



Sustainable Crafts: Describing Conceptual Evolution Through a Bibliometric Analysis and Systematic Literature Review

María Belén Prados-Peña^{1†}, Francisco Jesús Gálvez-Sánchez^{2*†}, Ana García-López³ and Valentín Molina-Moreno⁴

¹Department of Marketing and Market Research, University of Granada, Granada, Spain, ²Department Business Organization, Catholic University of Murcia, Murcia, Spain, ³Drawing Department, Faculty of Fine Arts, University of Granada, Granada, Spain, ⁴Department of Management-1, University of Granada, Granada, Spain

OPEN ACCESS

Edited by:

Elie Bouri,
Lebanese American University,
Lebanon

Reviewed by:

Provash Kumer Sarker,
Bangladesh Bank, Bangladesh
Anupam Dutta,
University of Vaasa, Finland

*Correspondence:

Francisco Jesús Gálvez-Sánchez
fjgalvez3@ucam.edu

[†]These authors have contributed
equally to this work and share first
authorship

Specialty section:

This article was submitted to
Environmental Economics and
Management,
a section of the journal
Frontiers in Environmental Science

Received: 21 May 2022

Accepted: 07 June 2022

Published: 29 June 2022

Citation:

Prados-Peña MB, Gálvez-Sánchez FJ,
García-López A and Molina-Moreno V
(2022) Sustainable Crafts: Describing
Conceptual Evolution Through a
Bibliometric Analysis and Systematic
Literature Review.
Front. Environ. Sci. 10:949681.
doi: 10.3389/fenvs.2022.949681

Sustainability has been progressively incorporated into all dimensions of society as a response to the negative externalities of the traditional production model, and the craft sector has been no stranger to this. Thus, the present work constitutes a bibliometric analysis of 894 research articles from the Scopus database on sustainable crafts in the 21st century, identifying the growth trends, published articles, and the most productive journals, authors, institutions, and countries. Additionally, we have identified the main research topics that have emerged in sustainable crafts in three time periods: before the international financial crisis, the post-crisis period, and, finally, within the 2030 Agenda and the Sustainable Development Goals set out by the United Nations (UN). Based on the bibliometric indicators analysed, we conclude that this research area has grown exponentially, particularly in response to the Sustainable Development Goals, increasing the abundance and diversity of the issues investigated.

Keywords: sustainable crafts, environmental sustainability, social sustainability, scientometrics, literature review

1 INTRODUCTION

Modern society has become increasingly aware of the need to incorporate economic, social, and environmental concerns into a model characterized by globalization, climate change, the depletion of natural resources, and an ageing population, which invite us to modify our current habits. As a result, sustainability has acquired considerable significance in recent years (Nguyen et al., 2021), even more so after the United Nations established its 17 Sustainable Development Goals (United Nations, 2015a).

However, the concept of sustainable development is not so novel and emerged in the early 1970s to protect the environment and ensure development without the associated destruction (Nguyen et al., 2021). It was defined by the World Commission on Environment and Development (WCED) in 1987 as “meeting the needs of the present without compromising the ability of future generations to meet their needs” (WCED, 1987). Subsequently, the United Nations has shown its commitment through Agenda 21 (United Nations, 1992), the Millennium Development Goals (United Nations, 2000), and the recent Sustainable Development Goals (United Nations, 2015).

In addition to the support of supranational institutions, over the last 50 years, several currents of economic-environmental thought have focused on sustainability. One of the first was industrial economics, introduced by Stahel and Reday (1976), which refers to the combination of factors of production for generating products and services destined for the market. Years later, Stahel himself

introduced the need to evolve from the concept of ownership to that of use, thus limiting the exploitation of natural resources (Stahel, 1982). Then, in 1996, Lyle introduced the notion of regenerative design (Lyle, 1996), which prolonged the useful life of products, making them more sustainable, and in 1997 Benyus began to analyse natural models for this purpose, thus introducing the concept of biomimetics (Benyus, 1997). By the 21st century, the concepts of cradle-to-cradle (McDonough and Braungart, 2010), loop and performance economy (Stahel, 2010), blue economy (Pauli, 2010), and ecology (Commoner, 2020) had already emerged. Moreover, recent years have seen the introduction of the Circular Economy, which figures centrally in a proposed model that considers the balance between technical and biological cycles to favour the conservation of natural resources (Ellen Macarthur Foundation, 2012; Birat, 2015).

However, sustainable development is more than a concern for environmental issues; it is a concern for the longevity of the planet and all its life forms, and, consequently requires a commitment to social equality and democratic and inclusive processes, as well as a concern for the needs of future generations (Ferraro et al., 2011). Therefore, sustainable development encompasses cultural, social, economic, environmental, ethical, and political aspects (Thackara, 2014; Leal-Filho et al., 2015).

The volume of production in the craft sector has gradually decreased over the last century and has been replaced by industrial production. In today's post-industrial era, the artisan has to compete nationally and internationally with products that appear to have been made by hand, when in fact they are mass-produced (Fillis, 2012). However, in recent decades there has been a resurgence of crafts and artisanal processes (Fox-Miller, 2017), as new markets have emerged, particularly among urban consumers, who have attributed ethical, environmental and sociocultural value to crafts (Wood, 2011). According to Fuller-Love et al. (2006), crafts are a source of creativity and innovation, with a positive impact on the development of the rural economy. This change has reestablished the links with sustainability, creating a context in which both crafts and artisans have become more valued (Zhan and Walker, 2019).

According to these authors, the environmental impact of crafts has traditionally been considered low. On the one hand, the materials used are generally renewable. On the other hand, manual skills and human energy are an important part of the process (Zhan & Walker, 2019). Furthermore, handmade objects often have a long lifespan and their traditional designs give them an appearance of timelessness (Nugraha, 2012). Yair (2010) highlighted the importance of craft materials to ensure environmental sustainability, while Cox and Bebbington (2014) proposed other relationships such as responsible and sustainable business performance, development of knowledge and skills, social responsibility and business continuity. cultural and aesthetic experience. In addition, UNESCO has considered crafts as part of our intangible heritage, establishing the objective of safeguarding and respecting intangible cultural heritage (UNESCO 2003), while for Fillis (2008), crafts are a creative industry. Thus, Hartley (2005) and Hesmondhalgh (2007) indicate that the recent literature on crafts suggests that the craft sector should be considered as part of the cultural and creative industries.

However, the concept of sustainable crafts is relatively new (Väänänen and Pöllänen, 2020). For Bamford (2011), this dimension is incorporated into the sector based on “design for sustainability” as an antidote to the combined impacts of hyper-efficient production and rampant “throw-away” consumerism. Väänänen and Pöllänen (2020) consider that sustainable craft is currently a broad concept involving two fundamental components: craft (design) and sustainability, concluding that craft can be a catalyst for the transformation toward more sustainable societies. Finally, Zhan and Walker (2019) examined the definition and nature of craft from practical, epistemological, and ontological perspectives. According to these authors, craft is characterised by its ecological attributes, connection to the locality, exemplification of systems thinking, and its relationship with authentic notions of self. Traditional crafts can therefore provide insights for positive transformation, as they embody a manifestation of community, knowledge, practices, and values based on context and place.

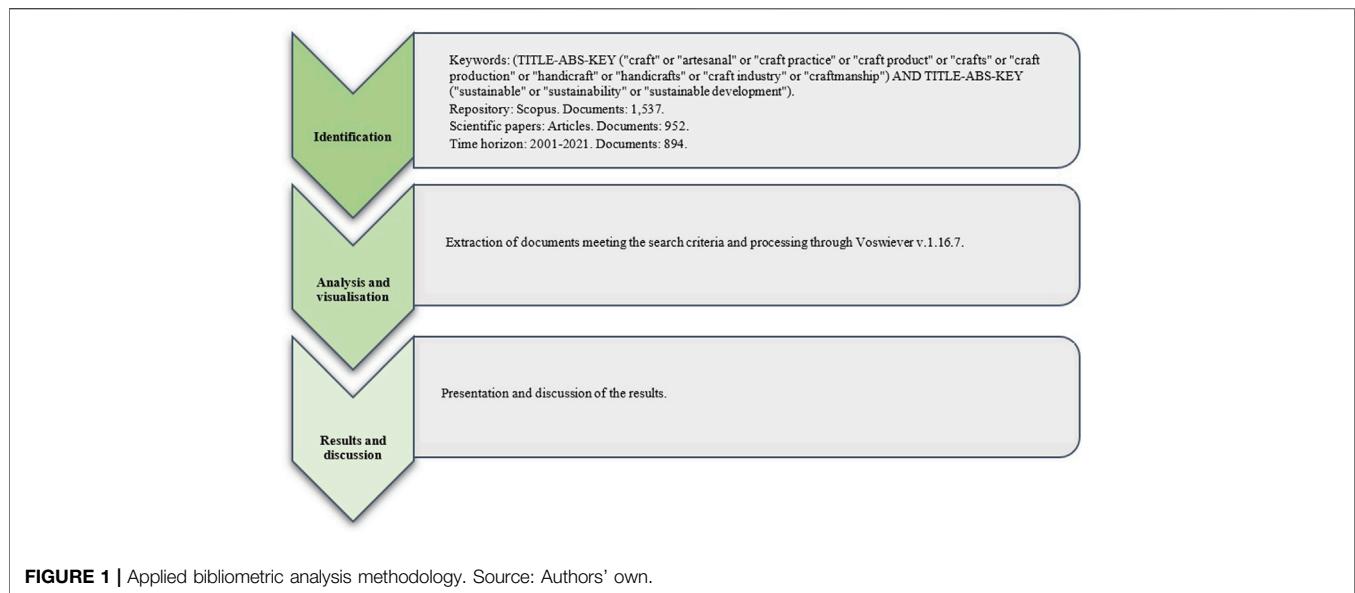
However, the concept has not been clearly defined. Thus, Väänänen et al. (2017) consider a need to define the concept of sustainable crafts in the face of growing concern and debate about the presence and future of crafts in a context of sustainability. Offering a novel perspective on the concept as a holistic system consisting of craft practice, product, and intangible craftsmanship, Väänänen and Pöllänen (2020) raise the need to conceptualise sustainable crafts from both a theoretical and practical perspective. We also know that the transition towards more sustainable societies requires a major shift and reorientation of consumer mindsets, lifestyles, patterns, and values (Ferraro et al., 2011). In this context, our research aims to analyse the degree of development of the concept of sustainable crafts. To this end, we propose the methodology of scientometrics or bibliometric analysis to map the evolution of the concept (Donthu et al., 2021; Kumar et al., 2021) and analyse the degree of current knowledge and future research trends in this area of knowledge. Therefore, we address the following research questions:

- Q1.** What is the trend of scientific publications on sustainable crafts?
- Q2.** What are the main thematic areas and the most relevant publications in sustainable crafts?
- Q3.** Which are the most prolific authors, journals, institutions, and countries in sustainable crafts?
- Q4.** What are the main Global cooperation networks of authors, institutions, and countries?
- Q5.** What are the main current and future research topics in sustainable crafts?

2 METHODOLOGY

2.1 Database and Methodology of Bibliometric Analysis

Scientometrics or bibliometric analysis is a technique that mainly aims to identify, organise, and analyse metadata to examine the evolution of an area of knowledge over a specific period (Lievrouw, 1989; Cronin, 2001; Keathley-Herring et al., 2016; Rey-Martí et al., 2016).



For the data, we used the Scopus database. However, the main scientific repositories such as Web Of Science, Scopus, PubMed, and Google Scholar have been consulted, following the recommendations of Harzing and Alakangas (2016) and Mongeon and Paul-Hus (2016). Scopus was selected because 1) it is the repository that contains the largest volume of information in terms of authors, countries, and institutions (Zhang and Eichmann-Kalwara, 2019); 2) it contains the greatest volume of articles and journals that meet the scientific quality requirements of peer review (Ackerson and Chapman, 2003; Mingers and Lipitakis, 2010); 3) although its metrics correlate highly with Web of Science, the coverage provided by the latter is lower (Bakkalbasi et al., 2006; Archambault et al., 2009); and 4) it shows detailed attributes and variables of publications (Nascimento and Rodrigues, 2015). Thus, Scopus has been selected as the most suitable repository for bibliometric reviews (Donthu et al., 2021).

2.2 Methodological Procedure

The bibliometric or scientometric analysis was carried out in three phases (see **Figure 1**).

First, the search criteria were selected to identify the records in the repository (identification phase). Then, having obtained the records that met the search requirements, the data were exported for analysis using the Vosviewer v. 1.6.18 software (analysis and visualisation phase). Finally, the connections and associations between the scientific documents were established, and a discussion was established (results and discussion phase).

2.2.1 Identification Phase

The search for the selected terms was carried out using the fields "article title, abstract, and keywords." Accordingly, the search terms used were as follows: (TITLE-ABS-KEY ("craft" or "craft" or "craft practice" or "craft product" or "crafts" or "craft production" or "handicraft" or "handicrafts" or "craft industry" or "craftmanship") AND TITLE-ABS-KEY

("sustainable" or "sustainability" or "sustainable development")) AND (EXCLUDE (PUBYEAR, 2022) OR EXCLUDE (PUBYEAR, 2000) OR EXCLUDE (PUBYEAR, 1999) OR EXCLUDE (PUBYEAR, 1998) OR EXCLUDE (PUBYEAR, 1997) OR EXCLUDE (PUBYEAR, 1996) OR EXCLUDE (PUBYEAR, 1995) OR EXCLUDE (PUBYEAR, 1994) OR EXCLUDE (PUBYEAR, 1993) OR EXCLUDE (PUBYEAR, 1992) OR EXCLUDE (PUBYEAR, 1991) OR EXCLUDE (PUBYEAR, 1990) OR EXCLUDE (PUBYEAR, 1989) OR EXCLUDE (PUBYEAR, 1986)) AND (LIMIT-TO (DOCTYPE, "ar")). The data were downloaded in January 2022, obtaining 1,537 documents that met the search requirements.

The first filter applied in Scopus was the type of scientific paper. Next, research articles were selected since, according to Paul et al. (2021), these are evaluated based on novelty and undergo a rigorous blind peer-review process, ensuring higher scientific quality. Consequently, we excluded 585 publications that did not meet the search criteria.

The time horizon filter was then applied, selecting 2001–2021. As a result, the total number of documents meeting the search requirements was 894.

2.2.2 Analysis and Visualisation Phase

Additionally, we used Vosviewer v.1.6.18 to generate network maps, which allows us to cluster and process words (Sedighi, 2016; Meseguer-Sánchez et al., 2021a; Gálvez-Sánchez et al., 2021). Consequently, from the sample of articles meeting the search requirements, we analysed the interactions between authors, countries, and the evolution of keywords. This procedure has been widely used in many review studies for visualising co-citations and co-occurrence maps based on keywords (Van Eck and Waltman, 2010; Belmonte-Ureña et al., 2021; Meseguer-Sánchez et al., 2021b). The keyword analysis allowed us to examine the conceptual domains and detect the existing interrelationships.

TABLE 1 | Main characteristics of the scientific production in sustainable crafts. Source: Authors' own.

Year	Articles	Authors	Countries	Institutions	Citations	Journals	Citations per article	Average number of authors
2001	5	6	3	7	2	4	0.40	1.20
2002	11	19	10	11	5	11	0.45	1.73
2003	6	12	7	10	6	6	1.00	2.00
2004	10	15	7	14	36	10	3.60	1.50
2005	6	17	4	11	63	6	10.50	2.83
2006	16	36	13	25	70	16	4.38	2.25
2007	17	36	9	27	99	16	5.82	2.12
2008	14	33	12	24	101	13	7.21	2.36
2009	26	65	16	40	119	26	4.58	2.50
2010	28	73	15	46	173	25	6.18	2.61
2011	39	103	24	67	213	35	5.46	2.64
2012	36	109	21	74	272	33	7.56	3.03
2013	43	114	30	75	315	42	7.33	2.65
2014	34	88	25	63	354	33	10.41	2.59
2015	51	153	33	105	403	46	7.90	3.00
2016	49	146	31	100	516	47	10.53	2.98
2017	77	211	37	139	586	61	7.61	2.74
2018	79	243	40	150	713	63	9.03	3.08
2019	93	281	47	174	904	80	9.72	3.02
2020	121	356	52	260	1,332	106	11.01	2.94
2021	133	419	56	279	1,737	104	13.06	3.15
2001–2021	894	2,394	108	1,685	8,019	600	8.97	2.52

2.2.3 Results and Discussion Phase

Authors, journals, subject areas, countries, institutions of affiliation, Global cooperation networks, and keywords were analysed. In the case of authors, institutions, and countries, Global cooperation networks have been established based on the analysis of co-authorship. Thus, as the frequency of co-authorship increases, the interrelationship between them intensifies, increasing the conceptual relationship between them. The keyword analysis is based on the co-occurrence method, developed to identify a conceptual and thematic structure. The results show an overview of the most explored research themes in the relationship between crafts and sustainability.

3 PUBLICATION TRENDS IN SUSTAINABLE CRAFTS

This section presents the results concerning the main characteristics of the scientific production of sustainable crafts in 2001–2021 (see **Table 1**). Specifically, the results are presented on the number of published articles, authors, countries, institutions, citations, journals, the average number of citations, and the average number of authors in the research area.

The first publication in sustainable crafts was by Stahel, W. R. in 1986, concerned with optimising the lifespan of craft products (Stahel, 1986). Since then, at least 953 articles have been published in this line of research and are available in the Scopus database. **Table 1** shows the significant annual increase in all the scientometric indicators analysed in 2001–2021. This line of

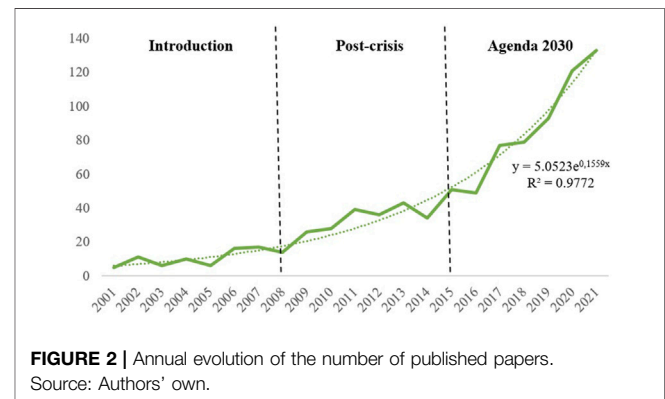


FIGURE 2 | Annual evolution of the number of published papers. Source: Authors' own.

research has grown considerably and has acquired a relevant position in the current scientific literature, particularly since 2015.

However, as shown in **Figure 2**, there are three distinct periods in the evolution of scientific output on sustainable crafts.

The first period runs until 2008 when the international financial crisis was declared and is characterised by a practically residual scientific production: a trend that has continued since this line of research began in 1986. The second period begins just after the financial crisis. It covers up to 2015, when there was a slight increase in research, possibly caused by changes in consumer habits resulting from the profound international economic and financial crisis. In fact, for Antal and Van den Bergh (2013), after the global crisis of 2008, “*decoupling growth and environmental*

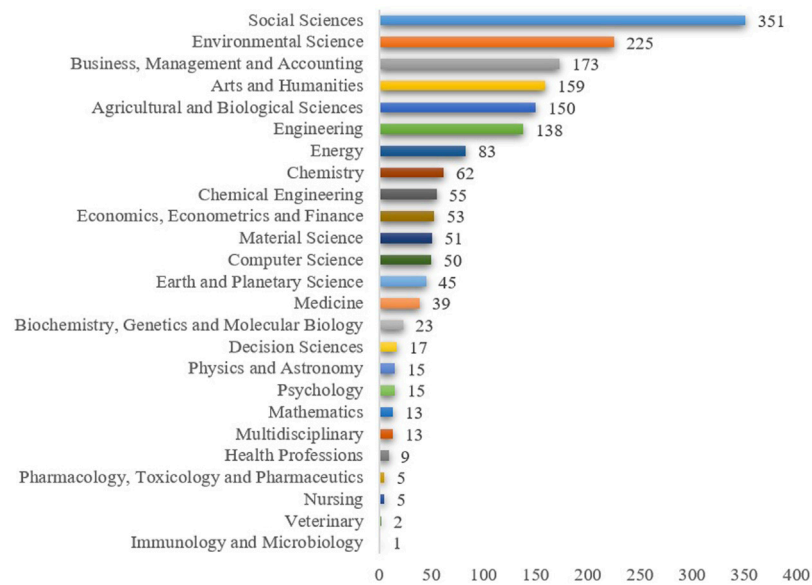


FIGURE 3 | Thematic areas in sustainable crafts. Source: Authors' own.

pressures is the main hope and focus of policy and a large part of the economy,” alluding to the increasing popularity of green growth. Finally, the third period from 2015 onwards has seen exponential growth, possibly triggered by the 2030 Agenda and the 17 Sustainable Development Goals of the United Nations (United Nations, 2015), which seems to have prompted researchers to more readily adopt the guidelines of the international community and apply these to the craft sector.

4 MOST INFLUENTIAL SUBJECT AREAS AND PUBLICATIONS IN SUSTAINABLE CRAFTS

This section describes the results of the main thematic areas of publications on sustainable crafts, along with the most influential articles in this line of research.

Figure 3 shows the distribution of published research articles on sustainable crafts according to the various thematic areas of the Scopus database.

Twenty-five thematic areas were identified concerning this line of research. Social Science is the subject area with the highest volume of scientific papers ($n = 351$; 20.53%), followed by Environmental Science ($n = 225$; 12.84%); Business, Management and Accounting ($n = 173$; 9.87%); Arts and Humanities ($n = 159$; 9.08%); and Agricultural and Biological Sciences ($n = 150$; 8.56%). The remaining 39.61% of the publications are distributed across 20 thematic areas, indicating that the research topics in sustainable crafts are widely distributed. Therefore, this line of research is being approached from a multidisciplinary perspective.

Table 2 shows the most relevant publications in this research area according to the number of total citations.

We have found different trends within the most relevant contributions to research on sustainable craftsmanship.

One trend is concerned with the sustainability of the craft sector based on the benefits of sustainable agriculture. Thus, while McCabe (2003) analysed agriculture to overcome the pressures of population growth, Calvo-Iglesias et al. (2006) explored the management of farmers' knowledge to protect local cultural heritage and promote changes in the landscape.

Pieroni (2008) analysed how botanical taxa contribute to sustainable trade activities based on food, medicines, and craft products, while Schmidt et al. (2007) examined the effects of harvesting on population ecology for craft sustainability.

Other research articles address sustainability in the crafts sector from a broader perspective. For example, Wiek and Iwaniec (2014) critically reviewed sustainability criteria and their applications in crafts. Pansera and Sarkar (2016), on the other hand, studied how new craft entrepreneurs are creating innovations that offer solutions to meet unaddressed and ignored consumer needs while achieving higher levels of sustainability, productivity, poverty reduction, and local inclusion. Feng and Chen (2018) also studied the impact of environmental regulation on green innovation in the craft sector.

Finally, the most cited research articles include proposals to protect the property rights of artisan cultural models (Santagata, 2002). Some of these articles also explore the impact of sustainable tourism on the generation of jobs and wealth in local communities (Mbaiwa, 2011) and the development of new concepts such as direct manufacturing resulting from the combination of artisanal production, mass production, and mass customisation (Chen et al., 2015).

TABLE 2 | Most relevant publications on sustainable crafts. Source: Authors' own.

Year	Authors	Title	Citations
2015	Chen, D., Heyer, S., Ibbotson, S., (...), Steingrímsson, J.G., Thiede, S., (...), Steingrímsson, J.G., Thiede, S., (...).	Direct digital manufacturing: Definition, evolution, and sustainability implications	241
2002	Santagata, W.	Cultural districts, property rights, and sustainable economic growth	180
2014	Wiek, A., Iwaniec, D.	Quality criteria for visions in sustainability science	135
2003	McCabe, J.T.	Sustainability and livelihood diversification among the Maasai of northern Tanzania	114
2018	Feng, Z., Chen, W.	Environmental regulation, green innovation, and green industrial development: An empirical analysis based on the spatial Durbin model	91
2011	Mbaiwa, J.E.	Changes in traditional livelihood activities and lifestyles caused by tourism development in the Okavango Delta, Botswana	80
2008	Pieroni, A.	Local plant resources in the ethnobotany of Theth, a village in the Northern Albanian Alps	73
2007	Schmidt, I.B., Figueiredo, I.B., Scariot, A.	Ethnobotany and effects of harvesting on the population ecology of <i>Syngonanthus nitens</i> (Bong.) <i>Ruhland</i> (Eriocaulaceae), an NTFP from the Jalapao region, central Brazil	72
2016	Panera, M., Sarkar, S.	Crafting sustainable development solutions: Frugal innovations of grassroots entrepreneurs	68
2006	Calvo-Iglesias, M.S., Crecente-Maseda, R., Fra-Paleo, U.	Exploring the farmer's knowledge as a source of information on past and present cultural landscapes. A case study from NW Spain	64

TABLE 3 | Most productive authors according to the number of research articles published. Source: Authors' own.

Authors	A	TC	TC/A	Institution	C	H index
Bernal, R.	6	37	6.17	Guadualito Nature Reserve	Colombia	2
Galeano, G.	6	31	5.17	National University of Colombia	Colombia	3
García, N.	4	32	8.00	Pontificia Universidad Javeriana	Colombia	2
Hofverberg, H.	4	12	3.00	Malmö Högskola	Sweden	2
Walker, S.	4	34	8.50	Lancaster University	United Kingdom	1
Zhan, X.	4	29	7.25	Lancaster University	United Kingdom	1
Gambia, J.	3	24	8.00	Rhodes University	South Africa	1
Hwang, S.H.	3	9	3.00	National Yunlin University of Science and Technology	Taiwan	1
Kaipainen, M.	3	13	4.33	Itä-Suomen yliopisto	Finland	1
Kashima, Y.	3	13	4.33	University of Melbourne	Australia	1

(A): the number of articles published (TC): total citations; (TC/A): average citations per article; (C): Country; (H index): Hirst index in the research area.

5 MAJOR CONTRIBUTIONS AND GLOBAL COOPERATION NETWORKS

This section presents the productivity results of authors, institutions, countries, journals, and their Global cooperation networks. Global cooperation networks provide insight into the relationships between researchers and the dissemination of knowledge (Chen, 2006), while collaborations enable new high-impact research by generating synergies that contribute to exchanging ideas (Acedo et al., 2006). In the international cooperation maps, the size of the circles indicates the number of published scientific papers, the colours indicate the clusters of cooperation, and the distance refers to the frequency of co-authored publications. **Table 3** shows the ten most productive authors in sustainable crafts in 2001–2021 and their main characteristics.

Bernal, R. and Galeano, G., both of Colombian origin, are the most productive authors, with six published research articles, five of which have been co-authored. In addition, all the articles published by the other Colombian author in this line of research, García, N., were co-authored with his compatriots. The same is

true of the British authors Walker, S. and Zhan, X., who have co-authored all their publications in this line of research.

Bernal, R., and Walker, S. are the two authors with the greatest dissemination of their research outcomes (37 and 34 total citations, respectively), the latter having the highest average number of citations per article (8.5). The low number of citations of the ten most productive authors in the research area translates to an H-index of between 1 and 3.

Figure 4 shows the global cooperation networks of the co-authors in sustainable crafts. For 2,394 authors, co-authorship on a minimum of two published articles was selected. A total of 132 authors were obtained, of which 36 form the eight clusters of international cooperation in sustainable crafts.

Table 4 shows the ranking of the 10 most productive institutions and their international cooperation results in the period 2001–2021 in the research line of sustainable crafts.

The most productive institutions are the American Arizona State University and the British Oslo Metropolitan University (both with eight research articles). The American institution has the highest citation volume and average number of citations per

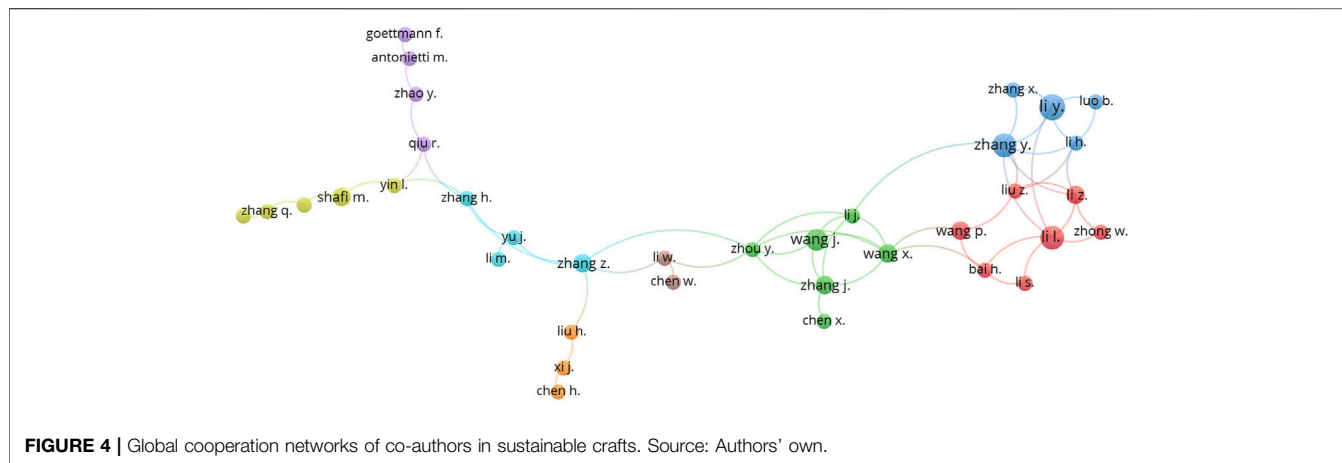


FIGURE 4 | Global cooperation networks of co-authors in sustainable crafts. Source: Authors' own.

TABLE 4 | Ranking of the ten most productive institutions in sustainable crafts. Source: Authors' own.

Institution	C	A	TC	TC/A	H index	CI (%)	TC/A	
							IC	NIC
Arizona State University	United States	8	186	23.25	4	50.0	9.00	37.50
Lancaster University	United Kingdom	8	70	8.75	5	12.5	4.00	9.43
National Yunlin University of Science and Technology	Taiwan	7	32	4.57	3	28.6	1.00	6.00
National University of Colombia	Colombia	7	44	6.29	4	57.1	8.75	3.00
The University of British Columbia	Canada	6	89	14.83	5	33.3	12.50	16.00
University of KwaZulu-Natal	South Africa	6	24	4.00	4	0.0	0.00	4.00
Chinese Academy of Sciences	China	6	92	15.33	4	50.0	3.67	27.00
University of South Africa	South Africa	5	30	6.00	3	0.0	0.00	6.00
University of São Paulo	Brazil	5	65	13.00	2	40.0	31.50	0.67
University of Waterloo	Canada	5	89	17.80	4	40.0	19.0	16.67

(C): Country; (A): number of articles published (TC): total citations; (TC/A): average citations per article; (H index): Hirst index in the research area; (CI): cooperative index; (TC/A CI): average number of citations from international cooperation; (TC/A NIC): average number of citations without international cooperation.

article (186 and 23.25, respectively). However, Lancaster University and The University of British Colombia achieve the highest H index in the research area (both with H index = 5).

Regarding the research outcomes of global networks, only the National University of Colombia publishes more articles from international collaborations than domestic co-authors (CI = 57.1%). In contrast, the Arizona State University and the Chinese Academy of Sciences published the same number of articles with international co-authors as those with domestic co-authors. At the other extreme are the two African institutions that have not published any articles with other international co-authors in this line of research. These findings suggest that the average number of citations is higher for articles published with domestic co-authors in 70% of the institutions, except for the Universidad Nacional de Colombia, Universidade de São Paulo, and the University of Waterloo.

Figure 5 shows the global cooperation networks of the institutions in sustainable crafts research. For 1,685 identified institutions, an interaction of at least two published research articles was selected, and 19 international institutions were identified.

There is a lack of connections between the institutions identified, indicating no Global cooperation network between the institutions working in this research area.

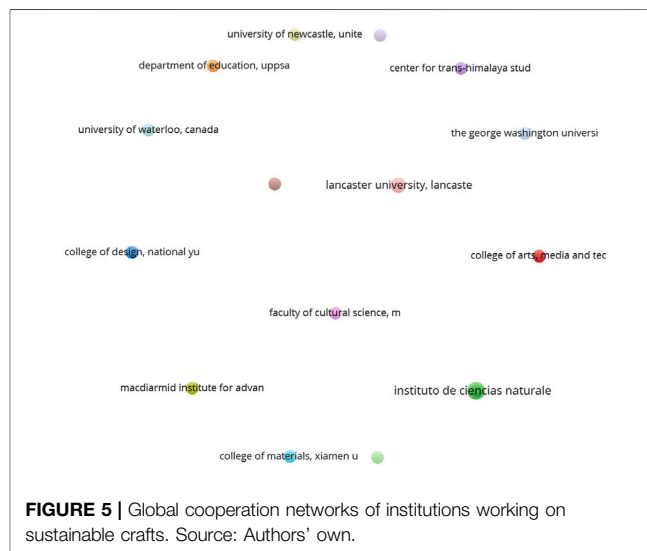


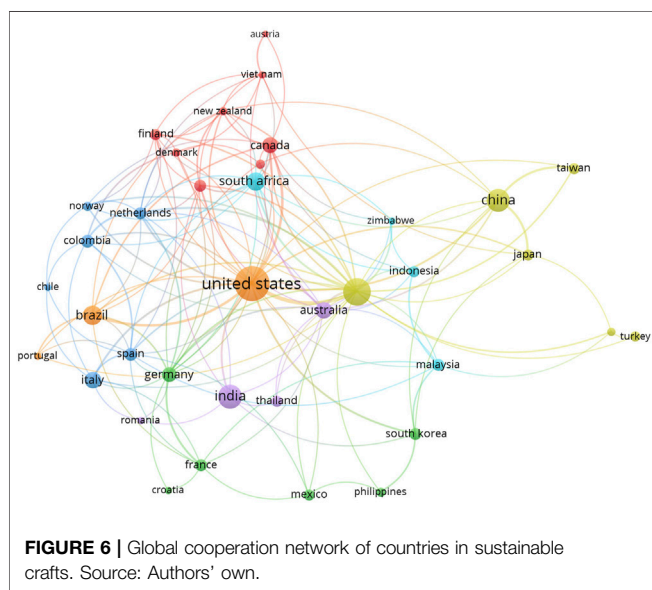
FIGURE 5 | Global cooperation networks of institutions working on sustainable crafts. Source: Authors' own.

Concerning the most productive countries and their cooperative research results, Table 5 presents the top 10 in sustainable crafts in 2001–2021.

TABLE 5 | Top 10 most productive countries in sustainable crafts and their cooperative networks. Source: Authors' own.

Country	A	TC	TC/A	H index	NC	Main collaborators	CI (%)	TC/A	
								IC	NIC
United States	154	2,786	18.09	20	37	The United Kingdom. Brazil. Canada. China. India	27.9	14.47	19.50
United Kingdom	92	1,168	12.70	18	34	The United States. Australia. Netherlands. South Africa. Belgium	39.1	18.36	9.05
India	72	400	5.56	12	10	The United States. Australia. Netherlands. Romania. Saudi Arabia	12.5	7.11	5.33
China	66	866	13.12	18	11	Japan. The United States. Australia. Egypt. Macao	24.2	5.31	15.62
Brazil	48	496	10.33	11	11	The United States. Canada. Germany. Portugal. The United Kingdom	27.1	19.00	7.11
South Africa	43	361	8.40	11	22	The United Kingdom. Canada. Kenya. Sweden. The United States	27.9	15.75	5.55
Italy	35	461	13.17	10	11	The United States. Spain. Chile. Colombia. France	22.9	11.25	13.74
Australia	34	444	13.06	8	18	The United Kingdom. China. Germany. The United States. Canada	50.0	21.59	4.53
Canada	30	334	11.13	10	17	The United States. Brazil. New Zealand. South Africa. The United Kingdom	50.0	12.87	9.40
Germany	28	915	32.68	12	19	France. Australia. Brazil. Netherlands. The United Kingdom	53.6	26.67	39.62

(A): number of articles published (TC): total citations; (TC/A): average citations per article; (H index): Hirst index in the research area; (CI): cooperative index; (TC/A CI): average number of citations from international cooperation; (TC/A NIC): average number of citations without international cooperation.



The United States and the United Kingdom are the most productive countries in sustainable crafts research, with 154 and 92 published articles. At the same time, these countries have also achieved the highest dissemination of their research results, with 2,786 and 1,168 total citations, respectively. Moreover, together with China, they are the countries with the highest H index in the research area (20 and 18 respectively). Despite this, Germany is ranked in the top 3 for total citations (915), making it the country with the highest average number of citations per article (32.68).

In terms of international cooperation results, the United States and the United Kingdom have the highest number of international contributors (37 and 34 respectively). However, most of their articles are published by domestic co-authors. Only Germany has cooperation rates above 50% (CI = 53.6%), while Canada and Australia have an international cooperation rate of 50%.

Figure 6 shows the Global cooperation networks of countries working in sustainable crafts for 2001–2021. For the 108 countries identified, analysis of at least six published research articles resulted in seven Global cooperation networks consisting of 37 countries. The

high number of countries, together with the high level of interaction, indicates that a stable and extensive Global cooperation network on sustainable crafts exists at the international level.

Finally, **Table 6** shows the ten most productive journals in sustainable crafts and their main characteristics in 2001–2021.

Sustainability Switzerland is the most productive journal in sustainable crafts, with 35 publications, followed by Design Journal and Craft Research (15 and 14 respectively). However, the Journal of Cleaner Production, with only 12 publications, has achieved the greatest dissemination of research results, with a total of 449 citations. These numbers indicate that this journal has the highest average number of citations (37.42) and, therefore, the one with the highest H index in the research area (9), followed by the two most productive journals (Sustainability Switzerland and Design Journal).

6 CURRENT AND FUTURE RESEARCH TOPICS IN SUSTAINABLE CRAFTS

This section presents the results of the analysis of the keywords, which are representative of the content (Comerio and Strozzi, 2019) in scientific papers on sustainable crafts up to 2021. Furthermore, this analysis allows for visualising the evolution of these research works throughout time (Fang et al., 2018), creating a picture of the line of research (Ding et al., 2001). Accordingly, co-occurrence is based on records sharing the same keywords are similar (Kessler, 1963; Weinberg, 1974). For this purpose, we used the VosWiewer tool, which, according to Park and Nagy (2018), develops the keyword matrix based on extraction and frequency calculation.

Accordingly, the keyword analysis is organised according to the three time periods shown in **Figure 2**.

6.1 Introduction of the Concept of Sustainable Crafts (2001–2007)

For a total of 71 research articles published in this period, only 17 keywords were identified, among which there is no co-occurrence. This finding indicates that in these 7 years, in addition to the few articles published, these works are

In terms of sustainable fisheries, the main contributions were those of Ross et al. (2008), who developed a technology transfer programme to implement small-scale farming to ensure the sustainability of the Mexican silverside *Menidia estor* and protect the livelihood of farmers. In addition, Cillari et al. (2012) proposed the use of bottom longlining to ensure the sustainability and recovery of artisanal fisheries in the Strait of Sicily.

6.2.2 Resource Management

Zhang et al. (2010) were the first to propose a waste exchange model to improve energy efficiency and reduce the fossil fuel dependence of the craft sector, while Kabongo and Boiral (2011) created a model for the management of waste materials, proposing up to five types of waste recovery. da Silva Viera et al. (2010) focused on reincorporation into the production cycle, proposing the reuse of sawmill waste as raw material for the design of small wood products, thus ensuring the economic and social sustainability of disadvantaged populations.

Important contributions have also been made to the management of forest resources. For example, Bruschi et al. (2014) analysed the negative externalities of the production model and called for caution regarding the overexploitation and destructive harvesting of woody species to ensure their sustainability. Pieroni (2008) discussed how botanical taxa contribute to the development of sustainable trade activities based on food, medicine, and handicraft products. Moreover, Dovie et al. (2008) found that groups with greater botanical knowledge implement resource selection and apply habits oriented towards prioritisation, planning, and conservation monitoring.

6.2.3 Environmental Performance: Water Management

Important contributions have emerged in the governance of water management. For example, Kuzdas and Wiek (2014) studied various governance styles in water management in response to the impact of climate change, while Jaglin et al. (2011) argue that these measures should be based on workable co-production arrangements between local governments and other actors, underpinned by coherent coordination and regulatory mechanisms.

Moreover, contributions from the management of the cultural heritage of water emerged in this period. For example, Rugani et al. (2011) found that, in the Italian city of Siena, aside from achieving better environmental outcomes than other contemporary management systems, conservation of its network of underground galleries was essential to the cultural heritage of the city. In addition, Studds and Miller (2010) proposed solutions for the reuse of dredged sediment materials to ensure the future viability of the waterway.

6.2.4 Forest Sustainability Management

In this cluster, the contributions are concerned with the management of forest resources. Thus, da Silva Viera et al. (2010) found that the reuse of forest residues contributed to the generation of new products, whose commercialisation also had important social and economic implications for the

community. In addition, Bruschi et al. (2014) suggested a model that includes the participation of local communities in the forest management of woody species to avoid deforestation and overexploitation. Furthermore, Glover and Elsiddig (2012) suggested the design of integrated policies for sustainable forest management based on partnerships with local communities and the promotion of property rights, while for Camacho et al. (2012), the experiences derived from the management of natural forest resource systems vary according to local cultures, beliefs, and traditions. Finally, in this period, Barzekar et al. (2011) proposed a set of multidisciplinary indicators for monitoring ecotourism in forests.

6.2.5 Knowledge Management for Sustainability

Finally, the smallest cluster includes some contributions toward knowledge management to achieve sustainability in the artisanal sector. The main works are those of Gavronski et al. (2012), who established the relationship between knowledge management and the social climate of the plant to ensure sustainability in operations. In addition, Kabongo and Boiral (2011) proposed an analytical framework for managing waste material recovery practices, while Griffiths (2012) concluded that environmental quality standards contribute to developing new, more sustainable manufacturing technologies.

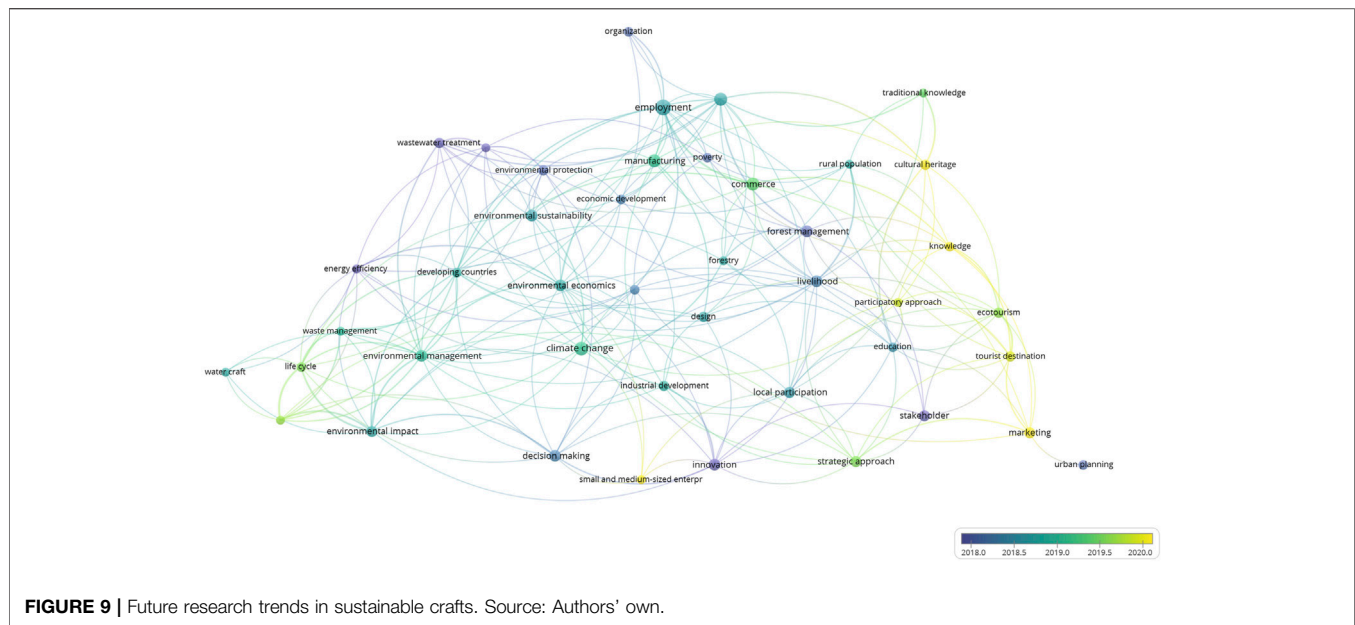
6.3 Sustainable Crafts in the Framework of the 2030 Agenda and the 17 SDGs (2015–2021)

From 602 research articles published in this period, 2,622 keywords were identified. After analysing at least five co-occurrences, 80 keywords were obtained. After further filtering, the final number of keywords represented in Figure 8 is 43, grouped around 4 clusters.

6.3.1 Local Sustainability

An important part of the search for sustainability in the craft sector has been based on local impact. The latter constitutes the main axis of the sustainable development of traditional crafts, as their end products have dual artistic and economic characteristics (Fan and Feng, 2019). Chen et al. (2015) established different manufacturing paradigms ranging from handcrafting to mass production with the industrial revolution, finding that artisans often produced various products. Still, the products shared similarities in their production methods, although sometimes their marketability was limited to the local community Chen et al. (2015).

Along these lines, some authors have analysed how craft brewers are clear indicators of urban renewal and economic development of territories (Gatrell et al., 2018), while souvenir shops selling artisanal products tell local and 'real' stories and are therefore more accepted by tourists than mass-produced souvenirs, even if the latter are often cheaper (Anastasiadou and Vettese, 2019). Consequently, in the face of increasing tourism, the craft sector contributes to the economic sustainability of local regions more than the industrial sector (Olya et al., 2018). Therefore, the conservation and sustainable



Schnitzer et al. (2016) developed and tested a sustainable livelihood model consistent with environmental protection in handicraft villages in rural areas, based on different techniques and integrated components, including handicraft production.

However, some authors have paid attention to other issues. For example, the supply chain is of particular importance in labour-intensive industries such as handicrafts (Hannibal and Kauppi, 2019). In addition, Laitala et al. (2018) focused on fashion to show how repair, redesign, and modification are real alternatives for prolonging the usage life of clothing, correlating positively with the environmental and social benefits perceived by consumers.

Finally, the keywords from this period are ordered from darkest to lightest colour, thus showing future research trends in the craft sector (Figure 9).

Future research trends in sustainable crafts mainly focus on the potential of heritage management, knowledge, and promotion of the craft sector's values, traditions, and fundamentals for achieving social, economic, and environmental sustainability.

7 DISCUSSION AND CONCLUSION

This article employed scientometric methodology to address the conceptual development of sustainable crafts in the period 2001–2021. To achieve this objective, we conducted a bibliometric review of 894 research articles available in the Scopus database for the selected period, generating four main conclusions:

C1. The main characteristics of the research area indicate strong growth in the concept of sustainable craftsmanship in the 21st century and, consequently, an increased level of interest from the research community. The large number and weighting of thematic areas presented in Figure 3 suggest a high degree of multidisciplinary in this area of knowledge. In addition, three

distinct periods have been detected, with the period following the declaration of the 2030 Agenda leading to exponential quantitative and qualitative growth in this research area.

C2. The most prolific authors in sustainable crafts have been the Colombian authors Bernal, R. and Galeano, G., while Arizona State University is the most productive institution. The United States is the most prolific country, while the most productive journal is Sustainability Switzerland.

C3. A low degree of international cooperation has been detected, particularly at author and institution levels. However, countries—although showing particularly low output—have significantly larger and more consistent Global cooperation networks.

C4. Multiple research themes have been identified. While in the period 2001–2007, relatively few research articles were published, and these had low interrelation and no particular topic of interest, after the international financial crisis, the following topics were identified: ecotourism and sustainable fisheries; resource management; environmental performance: water management; forest sustainability management; and knowledge management to achieve sustainability. However, the period 2015–2021 saw exponential growth, with four major emerging research themes: local sustainability, cultural heritage management; resource management; and social sustainability. Consequently, we detected a gradual increase in the keywords resulting from the research articles published in each of the three periods analysed and a quantitative and qualitative increase in the research topics, particularly after the United Nations published the 2030 Agenda and the Sustainable Development Goals in 2015. From this perspective, the main research trends in the foreseeable future will focus on the potential of heritage management, knowledge, and the promotion of the sustainable craft sector's values, traditions, and foundations.

Thus, the present work makes a novel and innovative contribution to this research area. Specifically, we have

provided a holistic view of crafts through the lens of sustainability, following the recommendations of Väänänen et al. (2017), finding a great growth in scientific production in this research field after the 17 SDGs. This increase has caused new concerns to arise in the artisan sector, which is adopting a comprehensive vision of sustainability. Consequently, our conclusion extend the considerations of Fröcklin et al. (2018) and Oyekunle and Sirayi (2018), finding social, environmental, economic and cultural applications in the concept of sustainable crafts. However, we have not found any research work that addresses the influence of sustainable crafts on the Sustainable Development Goals, so we propose that future research addresses the impact of the sustainable actions of the crafts sector on the various SDGs.

As a result, we conclude that the craft sector has responded to the challenges posed by sustainability. A very relevant aspect of the artisan sector has traditionally been its contribution to local development. While Yang et al. (2018), Oyekunle and Sirayi (2018) and Zhan and Walker (2019) detected the productive and recovery value and asset management of the sector, our findings extend to the consideration of sustainable craftsmanship that has been the engine of the development of productive sectors auxiliary, such as tourism, thus causing strong professional development and employment growth, especially in rural areas. At the same time, this concern for management has contributed to a greater awareness of environmental issues, giving rise to a more sustainable social and environmental management model. Thus, traditional crafts have adapted to the challenges posed by the major international financial crisis, proposing sustainable solutions and alternatives to the unbridled consumption habits characteristic of industrial production. However, it is consumers who, through their purchasing decisions, ultimately determine the preservation of the sector. Therefore, we propose research studies that analyse the meaning of sustainability for consumers and how this can be incorporated into the brand image of artisan products.

A very relevant theme of sustainable crafts is concern for the environment. Our findings extend the considerations of Zhan and Walker (2019), finding that sustainable crafts is, at least in its concept, a clean production model that already has instruments to apply the operating bases of the circular economy. Consequently, we have verified that solutions have been proposed for the correct management of natural resources, as well as for recycling, the recovery of waste and its reincorporation into the supply chain. However, there are still margins for improvement in sustainable crafts in the environmental dimension, especially linked to the development of indicators to measure the circularity of the craft production process, for which we propose the development of lines of research that contribute to the development of indicators that help the craft sector to continue moving towards a cleaner production model.

For all these reasons, we conclude that after the Sustainable Development Goals, sustainable crafts have experienced strong growth in their concern for social, economic and environmental sustainability, becoming a productive model that respects the environment, generating growth and economic development.

local, which coincides with the findings of Väänänen and Pöllänen (2020).

Consequently, our findings could be useful for policymakers since we provide a scientific basis for the impact of the craft sector on environmental, social, and economic sustainability. As a result, policymakers could implement mechanisms to ensure and promote the values and survival of traditional crafts. In addition, our findings could be valuable for the artisans themselves and their representative institutions by demonstrating examples of good sustainable development practices to enhance sustainability at the local level. Finally, our results could also help researchers, as we provide data that could underpin their future hypotheses concerning the trajectory of the existing discussion on sustainable crafts.

Finally, we should note that this study has certain limitations that should be considered for future research. The database used was Scopus, so we propose considering other repositories such as Google Scholar or Web of Science. In addition, we have only considered research articles in this review. Thus, in future work, we consider it worthwhile to incorporate a greater diversity of research documents, such as book chapters or conference papers, which could complement the information obtained. Moreover, the computer tool used for data visualisation and clustering was VosWiewer, and so using other software could also provide slightly different or complementary results. Finally, the bibliometric analysis methodology does not consider that citations require time to be analysed. Thus, content analysis could provide a complementary method for evaluating research in the future (Hughes, 2011).

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

Conceptualization, MP-P, FG-S, and AG-L; methodology, MP-P, and FG-S; formal analysis, MP-P, and FG-S; writing—preparation of the original draft, MP-P, FG-S, and VM-M; Writing—Proofreading, and Editing, MP-P, FG-S, AG-L, and VM-M; supervision, AG-L, and VM-M; acquisition of funds, AG-L, and VM-M. All authors have read and accepted the published version of the manuscript.

FUNDING

This study was funded by RRREMAKER. RRREMAKER MSC-RISE-H2020 project has received funding from the European Union's Horizon 2020 Research and Innovation programme under the Marie Skłodowska-Curie, proposal number: 101008060.

REFERENCES

- Acedo, F. J., Barroso, C., Casanueva, C., and Galán, J. L. (2006). Co-Authorship in Management and Organizational Studies: An Empirical and Network Analysis*. *J. Manag. Stud.* 43 (5), 957–983. doi:10.1111/j.1467-6486.2006.00625.x
- Ackerson, L. G., and Chapman, K. (2003). Identifying the Role of Multidisciplinary Journals in Scientific Research. *Coll. Res. Libr.* 64 (6), 468–478. doi:10.5860/crl.64.6.468
- Anastasiadou, C., and Vettese, S. (2019). "From Souvenirs to 3D Printed Souvenirs". Exploring the Capabilities of Additive Manufacturing Technologies in (Re)-framing Tourist Souvenirs. *Tour. Manag.* 71, 428–442. doi:10.1016/j.tourman.2018.10.032
- Antal, M., and Van den Bergh, J. C. J. M. (2013). Macroeconomics, Financial Crisis and the Environment: Strategies for a Sustainability Transition. *Environ. Innov. Soc. Transitions* 6, 47–66. doi:10.1016/j.eist.2013.01.002
- Archambault, É., Campbell, D., Gingras, Y., and Larivière, V. (2009). Comparing Bibliometric Statistics Obtained from the Web of Science and Scopus. *J. Am. Soc. Inf. Sci.* 60 (7), 1320–1326. doi:10.1002/asi.21062
- Bakkalbasi, N., Bauer, K., Glover, J., and Wang, L. (2006). Three Options for Citation Tracking: Google Scholar, Scopus and Web of Science. *Biomed. Digit. Libr.* 3, 1–8. doi:10.1186/1742-5581-3-7
- Bamford, R. (2011). "Ecology and the Aesthetics of Imperfect Balance," in *Sustainability in Craft and Design*, 49–100.
- Barzekar, G., Aziz, A., Mariapan, M., and Ismail, M. H. (2011). Delphi Technique for Generating Criteria and Indicators in Monitoring Ecotourism Sustainability in Northern Forests of Iran: Case Study on Dohezar and Sehezar Watersheds. *Folia For. Pol.* 53 (2), 130–141.
- Belmonte-Ureña, L. J., Plaza-Ubeda, J. A., Vazquez-Brust, D., and Yakovleva, N. (2021). Circular Economy, Degrowth and Green Growth as Pathways for Research on Sustainable Development Goals: A Global Analysis and Future Agenda. *Ecol. Econ.* 185, 107050. doi:10.1016/j.ecolecon.2021.107050
- Benyus, J. M. (1997). *Biomimicry: Innovation Inspired by Nature*. New York: Morrow.
- Birat, J.-P. (2015). Life-cycle Assessment, Resource Efficiency and Recycling. *Metall. Res. Technol.* 112 (2), 206. doi:10.1051/metal/2015009
- Bozkurt, Ö., and Lara Cohen, R. (2019). Repair Work as Good Work: Craft and Love in Classic Car Restoration Training. *Hum. Relat.* 72 (6), 1105–1128. doi:10.1177/0018726718786552
- Bruschi, P., Mancini, M., Mattioli, E., Morganti, M., and Signorini, M. A. (2014). Traditional Uses of Plants in a Rural Community of Mozambique and Possible Links with Miombodegradation and Harvesting Sustainability. *J. Ethnobiol. Ethnomedicine* 10 (1), 1–22. doi:10.1186/1746-4269-10-59
- Calvo-Iglesias, M. S., Crecente-Maseda, R., and Fra-Paleo, U. (2006). Exploring Farmer's Knowledge as a Source of Information on Past and Present Cultural Landscapes. *Landsc. Urban Plan.* 78 (4), 334–343. doi:10.1016/j.landurbplan.2005.11.003
- Camacho, L. D., Combalicer, M. S., Yeo-Chang, Y., Combalicer, E. A., Carandang, A. P., Camacho, S. C., de Luna, C. C., and Rebugio, L. L. (2012). Traditional Forest Conservation Knowledge/technologies in the Cordillera, Northern Philippines. *For. Policy Econ.* 22, 3–8. doi:10.1016/j.forpol.2010.06.001
- Chen, C. (2006). CiteSpace II: Detecting and Visualizing Emerging Trends and Transient Patterns in Scientific Literature. *J. Am. Soc. Inf. Sci.* 57 (3), 359–377. doi:10.1002/asi.20317
- Chen, D., Heyer, S., Ibbotson, S., Saloni, K., Steingrímsson, J. G., and Thiede, S. (2015). Direct Digital Manufacturing: Definition, Evolution, and Sustainability Implications. *J. Clean. Prod.* 107, 615–625. doi:10.1016/j.jclepro.2015.05.009
- Chi, X., Lee, S. K., Ahn, Y.-j., and Kiatakwsin, K. (2020). Tourist-perceived Quality and Loyalty Intentions towards Rural Tourism in China. *Sustainability* 12, 3614. doi:10.3390/su12093614
- Cillari, T., Falautano, M., Castriota, L., Marino, V., Vivona, P., and Andaloro, F. (2012). The Use of Bottom Longline on Soft Bottoms: An Opportunity of Development for Fishing Tourism along a Coastal Area of the Strait of Sicily (Mediterranean Sea). *Ocean Coast. Manag.* 55, 20–26. doi:10.1016/j.ocecoaman.2011.10.007
- Comerio, N., and Strozzi, F. (2019). Tourism and its Economic Impact: A Literature Review Using Bibliometric Tools. *Tour. Econ.* 25 (1), 109–131. doi:10.1177/1354816618793762
- Commoner, B. (2020). *The Closing Circle: Nature, Man, and Technology*. Mineola: Courier Dover Publications.
- Cox, E., and Bebbington, J. (2014). *Craft and Sustainable Development: An Investigation*. Available at: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.933.6413&rep=rep1&type=pdf> (accessed Jan 5, 2022).
- Cronin, B. (2001). Bibliometrics and beyond: Some Thoughts on Web-Based Citation Analysis. *J. Inf. Sci.* 27 (1), 1–7. doi:10.1177/016555150102700101
- da Silva Vieira, R., Lima, J. T., Moreira da Silva, J. R., Gherardi Hein, P. R., Baillères, H., and Pereira Barauna, E. E. (2010). Small Wooden Objects Using Eucalypt Sawmill Wood Waste. *BioResources* 5 (3), 1463–1472.
- Ding, Y., Chowdhury, G. G., and Foo, S. (2001). Bibliometric Cartography of Information Retrieval Research by Using Co-word Analysis. *Inf. Process. Manag.* 37 (6), 817–842. doi:10.1016/s0306-4573(00)00051-0
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., and Lim, W. M. (2021). How to Conduct a Bibliometric Analysis: An Overview and Guidelines. *J. Bus. Res.* 133, 285–296. doi:10.1016/j.jbusres.2021.04.070
- Dovie, D. B. K., Witkowski, E. T. F., and Shackleton, C. M. (2008). Knowledge of Plant Resource Use Based on Location, Gender and Generation. *Appl. Geogr.* 28 (4), 311–322. doi:10.1016/j.apgeog.2008.07.002
- Ellen Macarthur Foundation (2012). *Towards the Circular Economy*. Available at: <http://www.ellenmacarthurfoundation.org/business/reports> (accessed Jan 5, 2022).
- Fan, K.-K., and Feng, T.-T. (2019). Discussion on Sustainable Development Strategies of the Traditional Handicraft Industry Based on Su-Style Furniture in the Ming Dynasty. *Sustainability* 11, 2008. doi:10.3390/su11072008
- Fang, Y., Yin, J., and Wu, B. (2018). Climate Change and Tourism: A Scientometric Analysis Using CiteSpace. *J. Sustain. Tour.* 26 (1), 108–126. doi:10.1080/09669582.2017.1329310
- Feehey, A. E. (2017). Cultural Heritage, Sustainable Development, and the Impacts of Craft Breweries in Pennsylvania. *City, Cult. Soc.* 9, 21–30. doi:10.1016/j.ccs.2017.03.001
- Feng, Z., and Chen, W. (2018). Environmental Regulation, Green Innovation, and Industrial Green Development: An Empirical Analysis Based on the Spatial Durbin Model. *Sustainability* 10 (1), 223. doi:10.3390/su10010223
- Ferraro, E., White, R., Cox, E., Bebbington, J., and Wilson, S. (2011). Craft and Sustainable Development: Reflections on Scottish Craft and Pathways to Sustainability. *Craft+ Des. Enq.* 3, 1–26. doi:10.22459/cde.03.2011.06
- Fillis, I. (2008). The Internationalisation Process of the Smaller Firm: an Examination of the Craft Microenterprise. *Open Bus. J.* 1 (1), 53–61. doi:10.2174/1874915100801010053
- Fillis, I. (2012). An Aesthetic Understanding of the Craft Sector. *Creative Industries J.* 5 (1-2), 23–41. doi:10.1386/cij.5.1-2.23_1
- Fox Miller, C. (2017). The Contemporary Geographies of Craft-Based Manufacturing. *Geogr. Compass* 11, e12311. doi:10.1111/gec3.12311
- Fröcklin, S., Jiddawi, N. S., and de la Torre-Castro, M. (2018). Small-scale Innovations in Coastal Communities: Shell-Handicraft as a Way to Empower Women and Decrease Poverty. *Ecol. Soc.* 23, 2. doi:10.5751/ES-10136-230234
- Fuller-Love, N., Midmore, P., Thomas, D., and Henley, A. (2006). Entrepreneurship and Rural Economic Development: a Scenario Analysis Approach. *Int J. Ent. Behav. Res.* 12 (5), 289–305. doi:10.1108/13552550610687655
- Gálvez-Sánchez, F. J., Lara-Rubio, J., Verdú-Jóver, A. J., and Meseguer-Sánchez, V. (2021). Research Advances on Financial Inclusion: A Bibliometric Analysis. *Sustainability* 13 (6), 3156. doi:10.3390/su13063156
- García-Rosell, J.-C., and Mäkinen, J. (2013). An Integrative Framework for Sustainability Evaluation in Tourism: Applying the Framework to Tourism Product Development in Finnish Lapland. *J. Sustain. Tour.* 21 (3), 396–416. doi:10.1080/09669582.2012.708038
- Gatrell, J., Reid, N., and Steiger, T. L. (2018). Branding Spaces: Place, Region, Sustainability and the American Craft Beer Industry. *Appl. Geogr.* 90, 360–370. doi:10.1016/j.apgeog.2017.02.012

- Gavronski, I., Klassen, R. D., Vachon, S., and Nascimento, L. F. M. d. (2012). A Learning and Knowledge Approach to Sustainable Operations. *Int. J. Prod. Econ.* 140 (1), 183–192. doi:10.1016/j.ijpe.2012.01.037
- Glover, E. K., and Elsidig, E. A. (2012). The Causes and Consequences of Environmental Changes in Gedaref, Sudan. *Land Degrad. Dev.* 23 (4), 339–349. doi:10.1002/ldr.2167
- Godratollah, B., Azlizam, A., Manohar, M., Mohd, H. I., and Syed, M. H. (2011). Delphi Technique for Generating Criteria and Indicators in Monitoring Ecotourism Sustainability in Northern Forests of Iran. Case Study on Dohezar and Sehezar Watersheds. *Folia For. Pol. Ser. A* 53 (2), 130–141.
- Gosling, A., Shackleton, C. M., and Gambiza, J. (2017). Community-based Natural Resource Use and Management of Bigodi Wetland Sanctuary, Uganda, for Livelihood Benefits. *Wetl. Ecol. Manage* 25 (6), 717–730. doi:10.1007/s11273-017-9546-y
- Griffiths, B. (2012). Manufacturing Paradigms: the Role of Standards in the Past, the Present and the Future Paradigm of Sustainable Manufacturing. *Proc. Institution Mech. Eng. Part B J. Eng. Manuf.* 226 (10), 1628–1634. doi:10.1177/0954405412447695
- Guan, T., Meng, K., Liu, W., and Xue, L. (2019). Public Attitudes toward Sustainable Development Goals: Evidence from Five Chinese Cities. *Sustainability* 11 (20), 5793. doi:10.3390/su11205793
- Hai, L. T., Schnitzer, H., van Thanh, T., Thao, N. T. P., and Braunegg, G. (2016). An Integrated Eco-Model of Agriculture and Small-Scale Industry in Craft Villages toward Cleaner Production and Sustainable Development in Rural Areas - A Case Study from Mekong Delta of Viet Nam. *J. Clean. Prod.* 137, 274–282. doi:10.1016/j.jclepro.2016.06.146
- Hannibal, C., and Kauppi, K. (2019). Third Party Social Sustainability Assessment: Is it a Multi-Tier Supply Chain Solution? *Int. J. Prod. Econ.* 217, 78–87. doi:10.1016/j.ijpe.2018.08.030
- Hartley, J. (2005). *Creative Industries*. Oxford: WileyBlackwell.
- Harzing, A.-W., and Alakangas, S. (2016). Google Scholar, Scopus and the Web of Science: a Longitudinal and Cross-Disciplinary Comparison. *Scientometrics* 106 (2), 787–804. doi:10.1007/s11192-015-1798-9
- Hesmondhalgh, D. (2007). *The Cultural Industries*. London: Sage.
- Huang, H. P. (2015). Eco-efficiency on the Circular Economy Development Pattern in Jiangxi Province. *Shengtai Xuebao* 35, 2894–2901. doi:10.5846/stxb201306171725
- Hughes, P. (2011). Towards a Post-consumer Subjectivity: a Future for the Crafts in the Twenty First Century? *Sustain. Craft Des.* 7, 1456. doi:10.22459/CDE.03.2011.02
- Jaglin, S., Repussard, C., and Belbéoc'h, A. (2011). Decentralisation and Governance of Drinking Water Services in Small West African Towns and Villages (Benin, Mali, Senegal): the Arduous Process of Building Local Governments. *Can. J. Dev. Studies/Revue Can. d'études du développement* 32 (2), 119–138. doi:10.1080/02255189.2011.596021
- Kabongo, J., and Boiral, O. (2011). Creating Value with Wastes: a Model and Typology of Sustainability within Firms. *Bus. Strat. Env.* 20 (7), 441–455. doi:10.1002/bse.709
- Keathley-Herring, H., Van Aken, E., Gonzalez-Aleu, F., Deschamps, F., Letens, G., and Orlandini, P. C. (2016). Assessing the Maturity of a Research Area: Bibliometric Review and Proposed Framework. *Scientometrics* 109 (2), 927–951. doi:10.1007/s11192-016-2096-x
- Kessler, M. M. (1963). Bibliographic Coupling between Scientific Papers. *Amer. Doc.* 14 (1), 10–25. doi:10.1002/asi.5090140103
- Kumar, S., Lim, W. M., Pandey, N., and Christopher Westland, J. (2021). 20 Years of Electronic Commerce Research. *Electron Commer. Res.* 21 (1), 1–40. doi:10.1007/s10660-021-09464-1
- Kuzdas, C., and Wiek, A. (2014). Governance Scenarios for Addressing Water Conflicts and Climate Change Impacts. *Environ. Sci. Policy* 42, 181–196. doi:10.1016/j.envsci.2014.06.007
- Laitala, K., Klepp, I., and Henry, B. (2018). Does Use Matter? Comparison of Environmental Impacts of Clothing Based on Fiber Type. *Sustainability* 10 (7), 2524. doi:10.3390/su10072524
- Leal Filho, W., Manolas, E., and Pace, P. (2015). The Future We Want. *Int. J. Sustain. High. Educ.* 16 (1), 112–129. doi:10.1108/IJSHE-03-2014-0036
- Li, W.-T., Ho, M.-C., and Yang, C. (2019). A Design Thinking-Based Study of the Prospect of the Sustainable Development of Traditional Handicrafts. *Sustainability* 11 (18), 4823. doi:10.3390/su11184823
- Lievrouw, L. A. (1989). The Invisible College Reconsidered. *Commun. Res.* 16 (5), 615–628. doi:10.1177/009365089016005004
- Lyle, J. T. (1996). *Regenerative Design for Sustainable Development*. New Jersey: John Wiley & Sons.
- Maroyi, A. (2017). Diversity of Use and Local Knowledge of Wild and Cultivated Plants in the Eastern Cape Province, South Africa. *J. Ethnobiol. Ethnomedicine* 13 (1), 1–16. doi:10.1186/s13002-017-0173-8
- Mbaiwa, J. E. (2011). Changes on Traditional Livelihood Activities and Lifestyles Caused by Tourism Development in the Okavango Delta, Botswana. *Tour. Manag.* 32 (5), 1050–1060. doi:10.1016/j.tourman.2010.09.002
- McCabe, J. T. (2003). Sustainability and Livelihood Diversification Among the Maasai of Northern Tanzania. *Hum. Organ.* 62 (2), 100–111. doi:10.17730/humo.62.2.4rwr1n3xptg29b8
- McDonough, W., and Braungart, M. (2010). *Cradle to Cradle: Remaking the Way We Make Things*. New York: North Point Press.
- Meseguer-Sánchez, V., Gálvez-Sánchez, F. J., López-Martínez, G., and Molina-Moreno, V. (2021a). Corporate Social Responsibility and Sustainability. A Bibliometric Analysis of Their Interrelations. *Sustainability* 13 (4), 1636. doi:10.3390/su13041636
- Meseguer-Sánchez, V., Gálvez-Sánchez, F. J., Molina-Moreno, V., and Wandosell-Fernández-de-Bobadilla, G. (2021b). The Main Research Characteristics of the Development of the Concept of the Circular Economy Concept: A Global Analysis and the Future Agenda. *Front. Environ. Sci.* 9, 704387. doi:10.3389/fenvs.2021.704387
- Mingers, J., and Lipitakis, E. A. E. C. G. (2010). Counting the Citations: a Comparison of Web of Science and Google Scholar in the Field of Business and Management. *Scientometrics* 85 (2), 613–625. doi:10.1007/s11192-010-0270-0
- Mongeon, P., and Paul-Hus, A. (2016). The Journal Coverage of Web of Science and Scopus: a Comparative Analysis. *Scientometrics* 106 (1), 213–228. doi:10.1007/s11192-015-1765-5
- Mustafa, B., Hajdari, A., Pieroni, A., Pulaj, B., Koro, X., and Quave, C. L. (2015). A Cross-Cultural Comparison of Folk Plant Uses Among Albanians, Bosniaks, Gorani and Turks Living in South Kosovo. *J. Ethnobiol. Ethnomedicine* 11 (1), 1–26. doi:10.1186/s13002-015-0023-5
- Nascimento, F. D. A., and Rodrigues, F. M. (2015). Growth Trend of Scientific Literature on Genetic Improvement through the Database Scopus. *Scientometrics* 105 (2), 805–816. doi:10.1007/s11192-015-1733-0
- Nguyen, T. L., Nguyen, T. B. H., Nguyen, T. H., and Le, V. L. H. (2021). Environmental Protection Policies at Craft Villages in Hanoi in the Context of Sustainable Development. *E3S Web Conf.* 258, 05014. doi:10.1051/e3sconf/202125805014
- Nugraha, A. (2012). *Transforming Tradition: A Method for Maintaining Tradition in a Craft and Design Context*. Espoo: Aalto University.
- Olya, H. G. T., Alipour, H., and Gavilyan, Y. (2018). Different Voices from Community Groups to Support Sustainable Tourism Development at Iranian World Heritage Sites: Evidence from Bisotun. *J. Sustain. Tour.* 26 (10), 1728–1748. doi:10.1080/09669582.2018.1511718
- Oyekunle, O. A., and Sirayi, M. (2018). The Role of Design in Sustainable Development of Handicraft Industries. *Afr. J. Sci. Technol. Innovation Dev.* 10 (4), 381–388. doi:10.1080/20421338.2018.1461968
- Pallarès-Blanch, M., Tulla, A. F., and Vera, A. (2015). Environmental Capital and Women's Entrepreneurship: A Sustainable Local Development Approach. *Carpathian J. Earth Environ. Sci.* 10 (3), 133–146.
- Pansera, M., and Sarkar, S. (2016). Crafting Sustainable Development Solutions: Frugal Innovations of Grassroots Entrepreneurs. *Sustainability* 8 (1), 51. doi:10.3390/su8010051
- Pao, H.-T., Chen, H., and Li, Y.-Y. (2015). Competitive Dynamics of Energy, Environment, and Economy in the U.S. *Energy* 89, 449–460. doi:10.1016/j.energy.2015.05.113
- Park, J. Y., and Nagy, Z. (2018). Comprehensive Analysis of the Relationship between Thermal Comfort and Building Control Research - A Data-Driven Literature Review. *Renew. Sustain. Energy Rev.* 82, 2664–2679. doi:10.1016/j.rser.2017.09.102
- Paul, J., Lim, W. M., O'Cass, A., Hao, A. W., and Bresciani, S. (2021). Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR). *Int. J. Consumer Stud.* 45, 12695. doi:10.1111/ijcs.12695
- Pauli, G. A. (2010). *The Blue Economy: 10 years, 100 Innovations, 100 Million Jobs*. New Mexico: Paradigm Publications.

- Pieroni, A. (2008). Local Plant Resources in the Ethnobotany of Theth, a Village in the Northern Albanian Alps. *Genet. Resour. Crop Evol.* 55 (8), 1197–1214. doi:10.1007/s10722-008-9320-3
- Rey-Martí, A., Ribeiro-Soriano, D., and Palacios-Marqués, D. (2016). A Bibliometric Analysis of Social Entrepreneurship. *J. Bus. Res.* 69 (5), 1651–1655. doi:10.1016/j.jbusres.2015.10.033
- Ross, L. G., Martínez Palacios, C. A., and Morales, E. J. (2008). Developing Native Fish Species for Aquaculture: The Interacting Demands of Biodiversity, Sustainable Aquaculture and Livelihoods. *Aquac. Res.* 39 (7), 675–683. doi:10.1111/j.1365-2109.2008.01920.x
- Rugani, B., Pulselli, R. M., Niccolucci, V., and Bastianoni, S. (2011). Environmental Performance of a XIV Century Water Management System: An Emergency Evaluation of Cultural Heritage. *Resour. Conserv. Recycl.* 56 (1), 117–125. doi:10.1016/j.resconrec.2011.08.009
- Santagata, W. (2002). Cultural Districts, Property Rights and Sustainable Economic Growth. *Int. J. Urban Regional Res.* 26 (1), 9–23. doi:10.1111/1468-2427.00360
- Schmidt, I. B., Figueiredo, I. B., and Scariot, A. (2007). Ethnobotany and Effects of Harvesting on the Population Ecology of *Syngonanthus Nitens* (Bong.) Ruhland (Eriocaulaceae), a NTFP from Jalapão Region, Central Brazil. *Econ. Bot.* 61 (1), 73–85. doi:10.1663/0013-0001(2007)61[73:aeo]2.0.co;2
- Schösler, H., and de Boer, J. (2018). Towards More Sustainable Diets: Insights from the Food Philosophies of "gourmets" and Their Relevance for Policy Strategies. *Appetite* 127, 59–68. doi:10.1016/j.appet.2018.04.022
- Sedighi, M. (2016). Application of Word Co-occurrence Analysis Method in Mapping of the Scientific Fields (Case Study: The Field of Informetrics). *Libr. Rev.* 65 (13), 52–64. doi:10.1108/LR-07-2015-0075
- Simard, N. S., Miltitz, T. A., Kinch, J., and Southgate, P. C. (2019). Artisanal, Shell-Based Handicraft in Papua New Guinea: Challenges and Opportunities for Livelihoods Development. *Ambio* 48 (4), 374–384. doi:10.1007/s13280-018-1078-z
- Sperandio, G., Amoriello, T., Carbone, K., Fedrizzi, M., Monteleone, A., Tarangioli, S., et al. (2017). Increasing the Value of Spent Grain from Craft Microbreweries for Energy Purposes. *Chem. Eng. Trans.* 58, 487–492. doi:10.3303/CET1758082
- Stahel, W. R. (1986). R&D in a Sustainable Society. *Sci. Public Policy* 13 (4), 196–203. doi:10.1093/spp/13.4.196
- Stahel, W. R., and Reday, G. (1976). *The Potential for Substituting Manpower for Energy*. Brussels: Report to the Commission of the European Communities.
- Stahel, W. R. (1982). "The Product Life Factor," in *An Inquiry into the Nature of Sustainable Societies: The Role of the Private Sector* (Texas: Houston Area Research Center), 72–105.
- Stahel, W. (2010). *The Performance Economy*. Berlin: Springer.
- Studds, P., and Miller, Z. M. (2010). Sustainable Material Reuse Solutions for Dredged Sediments. *Int. J. Sustain. Eng.* 3 (1), 33–39. doi:10.1080/19397030903380960
- Thackara, J. (2014). "A Whole New Cloth: Politics and the Fashion System," in *Handbook of Sustainability and Fashion*. Editors K. Fletcher, and M. Tham (London and New York: Routledge Taylor & Francis Group).
- UNESCO (2003). *Text of the Convention for the Safeguarding of the Intangible Cultural Heritage*. Available at: <https://ich.unesco.org/en/convention> (accessed July 20, 2021).
- United Nations (2015). *Sustainable Development Goals*. New York: United Nations.
- United Nations (2000). *The Millennium Development Goals Report*. New York: United Nations.
- United Nations (UN) (1992). "Agenda 21," in *A Sustainable Development Agenda for the 21st Century* (Rio de Janeiro, Brazil: United Nations Conference on Environment and Development).
- Väänänen, N., and Pöllänen, S. (2020). Conceptualizing Sustainable Craft: Concept Analysis of Literature. *Des. J.* 23 (2), 263–285. doi:10.1080/14606925.2020.1718276
- Väänänen, N., Pöllänen, S., Kaipainen, M., and Vartiainen, L. (2017). Sustainable Craft in Practice: From Practice to Theory. *Craft Res.* 8 (2), 257–284. doi:10.1386/crre.8.2.257_1
- Van Eck, N. J., and Waltman, L. (2010). Software Survey: VOSviewer, a Computer Program for Bibliometric Mapping. *Scientometrics* 84 (2), 523–538. doi:10.1007/s11192-009-0146-3
- Weinberg, B. H. (1974). Bibliographic Coupling: A Review. *Inf. Storage Retr.* 10 (5–6), 189–196. doi:10.1016/0020-0271(74)90058-8
- Wiek, A., and Iwaniec, D. (2014). Quality Criteria for Visions and Visioning in Sustainability Science. *Sustain. Sci.* 9 (4), 497–512. doi:10.1007/s11625-013-0208-6
- Wood, S. (2011). "Sustaining Crafts and Livelihoods: Handmade in India," in *Sustainability in Craft and Design*, 89–100.
- World Commission on Environment and Development (WCED) (1987). *Our Common Future*. New York: Oxford University Press.
- Yair, K. (2010). *Craft & Environmental Sustainability*. London: Crafts Council.
- Yang, Y., Shafi, M., Song, X., and Yang, R. (2018). Preservation of Cultural Heritage Embodied in Traditional Crafts in the Developing Countries. A Case Study of Pakistani Handicraft Industry. *Sustainability* 10 (5), 1336. doi:10.3390/su10051336
- Zhan, X., and Walker, S. (2019). Craft as Leverage for Sustainable Design Transformation: A Theoretical Foundation. *Des. J.* 22 (4), 483–503. doi:10.1080/14606925.2019.1613040
- Zhang, L., and Eichmann-Kalwara, N. (2019). Mapping the Scholarly Literature Found in Scopus on "research Data Management": A Bibliometric and Data Visualization Approach. *J. Librariansh. Sch. Commun.* 7, 1. doi:10.7710/2162-3309.2266
- Zhang, X. H., Deng, S., Jiang, W., Zhang, Y., Peng, H., Li, L., et al. (2010). Emergency Evaluation of the Sustainability of Two Industrial Systems Based on Wastes Exchanges. *Resour. Conserv. Recycl.* 55 (2), 182–195. doi:10.1016/j.resconrec.2010.09.007

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.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2022 Prados-Peña, Gálvez-Sánchez, García-López and Molina-Moreno. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.