015)</p> <p>(39) Construction of pathways for bicycles and regulations for using them as the sole transport in designated areas (Garling & Friman, 2015)</p> <p>(40) Incentives/awards for being socially responsible, caring and fair businesses 4.2.10 (Lashley, 2016)</p> <p>(41) Regulations for increasing efficiency of production facilities and waste minimization</p> <p>(42) Regulations for extended producer responsibility</p>
Ethics	<p>(43) Personal values in making purchase decisions for green and locally grown products (Fuchs, 2013)</p> <p>(44) Concern for the society (Fuchs, 2013)</p> <p>(45) Concern for the environment (Fuchs, 2013)</p> <p>(46) Awareness for sustainable consumption and production patterns (Moraes et al., 2012)</p> <p>(47) Change in habitual consumption practices (Fuchs, 2013; Shove, 2003)</p> <p>(48) Responsibility of the print and electronic media to promote SCP practices (Moraes et al., 2012)</p> <p>(49) Eating less meat products (Wahlen et al., 2012)</p> <p>(50) Using less water (Portney, 2015)</p> <p>(51) Reduced domestic food wastage (Fuchs, 2013; Stuart, 2009)</p> <p>(52) Reduction in home sizes (Wahlen et al., 2012)</p> <p>(53) Use of bicycles, public transports instead of private vehicles (Heinen et al., 2010)</p> <p>(54) Route planning while driving (van Wee 2014)</p> <p>(55) Being a corporate citizen (e.g., through reciprocity and fair play, social responsibility and caring) (Fisher & Lovell, 2012; Lashley, 2016)</p> <p>(56) Continually identify carbon footprint reduction potentials within the organization (such as ‘ecomagination’ or ‘energy treasure hunt’ type programs) (Hower, 2013).</p>

METHODOLOGY AND APPROACH

A thorough literature review was conducted to identify the 56 strategies of SCP listed under the womb approach. A range of scholarly articles in the areas of sustainability strategies were chosen. This includes research papers, book chapters, journal articles, and newspaper article. Curtin University's online library platform and google search engine, both were used to access relevant journals, articles, books and papers across all major databases (including ProQuest, JSTOR, Elsevier, Science direct, eBook-central, etc.). A range of organizational websites, relating to sustainability leadership and measures (e.g., UN, UNEP, UNDP, OECD, EU, etc.), were also accessed in conducting the literature review. A range of keywords (e.g., sustainability, SC, SP, sustainable transportation, sustainable meat and food consumption, ethics and sustainability, sustainable supply chain, sustainable procurement, sustainable domestic energy consumption, sustainable water consumption, sustainable marketing and PCS) were used to search for relevant articles. While reviewing journals and articles relating to a particular area of SCP, emphasis was given to essential factors and elements that contribute towards implementation and promotion of sustainability. For example, while reviewing literature on sustainable transportation, emphasis was given to those factors of transportation that contribute towards promoting sustainability and SCP patterns. Similarly, while reviewing articles and journals on sustainable procurement, factors that contribute towards promoting sustainable procurement system were identified. After reviewing all available topics and areas of SCP, along with any potential areas of unsustainability, a list of 56 factors to combat the unsustainability and promote SCP patterns were listed. Each of the factors were then thoroughly studies and placed under the 3 major groups proposed under the womb approach to SCP, based on their type. For example, strategy 3, 'reduction in domestic consumption of energy and water' and strategy 8, 'carbon labelling of food products', can be categorized under economic-social-ecological category. The reason for this choice is these strategies primarily focus towards attaining economic sustainability driven by social and ecological factors. However, strategy 36, 'regulation to use recycled water for cleaning, washing and gardening purposes', is driven by regulatory implications and therefore grouped under 'governance' category. On the other hand, strategy 44, 'concerns for the society', can only be made successful through moral obligations and therefore grouped under the 'Ethical' category.

In order to investigate the effectiveness of the 56 SCP strategies proposed in this paper and to identify any other missing or possible SCP strategies were conducted. The case studies involved two large corporations from two different demographics. Both the organizations claim to be sustainable organizations and have sustainability strategies in place. The first organization, named X, is in located in Qatar whereas the second one, named Y, is located in Bangladesh. Qatar is a country with a high human development index, Bangladesh falls within the category of a lower-middle income earner country (World Bank, 2022). Choosing these two countries would help to discover how sustainable organizations in these

Table 2. Interview participants

Employee position/department	Number of participants
Organization 'X'	
Director-admin	1
Manager-IT	1
Admin-supervisor	1
Asst. director-admin	1
Total	4
Organization 'Y'	
Coordinator/manager-sustainability	1
Manager-PR	1
Manager-IT	1
Asst. manager- sustainability	1
Manager-production	1
Total	5

two different economies combat unsustainable measures, and thus can be helpful in generalizing the research outcomes (reference). Organization X belongs to education and research category with main businesses in the areas of elementary and high schools, colleges, universities, and research centers. Organization Y, on the other hand, belongs to manufacturing industry category with businesses in the areas of ready-made garments, ceramics and cement. Both the case studies would involve open ended, semi-structured and some structured questions with an aim to seek understanding of sustainability strategies adopted. Open-ended or unstructured questions helped to understand the organization's detailed strategies relating to SCP, whereas semi-structured and unstructured questions were asked in order to eliminate the possibilities of divergence from the focus area (Jason & Glenwick, 2016). The questions focused on the following areas:

- Understanding of sustainability vs SCP patterns in the organizational context
- Use of structured metrics in attaining sustainability/SCP goals
- Elements of sustainability/SCP metrics in the organizational context
- Implementation of SCP strategies
- Impediments in the way of implementing SCP strategies
- Role of IT and Business Intelligence in measuring and promoting the SCP strategies
- Impediments in the way of promoting SCP strategies from IT/BI perspectives

Around 4-5 participants from Each of the organizations participated in the interviews. All the participants belonged to mid or strategic management tier and are associated with various operational areas, including IT, requiring them to work closely with the organizational sustainability strategies, visions and their implementations (Table 2). The interviewees were first sent the set of questionnaires, as a google form. Along with the other questions, the questionnaire asked them to list strategies that their organizations adopted as part of sustainability and SCP strategies. The interviewees of each organization were then asked to meet as a group using zoom platform to ensure that the strategies they listed were agreed upon and attested by others within the same organization.

Table 3. Survey results

Area of query	Yes	No	Partially
Is the organization a sustainable one with various sustainability strategies	8	0	1
Understanding of the difference between sustainability and SCP patterns	2	4	3
The organization has developed a list/matrix of SCP strategies	0	6	3

The group interviews took around 1 hour for each of X and Y. After the group interviews, discussion notes and strategies from both the organizations were listed and analyzed to come up with elements of SCP patterns. Based on the responses received from the interviewees, a list of factors to implement SCP patterns were noted. The factors were then compared with the 56 strategies proposed under the ‘womb approach to the factors and strategies of SCP’.

RESULTS AND ANALYSIS

Organization X, a non-profit entity established in Qatar in 1995. Engaged in education, research, innovation, and community development, it forms partnerships with global institutions to tackle challenges in Qatar and make lasting impacts locally and globally. The initiative, covering 12 square kilometers, hosts various universities, research centers, and community hubs, offering a distinctive model for multidisciplinary education and innovation. Guided by values such as excellence and innovation, organization X’s logo, featuring a local tree, symbolizes a commitment to sustainability, reflecting the reproductive cycle of the tree’s fruits and indicating the enduring future of the organization. Sustainability is a core value of this organization. This is evident through its entities like ‘Earthna’ and initiatives like the ‘Qatar National Research Fund’. Goal of these entities and initiatives align with the country’s commitment to achieving SDGs 2030. Organization X’s dedication and success in sustainability make it an ideal subject for this case study.

Organization Y, on the other hand, chosen for this case study, is located in Bangladesh and operates in diverse sectors such as apparels, textiles, ICT, ceramics and others. Established in 1991, it boasts a robust annual turnover of US\$780 million and a workforce of 38,000. With investments from notable entities like the IFC and Swedfund, organization Y expands its global footprint, including ventures in Ethiopia. Notably, the organization excels in sustainability, aligning with SDGs 2030 and earning acclaim from the UN global compact. As a signatory, it publishes sustainability reports following GRI guidelines, affirming its commitment to corporate governance, environmental stewardship, and community engagement on a global scale.

Survey results reveal that, despite being sustainable organizations, majority of the employees did not have a clear knowledge of the SCP strategies. Although, both the organizations had multiple sustainability strategies in place (listed in **Table 3**), majority of the employees agreed that they lacked a clear matrix that outlines the SCP strategies and their implementation guidelines. Majority of the employees agreed that their organizations utilized multiple isolated tools in analyzing and tracking the sustainability measures, rather than using single integrated Business Intelligence systems (7 out of 9 with the other 2 were ‘not sure’). They also blamed the

absence of a structured matrix as an impediment for not being able to utilize an integrated business intelligence system. Although the 2 later revelations are not the focus of this study, they would be helpful in the future in investigating the role of an integrated business Intelligence system in promoting SCP patterns.

Table 4 lists all the 56 SCP strategies along with total number of people, from both organizations, that endorsed them. Based on the responses received, it can be seen that all the strategies chosen to fall within the scope of the 56 strategies. Although the interviewees had the opportunity to include additional strategies based on their organizational operations, none were proposed by them. Both the organizations confidently claim to be sustainable organizations with multiple SCP strategies in place. Also, both organizations have varied and diverse operations in multiple areas of business. Endorsement of the strategies by mid and high-level management of these organizations proves the effectiveness of the 56 strategies proposed under the womb approach.

Although majority of the strategies have been endorsed by these organizations, some of the strategies have not been endorsed by anyone from either organization. One might consider this to be evidence of ineffectiveness or redundancy of these strategies. However, it has been explained earlier that this is a generalized list of strategies and are meant for all types of organizations regardless of their type or size. Careful planning and assessment of the strategies are required to implement them in a particular organizational context. Not all organizations are expected to implement all of them in order to promote SCP patterns. For example, in **Table 3**, strategy #7 which entails to reduce production of meat products, has zero endorsement. Because none of these organizations are associated with meat production, strategy #7 is not relevant to their context. Similarly, because none of these organizations produce electric vehicles, strategy #12 does not apply to them. Strategy #31 also does not apply to either of them as they are not governing bodies to impose tariffs on unsustainable products. Therefore, the strategies with zero endorsement simply applies to different contexts. Survey of the strategies with a larger sample space amongst multiple industries should further reveal their effectiveness in promoting SCP patterns.

Another issue with **Table 4** is the variation in the endorsement. Some of the strategies have been endorsed by fewer people whereas others by larger number of respondents. Group discussion sessions revealed that some of the strategies implemented by one functional area that employees in the other areas may not be fully aware of it. For example, a managerial level employee from organization Y informed of a few awareness training sessions on ‘social responsibility’ (strategy #55) that employees in the IT or PR department were not aware of. Similarly, organization X undertook a program to reduce food wastage (strategy #9) in the restaurant outlets in

Table 4. SCP strategies and endorsement (survey results)

Strategy	Endorsed by (nos)
1	2
2	5
3	3
4	3
5	4
6	5
7	0
8	5
9	2
10	8
11	3
12	0
13	4
14	3
15	4
16	7
17	8
18	2
19	2
20	2
21	3
22	4
23	6
24	7
25	7
26	7
27	3
28	4
29	3
30	0
31	0
32	4
33	0
34	0
35	0
36	0
37	0
38	0
39	3
40	0
41	9
42	2
43	2
44	6
45	6
46	6
47	4
48	0
49	0
50	9
51	4
52	0
53	4
54	3
55	2
56	3
Other strategies	0

their premises, that employees or management in other departments were not aware of.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

In the light of the above discussions, one may ask questions on the reliance on individual or organization ethical obligations in implementing SCP patterns. It needs to be reminded that ethical behavior may not always come naturally to individuals or organizations. Whilst some people in society choose to purchase eco-labelled products out of their personal obligations or due to social advertising, e.g., the *homo sociologicus* consumers (Fuchs, 2013), certain scholars argue that it is primarily the government's responsibility to enforce such behaviors (Cripps, 2013; Johnson, 2003). In a world where economic incentives are the primary focus for many businesses steering towards 'greenwashing', government-enforced regulations become essential for driving both individuals and organizations toward sustainability. The proposed "womb approach to the dimensions of SCP" could serve as a guiding framework in this regard. This approach aims to balance ethical obligations through various policies and strategies. The evolving boundary between ethics and governance highlights the importance of government oversight in monitoring ethical responses from both individuals and organizations, ensuring that SCP patterns are effectively implemented through relevant policy measures.

Another question one may ask is the application of the 56 strategies in a global organizational context. This paper presents two case studies of "sustainable organizations" where the majority of the 56 strategies were endorsed by various stakeholders. Although, the literature review shows that most of the proposed 56 strategies are already implemented in various contexts, in a fragmented way rather than as a cohesive approach, a broader survey across more organizations could be conducted to further test the strategies and generalize these findings. This would help to determine if the 56 strategies can be applied globally across diverse organizational contexts.

CONCLUSION

In conclusion, the 'womb approach to sustainable development' introduces a nuanced perspective, incorporating 'governance' as a fundamental element crucial for achieving balanced growth in economic, social, and ecological dimensions. Effective governance serves as a catalyst, ensuring harmonious development. Furthermore, recognizing the ethical considerations embedded in SCP patterns, the 'womb approach to the dimensions of SCP' integrates governance and ethics as indispensable components. This integration addresses crucial gaps in the existing literature, providing a holistic framework that emphasizes ethical responsibility and effective governance in tandem with sustainability goals. This approach serves as a valuable guide for organizations, enabling them to strategically plan and implement SCP strategies.

Aligned with the 'womb approach,' the paper proposes 56 strategies tailored to various organizational sizes and types. These strategies offer a versatile toolkit for organizations to navigate the complexities of SCP implementation, fostering

sustainable practices irrespective of their scale or nature. Overall, the 'womb approach' provides a comprehensive and ethical foundation for sustainable development and SCP, contributing to the advancement of responsible and balanced organizational practices.

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