

# Integrating Indigenous Knowledge System in Education for Sustainable Development in India

Manisha Ddung

Research scholar, Central Institute of Education, University of Delhi, New Delhi, India  
Corresponding Author Email: [manishadung99\[at\]gmail.com](mailto:manishadung99[at]gmail.com)

**Abstract:** *Emerging global issues, including environmental challenges, global warming, and climate change, need immediate action. Thus, Indigenous knowledge system has a huge role in sustainable development. The present education system failed to address these global issues; thus, it needs to be transformed. Therefore, the objectives of the study are to explore integration of indigenous knowledge in formal education and its challenges by using secondary data such as books, journals, articles and policy documents. The study is qualitative in nature. And used thematic analysis. Study found indigenous knowledge developed by the indigenous community through long-term interaction with nature and transmitted orally through daily life activities, cultural practices, folklore, dance, and stories. Indigenous knowledge plays an important role in agriculture, biodiversity, forest management, and water conservation by using their traditional knowledge. All these leads to sustainable development. Study revealed that the integration of Indigenous knowledge in formal education leads to a contextual and diverse learning environment, promoting inclusive education. NEP 2020 suggests incorporating tribal and indigenous learning ways in various subjects such as agriculture, medicine, yoga, sports, and philosophy. However, studies highlight some challenges in integration, including the advancement of technology, globalisation, modernisation, lack of interest among the young generation, lack of documentation, teachers' training, and irrelevant curriculum development. Study concludes that with government support and community active participation in decision making, effective integration can be made.*

**Keywords:** Indigenous Knowledge System, Sustainable Development, Education for Sustainable Development, Integration, Challenges

## 1. Introduction

The natural resources on earth are limited, which we are consuming so far. We are just consuming as much as we want, but we do not return anything to nature. Human beings have the capability to transform their environment. If they use their power wisely, they can develop society positively (Report of the United Nations Conference on the Human Environment, 1973). The first world conference on environmental issues commenced in 1972 to preserve and improve the human environment. However, through the Brundtland report, sustainable development gained global attention. It is defined as fulfilling the present needs of people without compromising the ability to meet the needs of future generations (World Commission on Environment and Development, 1987). To achieve sustainable development, education is a very important aspect as it develops skills, knowledge, and values, and responsibility in learners towards nature, climate, and society for a better future, that support sustainable development (UNESCO, 2017). Thus, there is a need for such a type of education that promotes sustainable development. Education for sustainable development enables individuals to make thoughtful decisions and take positive steps that contribute to people's well-being and protect the earth (UNESCO, 2017). Hence, to make ESD effective, one needs to consider the indigenous knowledge system because it promotes sustainable use of resources. The indigenous community has long-standing awareness of biodiversity conservation and natural resource management, such as forests, water and land conservation. Indigenous knowledge is developed by the particular community through long-term interaction with the environment and transmitted orally from generation to generation (Warren, 1991). The knowledge encompasses knowledge of agriculture, medicine, environmental and resource management (Muhhamad et al, 2018) and is transmitted by indigenous people through cultural practices and daily life in the form of stories, folklore,

dance, rituals, language and agricultural practices (Grenier, 1998). The formal educational system often ignores the Indigenous Knowledge System (IKS). However, the growing ecological issues, climate change, and unsustainable development have intensified the need for a transformative approach to education (UNESCO, 2020). The present study aims to explore the need to integrate IKS into education for sustainable development in India.

### 1.1 Sustainable development

The issues related to the environment are worsening every year. The forests are burning in the name of development, and the climate has been changing rapidly. The Brundtland Report 1987 was concerned about increasing global environmental changes, such as forest degradation, desertification, the greenhouse effect, acid rain, and global warming. The report highlights that human ways of developing countries are making people poorer and more vulnerable, and harming the environment. The report makes the Commission think about survival challenges for the upcoming generations with limited resources amid rapid population growth. Hence, the Commission made a strategy to deal with the emerging environmental and ecological issues, which is sustainable development. The Commission defines sustainable development as fulfilling the present needs without harming the ability to fulfil the needs of future generations. Global Education Monitoring Report 2016 defines sustainable development as an organising principle for global development that supports the well-being of people and the planet. It is a continuous process that requires responsible use of resources such as water, forest, soil, minerals and energy. Appropriate investment direction involves allocating wealth and resources to promote long term development and Environmental Conservation. For instance, renewable energy, sustainable agriculture method and eco-friendly industries. Effective use of technology means growth in production

without harming the environment, including water conservation and pollution control machines, as well as clean-energy technology. Institutional reform includes strong environmental laws, a transparent government system and citizen participation in policymaking (WCED, 1987).

## 1.2 Education for sustainable development

Rapid change in climate and other ecological challenges are the result of human irresponsible behaviour towards the environment. To address these challenges, immediate action is needed that changes our thought process, lifestyle, education system, and development process to support sustainable development. Irina Bokova, who is the director general of UNESCO, said that the most important thing that needs to be changed is our thinking toward education, which contributes to global development due to its huge impact on individuals' well-being and our planet's future. Education has the responsibility to equip learners with the right values and skills to deal with future challenges that prevent sustainable development (UNESCO, 2017). However, the ongoing educational framework is insufficient to point out the environmental crisis and needs to be transformed (UNESCO, 2020). The education system should develop skills, knowledge, and values, and a sense of responsibility in learners towards the environment, climate, and society for sustainable development by implementing the objectives of sustainable goals in every sphere of education, including curriculum, policy, and pedagogy (UNESCO, 2017). ESD development is an Important part of the Agenda 2030, which is primarily related to SDG 4, which aims to promote quality education and inclusion, and the remaining goals (UNESCO, 2020). It emphasises protecting the environment, economic viability, and social justice by enabling individuals to make thoughtful decisions, take positive steps, and respect cultural diversity, which leads to a sustainable future. Thus, integrating IK into education can help to achieve the SDGs (UNESCO, 2020), as they protect the environment through sustainable life practices.

## 2. Literature Review

Indigenous knowledge (IK) is developed through long-term observation of the environment by the indigenous community, transmitted across generations (Gadgil et al., 1993). It is based on cultural traditions and environmental experiences (Sindhia, 2018), and transmitted orally through stories, proverbs, songs, rituals and participation (Malapane, Chanza, and Musakwa, 2024). Indigenous knowledge encompasses conflict and natural disaster management that contribute to ecological balance and community livelihood (Domfeh, 2007). Incorporating IK into education can promote sustainable development as it contributes to biodiversity conservation and resource management (Joshi, 2021). Sustainable development refers to using available resources in such a way that our future generation can also benefit from those resources. The Brundtland report, 1987, defines sustainable development as meeting present needs without compromising future generations' ability to meet their needs. To achieve sustainable development, we need to develop the values and skills in human beings; with this, education is the most effective way to cultivate these values among people. Education for sustainable development has an important role in fostering sustainability as it develops a sense of

responsibility towards the environment (UNESCO, 2017). The current educational framework is unable to address the environmental crisis, therefore needs to transform itself (UNESCO, 2020). As the indigenous community has deep environmental knowledge and they live a sustainable life, their knowledge is useful to achieve sustainable development in our country. UNESCO (2020), suggests that integrating indigenous knowledge in education can help to achieve the Sustainable Development Goals. However, challenges persist in its integration, such as a lack of documentation, modernisation, globalisation of western values, and less interest among the young generation toward traditional practices (Bhagat, n.d.; Domfeh, 2007; Sultana, Muhammad and Zakaria, 2018). Study highlights community participation and governmental support can help in effective integration of indigenous knowledge in education.

### Rational need of the study

The rapid growth of environmental challenges needs immediate action, such as the sustainable use of resources and their conservation. As the indigenous community possesses a wealth of traditional techniques that promote sustainable development, they need to be integrated into every sphere of education. Although traditional knowledge has been neglected by the formal education system, despite its valuable and rich knowledge of environmental conservation. Now it's time to integrate it with formal education to achieve the Sustainable Development Goals.

### Objectives of the study

- 1) To understand the concept of indigenous knowledge system.
- 2) To analyse the role of indigenous knowledge (IK) in sustainable development.
- 3) To explore the need for integrating indigenous knowledge in formal education.
- 4) To identify the challenges in integrating IK into formal education.

### Method

The study has adopted a qualitative approach, and thematic analysis of the collected data by using secondary sources such as books, journals, research articles and policy documents.

## 3. Indigenous Knowledge System

Indigenous people live in isolated places far from the main city or town and have a deep connection with nature. According to UNESCO, Indigenous people are a group that have historically ties to a specific region, often predating colonial or outside influences. They maintain distinct cultural practices, language, and social structures. Indigenous people are rich in their traditional knowledge, which is a combination of knowledge and belief built through the generational interaction of living beings with their environment. It is passed down across generations through cultural transmission (Gadgil et al., 1993). The terms indigenous knowledge, local knowledge and traditional knowledge are used synonymously by the researchers and others (Onyanacha, 2022). Warren 1991 described that the Indigenous knowledge system was developed by the Indigenous community through long term interaction with their environment. Grenier (1998) defines IKS as the traditional knowledge that emerges within a particular geographical area where Indigenous people live.

This knowledge system is a cumulative form of life experiences and natural resource management developed through the experience of various generations, observations, and trial and error. It is passed down to the future generation through cultural practices, daily life activities, stories, dance and folklore (Grenier, 1998). These communities have deep ecological awareness and experience with nature, as it is crucial for their survival (Grenier, 1998). Thus, they use environmental resources in a balanced and sustainable manner (WCED, 1987). In this way, indigenous knowledge has a significant role in achieving sustainable development in India (Bansal et al., 2023).

### 3.1 Role of indigenous knowledge in sustainable development in India

NEP 2020 emphasises special courses on ethno-medical practices, forest management, and traditional agriculture, such as crop cultivation and farming among the tribal community.

#### Biodiversity conservation

Indigenous knowledge not only conserves biodiversity but also enhances and restores it. Indigenous people plant various species together in different sizes for microhabitats such as medicinal plants, palms, vines, and fruit trees, and they turn degraded land into productive land. Indigenous people use controlled fire to clear land so new grass can grow. Thus, animals, birds and other species can be attracted towards these land areas, leading to enhanced biodiversity. They practice rotational agriculture, fishing, and hunting to maintain biodiversity. Indigenous people have detailed knowledge about which plant species grow in which area and when. The traditional practice of restoration or biodiversity includes a sacred grove. Some conservation practices help safeguard biological communities in ponds, rivers, meadows and forests. Some species, including plants and animals such as Ficus. Some animals or birds are hunted during the day due to their reproduction at night. The group harvesting plays an important role in biodiversity conservation (Gadgil et al., 1993). The Oraon tribe of India contribute to biodiversity by protecting medicinal plants and traditional herbs (Karunamay, Sethy & Sharma, 2024).

#### Traditional technique related to health

The Oraon tribe of India protect traditional herbs known as Chakod. It is found in Jharkhand. It is a cure for skin diseases such as ringworm, leprosy, and other skin infections (Karunamay, Sethy & Sharma, 2024).

#### Forest conservation

Adivasi people of India are close to nature. They use slogans such as Jal, Jungle Jameen and worship nature. Hence, they nurture and protect the forest. The religious practices of the sacred Grove, among the Adivasi community, foster forest conservation (Karunamay Sethy & Sharma, 2024). Khasi and Jaintia communities of Meghalaya also maintain a sacred grove known as Kyntang (Das, Medhi and Banerjee, 20225).

#### Water conservation

The traditional water-conserving techniques in India include the stepwell of Gujarat and Rajasthan, the Eri system of Tamil Nadu, and the stone-cut channel of Kerala (Rajesh K, 2026). The Oraon tribe of India uses rainwater and check dams in

harvesting that promote water conservation (Karunamay, Sethi and Sharma 2024). These are the sustainable techniques towards water conservation. Johads are traditional earthen check dams used in semi-arid India to conserve rainwater (Bhagat, n.d.). Angami Naga of Nagaland used a terraced system with stone retaining walls for water conservation (Das, Medhi and Banerjee, 20225).

#### Traditional agricultural technique

The Oraon tribes used traditional techniques in agriculture, such as mixed crop and huge rainwater and check dams for harvesting. They avoid chemical fertiliser in their farming and preserve seed for the long term (Karunamay, Sethi and Sharma, 2024). On the other hand, the Baiga tribe in Madhya Pradesh practices sustainable shifting cultivation called Bewar (Bhagat n. d.). Pukhuri in Assam and Community tanks system in Manipur have been used for harvesting (Das, Medhi and Banerjee, 20225).

### 3.2 Integrating Indigenous knowledge in education for sustainable development

The current environmental issues are the result of human conduct, unsustainable lifestyles, and resource use. People's demand is increasing alongside rapid growth in population. To fulfil people's demand, governments and industries are using all available resources irresponsibly, leading to a rapid climate change landscape and forest degradation, and other major problems. Thus, to resolve these issues, humans are now returning to traditional methods, which are concerned with sustainable life practices that have been practised by Indigenous and local communities so far. These communities have deep ecological awareness and experience with nature. Therefore, they use environmental resources in a balanced and sustainable manner (WCED, 1987), leading to sustainable development. The current education system has failed to integrate traditional knowledge into education, which can help to preserve different cultural heritage and promote sustainable development (Sharma, 2021). UNESCO (2020) also suggests that integrating indigenous and local knowledge is helpful in achieving the Sustainable Development Goals.

#### National Education Policy 2020 on Integration of Indigenous Knowledge

India is aware of emerging global challenges and suggests empowering learners by making them aware of these challenges and becoming active promoters of a sustainable society. NEP emphasises the integration of IK into formal education, such as maths, astronomy, philosophy, yoga, architecture, medicine, cultivation, engineering, language, literature, sports, games, and governance. It aims to promote culturally relevant and contextual learning and foster an inclusive environment that lead sustainable development.

#### Environmental Education

Environmental education includes all aspects of sustainable development, including climate change, pollution, waste management, sanitation, conservation and management of biodiversity, forest and wildlife (NEP, 2020). As the indigenous community possesses all this knowledge, through long-term observation of nature, their traditional techniques should be covered and included in education.

### Geography education

Incorporating indigenous knowledge into geography education enhances environmental awareness, equips learners with contextual knowledge of diverse geographical areas and develops cultural understanding among students (Mondal, 2024). This enables learners to make responsible decisions towards the environment.

### 3.3 Challenges in integrating IKS in education

Integrating indigenous knowledge into education faces various challenges. Despite its valuable and rich knowledge that leads to a sustainable life approach, the formal education system has ignored it. However, due to growing major environmental challenges, various organisations and policies are suggesting its inclusion in formal education. The challenges in integration have been discussed below-

**Preservation of indigenous knowledge:** Preserving IK is difficult due to a lack of documentation (Domfeh, 2017). Without documentation, it is difficult to apply this knowledge in formal education.

**Globalisation and Modernisation:** Globalisation of Western knowledge and modern lifestyle adaptation among the young generation, who lack interest in their traditional knowledge transmission, prevents its effective integration in formal education (Bhagat, n.d., Sultana, Muhammad and Zakaria, 2018, Malapane, Chanza, and Musakwa, 2024).

**Invasion of technology:** The spread of technology is one of the reasons behind the disappearance of indigenous knowledge, as it reduces dependence on traditional practices (Malapane, Chanza, and Musakwa, 2024). Hence, the community are gradually shifting from traditional methods to unsustainable methods that are technology.

**Institutional challenges:** integration of IK in education includes a lack of teacher training, curriculum development issues, and limited policy implementation (Mondal, 2024).

### 4. Findings

- Study found that indigenous knowledge is orally transmitted and developed within local or indigenous communities through long-term interaction with the physical environment.
- Study reveal that indigenous knowledge is emerging as a way to deal with environmental issues and promote sustainable development through biodiversity conservation and forest management.
- Study found indigenous communities use traditional methods for water conservation, such as step-wells, Eri system, stone-cut channel, rainwater, and check dams.
- Study indicate that integrating indigenous knowledge in formal education fosters a diverse and contextual learning that promotes quality and inclusive education.
- Study found that integration of IK in formal education promotes sustainable development by spreading awareness toward the environment and cultivating values among learners.
- Study identifies challenges in integrating indigenous knowledge in education, such as lack of preservation, globalisation, modernisation, advancement of technology,

lack of interest among the young generation, lack of teachers' training, and appropriate and relevant curriculum development.

- Study found that for effective integration, it needs government support, policy formation, and community active participation.

### 5. Conclusion

In the emerging global issues, Indigenous knowledge is an emerging strategy that leads to sustainable development worldwide. It has a wealth of environmental knowledge that is gained by long-term observation of nature. Thus, it plays a substantial role in achieving sustainable development goal. Indigenous people live a sustainable life by conducting eco-friendly behaviour, which includes biodiversity conservation, forest management, and traditional agriculture methods. Various countries are starting to adopt IK and integrating it into formal education. However, its integration faces various challenges, including a lack of documentation, technological advancement, modernisation, globalisation, and institutional challenges. It needs government initiatives, policy implications, and community active participation for effective integration.

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