



# **Contribution of Indigenous Knowledge in Achievement of Sustainable Development Goals: A Literature Review**

**Bhavna Sharma<sup>a#</sup> and Reena Kumari<sup>a\*†</sup>**

<sup>a</sup> *Department of Commerce, Bhagat Phool Singh Women University Haryana, 131305, India.*

## **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/ARJASS/2021/v15i430272

### Editor(s):

(1) Dr. Ana Sofia Pedrosa Gomes dos Santos, Universidade de Lisboa, Portugal.

### Reviewers:

(1) Manuel Emilio Milla Pino, National University of Jaen, Peru.

(2) B K Sikka, G.B. Pant University of Agriculture & Technology, India.

(3) Neamt Radu Ionel, Romania.

Complete Peer review History, details of the editor(s), Reviewers and additional Reviewers are available here:

<https://www.sdiarticle5.com/review-history/78349>

**Received 05 October 2021**

**Accepted 10 December 2021**

**Published 16 December 2021**

**Review Article**

## **ABSTRACT**

Indigenous knowledge is the traditional knowledge that is unique to a society. Traditional knowledge is also called: 'local knowledge', 'folk knowledge', 'people's knowledge', 'traditional wisdom'. This knowledge is passed from generation to generation, usually by word of mouth and cultural customs. It has been the basis for agriculture, health care, food preparation, education, conservation and the other many activities that sustain societies in all over the world. Sustainable development means establishing a balance between socioeconomic development and environmental protection, with traditional knowledge local communities. In 2015, the United Nations agreed on 17 Sustainable Development Goals, a set of targets for improving lives while protecting natural resources by the year 2030 and they included indigenous peoples, and acknowledged that there can be no sustainable development without protecting the traditional knowledge. Indigenous knowledge plays an important role in achieving global sustainable development goals through various traditional practices. Therefore, in this study, contribution of various researchers is explored regarding role of indigenous knowledge in achieving sustainable development goals. On the basis of previous studies we found various areas in which indigenous

<sup>#</sup>Assistant Professor;

<sup>†</sup>Research Scholar;

\*Corresponding author: Email: reenasura7777@gmail.com;

knowledge is used. These areas include; agriculture, health, education, climate change, cultural identity, environmental justice, fisheries, forests and wildlife, natural resources. The use of indigenous knowledge in these sectors helps in achieving of sustainable development goals.

*Keywords: Indigenous knowledge; sustainable agriculture; environment; natural resources.*

## 1. INTRODUCTION

Indigenous knowledge means the traditions and practices of past generations or indigenous communities. Traditional knowledge has been passed from generations to from generations through social culture, formal practices, traditions, and other activities. Some forms of traditional knowledge are expressed in books, stories, folklore, rituals, songs, art, and even laws.

Indigenous knowledge is unique to a society, culture, and region. It is based on understanding, real life experiences and interpretation of indigenous peoples. This knowledge may include architecture, farming techniques, medicinal practices, health and nutrition, festivals.

The Brundtland Commission (1987) puts emphasis on the idea of passing on an environment with enough and good-quality resources for the future generation, just as we have given from our previous generations (Brundtland Report, 1987). Kim, Li & Son (2017) also examined the Role of Traditional Ecological Knowledge and Practices to Forest Management. Sabola, Henry, Kayambazinthu & Wilson (2007) studied the local ecological knowledge. Local farming system is sustainable and innovative. Techniques used for cultivation

are economically feasible and safe. The sustainable lifestyle, local diet, and dependence on rain- fed irrigation have influenced indigenous communities to cultivate and conserve traditional cultivars. By selecting and conserving the seeds from one season to the next helps in conserving the biodiversity. In ancient time the usage of plants, leaves, fruits, mineral, herbs and other resources plays an important role in health care system and sustainable life. Such practices are considered better than allopathic medicines available in the market because of many side effects after longer usage. The indigenous practices not only help in maintain health but also help in conserving biodiversity. Traditional communities were depends on plant and animal based medicine to meet their health care necessities. Plant medicine is an important part of the health care system and low prices, and affordable by local society.

### 1.1 Sustainable Development Goals

In September 2015, world leaders adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 SDGs to end poverty, fight inequality and injustice (Global Sustainable development Report, 2015). The 17 SDGs are as follows:

**Table 1. Sustainable development goals**

Goal 1	End poverty
Goal 2	End hunger, achieve food security
Goal 3	Provides better education
Goal 4	healthy lives
Goal 5	gender equality
Goal 6	Ensure sustainable management of water and sanitation
Goal 7	Ensure affordable, reliable, sustainable energy
Goal 8	decent work, economic growth, productive employment for all
Goal 9	infrastructure, promote inclusive and sustainable industrialization
Goal 10	Reduce inequality
Goal 11	Make sustainable cities and human safe
Goal 12	sustainable consumption and production
Goal 13	climate change
Goal 14	sustainably use the oceans, and marine resources
Goal 15	sustainable use of ecosystems, and land degradation
Goal 16	access to justice and build effective, accountable and inclusive institutions
Goal 17	Implementation of global partnership

Source: [www.un.org/sustainabledevelopment/sustainable-development-goals/](http://www.un.org/sustainabledevelopment/sustainable-development-goals/)

## 2. OBJECTIVES OF THIS STUDY

- To synthesize the existing literature on role of indigenous knowledge in sustainable development in different sectors.
- To identify contribution of indigenous knowledge in achieving SDGs.

## 3. DATA AND METHODOLOGY

The study adopted the systematic literature review methodology to review and analyze articles related to contribution of indigenous knowledge in sustainable development. This study used esteemed databases such as

Elsevier, Taylor & Francis, Sage, Wiley online library and other database (Google Scholar, research gate, JSTOR) for the literature search and the following keywords: Indigenous knowledge and sustainable agriculture, sustainable education, role of traditional knowledge in different sector. The study have systematically classified the 50 selected research studies on the basis of publication year, journal title, location of study, type of research and data, statistical techniques, etc. Thus, in this context, it will be expedient to understand the literature available on the contribution of indigenous knowledge in sustainable development goals.

## 4. LITERATURE REVIEW

**Table 2. Literature review**

Sr. no.	Title	Author(s) name/ Year	Country	Journal name	Type of study	Technique used	Findings
1.	Women's Use of Indigenous Knowledge for Environmental Security and Sustainable Development in Southwest Nigeria	Aluko [1]	Nigeria	The International Indigenous Policy Journal	Qualitative data, Interviews	Frequencies, Percentages, Content analysis	The findings revealed that, the traditional knowledge is very helpful in sustaining life and it used in different sectors like: agriculture, food processing and preservation, family health care, and child care.
2.	Indigenous knowledge as data for modern fishery management: a case study of Dungeness crab in Pacific Canada	Ban, Eckert, McGreer & Frid [2]	Canada	Ecosystem Health and Sustainability	Semi-Structured Interviews	Percentage	The study showed that, local depletions impacted the ability of indigenous fishers to access local foods. Traditional knowledge provides different valuable information about fishery management.
3.	Role of rural identity in traditional agricultural landscape maintenance: the story of a post-communist country	Bezák & Dobrovodská [3]	Slovakia	Agroecology and Sustainable Food Systems	Questionnaire survey, Semi-structured interviews, Workshops	Correlation, regression	The research showed that, rural identity communicated in the knowledge and perception of local land users is essential in local agriculture landscaped maintenance and sustainable rural development.
4.	Environmental Education in India: An Approach to Sustainable Development	Bhat, Zahid, Sheikh & Parrey [4]	India	FIIB Business Review	Literature Review	Content analysis	The study showed that, various steps has been taken for imparting environmental education to communities and educational institutions at globally and nationally by government and non-government organizations. Students have become very much adept to such information related to their surroundings.
5.	Knowledge management, the missing piece in the 2030 agenda and SDGs puzzle	Briceño & Santos [5]	Brazil	International Journal of Sustainability in Higher Education	Systematic scientific literature review	Content analysis	The study showed that, how and which frameworks may be applied to reach the 2030 agenda for sustainable development and sustainable development goals.
6.	Sustainable development And traditional Knowledge: a case study	Costa-Neto [6]	Brazil	Sustainable Development	Interviews	Comparative cognitive tables	The research showed that, local knowledge of Siribinha fishermen's is a valuable resource, which is considered to be sufficient in the

Sr. no.	Title	Author(s) name/ Year	Country	Journal name	Type of study	Technique used	Findings
	In a Brazilian artisanal fishermen's community						developmental processes and in studies of fish species management.
7.	Indigenous medicine and primary health care: The importance of lay knowledge and use of medicinal plants in rural South Africa	Dahlberg & Trygger, [7]	Africa	Human Ecology	In-depth interviews, participatory observation	Thematic analysis	The findings showed that, medical plants were mostly used by rural people. Household remedies were not only used to solve the problems of natural causes, but also for problems related to magical or spiritual linkages.
8.	The contribution of local knowledge in agriculture to sustainable development	Echoh, Masron & Gapor [8]	Malaysia.	International Journal of Business and Management Study – IJBMS	Interview, Focus group discussion and Participant observation	content analysis	The study concluded that, the "berdandang" systems of planting cultivation helps in reducing the maintenance cost because all farmers is doing the same task for their paddy. And they believed that it also reduce the risk of water and air pollution at the paddy field by using original and organic pesticides.
9.	Traditional and Local Knowledge in Chile: Review of Experiences and Insights for Management and Sustainability	Guerrero-Gatica et al. [9]	Chile	Sustainability	Literature Review	Content analysis	The findings revealed that, TLK improve new tools to conserve and manage biodiversity, basic and applied knowledge, by incorporating social and natural sciences, basic and applied knowledge, and by combining traditional and social evidence into the explanation of social-ecological practices.
10.	Harnessing indigenous knowledge for climate change-resilient water management – lessons from an ethnographic case study in Iran	Ghorbani et al. [10]	Iran	Climate and development	Qualitative Observation	Narrative analysis	The researchers studied that, historically-dependent community establish a social contract and cultural convention link for water distribution, profit-sharing and social responsibility; collectively they construct an equitable system of role-sharing, socio ecological resilience social benefit distribution, and adaptive capability in the face of climate change-induced drought.
11.	Indigenous Knowledge for Development: Opportunities and Challenges	Gorjestani [11]	Uganda	Working paper (world bank)	Working paper		The findings revealed that, indigenous knowledge is an important factor for sustainable development. Empowerment of Traditional communities is a necessity for the integration of traditional knowledge in the development procedure. The integration of suitable indigenous knowledge systems into development programs has already contributed to usefulness, efficiency, and sustainable development impact.
12.	Indigenous environmental values as human values	Gratani et al. [12]	Australia	Cogent Social Sciences	Interviews	Content analysis	The study conducted that, this project to understand the perspective of the participant community as first step towards achieving environmental management more respectful of the local Traditional Owners' perspective.
13	Indigenous concepts, values and knowledge for sustainable development: New Zealand case studies	Harmsworth [13]	New Zealand	7th Joint Conference: "Preservation of Ancient Cultures and the Globalization Scenario"	Case studies	Descriptive analysis	The study concluded that, traditional knowledge helps to find solutions of various complex problems, enhance sustainability of our environment, to provide a basis for strengthening cultural

Sr. no.	Title	Author(s) name/ Year	Country	Journal name	Type of study	Technique used	Findings
				(School of Maori and Pacific Development & International Centre for Cultural Studies (ICCS))			identity, and to develop economic opportunities. Indigenous knowledge provides the platform for cultural diversity and helps in maintaining sustainability.
14.	Indigenous Knowledge about Consumption of Edible Insects in South Africa	Hlongwane , Slotow & Munyai [14]	South Africa	Insects	Questionnaires	Chi square test	Findings revealed that, edible insects are a nutritious diet and play main role in people's livelihoods in rural areas.
15.	Ethnic food knowledge of highland pastoral communities in the Himalayas and prospects for its sustainability	Kala [15]	India	International Journal of Gastronomy and Food Science	literature review	Systematic literature review	The findings revealed that, traditional foods and beverages of pastoral communities being highly nutritious and healthy, it improve the health of society and sustainability of food systems.
16.	Indigenous and local knowledge promoting sdgs in indonesia: the case of the sumbanese cultural festival	Koike [16]	Indonesia	Journal of Environmental Science and Sustainable Development	case study	Thematic analysis	Results indicated that, ILK plays an important role in collaboration between local leaders and NGO activists are applicable to achieve Sustainable development goals. ILK not only be utilized to accomplish their own goals but also helpful in achieving various sustainable development goals.
17.	Traditional agricultural practices in India: an approach for environmental sustainability and food security	Patel, Sharma & Singh [17]	India	Energy Ecology and Environment	Systematic literature review	Content analysis	The findings revealed that, double cropping, agroforestry, crop rotation, use of traditional varieties and resources and traditional agricultural practices in India which have to be important in view of the environment and food security. Such practices have played important role in achieving the sustainability of agriculture by improving nutrition quality.
18.	Indigenous and local knowledge in sustainability transformations research: a literature review	Lam et al. [18]	Sweden	Ecology and society	Systematic literature review	content analysis	Results indicated that, ILK plays an important role in making environment sustainable and contribute to a more plural understanding of transformations and the assessment of transformative change.
19.	Indigenous Peoples, Resource Extraction and Sustainable Development: An Ethical Approach	Lertzman & Vredenburg, [19]	Australia	Journal of Business Ethics	case study, conceptual framework	content analysis	The research showed that, the technical knowledge provides the basis for advancing ethical methods to sustainable development with Indigenous peoples. This ethical methodology is suitable to companies working in natural resource activities where the traditional peoples are involved.
20.	Indigenous knowledge and implications for the sustainable development agenda	Magni [20]	Switzerland	Wiley online library	Literature review	Content analysis	The paper found that, greater number of challenges addressed in community with adoption of the new SDG agenda, many goals directly affect the indigenous peoples' lives because of strong relationship between their traditional knowledge and Nature, community, has proven to be efficient to meet some of these challenges.

Sr. no.	Title	Author(s) name/ Year	Country	Journal name	Type of study	Technique used	Findings
21.	The Use of Indigenous Knowledge in Agriculture Allied Sectors in Coastal Region of West Bengal, India	Majumdar et al. [21]	India	International Research Journal of Applied Sciences	Focused group discussion	Content analysis	The study concluded, the people of this region continue subsistence farming in their agriculture fields through their traditional knowledge and climate forecast and it is helpful in improvement of structure, soil fertility, crops, collection of seeds and storage for future purpose. Indigenous Knowledge of rainfall calculation is helpful for the showing season and these knowledge practices also helpful in the achievement of the food security, which is vital of nutritionally safe food supply at family levels.
22.	Viewpoint: Indigenous knowledge systems and environmental social work education: Towards environmental sustainability	Masoga & Shokane [22]	South Africa	Southern African Journal of Environmental Education	Focus group discussion	Qualitative content analysis	The study concluded that, integration of Traditional knowledge system in environmental education and in social work can contribute to sustain environment.
23.	Indigenous environmental justice and sustainability	McGregor, Whitaker & Sriharan [23]	Canada	Current opinion in Environmental Sustainability	Systematic literature review	Content analysis	Findings revealed that, to achieve environmental justice and sustainable future, the voices of Indigenous peoples must be needed at every level. Traditional peoples have recognized indigenous knowledge and legal systems as central to supportive and enabling adaptive capability and sustainability in the face of the climate disaster.
24.	No one will be left behind?" Taino indigenous communities in the Caribbean and the road to SDGs 2030	Smith & Spencer [24]	New Zealand	Worldwide Hospitality and Tourism Themes	qualitative case study approach coupled with a literature review	Content analysis	The findings showed that, the members of the indigenous communities' views and indigenous tourism as a solution to sustain their tradition and provide income for their people; they provide strong suggestions on how this may be attained in keeping with the 2030 sustainable development goals.
25.	Applying indigenous knowledge in agricultural extension: The case of agritex workers in zimbabwe	Mugwisi [25]	Zimbabwe	Advances in Knowledge Acquisition, Transfer, and Management	Questionnaire	Frequency, percentage	The results showed that, the majority of the extension workers used traditional methods for agricultural sustainability.
26.	The Role of Indigenous and Traditional Knowledge in Ecosystem-Based Adaptation: A Review of the Literature and Case Studies from the Pacific Islands	Nalau et al. [26]	Pacific Islands	Weather, climate and society	Literature review	content analysis	The study revealed that, the literatures of experts provides strong support to the concepts as "community participation" and use of Traditional knowledge in climate adaptation activities to increase efficiency and the feeling of ownership of climate adaptation consequences.
27.	The influence of socioeconomic factors on traditional knowledge: a	Paniagua-Zambrana, et al. [27]	America	Ecology and Society	Semi structured interview	Descriptive analysis (MANOVA), Correlation	The researchers studied that, there are no local patterns in the analytical power of socioeconomic factors and that their influence on palm-use

Sr. no.	Title	Author(s) name/ Year	Country	Journal name	Type of study	Technique used	Findings
	cross scale comparison of palm use in northwestern South America						knowledge is highly localized.
28.	The Role of Indigenous Knowledge in Fisheries Research in Ogbia Creek, Niger Delta	Ngodigha, Abowei & Ogamba [28]	Niger Delta	Novelty journal	Interviews	Frequency, Percentage	The paper concluded that, Local Ecological Knowledge could complement scientific studies as it seems to address all the different measurements (ecology, fish reproduction, trophic relationships) of the ecosystem as a source of new scientific investigation.
29.	Knowledge for sustainable development: a worldviews perspective	Opstal & Huges [29]	Netherlands	Environment Development and Sustainability	Critical Literature Review	Content analysis	The researchers identified that, re-interpretation of sustainable development as a worldview constructs in progress, identifying shared goals, interpretative flexibility, co-production of knowledge, subjectivity awareness, self-reflexivity, respect for a diversity of knowledge, a systems approach, trans disciplinarily and recognition of contextually are required for SD paradigm.
30.	Documentation and Application of Indigenous Traditional Knowledge (ITK) for Sustainable Agricultural Development	Pandey, Mittal & Sharma [30]	India	Asian Journal of Agricultural Extension, Economics & Sociology	Interview Notes, Photos, Audio-recordings, Video-recordings	Mean	It concluded that, traditional knowledge is vital for the well-being and for sustainable development as it has evolved after thousands of years of observation and experience. By linking the traditional knowledge systems with farmer, research and extension then the output of researches can be made more fertile and functional.
31.	Traditional knowledge for sustainable forest management and provision of ecosystem services	Parrotta, Yeo-Chang & Camacho [31]	UK	International Journal of Biodiversity Science, Ecosystem Services & Management	Review paper	Content analysis	The research showed that, traditional knowledge for the management of ecosystem and the challenges that indigenous communities face in conserving, fully utilizing, and passing on their knowledge and wisdom to younger generations. Forestry professionals, government decision-makers and policy makers have play vital roles to reverse the loss of traditional knowledge and improve the biodiversity conservation and ecosystem service benefits that traditional knowledge-based forest management systems have usually provided.
32.	Indian traditional knowledge for the treatment of kidney stone: a review	Patale, Awaley & Nakade [32]	India	International journal of researches in biosciences, agriculture and technology	Literature Review	Content analysis	The research indicated that, total 58 plant species used by various communities and from different localities of India to remove kidney stone.
33.	Rural Women's Awareness on Indigenous Technical Knowledge: Case of Northern Bangladesh	Pervez, Gao & Uddin [33]	Bangladesh	Anthropologist	Interviews, Field notes, Observations and Focus Group Discussions (FGDs)	mean, mode, SD, Linear regression model,	Findings of the study revealed that, most of the rural women were aware about traditional knowledge. They have significant awareness in all subsectors of agriculture and their awareness serves the purpose of sustainable agriculture.

Sr. no.	Title	Author(s) name/ Year	Country	Journal name	Type of study	Technique used	Findings
34.	Promoting tribal communities and indigenous knowledge as potential solutions for the sustainable development of India	Priyadarshini & Abhilash [34]	India	Environmental development	Secondary data	pilot study	The study revealed that, with the help of Indigenous knowledge improvement in the income, women and child health and education of these communities can be possible through traditional knowledge and its directly have a positive effect on the SDG 1, 2, 3, and 4.
35.	The use of indigenous knowledge in primary health care: A case study of Makanye community in Limpopo Province, South Africa	Rankoana et al., [35]	Limpopo Province	African Journal for Physical, Health Education, Recreation and Dance	Focus group discussions	content analysis	The results indicated that, disease etiology, medical ethno- botanical, health implications of food and knowledge as the traditional knowledge systems used to maintain good health.
36.	Indigenous knowledge: searching for a model of sustainable development for humankind	Rudnev [36]	Russia	Global Bioethics	Literature Review	Content analysis	The findings revealed that, indigenous knowledge plays important role in different areas like: Life-support activities, nature – society relationships, bridge the gap between past and future, Jurisdiction and law, better understanding of the cultures, forecasting and directing the future.
37.	Synergy between traditional knowledge of use and tree population structure for sustainability of Cola nitida (Vent.) Schott. & Endl in Benin (West Africa)	Savi et al. [37]	West Africa	Environment Development and Sustainability	Semi-structured interviews	Analysis of covariance ANCOVA	The findings revealed that, local species, local plants and establishment of Cola garden is necessary for sustainability. Genetic studies to guide sampling of trees for the establishment of garden are also suggested.
38.	Role of SDGs in Reconceptualising the Education for Sustainable Development Curriculum in Higher Education in South Africa	Shava, Makokotlela & Hebe [38]	South Africa	Scaling up SDGs implementation	Literature review	Content analysis	The reviews founded that, there was no coverage of SDGs in the module and that there was a limited effort towards Africanisation and contextualization of the content.
39.	Traditional knowledge and bio cultural diversity: learning from tribal communities for sustainable development in northeast India	Singh, Pretty & Pilgrim [39]	northeast India	Journal of Environmental Planning and Management	Participatory techniques, Interview, Questionnaire	Descriptive analysis	The results indicated that, the participation of knowledge holders in various village level activities can improve the promotion of traditional practices, learning of knowledge and conservation of related resources. Knowledge holders of different age groups and social systems have many and different important traditional practices that provide solutions to current challenges and problems.
40.	Advancing sustainability science for the SDGs	Smith et al. [40]	Canada	Sustainability Science	Literature Review	Content analysis	The study showed that, local knowledge encouraging many local action-learning experiments that link with many SDGs, and which are actively networked and followed to achieving global goals.
41.	Knowledge translation and indigenous knowledge	Smylie et al. [41]	Canada	International Journal of Circumpolar Health	Literature review based	Thematic analysis	The findings revealed that traditional knowledge translation methods for health sciences research is essential for sustainable developed.



Sr. no.	Title	Author(s) name/ Year	Country	Journal name	Type of study	Technique used	Findings
42.	Mentoring Program to Achieve SDGs in Local Contexts: A Case Study in Communities from Southern Mexico	Franquesa-Soler & Sandoval-Rivera [42]	Mexico	Sustainability	case study	Thematic analysis	The study concluded that, the sustainable development goals acted as a referential guide to assure aligned objectives, but the program also incorporated shared intergenerational concerns.
43.	Creating a space for place and multidimensional well-being: lessons learned from localizing the SDGs	Sterling et al. [43]	Pacific Islands	Sustainability Science	Secondary data	Descriptive statistics	The study indicated that, traditional knowledge helps in achieving SDGs through various local norms and values available in the society.
44.	Efforts of Indigenous Knowledge in Forest and Wildlife Conservation: A Case Study on Bulang people in Mangba village in Yunnan Province, China	Su, Ren, Qin, Hou & Wen [44]	China	Forests	interviews, group Discussions, participant observation, and secondary data	Descriptive analysis	The findings revealed that, the local people effectively and efficiently use the resources through moral constraints, public belief constraints, and worship customs. Indigenous knowledge has also played an important role in protecting forests, wild animals, and plants.
45.	A review of Indigenous knowledge and participation in environmental monitoring	Thompson, Lantz & Ban [45]	Australia	Ecology and Society	Literature review	Content analysis	The study demonstrated that, indigenous peoples and their knowledge have been engaged in environmental observing through a multiplicity of participatory measures.
46.	Indigenous Knowledge and Farmer Perceptions of Climate and Ecological Changes in the Bamenda Highlands of Cameroon: Insights from the Bui Plateau	Tume, Kimengsi & Fogwe [46]	Cameroon	Climate	Focus group discussions, Interview, Questionnaire	Frequency, Percentage	The results indicated that, indigenous farmers have the ability to exactly observe and anticipate local conditions in many ways to serve their local realities more aptly than outer forecasts. Such indigenous knowledge plays an important role in understanding local climate information that replicates biological variability.
47.	Introduction: toward more inclusive definitions of sustainability	Virtanen, Siragusa, & Guttorm [47]	Finland	Current opinion in Environmental Sustainability	Systematic literature review	Content analysis	The findings revealed that, various dimensions of Traditional ideas of sustainability show how context-based relational thinking bridges community-based governance, humans and nonhumans, language education, , and quality of life and health.
48.	Acknowledging Indigenous and Local Knowledge to Facilitate Collaboration in Landscape Approaches—Lessons from a Systematic Review	Williams, Sikutshwa & Shackleton [48]	South Africa	Land	Systematic Literature Review	qualitative (content) and quantitative (descriptive)	The researcher studied that, multiple landscape values and their interaction with structures and policies dealing with landscape management and governance are important for broader adoption of landscape methods that include ILK as a key part.
49.	Application of Traditional Knowledge of Hani People in Biodiversity Conservation	Yang , Wang, Wang & Guo [49]	China	Sustainability	interviews with villagers, focus group discussion, and field investigation	Descriptive analysis	The findings showed that, 80% of the world's protected areas are settled by indigenous people. Approximately 11% of the worlds and 22% of developing countries' forests are managed by local societies or minorities.

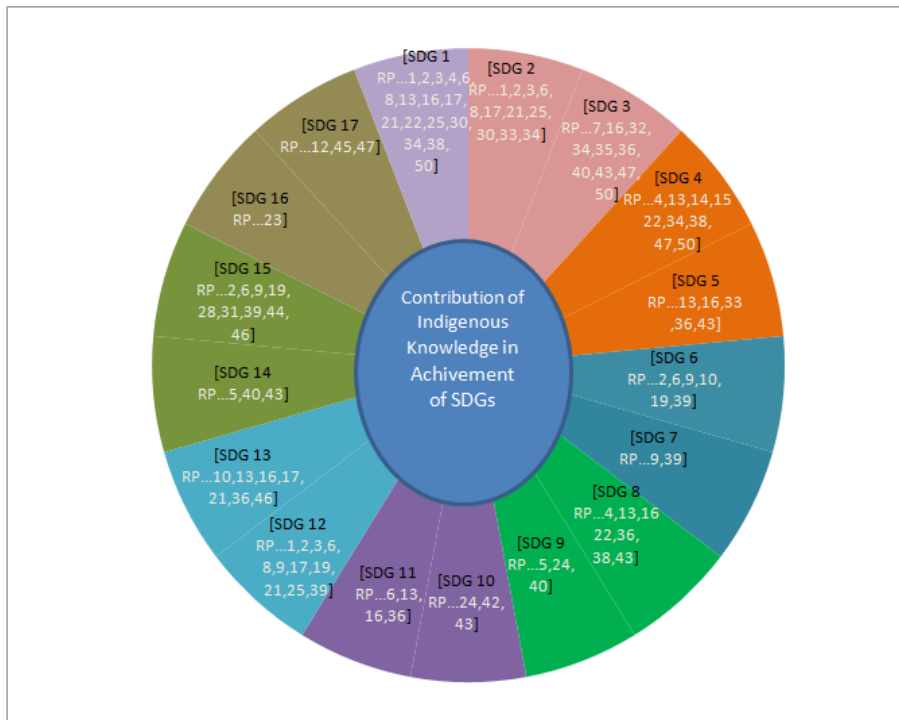
Sr. no.	Title	Author(s) name/ Year	Country	Journal name	Type of study	Technique used	Findings
50.	An Application of Sustainable Development in Indigenous People's Revival: The History of an Indigenous Tribe's Struggle in Taiwan	Yu [50]	Taiwan	Sustainability	Case study, interview	Thematic analysis	The researchers studied that, Smangus people encompassing everything from flora and fauna for food, landscape, medical purposes to weather, landscape, and natural resources in an environment friendly manner and an approach to sustain their local knowledge.

Source: Compiled by researchers

### 5. IDENTIFICATION OF DIFFERENT SECTORS OF INDIGENOUS KNOWLEDGE AND CONTRIBUTION OF THESE SECTORS IN ACHIEVEMENT OF SDGs

Indigenous communities have much contribute to almost all the issues which are the cause of unsustainable use of natural resources. Traditional knowledge can contribute to these worldwide issues through various local practices such as sustainable use of plants and animals, and issues such as climate change, desertification and water quality. Indigenous knowledge is the basis for survival strategies and better decision-making. Various areas are identified by researchers in previous studies

conducted in various countries using different techniques such as descriptive statistics, frequency, percentage, factor analysis, content analysis. On the basis of previous studies, various areas are found in which indigenous knowledge is used. These areas include; agriculture, health, education, climate change, cultural identity, environmental justice, fisheries, forests and wildlife, natural resources. The use of indigenous knowledge in these sectors helps in achieving of sustainable development goals. These awareness systems include all areas of life because they are developed by the people from their real and traditional knowledge. Contribution of indigenous knowledge in SDGs represent in this figure below.



**Fig. 1. Contribution of indigenous knowledge in achievement of SDGs**

Note. SDGs -Sustainable development goals, RP- Research papers related to indigenous knowledge explained in Table no. 2

This pie diagram depicts the relationship of indigenous knowledge and sustainable development goals. It is based on the contribution explained by various past researchers in their research articles.

## 6. CONCLUSION

This systematic literature review investigated the current role of Indigenous local knowledge in sustainability and role of indigenous knowledge in achieving sustainable development goals. Today greatest challenges which the society is facing are the issues of socio-economic growth, poverty reduction, the protection of the earth's resources and human welfare and development, common and life support system. Indigenous knowledge systems contribute directly to biological and cultural diversity, conflict resolution, poverty eradication, food security and ecosystem health. Their awareness related to traditional food sources and the fundamental connection between food systems and healthy landscapes can help to promote diets that are sustainable. Local Knowledge contributes towards sustainable development in various sectors like agriculture, health, education, environment through traditional practices. From the viewpoint of anthropology, in order to achieve the SDGs, traditional knowledge is necessary to solve many issues related to sustainable natural resource management and biodiversity conservation. So, it is necessary to respect our traditional knowledge and use local knowledge and practices to make our environment more sustainable. Thus framing policies for sustainable development will require cooperation between scientists and traditional knowledge holders which include local peoples. The government and our society can take the initiatives to support indigenous peoples like, finding new markets for local products, land management plans that are climate-resistant and developing forest, protection of indigenous intellectual property and cultural identities.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Aluko YA. Women's use of indigenous knowledge for environmental security and sustainable development in Southwest Nigeria. *International Indigenous Policy Journal*. 2018;9(3).
2. Ban NC, Eckert L, McGreer M, Frid A. Indigenous knowledge as data for modern fishery management: a case study of Dungeness crab in Pacific Canada. *Ecosystem Health and Sustainability*. 2017;3(8):1379887.
3. Bezák P, Dobrovodská M. Role of rural identity in traditional agricultural landscape maintenance: the story of a post-communist country. *Agroecology and Sustainable Food Systems*. 2019;43(1):3-20.
4. Bhat SA, Zahid AT, Sheikh BA, Parrey SH. Environmental education in India: An approach to sustainable development. *FIIB Business Review*. 2017;6(1):14-21.
5. Briceño CEB, Santos FCA. Knowledge management, the missing piece in the 2030 agenda and SDGs puzzle. *International Journal of Sustainability in Higher Education*;2019.
6. Costa-Neto EM. Sustainable development and traditional knowledge: a case study in a Brazilian artisanal fishermen's community. *Sustainable Development*. 2000;8(2):89-95.
7. Dahlberg AC, Trygger SB. Indigenous medicine and primary health care: The importance of lay knowledge and use of medicinal plants in rural South Africa. *Human Ecology*. 2009;37(1):79-94.
8. Echoh DU, Masron T, Gapor SA. The contribution of local knowledge in agriculture to sustainable development. *International Journal of Business and Management Study - IJBMS*, 2015;2(2):38-42.
9. Guerrero-Gatica M, Mujica MI, Barceló M, Vio-Garay MF, Gelcich S, Armesto JJ. Traditional and Local Knowledge in Chile: Review of Experiences and Insights for Management and Sustainability. *Sustainability*, 2020;12(5):1767.
10. Ghorbani M, Eskandari-Damaneh H, Cotton M, Ghoochani OM, Borji M. Harnessing indigenous knowledge for climate change-resilient water management—lessons from an ethnographic case study in Iran. *Climate and Development*. 2021;1-14.
11. Gorjestani N. Indigenous Knowledge for Development: Opportunities and Challenges;2001.
12. Gratani M, Sutton SG, Butler JR, Bohensky EL, Foale S. Indigenous environmental values as human values.

- Cogent Social Sciences. 2016; 2(1):1185811.
13. Harmsworth G. Indigenous concepts, values and knowledge for sustainable development: New Zealand case studies. In 7th Joint Conference on the Preservation of Ancient Cultures and the Globalization Scenario. India. 2002;22-24.
  14. Hlongwane ZT, Slotow R, Munyai TC. Indigenous Knowledge about Consumption of Edible Insects in South Africa. *Insects*. 2021;12:22.
  15. Kala CP. Ethnic food knowledge of highland pastoral communities in the Himalayas and prospects for its sustainability. *International Journal of Gastronomy and Food Science*. 2021;100309.
  16. Koike M. Indigenous and local knowledge promoting SDGs in Indonesia: The case of the sumbanese cultural festival. *Journal of Environmental Science and Sustainable Development*. 2019;2(2):8.
  17. Patel SK, Sharma A, Singh GS. Traditional agricultural practices in India: An approach for environmental sustainability and food security. *Energy, Ecology and Environment*, 2020;5(4):253-271.
  18. Lam DP, Hinz E, Lang D, Tengö M, Wehrden H, Martín-López B. Indigenous and local knowledge in sustainability transformations research: A literature review. *Ecology and Society*. 2020;25(1).
  19. Lertzman DA, Vredenburg H. Indigenous peoples, resource extraction and sustainable development: An ethical approach. *Journal of Business Ethics*. 2005;56(3):239-254.
  20. Magni G. Indigenous knowledge and implications for the sustainable development agenda. *European Journal of Education*. 2017;52(4):437-447.
  21. Majumdar P, Pegu C, Ghadei SS, Behera BK, Das BK. The Use of Indigenous Knowledge in Agriculture Allied Sectors in Coastal Region of West Bengal, India;2019.
  22. Masoga MA, Shokane AL. Indigenous knowledge systems and environmental social work education: Towards environmental sustainability. *Southern African Journal of Environmental Education*. 2019;35.
  23. McGregor D, Whitaker S, Sritharan M. Indigenous environmental justice and sustainability. *Current Opinion in Environmental Sustainability*. 2020;43:35-40.
  24. Smith J, Spencer AJ. No one will be left behind?" Taíno indigenous communities in the Caribbean and the road to SDGs 2030. *Worldwide Hospitality and Tourism Themes*;2020.
  25. Mugwisi T. Applying indigenous knowledge in agricultural extension: The case of Agritex workers in Zimbabwe. *Indilinga African Journal of Indigenous Knowledge Systems*, 2017;16(1):160-177.
  26. Nalau J, Becken S, Schliephack J, Parsons M, Brown C, Mackey B. The role of indigenous and traditional knowledge in ecosystem-based adaptation: A review of the literature and case studies from the Pacific Islands. *Weather, Climate, and Society*. 2018;10(4):851-865.
  27. Paniagua-Zambrana NY, Camara-Lerét R, Bussmann RW, Macía MJ. The influence of socioeconomic factors on traditional knowledge: A cross scale comparison of palm use in northwestern South America. *Ecology and Society*. 2014;19(4).
  28. Ngodigha SA, Abowei JFN, Ogamba EN. The Role of Indigenous Knowledge in Fisheries Research in Ogbia Creek, Niger Delta. *International Journal of Novel research in life sciences*. 2015;2(5).
  29. Opstal M, Hugé J. Knowledge for sustainable development: a worldviews perspective. *Environment, Development and sustainability*. 2013;15(3):687-709.
  30. Pandey V, Mittal R, Sharma P. Documentation and Application of Indigenous Traditional Knowledge (ITK) for Sustainable Agricultural Development. *Asian Journal of Agricultural Extension, Economics & Sociology*. 2017;1-9.
  31. Parrotta J, Yeo-Chang Y, Camacho LD. Traditional knowledge for sustainable forest management and provision of ecosystem services;2016.
  32. Patale CK, Awaley MG, Nakade JG. Indian traditional knowledge for the treatment of kidney stone: a review;2020.
  33. Kanak Pervez AKM, Gao Q, Uddin ME. Rural women's awareness on indigenous technical knowledge: Case of northern Bangladesh. *The Anthropologist*. 2015;21(3):415-426.
  34. Priyadarshini P, Abhilash PC. Promoting tribal communities and indigenous knowledge as potential solutions for the sustainable development of India.

- Environmental Development. 2019;32 :100459.
35. Rankoana SA, Nel K, Mothibi K, Mothiba TM, Mamogobo P, Setwaba M. The use of indigenous knowledge in primary health care: A case study of Makanye community in Limpopo Province, South Africa: indigenous knowledge system in health care. *African Journal for Physical Health Education, Recreation and Dance*. 2015;21(sup-1):272-278.
36. Rudnev V. Indigenous knowledge: searching for a model of sustainable development for humankind. *Global Bioethics*. 2015;26(2):46-51.
37. Savi MK, Noumonvi R, Chadaré FJ, Daïnou K, Salako VK, Idohou R, Kakai RG. Synergy between traditional knowledge of use and tree population structure for sustainability of *Cola nitida* (Vent.) Schott. & Endl in Benin (West Africa). *Environment, Development and Sustainability*. 2019;21(3):1357-1368.
38. Shava S, Makokotlela MV, Hebe H. Role of SDGs in Reconceptualising the Education for Sustainable Development Curriculum in Higher Education in South Africa. *Scaling up SDGs Implementation*. 2020;169-179.
39. Singh RK, Pretty J, Pilgrim S. Traditional knowledge and biocultural diversity: learning from tribal communities for sustainable development in northeast India. *Journal of Environmental Planning and Management*. 2010;53(4):511-533.
40. Smith MS, Cook C, Sokona Y, Elmqvist T, Fukushi K, Broadgate W, Jarzebski MP. Advancing sustainability science for the SDGs. *Sustainability Science*. 2018;13(6):1483-1487.
41. Smylie J, Martin CM, Kaplan-Myrth N, Steele L, Tait C, Hogg W. Knowledge translation and indigenous knowledge. *International Journal of Circumpolar Health*. 2004;63(sup2):139-143.
42. Franquesa-Soler M, Sandoval-Rivera JCA. Mentoring Program to achieve SDGs in local contexts: a case study in communities from southern Mexico. *Sustainability: The Journal of Record*. 2019;12(2):109-114.
43. Sterling EJ, Pascua P, Sigouin A, Gazit N, Mandle L, Betley E, McCarter J. Creating a space for place and multidimensional well-being: lessons learned from localizing the SDGs. *Sustainability Science*. 2020;15:1129-1147.
44. Su K, Ren J, Qin Y, Hou Y, Wen Y. Efforts of indigenous knowledge in forest and wildlife conservation: A case study on Bulang People in Mangba Village in Yunnan Province, China. *Forests*. 2020;11(11):1178.
45. Thompson KL, Lantz T, Ban N. A review of Indigenous knowledge and participation in environmental monitoring. *Ecology and Society*. 2020;25(2).
46. Tume SJP, Kimengsi JN, Fogwe ZN. Indigenous knowledge and farmer perceptions of climate and ecological changes in the bamenda highlands of Cameroon: insights from the Bui Plateau. *Climate*. 2019;7(12):138.
47. Virtanen PK, Siragusa L, Guttorm H. Introduction: Toward more inclusive definitions of sustainability. *Current Opinion in Environmental Sustainability*, 2020;43:77-82.
48. Adade Williams P, Sikutshwa L, Shackleton S. Acknowledging indigenous and local knowledge to facilitate collaboration in landscape approaches—Lessons from a systematic review. *Land*. 2020;9(9): 331.
49. Yang J, Wang YC, Wang D, Guo L. Application of traditional knowledge of hani people in biodiversity conservation. *Sustainability*. 2018;10(12):4555.
50. Yu CY. An application of sustainable development in indigenous people's revival: The history of an indigenous tribe's struggle in Taiwan. *Sustainability*. 2018; 10(9):3259.

© 2021 Sharma and Kumari; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle5.com/review-history/78349>