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RECEIVED 24 June 2023

ACCEPTED 01 August 2023

PUBLISHED 10 August 2023

CITATION

Leal Filho W, Dibbern T, Viera Trevisan L,
Coggo Cristofolletti E, Dinis MAP,
Matandirotya N, Sierra J, Shulla K,
Buttriss G, L'Espoir Decosta P, Mbah MF
and Sanni M (2023), Mapping universities-
communities partnerships in the delivery
of the Sustainable Development Goals.
Front. Environ. Sci. 11:1246875.
doi: 10.3389/fenvs.2023.1246875

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Mapping universities-communities partnerships in the delivery of the Sustainable Development Goals

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The establishment of partnerships between universities and communities can significantly support the implementation of initiatives related to sustainability as a whole and help to realize some of the United Nations Sustainable Development Goals. Despite the usefulness of mapping of partnerships, there is a perceived necessity for studies, which may shed some light on these interactions, and the many advantages they offer. Against this background, this paper reports on a study which has assessed the extent to which partnerships between universities and communities may assist in achieving the SDGs. Methodologically, by means of a bibliometric analysis and the use of a set of enlightening case studies, the paper introduces some of the partnerships being implemented today and draws the lessons learned, which may be helpful in future initiatives. A total of eight initiatives are presented and discussed during the paper. The results suggest that more joint efforts are needed, as part of efforts to accelerate the implementation of the SDGs at the university level, including a list of measures that Higher Education Institutions (HEIs) could apply to address those goals. Overall, this research contributes to the sustainability area by providing empirical evidence, insights, and recommendations for fostering partnerships between universities and communities. It adds to the existing body of knowledge and understanding of how collaborative efforts can contribute to sustainable development and the achievement of the SDGs.

KEYWORDS

university-community engagement, Sustainable Development Goals (SDGs),
partnerships, cooperation, sustainability, higher education institutions (HEIs)

1 Introduction

Around the globe, cross-stakeholder partnerships have become an important delivery mechanism for social, economic, cultural, environmental, crisis management and/or conflict prevention programs. In the context of the complex, entangled and unpredictable challenges underpinning the Sustainable Development Goals (SDGs), single entity interventions have proven themselves woefully ill-equipped to achieve desired results. Indeed, by being too narrow in their approach, too inflexible, and too constrained in their reach, they have been unable to move at the pace, scale and impact demanded by the challenges at hand. By contrast, at their best, partnerships, i.e., clusters of stakeholders working collaboratively to address a common challenge, provide a model of working that draws on the unique competencies, knowledge, experiences, and expertise of what different communities, organizations and sectors have to offer in ways that are intentionally designed to be inclusive and that are dedicated to building sustainable solutions (Mundy and Tennyson, 2019; Leal Filho et al., 2022). It is no wonder, then, that SDG17, partnerships for the goals, is often deemed the most important of all the United Nations (UN) SDGs—achieving the other goals depends on it. Indeed, the UN makes clear that the “SDGs can only be realized with strong global partnerships and cooperation” (United Nations, 2022).

Yet a high degree of variability appends the notion of “partnership”, characterized by “diverse definitions, conceptual similarities/differences, evidence volume and dispersion, logistics/resource and feasibility issues” (Hoekstra et al., 2020, 2), which presents significant challenges for synthesis. Indeed, such variability is evidenced in the diversity of partnership approaches (e.g., community-based partnerships, participatory action research, transdisciplinary co-production), intentions (e.g., along a spectrum from transactional to collaborative); typologies (e.g., public-private partnership, research/learning, capacity-building, multi-stakeholder, local/national/international, single or multi-sectoral) and terminologies (e.g., coalitions, affiliations, collaborative, networks) in use across multiple fields, disciplines, and organizational contexts. Because partnering requires people from “different entities, sectors and communities to cross their organizational boundaries and engage differently” (Mundy and Tennyson, 2019, 6), there is a need for operational principles and strategies that can ensure they are both productive and manageable.

While the literature is somewhat limited in describing optimal partnering processes, some key principles have emerged for partnering in a variety of contexts, including those of relevance to the pursuit of the SDGs (i.e., complex, multi-faceted, multi-scalar, multi-sectoral). Mundy and Tennyson. (2019) of the Partnership Brokers Association, for instance, identify the following five principles as being particularly valuable: diversity—a commitment to exploring partners’ respective motivations and perspectives, equity—which entails engaging power asymmetries in generative ways, mutual benefit—the right of all partners to gain from the partnership, openness—referring to the precondition of trust for viable partnership and courage—the need for partners to be tenacious in working through inevitable challenges.

Increasingly, the kind of partnerships arising to meet sustainability challenges and advance the SDGs are those

undertaken in the vein of transdisciplinary co-production (TDCP)—partnerships in community settings between academics and community practitioners who possess diverse backgrounds, experiences, knowledge, and skills for the purpose of shared knowledge production (Ostrom, 2009; Polk, 2015; Popa et al., 2017; Byrne et al., 2020). In addition to the principles detailed above, TDCP partnerships emphasize the principle of shared ownership at every step of the collaboration, which means shared framing of problems and goals of the partnership, shared management and ownership of research processes, and ownership of related outputs/products (Polk, 2015; Schneider et al., 2019; Slater and Robinson, 2020).

Regardless of the principles considered, effective partnerships have the benefit of assisting in creating new platforms for knowledge generation and the delivery of SDGs around the world. University-community partnerships are defined as associations between community structures and institutions of higher learning to achieve an array of developmental goals (Eckerle Curwood et al., 2011). The partnerships mostly serve the purpose of coming up with new knowledge as well as application of the findings (Young et al., 2020), thus jointly facilitating combined knowledge generation. University-community partnerships can involve such initiatives that include research projects that are performed at a community level, or training programs that are done at the same level (Strier, 2011; Munro et al., 2016).

Considering this context, this paper reports on a study that has assessed the extent to which partnerships between universities and communities may assist in achieving the SDGs. To this end, it is organized into 5 sections. The goal of the first two sections is to reflect on how partnerships can contribute to the advancement of the SDGs, focusing on the contribution of Higher Education Institutions (HEIs) through university-community-engagement (UCE). The third section presents the methodology used to conduct this study, considering the combination of bibliometric analysis and the presentation of eight case studies to explore community-university partnerships centered on the SDGs. The case studies, derived from an expert-driven literature review, examined collaborative partnerships involving universities and communities in implementing SDGs in various global regions. This integrated approach aimed to provide a more comprehensive and insightful analysis, resulting in valuable knowledge to support the advancement of universities-community implementation of SDGs. Finally, the fourth section, presents the results obtained, given the bibliometric analysis performed and the case studies considered, followed by the conclusions section.

2 Partnerships and the UN Sustainable Development Goals

The UN SDGs provide goals not only to nations, but institutions can also be guided by them and contribute to their achievement with good governance at a local, regional, national, and international scale, relying on networks and collaborative assets (Biermann et al., 2017). The SDGs are designed to provide a common language among institutions for addressing global sustainability issues, where every contribution is valid. In other words, the integrated

nature of sustainability (of which the SDGs try to translate, from a certain perspective, into specific goals) requires multi-level and inter-disciplinary collaboration and governance with different types of actors at various scales (Leck and Simon, 2013; 2018). Although the SDGs are not specifically focused on higher education, universities have a responsibility to develop curriculum and provide learning of contemporary social and environmental issues (Leal Filho et al., 2023b). At the same time, there is also a demand to increase the involvement of universities with societal problems, especially from the students'—the future change agents (Agusdinata, 2022; Mancini et al., 2022). Achieving the SDGs, however, will require all sectors and actors working together integrating their resources, knowledge and expertise (Leal Filho et al., 2021a).

Global education programs have collaborations. The United Nations Educational, Scientific and Cultural Organization (UNESCO) Global Action Programme (GAP), which was launched at the World Conference on Education for Sustainable Development in November 2014 in Aichi-Nagoya, Japan, aims to scale up Education for Sustainable Development (ESD) at all levels, in all areas of education, and in all sustainable development sectors. One of the five priorities of GAP is accelerating sustainable solutions at the local level (UNESCO, 2016). Regional Centers of Expertise (RCEs) for ESD global network contributed to the GAP priority five, i.e., accelerating local level actions, through several projects of partnerships between the Universities and communities (including youth). These projects, although diverse, linked formal and informal education, contributing to Target 4.7 of SDG4, on quality education. The main topic that connected most of this project was climate change, thus contributing to the SDG13, on Climate Action (UNU-IAS, 2020). As a result, an element that can intensify or facilitate the collaboration of HEIs with communities is that they are part of network structures, either formal or informal, on sustainability or specific thematic issues concerning the communities (Leal Filho et al., 2021b). It is easier for HEIs that have experience and capability collaborating with other local, regional, and national actors, to be engaged in new initiatives that encourage SDGs implementation by partnerships with the communities.

The subsequent UNESCO ESDfor2030 RoadMap (2020), considers ESD as a crucial element of quality education and a key enabler of all 17 SDGs (UNESCO, 2020), reinforcing the role of Target 4.7 as a specific tool for collaboration, as the nature of informal education facilitates this approach.

UCE (Munro et al., 2016; Benneworth, 2018; Farnell et al., 2020; Hong et al., 2022), relates to a wide range of engagement between students, staff and management with communities and external organizations aimed at generating mutual benefits between the parties. This is often framed within the context of university's third mission, with the others being teaching and research. Engagement is a practice/process shaped by three characteristics (Benneworth, 2018; Farnell et al., 2020): i) as a process of knowledge exchange, going beyond the idea of "knowledge transfer"; ii) involving communities and organizations outside the academy in partnership arrangements; iii) and oriented towards societal needs, that is, aiming to tackle determined societal problems. In general, Farnell et al. (2020) define some types of engagement practices: teaching and learning activities within a wider or non-academic

public, research oriented to societal needs of external communities or participatory research in partnership, service and knowledge exchanges, student initiatives within the community, university-level engagement (formal partnerships between HEIs and external groups) and opening of academic services to the community). Nevertheless, UCE are often guided by context-specific and bottom-up practices, generating difficulties in institutionalizing, and valuing this commitment in HEIs. As UCE practices involve in their core the establishing of partnerships oriented towards societal needs it is argued that the SDGs can be an important opportunity for systematic change in higher education and useful process for determining the mechanisms for developing mutually beneficial partnership opportunities with the community (El-Jardali et al., 2018; Leal Filho et al., 2021a). UCE encourages within the university the emergence of relevant institutional strategies and advances university operations, curriculum, research and importantly university culture and reputation, and the generation of new knowledge (Kestin et al., 2017). UCE also act as an important mechanism for promoting awareness within the university community (Leal Filho et al., 2021b). In general, universities have the capability to contribute to the SDGs through teaching, research, and engagement as one of the main sources of expertise and knowledge, but also by making their campus more sustainable and by including the SDGs as strategic institutional agendas (Hong et al., 2022).

Collaboration with local, national and international organizations, is the key to making progress in the SDGs at the level of higher education, with the potential to strategically align the university with society, facilitate better communication with the community, and create alignment with local, regional and global agendas (Valencia et al., 2019), enhance their impact at a local community (Watson et al., 2011) and shape national policy and contribute to social change. UCE also contributes to capacity building for sustainable development (Shiel et al., 2016; Wescott, 2022), benefiting the communities and the university itself. Capacity building activities "strengthen the knowledge, abilities, skills and behavior of individuals, and improve institutional structures and processes" (Ku and Yuen-Tsang, 2011, 470). Mandarano (2015) points out that capacity building involves developing knowledge, networks, norms, trust, and skills with the intention of improving community conditions, with the formal and informal involvement of individuals in the process of planning and implementing activities. The key point is the engagement of local stakeholders through university-community engagement projects in co-construction processes (Shiel et al., 2016).

Due to their role, universities pose unique resources and capabilities to provide expertise, develop policy and carry out sustainable development. However, the often-siloed structure of universities can mean that this knowledge may be fragmented, distributed in different faculties, schools, and disciplines of the university that each tend to focus on goals and targets relevant to their work or have different interests providing a barrier to a coordinated approach to implementation (IARU, 2018). Policy can only be properly designed through a co-evolutionary process across different but interacting network actors when trade-offs between different goals and synergies have been identified. Integrating these internal resources with network resources results in the development of 'network core competencies and a

network mandate (Shrestha and L'Espoir Decosta, 2021), that potentially fosters mutual collaborations.

Given the conception of the SDGs as the development of ambitions and aspirations of the world (Leal Filho et al., 2019), it can be underscored that the role of global partnership is fundamental. While insights into the global partnership for the goals are captured in the 19 targets of SDG17, it is worth highlighting that this is not limited to partnerships at the macro levels of North-South, South-South and triangular regional and international cooperation as expressed in target 6 but also includes, micro level partnerships in member states of the UN, and touching on capacity-building in developing countries to support national plans to implement all the SDGs as maintained in target 9 (Küfeoğlu, 2022). Just as it can be argued that an enterprise cannot effectively contribute to sustainable development without being sustainable in the first instance (Mbah et al., 2022), global partnerships for the goals begin with strong systems and structures that support national partnerships for the goals, and this includes multi-stakeholder partnerships, cross-sector partnerships, sustainable community plans, quality of governance, policy coherence, and shared commitment (MacDonald et al., 2018; Maltais et al., 2018; Castillo-Villar, 2020; Eweje et al., 2020). Within the context of national or local partnerships for the SDGs, the role of university-community/industry partnerships cannot be overlooked. Castillo-Villar (2020, 3) argues that “partnerships between industry and HEIs have become one of the main strategies for development since the beginning of the 1980s”. Although this partnership can be situated within a university's community engagement which includes community-based research activities (Mbah et al., 2021; Lepore et al., 2022), and service mission elements, sometimes underlined by symbiosis or mutual benefits (Mbah and Fonchingong, 2019), there is potential for far-reaching impacts that touch on the SDGs (Tandon and Chakrabarty, 2018).

3 Methods

Methodologically, this paper was carried out by combining a bibliometric analysis and a set of eight case studies illustrating community-university partnerships focusing on the SDGs. The bibliometric analysis is considered as a methodology that can establish an overview about a selected area of knowledge. The bibliometric research allows for the quantitative and qualitative evaluation of the scientific production of researchers, institutions, or countries, enabling an objective analysis of the impact and relevance of their contributions to the field of knowledge. Moreover, by analyzing citations and references, this approach allows for the identification of trends in specific areas of knowledge, including emerging ones, aiding in the understanding of themes that are gaining increasing importance and are likely to become even more relevant in the future (Zupic and Čater, 2015).

In this study, the data collection process and analysis were conducted with the aim of exploring and identifying central themes related to the topic under study. The publications were gathered using the SCOPUS database in November 2022, and the VOSviewer software was employed for the analysis. The search terms were carefully chosen to encompass a range of concepts related to sustainability, sustainable development, and the UN

SDGs, as well as university-community partnerships and outreach initiatives. The terms used in this search were as follows: (“sustainability” OR “sustainable development” OR “SDGs” OR “2030 agenda” OR “global goals”) AND (“university-community partnership” OR “universities-communities partnerships” OR “outreach university” OR “HEI* outreach”), limiting our results to articles, book chapters, reviews and books, published in English. The search for these themes was made via “topics”, considering the title, abstract, and keywords of the articles indexed in the SCOPUS database. Considering these sets and filters, a set of 536 publications was obtained. It is essential to recognize that the exploratory nature of this research provides a broad overview of the literature landscape, but it may not capture all nuances and intricacies within the field.

To analyze the results, version 1.6.18 of the VOSviewer (van Eck and Waltman, 2018) software was used, observing the frequency of keyword usage by the authors of the identified documents. Through the utilization of this software and the establishment of specific analysis parameters, a total of 2,354 keywords were identified. Employing a minimum co-occurrence threshold of 6, 65 keywords met the criteria for further analysis. The results obtained through this search and analysis are presented and discussed in the next section of this paper.

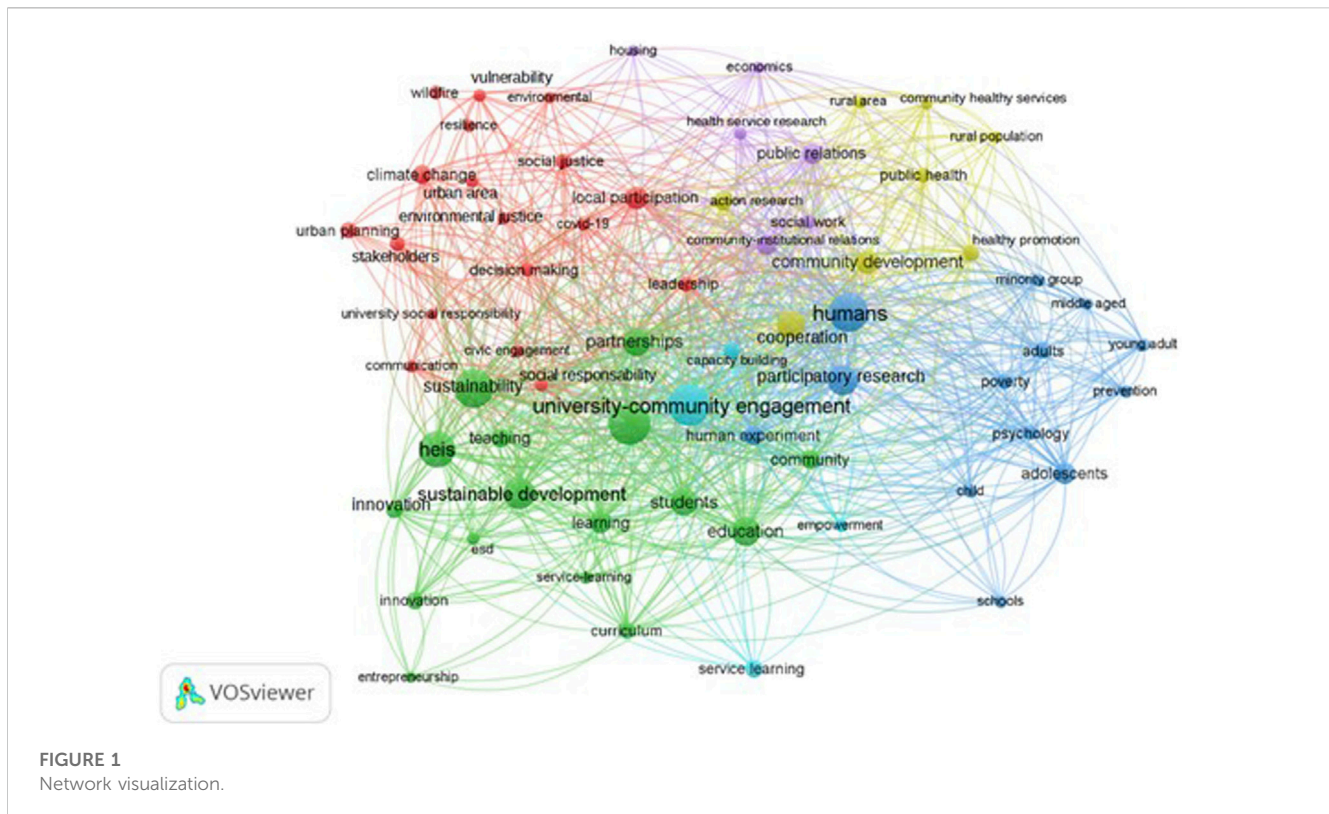
The application of VOSviewer 1.6.18 (van Eck and Waltman, 2018) and the analysis of keyword frequency allowed for a systematic and objective exploration of central themes. By using a well-established software tool for bibliometric analysis, the study aimed to reduce potential biases and enhance the validity of the results. The software's consistent algorithms and data processing techniques contribute to minimizing potential biases and inconsistencies in the analysis. The study acknowledges its limitations regarding generalizability. The decision to focus on articles, book chapters, reviews, and books published in English and utilizing Scopus might have excluded relevant research from other sources and languages, potentially limiting the generalizability of the findings to a broader global context.

Besides the bibliometric analysis, eight international case studies resulted from an expert-driven literature review and analysis, aiming to obtain information towards collaborative partnerships involving the universities and communities in the successful implementation of the SDGs in different regions of the world. The inclusion of case studies resulting from the mentioned expert-driven literature review adds qualitative depth to the research, offering real-world examples of university-community partnerships in different global regions.

The adoption of both the bibliometrics and case studies combined approach is believed to contribute to a more robust analysis of the topic under study, allowing to produce meaningful added knowledge, contributing to enlightenment towards universities-community implementation of SDGs.

4 Results and discussion

This section presents evidence of all data collected through the two selected approaches, bibliometrics and case studies, to enlighten the reader towards the actions being developed to successfully implement the SDGs in partnerships between universities and communities, hence guiding innovation.



4.1 Bibliometrics analysis

HEIs are increasingly cooperating with the community, providing societal impact (Medved and Ursic, 2021). The relationship between HEIs and communities can take many forms and embraces the different universities' activities, such as research, teaching, and outreach (Plummer et al., 2022, 2), besides active partnership activities regarding operations within the institutional structure of HEIs. According to the analysis developed via VOSviewer 1.6.8 (van Eck and Waltman, 2018) and the establishment of some analysis parameters, total of 2,354 keywords were identified. With a minimum co-occurrence of 6, 65 keywords could be visualized in the network of topics most present in the identified publications. Figure 1, below, presents the formulated network, based on the performed search.

The **yellow** cluster, for instance, shows the connections between HEIs and public health, as well as rural areas and populations. In this regard, Medved and Ursic. (2021) claim that HEIs should prioritize supporting underprivileged neighborhoods with higher levels of social inequality. The **purple** cluster presents further connections between HEI's and health issues, but putting the focus on housing and economic aspects, which may be generated by the indirect impact (or business spillover) of HEIs on the housing sector due to the high demand that universities imply for city residences (Mohammed et al., 2022).

The **red** cluster includes keywords such as climate change, environmental justice, university social responsibility, local participation, social justice, and vulnerability, among others, highlighting that climate change is a core challenge for the current society. However, it is well known that climate change affects developing countries at a larger extent, in which the most vulnerable populations, such as the poor, refugees, migrants, and

rural people suffer the worst of its consequences (Cisco and Gatto, 2021). In this context, the literature reveals that humankind's survival on Earth depends on the intergenerational dilemmas' solutions through communication and cooperation between the different generations and stakeholders (Shahen et al., 2021). Therefore, HEIs are fundamental partners to succeed in this mission due to their knowledge, capacity, and pivotal role to shape transformations towards sustainable development (Oberlack et al., 2019).

The **green** cluster presents the connections between university-community engagement and the establishment of partnerships and teaching initiatives within the university context, as well as topics relating to sustainable development, innovation, and entrepreneurship. In this regard, Lu et al. (2022) presents that the establishment of alliances between different universities and different actors can be considered as strategic to address sustainable development, given the different contexts through which they are linked. The impact generated from these consists of an important part both for achieving the SDGs and for the community itself that is involved (Plummer et al., 2022).

The **ciano** cluster addresses the relationship between service learning, capacity building and empowerment. About those topics, Hsu et al. (2022) presents that university-community partnerships also contribute to the empowerment of the local community, given the interaction established between the parties. Through different approaches, it is a way to build local capacities and, at the same time, to collaborate with the challenges faced by the community itself.

The **blue** cluster shows the connections between participatory research, minority groups and different levels of action towards different publics (such as children, adults, and adolescents). Themes such as poverty and prevention are also highlighted. Chandramohan and Bhagwan. (2022) highlight the importance of this relationship

TABLE 1 University-community interactions contributing to the implementation of the United Nations Sustainable Development Goals.

Partnership nature	Thematic focus and addressed SDGs	Partnership approach, typology and actors involved	Findings
1. “Socially Engaged Universities—(SEU)” project, co-funded by the Erasmus + Programme 2014–2020	Intensify collaboration between local communities and universities	Community- based;	Partnerships determined the aspects influencing and acting as obstacles to the efficiency of community-university relationships. Intending that sustainable rural development adequately utilizes university resources, research and teaching initiatives in higher education should be adapted to the needs of surrounding communities
Mancini et al. (2022)	SDGs 12 & 15	Research/learning	
		University of Parma	
		Group of farmers in the Italian Apennines	
2. HEIs efforts to include civic involvement, responsibility, and a sustainable approach into their educational policies and to work with others supporting such endeavors	Action research initiatives and rural pop-up hubs as examples of creative interactive techniques	Community-based;	Increased students’ participation and critical thinking in both public and private HEIs
Dryjanska et al. (2022)	SDGs 4, 8 & 9	Research/learning;	
		Capacity-building	
		University of Zagreb, in Croatia	
		External stakeholders	
3. Collaboration between external non-academia organizations and HEIs	Participating in ongoing community initiatives, producing content for public consumption, or getting students involved in real-world situations as all creative methods to provide students actual work experience, through field excursions, internships, and practical training available to students	Community-based;	Governance of the monitored HEIs highly value cooperation with the non-academic world, perceived as very important at national level, more than at international level, resulting in improved civic duty, student sustainability, and civic involvement
Dryjanska et al. (2022); Tetreva and Vlckova (2020)	SDG4	Capacity-building	
		HEIs operating in the Czech Republic	
		The non-academic sphere	
4. HEIs and health community-based organizations, to combine nurses in higher education knowledge with that of community members	Understanding social innovation in the context of nursing	Participatory action research;	Policy changes promotion, contributing to reduce inequality at-risk population, benefiting the community and promoting student’s learning, resulting in healthcare equity, through community engagement
Zlotnick and McDonnell-Naughton. (2022)	SDGs 3, 5, 6 & 10	Research/learning	
		HEIs nurses worldwide	
		Non-profit and community-based organizations	
5. Maastricht Smart City project ‘Smart & Future-proof Station Square’	Redesign of the Station Square, aiming to contribute to a more sustainable urban mobility	Transdisciplinary co-production	Different stakeholders such as citizens, travelers and local entrepreneurs can actively contribute to a redesign process of the Station Square
Leal Filho et al. (2022); University of Graz. (2023)	SDG 11	Maastricht University, Netherlands	
		Stakeholders and citizens as co-creators of the renewed Station Square	
6. Tallinn University Social Entrepreneurship Master study program (SEMA)	Examining the subject of social entrepreneurship, shaped by higher education’s social enterprise program	Community-based;	SEMA instructs aspiring social entrepreneurs in problem-solving techniques and helps them comprehend the requirements of the beneficiaries, aiding in creating institutional connections between academics and other sectors
Lepik and Urmanavičienė. (2022)	SDGs 8 & 12	Capacity building	
		Tallinn University, Estonia	
		Community	

(Continued on following page)

TABLE 1 (Continued) University-community interactions contributing to the implementation of the United Nations Sustainable Development Goals.

Partnership nature	Thematic focus and addressed SDGs	Partnership approach, typology and actors involved	Findings
7. Initiative “Campus as a Living Lab” (CLL) to combine business, campus operations, and research, encouraging creative solutions	Lessons learned from CLL to be extended to living lab processes for interested organizations	Transdisciplinary co-production;	CLL can be used as an example to other large organizations (either campus or municipality scale) to implement managerial models for advancing sustainability purposes
Save et al. (2021)	SDGs 7, 8, 9, 10, 11 & 12	Public-private partnership	
		University of British Columbia, Canada	
		Non-academia	
8. “Digital Learning for Sustainable Development” platform, disseminating sustainable development modules to support the community training	Open access platform supporting the quick acquisition of sustainability knowledge and skills	Transdisciplinary co-production;	Integrated approach to research
Leal Filho et al. (2021a); Hamburg (2021)	All SDGs	Research/learning;	
		Capacity-building	
		Hamburg University of Applied Sciences, Germany	
		Community	

with the community, which can be set up as a source of social change. Therefore, initiatives involving the community are part of the commitment made by universities, since they are not dislocated from their surroundings.

The six clusters expose the main topics that are emerging in the literature on establishing partnerships between universities and the community, considering the different areas of action and engagement. From those, it is possible to observe an overview of what has been discussed in terms of establishing cooperation between both actors. The results obtained indicate that topics such as health issues, inequalities, climate change, social justice, innovation, and entrepreneurship, as well as the empowerment of different populations, poverty and social change are at the center of the debate on the establishment of partnerships between universities and communities (Leal Filho et al., 2022). Overall, these six clusters identified in the literature point to critical themes as central topics in the discourse on establishing partnerships between universities and communities. These findings offer valuable insights for fostering meaningful collaborations between universities and communities in addressing complex societal challenges and advancing sustainable development. By identifying these key areas of focus, the study contributes to the understanding of the ongoing efforts and achievements in establishing cooperation between universities and communities, laying the groundwork for future research and informed action to foster impactful partnerships in pursuit of a sustainable future.

In accordance with these findings, the following subsection highlights eight pertinent case studies that address the joint action of such actors.

4.2 Case studies

It is widely recognized that the collaboration resulting from the universities and the neighborhood community can contribute to further advance the SDGs at all levels. Based on a case study design

methodology (Corcoran et al., 2004; Yin, 2017), the case studies described in Table 1 are related to interactions among universities and communities guiding the implementation of SDGs.

The presented eight relevant international case studies, illustrate several ongoing initiatives. These examples have been identified and selected by the research team aiming to reflect geographical diversity, as well as the different ways in which collaboration between HEIs and local communities could be established and developed. Thus, these cases show how important this closer communication between universities and communities is to further contribute to addressing the SDGs. Moreover, these cases represent successful examples of how the bottom-up approach could be implemented in the local context to foster cooperation between different relevant stakeholders.

Whereas there are several cases demonstrating the positive outcomes of partnerships involving the academia and non-academic sphere, a lack of commitment from governance can contribute to hindering efforts to advance the UN SDGs.

When the UN set the 2030 Agenda (United Nations, 2015b) with its 17 SDGs, the debate towards the contribution of HEIs to global sustainable development was highlighted. In addition to SDG4 on quality education (United Nations, 2015a), universities can act as drivers of worldwide sustainable development, by their contribution to the creation of knowledge, creativity, and human development (Chankseliani and McCowan, 2021), through social innovation (Leal Filho et al., 2021a; Hamburg, 2021).

The following examples are centered in various university-community partnerships, involving a wider scope of initiatives. As an example, most of the farmers from Parma, in Italy, are family-run and do not seem to have access to concentrated outlets for selling their goods locally. A partnership with the local University of Parma was set up, aiming to promote the sustainability of short supply chains and benefit the producers of the Apennines, in particular. Fondazione Borri Foundation facilitated the

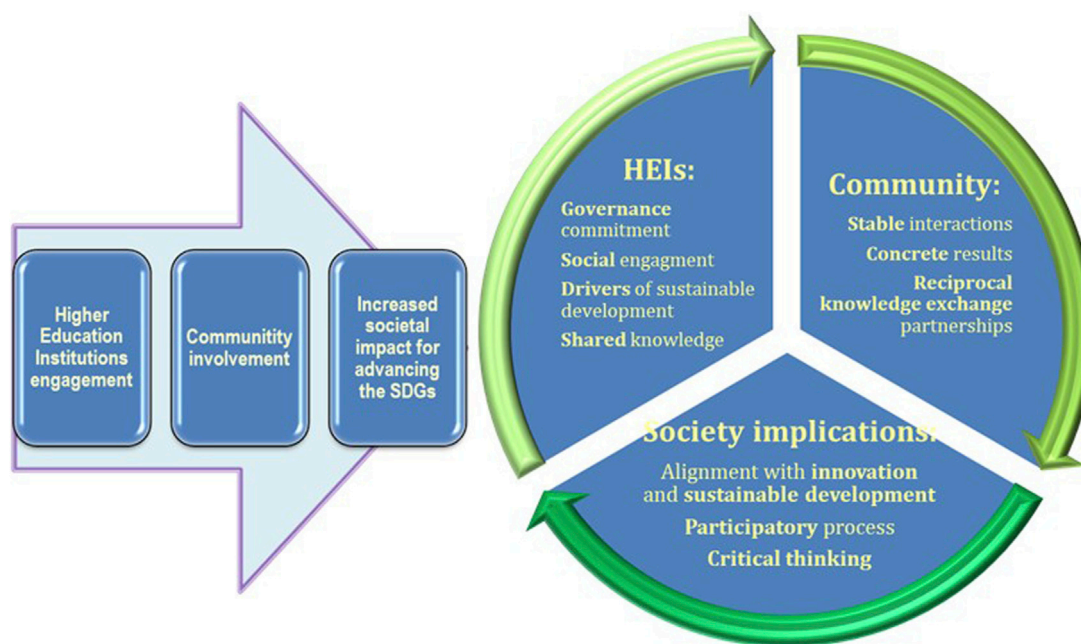


FIGURE 2
Key outcomes of university-community partnerships.

communication between the producers and the University of Parma, which, in turn, provided the foundation with staff, students, and equipment resources, resulting in participatory teaching and shared applied knowledge. Although farmers seemed to be initially reluctant to the partnership, it became evident that the capacity to participate in stable relationships over time and concrete results are crucial aspects to the success of this dual communication, requiring social engagement from universities, focused in participation and critical thinking (Mancini et al., 2022).

In the Czech Republic, the governance of HEIs is aware of the importance of collaborating with the non-academic sphere, including business, public and third sectors (Tetrevova and Vlckova, 2020), although valuing this partnership more in terms of national level than at international level. The authors from the study analyzing the reality in this country at national level argue that this may have negative implications in the quality of scientific research and educational quality, to be addressed through effective forms of collaboration at international level also, beyond universities first mission in the form of practical training and internships and field excursion, with the current involvement of HEIs being rather limited.

According to Dryjanska et al. (2022), in Croatia, and notwithstanding reforms, the education system still needs to be better aligned with social innovation and sustainable development. However, the country has been moving towards an education model at university level focused on transforming courses to introduce service learning, that is, aimed at responding to a specific social problem, rooted in specific social-physical contexts (Holst, 2022). Examples of that can be found in the University of Zagreb, a public university, where, for example, students of the “Sustainable Development and Social Innovation”, oriented to change, need to find a local social or environmental issue, connected to the SDGs. After that, local stakeholders or other actors are identified and then a

cooperation is established, through an action research approach, resulting in a very participative and innovative initiative, able to contribute to advance the SDGs, with students acting as effective drivers of change (Dryjanska et al., 2022).

Implemented living labs at universities are also a source of knowledge to be applied outside the campus (Leal Filho et al., 2022). Within its academic campuses and integrated residential neighborhood, the University of British Columbia, in Canada serves as a living laboratory for testing novel ideas, expanding a bioenergy plant, and influencing several regional policies (Save et al., 2021). The sustainability efforts made inside the campus can be further implemented by external organizations, at a wider level, either municipality or other living labs, fostering sustainability and illustrating the university-community engagement to advance the SDGs. Another illustration of a living lab can be found in Europe (University of Graz, 2023), where the Maastricht University is committed to implementing smart mobility concepts and involving not only the academic community but also businesses and interested stakeholders with complementary knowledge distributed across the City of Maastricht, thus actively involving the community in reciprocal knowledge exchange partnership.

In the Baltic region, Tallinn University, in Estonia, is the only institution with a Social Entrepreneurship curriculum (Lepik and Urmanavičienė, 2022). The Social Entrepreneurship Program at Tallinn University is a forward-thinking educational project with the goal of fostering entrepreneurship and innovation in the social and healthcare sectors, environmental protection, urban, rural, and community development, responding to complex societal challenges. The activities generate new knowledge and launch social innovations and social enterprises that satisfy local demands and expectations. The public's faith in social businesses

may improve because of this trend, which may also lessen the strain on already overburdened public services.

An integrative review conducted by Zlotnick and McDonnell-Naughton (2022), was able to identify academic population-based nursing partnerships producing successful social innovations. In most cases, public health intervention was accomplished via faculty guidance, so that nursing students could initiate cooperation with different key community stakeholders, e.g., schools, to intervene in nutrition, oral health, mental health, cancer or obesity education, disaster preparedness, intimate partner violence, among many others. These different initiatives took place in various regions of the world, such as Africa, United States or Guatemala and illustrate the mutual benefits achieved among the partners involved. The authors of this study highlight the different functions of the nursing academic partner, i.e., innovator, service provider, evaluator, fundraiser, or researcher. Despite the success of the implemented social actions, the need for a continuous “feedback loop” ensuring the sustainability of the partnership, is emphasized. An editorial by Oerther (2019) also details how the University of Missouri is engaged in health improvements, demanding local community involvement through extension university programs that contribute to creating positive changes in the community.

The Hamburg University of Applied Sciences in Germany is equipped to actively promote sustainability education across subjects and geographic boundaries. Supporting the UN SDGs, it has created a freely open “digital learning for sustainable development” platform, able to freely disseminate sustainability knowledge to the community, actively fostering education for sustainability “across themes and borders”.

Thus, and as observed through the case studies presented and discussed above, alliances and partnerships between institutions have the potential to improve cooperative learning processes towards achieving the SDGs (Chankseliani and McCowan, 2021), with one of the main roles of HEIs within the local civil community being to become more meaningful (Dryjanska et al., 2022). By collaborating with the local community, universities may enhance development through training, specialized research, volunteerism, and activities unique to that specific area or region. In this respect, technology will be crucial in aiding society to live better lives, with innovation and sustainability being the keys to the future (McDonnell-Naughton and Păunescu, 2022; Leal Filho et al., 2023b; Leal Filho et al., 2023c). Students are seen as agents of change, able to create social impact and to act as drivers of change, specifically in a post-pandemic world (Mancini et al., 2022). Organizational culture change takes time, namely at institutional level, and the barriers affecting sustainability performance needs to be considered at governance context (Leal Filho et al., 2023a), particularly if the ties to external actors are thin and mainly occurring in a background of knowledge or technology transfer to the private or public sector (Niedlich et al., 2019). Raising awareness of the need to establish stronger connections to municipalities and non-academic organizations will contribute to transforming society, through mutual interactions.

This collaboration processes have many advantages. Taking into consideration the main features of the eight examples illustrated, Figure 2 represents some of the key outcomes of university-community partnerships.

As explained before, cooperation between universities and the local communities in which they are rooted could lead to fruitful dynamics

with the potential of enhancing synergies, leading to strengthening local efforts aiming to support sustainable development initiatives. By actively engaging with the communities in which they are embedded, universities can play a pivotal role in supporting sustainable development initiatives at the local level. This collaborative approach can lead to a mutually beneficial exchange of knowledge, resources, and expertise, contributing to the overall wellbeing and progress of the community. Through such partnerships, universities can leverage their research capabilities, educational resources, and innovative solutions to address pressing societal challenges, including health disparities, housing needs, and climate change. The engagement of universities with underprivileged neighborhoods and vulnerable populations can bridge gaps and alleviate social inequalities, creating a more inclusive and equitable society.

By working collaboratively with governments, NGOs, businesses, and local organizations, universities can leverage their academic expertise to develop comprehensive and context-specific solutions. Nevertheless, it is crucial to recognize that successful partnerships require ongoing commitment, open dialogue, and a willingness to adapt to the evolving needs and priorities of the communities they serve. University-community partnerships encounter a range of challenges and complexities that can hinder their effectiveness and impact. Among these critical considerations are power imbalances, where universities wield more resources, expertise, and decision-making authority, potentially marginalizing community voices. Additionally, some partnerships may engage in extractive practices, involving communities superficially or solely for data acquisition without reciprocating tangible benefits. Sustaining these collaborations can also be challenging, as funding, personnel changes, and institutional shifts may disrupt continuity and consistent engagement over time. Moreover, the risk of researcher bias looms, with academic interests overshadowing genuine community needs and concerns. To address these issues, university-community partnerships must prioritize authentic community engagement, shared decision-making, and equitable distribution of benefits to foster more meaningful and impactful collaborations.

5 Conclusion

This study consisted in undertaking a mapping of universities-communities partnerships in the delivery of the UN SDGs. By means of a dual bibliometric analysis and case studies with examples illustrating the variety of partnerships, it emphasizes the advantages of working together. It has shown that partnerships between universities and communities can play a crucial role in promoting sustainable development. These collaborations facilitate the exchange of knowledge, expertise, and resources, leading to more effective and impactful initiatives.

The implications of this study to theory are two-fold. The first is the fact that it provides a welcome review of the literature on the topic, linking studies spread across a wide range of areas associated with partnerships. Secondly, it provides a timely analysis of the extent to which partnerships to achieve the UN SDGs are being pursued. This enhances the understanding of how such partnerships are being pursued and their potential impact on sustainable development. The paper also contributes to practice, since it lists some of the actions that universities may undertake to better link with communities in partnerships towards the implementation of the UN SDGs. Indeed, there are several ways via which universities

and communities can link up to work together to implement the UN's SDGs. Some measures they may deploy to address the current shortcomings include the following ones:

1. Establishing joint research projects based on partnerships that focus on local development needs and/or solutions to the sustainability-related challenges seen locally, e.g., fighting poverty, addressing hunger or improve the quality of education.
2. Supporting student-led initiatives that address SDG-related issues within the community, such as climate change, gender equality, and access to clean water.
3. Organizing joint public events and campaigns to increase the visibility of and raise awareness of the SDGs, and of their importance among members of local communities.
4. Developing joint programs that provide training and capacity-building activities for workers in cities/municipalities and community members.
5. Partnering with local businesses to promote sustainable consumption and production, emphasizing the local benefits of food and goods locally produced.
6. Better connecting universities with local organizations and networks to facilitate knowledge sharing and resource mobilization, this may be means of regular meetings on specific topics.
7. Creating scholarships and fellowships to support student and staff exchanges between universities and communities.
8. Developing collaborative projects between universities, communities, and the private sector to promote economic development and job creation.

Overall, the above recommendations offer a practical roadmap for universities and communities to work together towards the successful implementation of the UN SDGs. They encourage meaningful partnerships, local engagement, and collaborative efforts that have the potential to create a positive impact on both societal and environmental fronts. By bridging theory and practice, this paper contributes to the advancement of sustainable development initiatives on multiple levels.

This study has some limitations. The first one is the fact that the bibliometric analysis specifically focused on a limited set of searches strings. This approach may have inadvertently excluded relevant studies that used different terminologies or keywords to discuss partnerships and sustainable development. Also, the search was limited to articles, book chapters, reviews, and books, published in English. It might exclude relevant research published in other languages, which could have provided valuable insights from diverse perspectives and regions. This bias may affect the comprehensiveness and representativeness of the findings, limiting the generalizability of the results to a global context.

The case studies were limited to a set of 8, which resulted from an expert-driven literature review and analysis aiming to obtain information towards collaborative partnerships. While expert-driven reviews have their merits, the relatively small number of case studies might not capture the full breadth and diversity of community-university partnerships worldwide. The findings from these eight case studies should be interpreted with caution, as they may not fully reflect the intricacies and variations of different

partnership models and contexts. The study did not also consider the wide range of potential confounding factors that may affect the willingness of parties to cooperate. Community-university partnerships are influenced by various contextual factors such as cultural norms, political climate, economic conditions, and historical relationships.

Despite the limitations, the study provides a relevant addition to the literature, since it sheds light on the complex relations between universities and communities, maps some of the current partnerships, and outlines some of the actions that may be taken, in order to intensify them. To address these limitations, future research could consider conducting a more comprehensive and inclusive bibliometric analysis that incorporates a broader range of search terms and includes research published in multiple languages. Expanding the number of case studies and incorporating a diverse set of contexts and regions would provide a more robust and representative picture of community-university partnerships. Additionally, exploring potential confounding factors and contextual influences through qualitative research methods or mixed-methods approaches could offer deeper insights into the dynamics of these partnerships and contribute to more informed decision-making in practice.

In respect of prospects, the delay in pursuing the SDGs since 2020, instigated by the COVID-19 pandemic and currently- by the Ukraine conflict, suggest that advancing efforts now need to be intensified, so as to make up for the lost time. In this context, partnerships between universities and communities have the potential to provide a substantial contribution to the process of acceleration in the implementation of the SDGs, as widely demonstrated through this study.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

TD, LV, EC, MD, NM, JS, KS, GB, PL, MM, and MS wrote the original draft; WL and TD wrote the review draft; MD, JS, LV, and TD contributed with the case studies; WL and TD contributed to conceptualization. All authors contributed to the article and approved the submitted version.

Acknowledgments

This paper is part of the “100 papers to accelerate the implementation of the UN Sustainable Development Goals” initiative.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

- Agusdinata, D. B. (2022). The role of universities in SDGs solution co-creation and implementation: A human-centered design and shared-action learning process. *Sustain. Sci.* 17 (4), 1589–1604. doi:10.1007/s11625-022-01128-9
- Benneworth, P. (2018). "Definitions, approaches and challenges to community engagement," in *Mapping and critical synthesis of current state-of-the-art on community engagement in higher education* (UN: UNESCO). Available At: <https://www.tefce.eu/publications/mapping>.
- Biermann, F., Kanie, N., and Kim, R. E. (2017). Global governance by goal-setting: The novel approach of the UN sustainable development goals. *Curr. Opin. Environ. Sustain.* 26, 26–31. doi:10.1016/j.cosust.2017.01.010
- Byrne, E., Mullally, G., and Sage, C. (2020). *Transdisciplinary perspectives on transitions to sustainability*. Abingdon: Routledge.
- Castillo-Villar, R. G. (2020). Identifying determinants of CSR implementation on SDG 17 partnerships for the goals. *Cogent Bus. Manag.* 7 (1), 1847989. doi:10.1080/23311975.2020.1847989
- Chandramohan, S., and Bhagwan, R. (2022). Insights into community engagement at a university of technology in South Africa: A qualitative inquiry with academics. *Perspect. Educ.* 40 (2), 189–206. doi:10.18820/2519593X/pie.v40.i2.14
- Chankseliani, M., and McCowan, T. (2021). Higher education and the sustainable development goals. *High. Educ.* 81 (1), 1–8. doi:10.1007/s10734-020-00652-w
- Cisco, G., and Gatto, A. (2021). Climate justice in an intergenerational sustainability framework: A stochastic oig model. *Economies* 9 (2), 47–13. doi:10.3390/economies9020047
- Corcoran, P. B., Walker, K. E., and Wals, A. E. J. (2004). Case studies, make-your-case studies, and case stories: A critique of case-study methodology in sustainability in higher education. *Environ. Educ. Res.* 10 (1), 7–21. doi:10.1080/1350462032000173670
- Dryjanska, L., Kostalova, J., and Vidović, D. (2022). "Higher education practices for social innovation and sustainable development," in *Social innovation in higher education*. Editors C. Păunescu, K. L. Lepik, and N. Spencer (Cham: Springer). doi:10.1007/978-3-030-84044-0_6
- Eckerle Curwood, S., Munger, F., and Mitchell, T. (2011). Building effective community-university partnerships: Are universities truly ready? *Mich. J. Community Serv. Learn.* 17 (2), 15–26. Available At: <http://hdl.handle.net/2027/spo.3239521.0017.202>.
- El-Jardali, F., Ataya, N., and Fadlallah, R. (2018). Changing roles of universities in the era of SDGs: Rising up to the global challenge through institutionalising partnerships with governments and communities. *Health Res. Policy Syst.* 16 (1), 38–45. doi:10.1186/s12961-018-0318-9
- Eweje, G., Sajjad, A., Nath, S. D., and Kobayashi, K. (2020). Multi-stakeholder partnerships: A catalyst to achieve sustainable development goals. *Mark. Intell. Plan.* 39 (2), 186–212. doi:10.1108/MIP-04-2020-0135
- Farnell, T., Benneworth, P., Culum, B., Seeber, M., and Šćukanec Schmidt, N. (2020). TEFCE Toolbox for community engagement in higher education: *An institutional self-reflection framework*. Zagreb: Institute for the Development of Education.
- Hamburg, H. (2021). Digital learning for sustainable development. Available At: <https://dl4sd.org/>.
- Hoekstra, F., Mrklas, K. J., Khan, M., Vis-Dunbar, M., Sibley, K. M., Nguyen, T., et al. (2020). A review of reviews on principles, strategies, outcomes and impacts of research partnerships approaches: A first step in synthesising the research partnership literature. *Health Res. Policy Syst.* 18, 51–23. doi:10.1186/s12961-020-0544-9
- Holst, J. (2022). Towards coherence on sustainability in education: A systematic review of whole institution approaches. *Sustain. Sci.* 18, 1015–1030. doi:10.1007/s11625-022-01226-8
- Hong, X., Calderon, A., and Coates, H. (2022). Universities and SDGs: Evidence of engagement and contributions, and pathways for development. *Policy Rev. High. Educ.* 7, 56–77. doi:10.1080/23322969.2022.2121311
- Hsu, Y. C., Verma, H., Mauri, A., Nourbakhsh, I., and Bozzon, A. (2022). Empowering local communities using artificial intelligence. *Patterns* 3 (3), 1–7. doi:10.1016/j.patter.2022.100449
- IARU (2018). *Global priorities, educated solutions: The role of academia in advancing the sustainable development goals international alliance of research universities*. Stockholm: International Alliance of Research Universities.
- Kestin, T., van den Belt, M., Denby, L., Ross, K., Thwaites, J., and Hawkes, M. (2017). Getting started with the SDGs in universities: *A guide for universities, higher education institutions, and the academic sector*. Melbourne, Australia: SDNS Australia/Pacific.
- Ku, H. B., and Yuen-Tsang, A. W. (2011). "Capacity building," in *The SAGE handbook of governance* (London: SAGE Publications).
- Küfeoğlu, S. (2022). "SDG-17: Partnerships for the goals," in *Emerging technologies* (Cham: Springer), 497–504.
- Leal Filho, W., Abubakar, I. R., Mifsud, M. C., Eustachio, J. H. P. P., Albrecht, C. F., Dinis, M. A. P., et al. (2023a). Governance in the implementation of the UN sustainable development goals in higher education: Global trends. *Environ. Dev. Sustain.* 2023, 1–24. doi:10.1007/s10668-023-03278-x
- Leal Filho, W., Brandli, L. L., Dinis, M. A. P., Vidal, D. G., Paço, A., Levesque, V., et al. (2023b). International trends on transformative learning for urban sustainability. *Discov. Sustain.* 4 (1), 31–13. doi:10.1007/s43621-023-00145-7
- Leal Filho, W., Frankenberger, F., Salvia, A. L., Azeiteiro, U., Alves, F., Castro, P., et al. (2021a). A framework for the implementation of the Sustainable Development Goals in university programmes. *J. Clean. Prod.* 299, 126915. doi:10.1016/j.jclepro.2021.126915
- Leal Filho, W., Ozuyar, P. G., Dinis, M. A. P., Azul, A. M., Alvarez, M. G., Neiva, S. D. S., et al. (2022). Living labs in the context of the UN sustainable development goals: State of the art. *Sustain. Sci.* 18, 1163–1179. doi:10.1007/s11625-022-01240-w
- Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Ávila, L. V., Brandli, L. L., et al. (2019). Sustainable development goals and sustainability teaching at universities: Falling behind or getting ahead of the pack? *J. Clean. Prod.* 232, 285–294. doi:10.1016/j.jclepro.2019.05.309
- Leal Filho, W., Sima, M., Sharifi, A., Luetz, J. M., Salvia, A. L., Mifsud, M., et al. (2021b). Handling climate change education at universities: An overview. *Environ. Sci. Eur.* 33, 109–119. doi:10.1186/s12302-021-00552-5
- Leal Filho, W., Yang, P., Eustachio, J. H. P. P., Azul, A. M., Gellers, J. C., Giełczyk, A., et al. (2023c). Deploying digitalisation and artificial intelligence in sustainable development research. *Environ. Dev. Sustain.* 25 (6), 4957–4988. doi:10.1007/s10668-022-02252-3
- Leck, H., and Simon, D. (2013). Fostering multiscalar collaboration and co-operation for effective governance of climate change adaptation. *Urban Stud.* 50 (6), 1221–1238. doi:10.1177/0042098012461675
- Leck, H., and Simon, D. (2018). Local authority responses to climate change in South Africa: The challenges of transboundary governance. *Sustainability* 10 (7), 2542. doi:10.3390/su10072542
- Lepik, K. L., and Urmanavičienė, A. (2022). "The role of higher education institutions in development of social entrepreneurship: The case of Tallinn university social entrepreneurship study program, Estonia," in *Social innovation in higher education*. Editors C. Păunescu, K. L. Lepik, and N. Spencer (Cham: Springer). doi:10.1007/978-3-030-84044-0_7
- Lepore, W., Sharma, Y., Hall, B. L., and Tandon, R. (2022). "Co-constructing knowledge and communities: Community-university research partnerships and participatory research training," in *Remaking communities and adult learning* (Brill Sense), 79–93.
- Lu, Y. Y., Lin, C. H., Lee, C. H., Lin, S. Y., and Hu, B. H. (2022). Strategic alliances in institutions of higher education to promote sustainable development goals: A case study of two universities in taiwan. *JIRSEA* 20, 2. Available At: http://www.seaairweb.info/journal/articles/JIRSEA_v20_n02/JIRSEA_v20_n02_Article02.pdf.
- MacDonald, A., Clarke, A., Huang, L., Roseland, M., and Seitanidi, M. (2018). "Multi-stakeholder partnerships (SDG# 17) as a means of achieving sustainable communities and cities (SDG# 11)," in *Handbook of sustainability science and research* (Cham: Springer), 193–209.
- Maltais, A., Weitz, N., and Persson, Å. (2018). Sdg 17: Partnerships for the goals. *A review of research needs. Technical annex to the formas report forskning för agenda 2030*. Stockholm: Stockholm Environment Institute.
- Mancini, M. C., Arfini, F., and Guareschi, M. (2022). When higher education meets sustainable development of rural areas: Lessons learned from a community-university partnership. *Soc. Sciences-Basel* 11 (8), 338. doi:10.3390/socsci11080338
- Mandarano, L. (2015). Civic engagement capacity building: An assessment of the citizen planning academy model of public outreach and education. *J. Plan. Educ. Res.* 35 (2), 174–187. doi:10.1177/0739456X14566869
- Mbah, M. F., Ajaps, S., Johnson, A. T., and Yaffa, S. (2022). Envisioning the Indigenised university for sustainable development. *Int. J. Sustain. High. Educ.* 23, 1667–1684. doi:10.1108/ijhshe-09-2021-0413

- Mbah, M., and Fonchingong, C. (2019). Curating indigenous knowledge and practices for sustainable development: Possibilities for a socio-ecologically-minded university. *Sustainability* 11 (15), 4244. doi:10.3390/su11154244
- Mbah, M., Johnson, A. T., and Chipindi, F. M. (2021). Institutionalizing the intangible through research and engagement: Indigenous knowledge and higher education for sustainable development in Zambia. *Int. J. Educ. Dev.* 82, 102355. doi:10.1016/j.jedudev.2021.102355
- McDonnell-Naughton, M., and Păunescu, C. (2022). "Facets of social innovation in higher education," in *Social innovation in higher education*. Editors C. Păunescu, K. L. Lepik, and N. Spencer (Cham: Springer), 9–35. doi:10.1007/978-3-030-84044-0_2
- Medved, P., and Ursic, M. (2021). The benefits of university collaboration within university-community partnerships in Europe. *J. High. Educ. Outreach Engagem.* 25 (2), 79–94. Available At: <https://files.eric.ed.gov/fulltext/EJ1314067.pdf>.
- Mohammed, A. M. S., Ukai, T., and Hall, M. (2022). Towards a sustainable campus-city relationship: A systematic review of the literature. *Reg. Sustain.* 3 (1), 53–67. doi:10.1016/j.regsus.2022.03.004
- Mundy, J., and Tennyson, R. (2019). *Partnership Brokers association handbook*. 2nd Edition. Partnership Brokers Association. Available At: www.partnershipbrokers.org.
- Munro, A., Marcus, J., Wahl, J., Dolling, K., and Robinson, J. (2016). Combining forces: Fostering sustainability collaboration between the city of Vancouver and the university of British Columbia. *Int. J. Sustain. High. Educ.* 17 (6), 812–826. doi:10.1108/IJSHE-04-2015-0082
- Niedlich, S., Kummer, B., Bauer, M., Rieckmann, M., and Bormann, I. (2019). Cultures of sustainability governance in higher education institutions: A multi-case study of dimensions and implications. *High. Educ. Q.* 74 (4), 373–390. doi:10.1111/hequ.12237
- Oberlack, C., Breu, T., Giger, M., Harari, N., Herweg, K., Mathez-Stiefel, S. L., et al. (2019). Theories of change in sustainability science: Understanding how change happens. *GAIA - Ecol. Perspect. Sci. Soc.* 28 (2), 106–111. doi:10.14512/gaia.28.2.8
- Oerther, S. (2019). Localizing the united nations sustainable development goals to rural communities in America through university extension programmes. *Nurs. Open* 6 (3), 662–663. doi:10.1002/nop.2337
- Ostrom, E. (2009). A polycentric approach for coping with climate change. Available At: <http://documents1.worldbank.org/curated/en/480171468315567893/pdf/WPS5095.pdf>.
- Plummer, R., Witkowski, S., Smits, A., and Dale, G. (2022). Appraising HEI-community partnerships: Assessing performance, monitoring progress, and evaluating impacts. *Int. J. Community Res. Engagem.* 15 (1), 1–17. doi:10.5130/ijcre.v15i1.8014
- Polk, M. (2015). Transdisciplinary co-production: Designing and testing a transdisciplinary research framework for societal problem solving. *Futures* 65, 110–122. doi:10.1016/j.futures.2014.11.001
- Popa, S., Soto-Acosta, P., and Conesa, I. (2017). Antecedents, moderators, and outcomes of innovation climate and open innovation: An empirical study in SMEs. *Technol. Forecast. Soc. Change* 118, 134–142. doi:10.1016/j.techfore.2017.02.014
- Save, P., Terim Cavka, B., and Froese, T. (2021). Evaluation and lessons learned from a campus as a living lab program to promote sustainable practices. *Sustainability* 13 (4), 1739. doi:10.3390/su13041739
- Schneider, F., Giger, M., Harari, N., Moser, S., Oberlack, C., Providoli, I., et al. (2019). Transdisciplinary co-production of knowledge and sustainability transformations: Three generic mechanisms of impact generation. *Environ. Sci. Policy* 102, 26–35. doi:10.1016/j.envsci.2019.08.017
- Shahen, M. E., Kotani, K., and Saijo, T. (2021). Intergenerational sustainability is enhanced by taking the perspective of future generations. *Sci. Rep.* 11 (1), 2437–2511. doi:10.1038/s41598-021-81835-y
- Shiel, C., Leal Filho, W., do Paço, A., and Brandli, L. (2016). Evaluating the engagement of universities in capacity building for sustainable development in local communities. *Eval. Program Plan.* 54, 123–134. doi:10.1016/j.evalprogplan.2015.07.006
- Shrestha, R. K., and L'Esper Decosta, P. (2021). Developing dynamic capabilities for community collaboration and tourism product innovation in response to crisis: Nepal and COVID-19. *J. Sustain. Tour.* 31, 168–186. doi:10.1080/09669582.2021.2023164
- Slater, K., and Robinson, J. (2020). Social learning and transdisciplinary Co-production: A social practice approach. *Sustainability* 12 (18), 7511. doi:10.3390/su12187511
- Strier, R. (2011). The construction of university-community partnerships: Entangled perspectives. *High. Educ.* 62 (1), 81–97. doi:10.1007/s10734-010-9367-x
- Tandon, R., and Chakrabarty, K. (2018). Partnering with higher education institutions for SDG 17: The role of higher education in multi-stakeholder partnerships. *Approaches SDG 17*, 75–85. Available At: <https://unescochair-cbrs.org/pdf/Partnerships%20for%20SDG.pdf>.
- Tetrevova, L., and Vlckova, V. (2020). Collaboration between higher education institutions operating in the Czech republic and the non-academic sphere. *Eur. Educ.* 52 (1), 68–79. doi:10.1080/10564934.2019.1694846
- UNESCO (2020). *Education for sustainable development: A road map. ESD42030*. France: UNESCO. Available At: <https://unesdoc.unesco.org/ark:/48223/pf00000374802>.
- UNESCO (2016). *UNESCO global action Programme on education for sustainable development: Information folder*. France: UNESCO. Available At: <https://unesdoc.unesco.org/ark:/48223/pf00000246270>.
- United Nations (2015a). Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Available At: <https://sdgs.un.org/goals/goal4>.
- United Nations (2022). Goal 17 Revitalize the global partnership for sustainable development. Available At: <https://www.un.org/sustainabledevelopment/globalpartnerships/>.
- United Nations (2015b). Transforming our world: The 2030 agenda for sustainable development. Available At: <https://sdgs.un.org/2030agenda>.
- University of Graz (2023). Living lab experiment Maastricht. Available At: <https://smarterlabs.uni-graz.at/en/project-overview/living-lab-experiment-maastricht/>.
- UNU-IAS (2020). RCE project trends during the global action Programme on ESD (2015–2019). Available At: https://rcenetwork.org/portal/sites/default/files/flipping_book/pdf/RCE_ProjectDatabase_insights_online.pdf.
- Valencia, S. C., Simon, D., Croese, S., Nordqvist, J., Oloko, M., Sharma, T., et al. (2019). Adapting the sustainable development goals and the new urban agenda to the city level: Initial reflections from a comparative research project. *Int. J. Urban Sustain. Dev.* 11 (1), 4–23. doi:10.1080/19463138.2019.1573172
- van Eck, N. J., and Waltman, L. (2018). VOSviewer manual. Available At: https://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.8.pdf.
- Watson, D., Hollister, R., Stroud, S. E., and Babcock, E. (2011). The engaged university: *International perspectives on civic engagement*. Abingdon: Routledge.
- Wescott, G. (2002). Partnerships for capacity building: Community, governments and universities working together. *Ocean Coast. Manag.* 45, 549–571. doi:10.1016/S0964-5691(02)00086-8
- Yin, R. K. (2017). *Case study research and applications, design and methods*. 6 ed. SAGE Publications, Inc.
- Young, B. R., Leeks, K. D., Bish, C. L., Mihos, P., Marcelin, R. A., Kline, J., et al. (2020). Community-university partnership characteristics for translation: Evidence from CDC's prevention research centers. *Front. Public Health* 8, 79–14. doi:10.3389/fpubh.2020.00079
- Zlotnick, C., and McDonnell-Naughton, M. (2022). "Thinking outside the box: Social innovations emerging from academic nursing-community partnerships," in *Social innovation in higher education*. Editors C. Păunescu, K. L. Lepik, and N. Spencer (Cham: Springer), 245–272. doi:10.1007/978-3-030-84044-0_12
- Zupic, I., and Čater, T. (2015). Bibliometric methods in management and organization. *Organ. Res. Methods* 18 (3), 429–472. doi:10.1177/1094428114562629