

SDG commentary: services that sustainably manage resources for all humans-the regenerative service economy framework

Rebekah Russell-Bennett

School of Advertising, Marketing and Public Relations/Centre for Behavioural Economics, Society and Technology,
Queensland University of Technology, Brisbane, Australia

Michael Jay Polonsky

Department of Marketing, Deakin University, Melbourne, Australia, and

Raymond P. Fisk

ServCollab, San Marcos, Texas, USA and Department of Marketing, Texas State University, San Marcos, Texas, USA

Abstract

Purpose – The purpose of this paper is to propose a new service framework for managing nature and physical resources that balances the needs of people and planet.

Design/methodology/approach – The process used in this paper was a rapid literature review and content analysis of 202 articles in service journals and learned that there are limited papers on Sustainable Development Goal (SDG) #6 (clean water and sanitation) or SDG #7 (affordable and clean energy) and very few articles on SDG #12 (responsible production and consumption) that focused on environmental components of services. This highlighted the need to conceptualise a service framework for managing these resources sustainably.

Findings – The proposed regenerative service economy framework for managing natural and physical resources for all humans (without harming the planet) reflects insights from analysing the available service articles. The framework draws on the circular economy, an Indigenous wholistic framework and service thinking to conceptualise how service research can manage natural and physical resources in ways that serve both people and the planet.

Originality/value – This paper introduces the regenerative service economy framework to the service literature as an approach for guiding service researchers and managers in sustainably managing natural and physical resources in a sustainable way.

Keywords SDG, Clean water, Sanitation, Clean energy, Responsible consumption, Responsible production, Resources, Service ecosystem, Sustainability, Energy (SDG 7), Responsible consumption and production (SDG 12), Water and sanitation (SDG 6)

Paper type Research paper

1. Introduction

Services that manage resources for all humans is the third ServCollab service research theme. This theme is based on the United Nation's Sustainable Development Goals (UN SDGs) of clean water and sanitation (#6), affordable and clean energy (#7) and responsible consumption and production (#12) (see [Figure 1](#)). Resources are central to economic thought as shown in this definition: "economics is the study of how society manages its scarce resources" ([Mankiw, 2021](#), p. 2). As developed by service-dominant logic (2014), resources are also central to service research and to services marketing. While there is evidence of research on these SDGs across different marketing fields, there is scattered research in the services field.

A number of service researchers have made clarion calls for services to responsibly manage resources for the benefit of

people and the planet. The most recent call is contained in the ServCollab perspectives article on the service thinking mindset ([Alkire et al., 2023](#), p. 586), which emphasised that "human life is totally dependent on the resources of our living planet". Service thinking draws on Kate [Raworth's \(2018\)](#) Doughnut Economics, which calls for resource management to be socially and environmentally responsible in ways that avoid creating shortfalls such as unsafe water, unaffordable and socially unconscious energy usage, overshooting the planetary boundaries and creating biodiversity loss and ozone depletion. Service thinking highlights the interdependence of humans and the environment, where it is in humanity's self-interest to protect and nurture the environment and embrace a custodianship mindset ([Alkire et al., 2023](#)).

In this commentary, we examine the service literature to date on the three UN SDGs that constitute the service research theme of services that manage resources for all humans. We then propose a new framework and a research agenda for a service approach that can contribute to these SDGs. The first

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Figure 1 ServCollab's service research themes



Source: Russell-Bennett *et al.* (2024)

SDG is clean water and sanitation (#6). Across the developed world, water services that deliver clean drinking water and sanitation services that remove human waste are essential public services. Many developing countries (e.g. rural India, Nepal, parts of Africa) lack clean water and sanitation services and experience severe public health problems (Bisung and Elliott, 2017). Access to clean water and sanitation services is also an issue for Indigenous communities in the remote areas of developed countries such as Australia, Canada and the USA.

The second SDG is affordable and clean energy (#7). This goal covers access and supply of renewable energy, pricing of energy, energy efficiency and the transition from traditional energy infrastructure to clean energy (the clean energy transition). The third and final SDG is responsible consumption and production (#12), which is one of the broader areas within the SDGs with impacts across multiple other goals. Production and consumption draw on natural and human resources to create and satisfy goods and services.

Services and service research have the potential to advance each of these goals; however, given the breadth of approaches, it is unlikely that any single project on its own can address all aspects, especially given the reliance we have on the anthropocentric underpinnings of the dominant social paradigm, which assumes humans are the centre of all things (Dunlap and Liere, 1984). One reason for this may be the Abrahamic religion's belief that the earth and its natural resources were created to address human needs (Polonsky *et al.*, 2014). Most business research takes a very anthropocentric perspective where humans are the centre of all things (Kortetmäki *et al.*, 2022). Anthropocentrism is a Western/Northern perspective of human supremacism or human exceptionalism. Anthropocentrism is at the root of the many systems of exploitation of people and the planet during the last thousand years, which includes the extreme exploitation of colonialism.

Here, we acknowledge that Indigenous knowledge and perspectives have not been a part of the service research literature on these SDGs. Australian Indigenous peoples believe Country (including animals, flora, water, wind, soil, rock formations and cosmos) are sentient (Merlan, 2020). This belief is shared by Indigenous peoples around the world. We suggest that service researchers should adopt a more synergistic perspective we term as the *intergenerational custodian mindset*, which seeks to be in harmony with the perspectives of Indigenous people. An intergenerational custodian mindset acknowledges and respects the complex interdependence of all life on Earth that occurs over a long period of time spanning human generations.

The circular economy approach is shifting the way we use natural and physical resources from use and disposal to a reduction of waste and reuse (www.ellenmacarthurfoundation.org). The butterfly diagram of the circular economy includes some flows and aspects of the system (<https://ellenmacarthurfoundation.org/circular-economy-diagram>), however omits many of the key actors in the service ecosystem including communities, influencers, government, non-profit organisations, media and consumer groups. The circular economy approach is linear as evidenced by sequential flow of stages and does not take the ecosystem into account (Vargo, 2021). The circular economy is goods-centric, which does not include the use of natural and physical resources in the service delivery process or service processes. Drawing on the circular economy principle of regeneration which is a hallmark of Doughnut Economics (Raworth, 2018) and service thinking (Alkire *et al.*, 2023), we adopt an ecosystem approach to the activities involved in the consumption and production of both goods and services and label this as *the regenerative service economy*.

The purpose of this commentary is thus to propose a service framework that balances the needs of people and the planet. The *regenerative service economy framework* recognises the importance of mindset and service thinking practices to

sustainably manage resources for all humans. Specifically, we focus on the SDG natural physical resources of water and energy and the use of these natural resources in the service consumption and production process. To achieve this purpose, we undertook a literature search of nine service journals. This search identified a total of 17 articles for clean water and sanitation, 19 for affordable and clean energy and 166 for responsible consumption and production. The data were collected in early 2023, which explains the small number of 2023 papers. This paper commences with outlining the three SDGs that are the subject of the paper. As the paper is part of a series of commentaries that are a ServCollab (a global human service non-profit dedicated to bringing researchers together to reduce suffering, improve well-being and enable well-becoming) initiative, these SDGs are aligned with ServCollab's mission, and the results of a rapid literature review on the three SDGs in service research is discussed. The regenerative service economy framework for sustainably managing natural and physical resources is presented and discussed and finally a research agenda for future service research is outlined.

2. Defining the SDGs of clean water/sanitation, affordable and clean energy, and responsible consumption and production

2.1 Clean water and sanitation

The UN has identified that:

Clean water is a basic human need, and one that should be easily accessible to all. There is sufficient fresh water on the planet to achieve this. However, due to poor infrastructure, investment and planning, every year millions of people – most of them children – die from diseases associated with inadequate water supply, sanitation and hygiene. (<https://sdg-tracker.org/water-and-sanitation>)

The goal for SDG #6 is to ensure availability and sustainability of water and sanitation for all. This goal consists of eight targets which have one or two indicators of performance (see the [Appendix](#)). Because clean water and sanitation are essential resources for human life and all other life, service researchers should be investigating the availability and quality of water and sanitation across the service systems of the world. Such research might start at the national level, but from a service research perspective, such research should also focus on cities or communities where water and sanitation are unsafe or insufficient. In many parts of the world, poor communities and marginalised communities have never had adequate access to clean water and sanitation.

2.2 Affordable and clean energy

The UN explains that:

Energy is central to nearly every major challenge and opportunity the world faces today. Be it for jobs, security, climate change, food production or increasing incomes, access to energy for all is essential. (<https://sdg-tracker.org/energy>)

The goal for SDG #7 is to ensure access to affordable, reliable, sustainable and modern energy for all. This goal consists of five targets (see the [Appendix](#)) that each have one or two indicators of performance. Service research can support this goal to manage energy resources; however, it cannot do so alone. Service researchers need to collaborate with other disciplines including engineering, economists, technology experts and policy experts to identify how access can be improved and how

uptake of clean energy processes and tools can be accelerated. For example, creating community solar systems create benefits for all, through improved amenity, not just those generating or using the electricity.

2.3 Responsible consumption and production

According to the UN, SDG #12 responsible consumption and production is defined as:

Promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all. Its implementation helps to achieve overall development plans, reduce future economic, environmental and social costs, strengthen economic competitiveness and reduce poverty. (<https://sdg-tracker.org/sustainable-consumption-production>)

This goal consists of 11 targets (see the [Appendix](#)) that each have one or two indicators of performance. While there is no explicit discussion of services within this goal, it implicitly includes both traditional goods and services. The consideration of services is especially important as services can reduce production through the sharing economy. Services can also offer more responsible consumption choices, which can include used products, repairing products and more responsible disposal systems. In addition, many business services assist organisations in reducing their negative environmental impact. For example, firms have been established to collect used food oil that is then reprocessed into biofuels ([Peiró et al., 2010](#)) for intermediaries that connect consumer to consumer exchanges of unwanted goods, reducing waste to landfill ([Dhanorkar, S. 2019](#)).

These goals range from developing national plans to address responsible consumption and production (target 12.1), to more individualistic behaviours, such as (target 12.8) enhancing consumer awareness of environmental issues for sustainable development and lifestyles in harmony with nature.

3. ServCollab and SDGs #6, #7 and #12

ServCollab's mission is “to serve humanity through research collaborations that catalyse reducing suffering, improving well-being, and enabling well-becoming” ([ServCollab.org, 2023](#)). Hence, these three SDGs are very connected to ServCollab's mission. Firstly, effective management of resources (i.e. water and energy) and responsible consumption and production can reduce suffering on planet Earth. Secondly, seeking resilient service systems through responsible management of natural resources improves the well-being of humanity and planet Earth. Thirdly, seeking opportunities for innovative and collaborative service system solutions to the resource management SDGs can enable well-becoming on planet Earth.

ServCollab's focus on “Serving Humanity Through Collaboration” might seem to some people as focused only on humans. To counter this perception, the first ServCollab perspective article was titled “Service Ecosystem Health” ([Fisk and Alkire, 2021](#)), which is defined as “[...] the interdependent state of private, public, and planetary well-being necessary for sustaining life” (p. 195). That article also proposed a “Goldilocks Civilization” thought experiment that “[...] reimagines human service ecosystems to expand their ability to support individual human life, human societies, and the biodiversity of planet Earth” (p. 199). Here, the role of SDGs #6, #7 and #12 can be made clearer. All life on Earth requires

water, energy sources and must consume resources sustainably or risk extinction. The challenge for humanity is that we are a keystone species (Hawken, 2021). In Northern-/Western-dominant cultures (hegemony), many people continue to believe their culture is superior to other human cultures. This perspective is not universal, as Indigenous peoples and those from the Global South have different ontological positions. ServCollab advocates mutualism as humanity's only sustainable and regenerative solution (ServCollab.org, 2023).

4. Current service research and SDGs #6, #7 and #12

4.1 Clean water and sanitation in service research

A rapid literature review of the service literature in the nine service journals was undertaken using the search terms: water OR sanitation or hygiene. This resulted in 24 articles. After screening each article, 22 were removed as they were only tangential to the topic. The remaining two articles in service journals were modestly relevant to the hard challenges of the UN SDGs. Picazo-Tadeo *et al.* (2009) described ways to improve the efficiency of water utilities, and Piha and Rääkkönen (2017) explained the importance of customer toilets in retail stores.

Service researchers have not focused on clean water and sanitation as societal service research topics. However, clean water and sanitation are the foundations of human health. Hence, it is urgent that service researchers adopt clean water and sanitation as central topics for service research of any kind, especially transformative service research. The UN targets, indicators and performance to date are shown in the Appendix. For each indicator, service research opportunities are identified.

4.2 Affordable and clean energy in service research

A search of the service literature in the nine service journals was undertaken using the search terms: energy OR electricity, energy OR electricity AND customers OR consumer, energy OR electricity AND service OR consumption OR production. This resulted in 26 articles. After screening the articles, seven were removed as they referred to effort energy rather than electricity or gas energy resulting in 19 articles. The main energy topic covered by the articles was energy efficiency (4 articles), switching/defection (3) and smart energy technology (3). The first paper in the services journal appeared in 2006 (Ibáñez *et al.*, 2006) with occasional papers over the next ten years. An increase of articles appeared from 2019 and included topics varying from energy home management technology (Gonçalves *et al.*, 2020) to customer vulnerability and well-being (Russell-Bennett *et al.*, 2020). Australia and Sweden are dominant country contexts with 21% and 15% of articles, respectively.

Most of the research is at the micro-level of the ecosystem with consumers as the primary sample. There is an inferred rational behaviour approach, that is customers plan energy behaviour with a dominance of the "Theory of Planned Behaviour". Few of the articles specifically investigated the non-individual factors that create barriers for energy use (see Glavas *et al.*, 2020, as an exception) instead they examined factors such as motivation, informational influence, inertia, perceptions of service quality and values. The industries

outside of the energy sector that feature heavily in the service literature are food (see Tjärnemo and Södahl, 2015; Jeng and Yeh, 2016); specifically, restaurants, agriculture and grocery stores. There was little examination of systems features such as mindset, rules or flows (Meadows, 1999). There are thus opportunities to adopt a systems approach and in particular the role of mindset (as the most powerful leverage point in the system) (Meadows, 1999) to examine other levels of the service ecosystem, the interplay between actors within the service ecosystem and external factors that constrain clean energy use such as access, design of new tools to manage electricity, supply chain management of energy-efficient processes and devices and cross-industry use and sharing of energy.

When examining progress to date for SDG 7, the UN has identified a series of indicators and measured performance for each (see the Appendix). The performance data reveal that access is a key inhibitor of achieving SDG 7, particularly in countries of Western Asia and Africa. Service opportunities for each indicator are shown in the Appendix and demonstrate evidence of the need for energy organisations to share resources and design affordable energy services for mutual benefit. Both access and choice-set are largely out of individual control and largely within the remit of organisations such as retailers, networks and government. Thus, the responsibility for many of the indicators are system-wide rather than individual. A service ecosystem approach, which draws these actors together to design innovative affordable and accessible services that benefit people and the planet mutually, is needed.

4.3 Responsible consumption and production in service research

To explore what research has been done within the service domain of responsible consumption and production, we undertook a review of journals that discuss services. The key search process used the terms responsible OR sustainable AND consumption or production and revealed 233 articles. This resulted in 166 articles (see the Appendix).

There was limited examination of SDG #12 before 1999. Services papers increased in 2021 (note that as the data for this review were only collected in early 2023, this explains the incomplete data for this year). Seeking to summarise the coverage of these 166 service articles, we undertake a very simple content analysis of the titles to assess the focus of these papers. SDG #12 is interesting in that while it broadly covers consumption and production, it also specifies goals related to the very specific domains of travel, energy, food and fashion (see Table 1). It should be noted that papers could deal with multiple issues, for example, De Bruyne and Verleye (2022) discuss sharing broadly as well as this as a focused business strategy.

The overwhelming majority of services articles discuss a range of behavioural issues related to sustainable topics such how consumers address corporate sustainability strategies (e.g. Kessous *et al.*, 2016), how they participate in waste reducing retail activities (i.e. Nicolau *et al.*, 2022) or views on service technology and environmental impacts (i.e. Rausch *et al.*, 2021).

There is almost no research discussing waste management from a consumer perspective (an exception is Nicolau *et al.* (2022),

Table 1 Industries and topics represented in service research on SDG 12

SDG 12 industries	#	Focus	#
Fashion/Clothing	12	Strategy	37
Energy/Transportation	8	Measurement	8
Food	30	Circularity issues	14
Tourism	4	B2B	12

Source: Authors

with only limited discussion of this within the business context as well (e.g. Tootelian and Gallagher, 2009; Wu *et al.*, 2012). In fact, the business services context seems to be more generally under-represented in the services literature, with only 12 papers with a business-to-business (B2B) focus identified. Within this sample of articles, the business or strategy implications of SDG #12 are limited with a focus on broader strategies around greening or circularity as a business philosophy (Bordian *et al.*, 2023; Tingchi Liu *et al.*, 2014). The underrepresentation of business services within the services literature is something that has been previously noted (Knight, 1999) and needs to be addressed in the future.

There are also few service articles that measure the environmental impacts of services, although the quantification of environmental impacts arises in the non-service domain. For example, the literature in accounting discusses the measurement of firms' environmental impact (Vitolla *et al.*, 2019; Hichri, 2023; Niemenmaa, 2022). Environmental auditing and management services are explored in non-business journals, such as *Ecosystem Services* (e.g. Comte *et al.*, 2022) and need to be explored in the services literature.

SDG 12 focuses on the consumer and business decisions that minimise environmental impact, but limited discussion arose on the environmental impacts arising from behaviour change. The lack of environmental focus makes it impossible to assess whether any one alternative consumer or organisational action is environmentally preferable to another. Thus, there appears to be no real consideration within the service domain (or wider marketing domain) as to what actions are most environmentally important.

The complexity of issues covered in SDG #12 make a coordinated approach to researching these services issues problematic. For example, the travel sector is an important contributor to negative environmental impacts, yet there is no single coordinating body directing all tourism sustainability-related goals. In addition, a reduction of tourism conflicts with some other goals such as SDG #9, where developing tourism is critical to some nation's prosperity.

In the Appendix, we provide the indicators, performance to date and some service research opportunities linked to specific indicators. There are some broad suggestions that can be provided from this. Critically, service research needs to incorporate more concrete measures of how services impact given SDGs. This will allow firms, policymakers and consumers to identify environmentally effective alternatives. The services research also seems to ignore business services related to environmental issues, but rather see these as specialist discipline topics. In doing this, we will enable opportunities to consume more responsibly. This also creates more choices for participating, with better business and

consumer outcomes nurturing human–environmental healing and fostering happiness.

5. A framework and research agenda for sustainably managing resources for all humans – we are not owners but custodians of these resources

ServCollab argues that service researchers are uniquely positioned to help accelerate human progress (Fisk *et al.*, 2020). So, how can service researchers accelerate progress towards the three SDG goals reviewed in this commentary? We are already on the path to understanding how to better manage the resources of energy, water and how to more effectively consume and reuse resources. For instance, based on Raworth (2018), *service thinking* was introduced as a just, mutualistic and human-centred mindset for creating and regenerating service systems to meet the needs of people and the planet (Alkire *et al.*, 2023). More recently, Vargo (2021) and Fehrer *et al.* (2023) have advocated for a service ecosystems approach to the circular economy given the many similarities in principles.

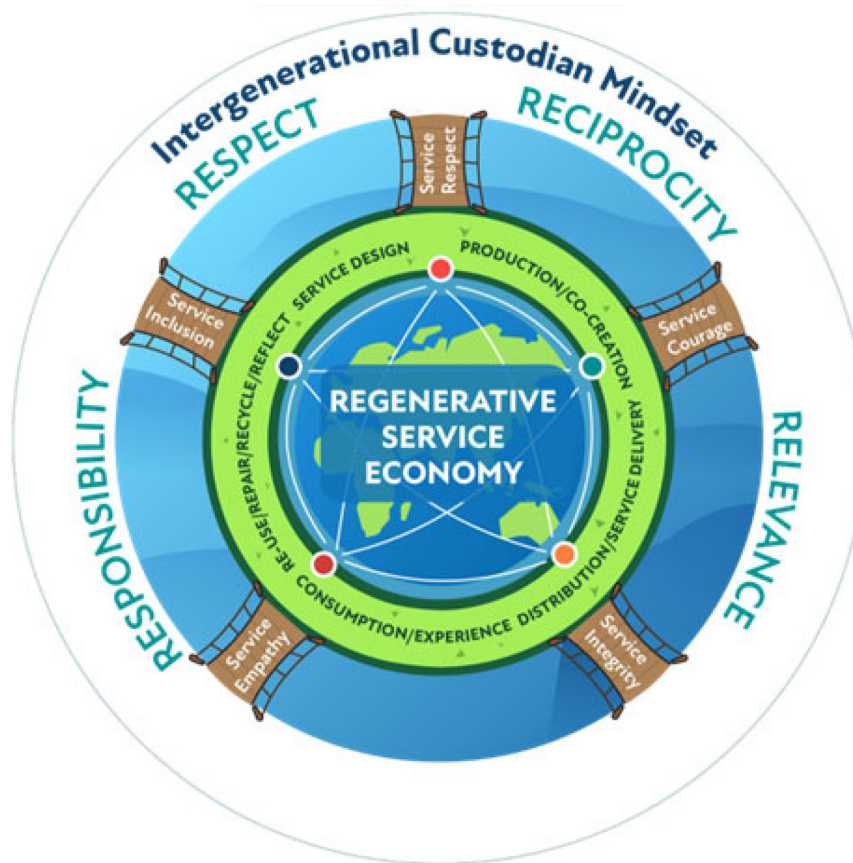
We propose a *regenerative service economy framework* for managing physical and natural resources for all humans (without harming the planet) that reflects insights from analysing the available service articles in Section 4. The service research opportunities sections for SDGs #6, #7 and #12 reflect the urgent need to increase access to affordable water and energy and to increase responsible production and consumption for all humans. The slowness of achieving these SDG indicators (and in some cases the complete absence of progress) indicates that there is an urgent need for mindset change across all resource systems. The analysis also revealed a need for a service ecosystem approach that draws actors together to facilitate mutual benefit for humans and the planet. Finally, the analysis identified the need for more effective service measurement. Measuring the impacts of services on human and environmental outcomes will allow for more effective decision making. We also need to broaden the discussion to more specialised organisational services that enable organisations to better manage their environmental responsibilities.

5.1 Conceptual framework of services that sustainably manage resources for all humans

The *regenerative service economy framework* (see Figure 2) draws on the circular economy, an Indigenous wholistic framework and service thinking to conceptualise how service research can manage natural and physical resources in ways that serve *both* people and planet. While the specific resources in this commentary are water, energy and resources involved in responsible production and consumption, the framework is broad enough to be applicable to other SDG resources. There are three components of our conceptual framework: intergenerational custodian mindset, the regenerative service economy and service thinking practices.

5.2 Mutualism as the key framework principle

Mutualism is the fundamental principle in this *regenerative service economy framework*, which is defined as reciprocally

Figure 2 The regenerative service economy framework for services that sustainably manage resources for all humans

Source: Authors

beneficial relationships between organisms (Alkire *et al.*, 2023). Planet Earth is the ultimate mutualism ecosystem where mutualism enables life to thrive. The need for mutualism in ecosystems also means that services cannot focus on a single SDG or industry to the exclusion of others, and services cannot focus on a single actor without considering the impact or input of other actors. The three economic sectors (commercial, nonprofit and public) need to work together in a “leaderful” way (Raelin, 2010). At times, each sector may be required to take the initiative but leading together is a shared responsibility.

Mutualism is best understood from a systems perspective that includes actors, resource flows and relationships and addresses power dynamics between human and planetary needs. From the perspective of mutualism, we are custodians of natural resources rather than owners. We need to share scarce resources when we produce and consume. We do not need to acquire a resource to be able to live healthily. Any assumption of a right to ownership tends to encourage behaviour that exploits natural resources. A custodian approach is consistent with Elinor Ostrom’s work on common pool resources (Atkins *et al.*, 2019; Wilson *et al.*, 2013).

An issue to be considered is the potential for tension and inconsistency between these resource-related SDGs. For instance, the European parliament noted an unsolvable tension in the current development model where production and consumption happen at the expense of natural resources and

creating tension between “safeguarding of natural resources and the aspirations for improved wellbeing” (Europa, 2022). Trade-offs are required to achieve the SDGs.

5.3 Intergenerational custodian mindset

We have termed the outer circle as an intergenerational custodian mindset that is necessary for services that sustainably manage resources for all humans. In doing so, we bring together the concepts of intergenerational and custodianship with mindset. Mindsets are the most powerful leverage point in a system (Meadows, 1999) and the best leverage point for designing services that manage resources for all humans sustainably. This mindset recognises that human–environment interactions are intergenerational and both short and long term. We develop the aspects of an intergenerational mindset by drawing from an Indigenous wholistic framework (one way to represent Indigenous ways of knowing and being) (Pidgeon, 2016; Kirkness and Barnhardt, 1991).

Human custodianship of the planet begins with an intergenerational mindset of human–environmental interactions (both short and long-term). Humans need to be custodians of natural resources and protect them for future generations. The *Indigenous wholistic framework* recognises balance in physical, spiritual, intellectual and emotional needs that are sustained by relationships with others including physical place (natural resources). The wholistic framework has

four elements, the 4Rs [from the seminal work of [Kirkness and Barnhardt \(1991\)](#) with First Nations' students]: respect, relevance, reciprocity and responsibility. We adopt the 4Rs in our outer circle as practices that represent an intergenerational human–environmental custodian mindset for services that manage resources for all humans.

Respect for the environment among Indigenous peoples arises from the fact that they often view elements of nature as being “a living entity and potentially a relative for which they have responsibility to protect” ([Wilson and Inkster, 2018](#), p. 1). The environment is seen as an ancient being sometimes preceding humanity, and thus something to be respected and protected, as it is not able to protect itself. This is directly related to the obligation that communities have to these resources, as there is recognition of their critical role in the survival of the people that draw on them ([Robinson et al., 2021](#)). Thus, there is a reciprocity obligation of humanity to the natural resources, which highlights the coexistence of nature and humanity ([Beckford et al., 2010](#)). Finally, services and goods should be produced and consumed that are respectful of all humans as well as respectful of the planet.

5.4 The regenerative service economy

The inner circle of the framework depicts a *regenerative service economy*, which draws on both circular economy models ([www.ellenmacarthurfoundation.org](#), [European Commission 2020](#)) and [Vargo's \(2021\)](#) non-circular systemic sustainability approach where value is created through service exchange in service ecosystems. Renewable resources are those where there is a “reproductive surplus, which is determined by the balance between births, deaths, and somatic growth” ([Hilborn et al., 1995](#), p. 45). Thus, the consumption of these resources is replaced by additional resources being created. However, once there are more resources extracted than are replaced, this results in declining resources. For example, riverways are critical resources that are renewable, assuming there is sufficient rain or melting snow. However, the extraction of too much water for irrigation can reduce water flows, water quality and growing capacity for communities and the ecosystems that are further downstream ([Borsato et al., 2020](#)). Regeneration applies to a range of resources that are able to replace themselves, whether it be animal populations, forests or other species. Many natural systems are regenerative or self-replenishing or even heal themselves after harm has been experienced, such as forests recovering after a fire. Human activity has a significant impact on both degradation and regeneration of renewable resources ([Robinson et al., 2021](#)), as if we extract too many fish or create conditions where forests cannot replenish themselves the system breaks down. Many of these natural systems create critical resources for human survival. For example, plant life is needed to create oxygen through photosynthesis. Yet in a recent paper, it was suggested that human induced global warming could result in a breakdown of the ability for forests to undertake this critical role in the ecosystem ([Bartels, 2023](#)).

Regeneration has recently become a major theme in the environmental literature regarding circularity. One of the best examples of this is the book *Regeneration: Ending the Climate Crisis in One Generation* by Paul [Hawken \(2021\)](#). He begins with this sentence “Regeneration means putting life at the

centre of every action and decision”. The circular economy was designed for resource connections, i.e. environmental flows, but not for connections to humans. Therefore, we added human service activities in the three stages of the customer journey (pre-service, service and post-service) ([Fisk, 1981](#)) that are relevant to regeneration; service design, co-creation, service delivery, experience and reflection. Service managers need to make strategic decisions at each stage of these activities that consider the regenerative consequences of their actions. These are a complement to the regenerative manufacturing activities of reuse–repair–recycle, production, distribution and consumption. Thus, the activities in the regenerative service economy involve both sustainable manufacturing and service for the purpose of “putting life at the centre of every action and decision” ([Hawken, 2021](#)). The coloured dots around the regenerative service economy globe represent these different sets of activities.

Unlike the circular economy which has a circular flow and sequential order of production and consumption activities, in the regenerative service economy, we draw on the non-circular flow concept from [Vargo \(2021\)](#) with lines that represent iteration and feedback between and across activities. Activities can be done in sequential order, or they can be reorganised, revisited or reformulated. In this way, the *regenerative service economy framework* mimics living systems processes and the “messiness” of the production and consumption process for both goods and services.

We fully support the logic of [Raworth's \(2018\)](#) *Doughnut Economics* model, which is a reframed economic approach for regenerative outcomes that benefit people and the planet. Raworth discusses what she calls the economy within society. According to [Raworth \(2018\)](#), the embedded economy contains four parts: households, markets, commons and the state. Thus, we use the term economy to encompass these four parts.

5.5 Service thinking practices as a bridge between mindset and the regenerative service economy

We use the metaphor of bridges to connect the outer mindset ring with the inner regenerative service economy ring. We propose five bridges representing the five practices of service thinking ([Alkire et al., 2023](#)). These service thinking practices are the observed manifestation of the service thinking mindset that drive actions and behaviours in a service ecosystem that benefits people and the planet ([Alkire et al., 2023](#)). Service thinking highlights the dual role of humans as custodians of natural resources and users of natural resources. [Alkire et al. \(2023\)](#) proposed four implications:

- 1 Service thinking values the core contribution of households.
- 2 Service thinking enables the market to serve wisely.
- 3 Service thinking can unleash the creativity and potential of the commons.
- 4 Service thinking can guide the state in becoming more accountable.

Each of these implications is consistent with the logic that custodianship of the planet requires a mutualistic relationship with all humans.

6. Research agenda for services that sustainably manage resources – the regenerative service economy

A research agenda has been developed to accompany the new *regenerative service economy framework* (see [Table 2](#)) which reflects how service research can support the achievement of the SDGs and targets shown in the [Appendix](#). These research questions identify key areas that need addressing by service scholars to help service scholars and managers sustainably manage natural and physical resources.

6.1 Future directions in measurement and evaluation of the regenerative service economy

The *regenerative service economy framework* needs to be supported with measurement and evaluation of each of the components. Service researchers have not been good at quantifying the impacts of outcomes within the broader transformative domain. There is a management saying that what gets measured is what gets done. Yet in services research and even the broader marketing research field, there is limited evaluation of the environmental impacts of changes in action. Rather, researchers focus on whether being green increases loyalty or purchase intentions. These business impacts are important, but there needs to also be an assessment of the environmental impact of changes. Thus, which decision reduces the environmental impact of the broader exchange?

One reason for the lack of such a focus is that there is no clear measure of a firm's or consumer's environmental impact. This like meso-level impacts arises in a range of transformative

service encounters. There are several difficulties associated with measuring impacts. Firstly, there are multiple measures for assessing one type of environmental impact, with no universal agreement as to which measure is best ([Visentin et al., 2020](#)). Secondly, environmental impacts are highly complex, that is, are we assessing the carbon-life cycles, impact on water use, exposure to toxic materials or weakening biodiversity? Thus, what environmental outcome is most salient?

A shared measurement system has been identified as one of the five components of an ecosystem of shared value ([Kramer and Pfitzer, 2016](#)) and recommended as a key path forward in fostering the clean energy transition ([Bedggood et al., 2023](#)). The need for all actors in a system to have common goals, such as the SDGs, which are tracked and monitored by a common measurement system has been highlighted as critical for an effective and human-centric energy sector ([Bedggood et al., 2023](#)). As such, if shared measurement systems do not exist, we cannot identify the impact of alternative actions, which makes organisational and consumer decision-making difficult because there is no consistent basis of comparison.

6.2 Future directions for service researchers

Based on the analysis of existing service research for each of the three SDGs and our proposed *regenerative service economy framework*, we outline two key directions for service researchers and a direction for service editors and reviewers. The first and most important research direction is to focus on the environmental consequences of actions, both consumer and firm. Within the literature, marketers focus on models

Table 2 Research agenda

Framework component	Potential research questions
The regenerative service economy framework	<ul style="list-style-type: none"> How can new services be designed that holistically include all natural resource SDGs? How can governments be organised to integrate rather than separate responsibility for natural resource SDGs? What are the power dynamics and tensions between actors in the service ecosystem for each SDG and how can these be addressed? What are the performance indicators of effective service management of resources, including assessing the health of the environmental system? Do service researchers have the expertise to explore services designed to improve environmental systems?
Intergenerational custodian mindset	<ul style="list-style-type: none"> What are the barriers and motivations to adopt an intergenerational mindset for designing and delivering services that manage resources? How can service processes that reflect an intergenerational mindset be designed for long-term success? How do we integrate long-term evaluations of effectiveness, alongside short-term business cycles.
Regenerative service economy	<ul style="list-style-type: none"> What are the relationships between the service activities in the regenerative service economy? Which actor capabilities are important for different service activities in the regenerative service economy? What are potential unintended negative consequences for activities and actors in the regenerative service economy and how can these be mitigated?
Service thinking for people and the planet	<ul style="list-style-type: none"> Do we have metrics that allow us to assess the impact of human activities on the natural environment, that can be integrated within existing business frameworks? How do we ensure that the negative environmental consequences of human activity are included when assessing the effectiveness of service outcomes? How do we make trade-offs between human and environmental values?

Source: Authors

examining changes in behaviour (White *et al.*, 2019), with the assumption that this will benefit firms. We need to start considering the consequences of all actors in the ecosystem on people and the planet. That is, while one service may reduce the firm's environmental impact, what is the consumers' and/or other service firm's environmental impact and what is the ecological benefit? This is critical as consumers (and businesses) increasingly make trade-offs in decisions, and these trade-offs need to create the most environmental value as well as increased welfare.

The second research direction is studying business services and actions. This is important because of the scale of activity. If a business can reduce packaging waste, then there is less waste for consumers to dispose of/recycle. If service businesses can collaborate with customers to mutually reduce their consumption of water and energy, they can reduce their environmental impacts. In addition, service researchers need to increase their focus on assisting business and industries in becoming regenerative. This means by-products, waste (including water and energy), need to be collected and reprocessed, not just at one stage of the process but throughout all stages of the process. Service researchers need to provide evidence that business resource actions that benefit people and the planet can also benefit shareholders. Unfortunately, without this evidence, commercial organisations will be slow to adopt actions that protect people and the planet when using natural and physical resources.

Third and finally, we would implore editors and reviewers in service journals to encourage service research that address not only SDGs #6, #7 and #12 but all the SDGs. This could be done through special issues call for papers, updating the scope of the journal webpage to include SDGs and public services, updating keywords to include public services and specific SDGs, adding *ad hoc* reviewers with expertise in these SDGs and communicating with reviewers about the scope of the journal as inclusive of these SDGs.

6.3 Future directions for service managers

Service managers have important responsibilities for the usage of water and energy in their organisational practices. Sustainable consumption of water, energy or any other resource should be practised by companies and customers (Lime, 2015). Service managers also have a role to play in creating sharing markets that will reduce consumption and production. For instance, many people are giving up car ownership because of car share schemes or ride share schemes (Becker *et al.*, 2018). This trend will certainly increase with autonomous cars but is still a long way off. Service managers need to demonstrate they can meet consumer needs without consumers having to acquire goods, by providing for these needs through services. Finally, service managers should not see responsible use of energy, water, production and consumption as the antithesis of profit. Indeed, recent research advocates for people-profits and planet (Larivière and Smit, 2022).

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Appendix

Table A1 Journal inclusion for review and numbers of articles

Journal name	#6	#7	#12
1. <i>Journal of Retailing and Consumer Services</i>	7	9	97
2. <i>Journal of Service Management</i>	2	2	13
3. <i>Journal of Service Research</i>	3	1	7
4. <i>Journal of Service Theory and Practice</i>	1	4	5
5. <i>Journal of Services Marketing</i>	1	1	21
6. <i>Service Business</i>	2	3	4
7. <i>Service Industries Journal</i>	1	2	14
8. <i>Services Marketing Quarterly</i>	0	1	2
9. <i>Service Science</i>	0	1	3
Total	17	24	166

Source: Created by the authors

Table A2 SDG #6 – targets, indicators, performance to date and service research opportunities

Indicator*	Progress*	Service research opportunity
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all		
Proportion of population using safely managed drinking water services	2022: 2.2 billion people lack safe drinking water services	Service inclusion research could investigate the circumstances preventing more than two billion people from access to safe drinking water. Service design research could develop or redesign services to include all of humanity in safe drinking water
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations		
Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water	2022: 3.4 billion people lack safely managed sanitation services, and 1.9 billion lack basic hygiene services	Service inclusion research could investigate the circumstances causing more than 1.9 billion people to lack safe sanitation services. Service design research could develop or redesign services to include all of humanity in safe sanitation services
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally		
6.3.1 Proportion of domestic and industrial wastewater flows safely treated	2022: 58% household wastewater safely treated, little progress being made	Service design research is needed that rethinks and redesigns waste water management approaches that are embedded in communities, cities and nations
6.3.2 Proportion of bodies of water with good ambient water quality		
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity		
6.4.1 Change in water-use efficiency over time	Water use efficiency improved by 9% 2015–2020 2020: water stress remains at a safe level of 18.2% but there are regional variations with Asia and Africa increasing water stress	Service design research is needed that analyses current water usage efficiencies and proposes alternative water usage designs
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources		
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate		
6.5.1 Degree of integrated water resources management	50% of countries lack effective frameworks for sustainable water management. Lack of cross-sector coordination over water use. Progress is being made but needs to double to achieve target	Service research could investigate the characteristics of the best managed water management systems. Service design research could develop or redesign water management services to improve water management practices services worldwide
6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation		
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes		
6.6.1 Change in the extent of water-related ecosystems over time	20% of river basins experiencing above natural fluctuations in surface water	Service researchers and ecosystem services research need to collaborate on service design research that reduces human damage to water resources and enables regenerative design for improving water resources
6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies		
6.a.1 Amount of water- and sanitation-related official development assistance (ODA) that is part of a government-coordinated spending plan	ODA decreased 15% between 2015 and 2021. Commitments have decreased since 2017	Service research is needed that addresses strategies for improving water- and sanitation-related official development assistance

(continued)

Table A2

Indicator*	Progress*	Service research opportunity
6.b Support and strengthen the participation of local communities in improving water and sanitation management		
6.b.1	% of countries that have procedures for community participation has remained high (over 70%) but % of countries with high levels of participation remains low (under 40%)	Service research could develop improved community communications about water management and community participation in water management decisions
Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management		
Note: * Goal 6 Department of Economic and Social Affairs (un.org)		
Source: Created by the authors		

Table A3 SDG 7 – targets, indicators, performance to date and service research opportunities

Indicator*	Progress as at 2022*	Service research opportunities
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services		
Proportion of population with access to electricity	Proportion of world population with access to electricity reached 91%, up from 83%, with 1.3 billion people gaining access. But over 700 million people globally are living in the dark	Service researchers could identify which opportunities enable affordable energy services. Service researchers could identify benefits for multiple actors in the system to work together for collective benefit
Proportion of population with primary reliance on clean fuels and technology	69% of the global population had access to clean cooking fuels and technologies. 2.4 billion cooking with harmful and polluting fuels	Service researchers could identify how to close the Digital Divide (level 1-access) for people experiencing hardship (LDCs and sub-Saharan Africa) Service innovation researchers could provide innovative solutions and processes for clean cooking fuels
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix		
Renewable energy share in the total final energy consumption	The share of renewable sources in total final energy consumption amounted to 17.7% globally. The electricity sector records the largest share of renewables (26.2%), heat and transport sectors have seen limited progress	Service researchers could identify tools and service communication that facilitate ease of consumer decision-making and choice of renewable energy Service innovation researchers could identify how to increase the options for heat and transport industries to use renewables. Service researchers could identify supply and demand-side barriers to adopting renewable energy
7.3 By 2030, double the global rate of improvement in energy efficiency		
Energy intensity measured in terms of primary energy and GDP	Improvement in primary energy intensity has slowed due to energy-intensive industrial production and only modest rates of technical efficiency	Service innovation researchers could identify how to design renewable energy services and responsible use of energy in service processes
7.a.1 By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology		
International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems	International financial flows in support of clean and renewable energy to developing countries have decreased 11% since 2020	Service researchers could foster international collaboration to facilitate sharing of clean energy research and technology
7.b.1 By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support		
Installed renewable energy-generating capacity in developing countries (watts per capita)	Annual rate of improvement of 9.8% but this is not on track for the targets	Service researchers could identify supply and demand-side barriers to adopting renewable energy Service researchers could develop case studies of best practice to identify service success criteria

Note: *<https://sdgs.un.org/goals/goal7>

Source: Created by the authors

Table A4 SDG #12 – targets, indicators, performance to date and service research opportunities

Indicators*	Performance to date*	Opportunities for service research
12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries		
Number of countries developing, adopting or implementing policy instruments aimed at supporting the shift to sustainable consumption and production	2019–2022: 484 policy instruments reported by 62 countries. Yet reporting decreasing 30% every year Regional imbalance with 50% come from Europe and Central Asia	Service researchers can assist in designing appropriate policies, including carrots and sticks, that will move to less harmful consumption and production for people and the planet (nurture healing). It is, however, unclear with myopic consumers and decision makers, whether voluntary options will be effective
12.2 By 2030, achieve the sustainable management and efficient use of natural resources.		
Material footprint, material footprint per capita and material footprint per GDP Domestic material consumption, domestic material consumption per capita and domestic material consumption per GDP	Total material footprint in 2019 95.9 billion tonnes	Service researchers can assist in developing effective measurement and tracking tools. Thus, services can assist in developing technologies, with specialist firms delivering business services to assist in this domain
12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses		
(a) Food loss index and (b) food waste index	2021: 13.2% of food lost globally (unchanged since 2016) not on track for halving food losses for 2030	Service researchers can focus on broader food systems, related to supplies and ensuring effective purchase. As many pre-packaged food plans that design and distribute pre-made or pre-packaged meals reducing waste Service researchers can assist in developing systems to collect “waste food” that is fit for human consumption for redistribution OR waste that can be reprocessed for other purposes such as energy production. Services need to be accessible for all customers
12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.		
Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement (a) Hazardous waste generated per capita; and (b) proportion of hazardous waste treated, by type of treatment	n.a	Service researchers can assist in developing models that facilitate circular economies to be developed. These include reverse and forward logistic management to ensure value from wastes are extracted and any unusable waste is appropriately disposed of (which in itself could be a new service). Service researchers can identify new service offerings may also be created that facilitate goods that are not currently used to other consumers and businesses (e.g. Craigs list”, B2B and C2C secondary markets) New services to protect customers from harmful waste
12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse		
By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse National recycling rate, tons of material recycled	n.a	Service researchers can develop frameworks and systems that support the sharing economy, including effective service intermediaries to ensure less production and thus less waste is created. It is important that access to services that reduce waste are available for all customers. Enabling choice is important to ensure autonomy and empowerment of customers

(continued)

Table A4

Indicators*	Performance to date*	Opportunities for service research
12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle		
Number of companies publishing sustainability reports	2022: 70% of companies publish sustainability reports – tripling since 2016. Sustainability indicators disclosed are policies on water and energy, occupational health and diversity. Only 10% report on all 17 SDGs	Services researchers can seek to better understand how business service providers (i.e. accounting and consulting firms) support integrated reporting frameworks, which will require the collection of information and thus management of activities to ensure targets are achieved
12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities		
Number of countries implementing sustainable public procurement policies and action plans	2022: 67 national governments reported implementation of sustainable public procurement policies, increase of 50% since 2020	Service researchers can work more on supply systems as information sharing is a critical role in the process. The identification and assessment of alternative goods and services relies on appropriate information being created but also on a method of enabling the sharing of this information in an objective way
12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature		
Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	n.a	Service researchers should enhance secondary service providers to ensure information accuracy and validity, enabling greater information sharing. Creating environmental goods and services (such as sharing economies) will create opportunities for lifestyles that are less harmful and that lead to happiness and well-being. But without a shift in the anthropocentric-dominant social paradigm, harmony with nature is unlikely
12.a: Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production		
Installed renewable energy-generating capacity in developing countries (in watts per capita)	n.a	Service researchers need to explore new service systems, such as community electricity grids drawing on carbon neutral production methods. This integration of technology and services to create new opportunities
12.b: Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products		
Implementation of standard accounting tools to monitor the economic and environmental aspects of tourism sustainability	n.a	Service researchers need to further explore the sustainable tourism sector creates a service system that serves to deceive tourism infrastructure, while considering its role in the natural ecosystem and thus is closest to embracing the interconnection between humanity and the natural environment. Service research can focus on the educational component of ecotourism enhancing consumer education about the ecosystem and thus assist in achieving goals such as 12.8

(continued)

Table A4

Indicators*	Performance to date*	Opportunities for service research
12.c Rationalise inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimising the possible adverse impacts on their development in a manner that protects the poor and the affected communities		
Amount of fossil-fuel subsidies (production and consumption) per unit of GDP	Rise in fossil fuel subsidies in 2021, governments spending \$732bn	Service researchers need to broaden their research into methodologies for assessing interventions, ensuring that practice and policy is effective in bringing about change. The development of services around the circular economy and sharing economy will also advance these outcomes. Such actions may be more easily implemented in developing countries, because of their initial disadvantaged positions. However, these countries also frequently do not have resources to implement innovations and equally important these populations may feel discriminated against for be prevented from having excesses of those in developed countries

Note: *<https://sdgs.un.org/goals/goal12>

Source: Created by the authors

Corresponding author

Rebekah Russell-Bennett can be contacted at: rebekah.russellbennett@gmail.com