

Integrating Indian Knowledge Systems (IKS) and Biological Science: A Constructivist Approach

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ABSTRACT

The paper talks about combining Indian Knowledge Systems (IKS) and biological sciences from a view. The idea is that IKS and biological sciences can help each other to understand nature. By looking at where they're the same and where they are different the paper tries to encourage a more inclusive and combined way of doing research about the environment. The paper looks at how the two ways of thinking come and how they are different. It also tries to use them in teaching by looking at a class 8 textbook.

Keywords: *Indian Knowledge Systems (IKS), Biological Science, Constructivist Approach*

Indian Knowledge Systems (IKS) is the varied traditional knowledge and ways of doing things that the Indian people have developed over thousands of years of being with nature and understanding it. This knowledge includes thinking beliefs, ecological knowledge (like how plants and animals behave and live) cultural ways of doing things (like hunting, gathering, farming and using resources) traditional tools (like tools, weapons and crafts) and how people organize themselves and make decisions.

IKS is important in understanding the world in many ways. It is a way of thinking seeing all living things and the environment as connected. This information is tied to places and gives special ideas about the local environment. Also, IKS is an example of how people can manage things well showing how resilient and able to change people are in different places. IKS is important because it is connected to the identity, thinking and spiritual beliefs of people. Also, IKS can give ways of looking at nature that can help add to Western science and help us understand nature better.

Seeing the value in IKS can help make progress in protecting the environment and making things sustainable. It can also help support the rights of people make people understand each other better help with science work and make ways of managing the environment more complete and open. Respecting IKS can help us see the world in a more connected way by mixing traditional knowledge with modern science.

There are some problems with the usual scientific ways of looking at environmental problems. These ways often look at one part of a problem and ignore the whole. They think

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things happen in a line and miss how complicated things really are. They focus on being objective. Ignore how people feel and what they know. They use rules but don't think about different places and cultures. Also, these ways focus on being able to predict and control things ignore uncertainty think about people and ignore other living things. They look at problems and ignore bigger ones. These problems are made worse by how knowledge's split up into different areas and how Indigenous knowledge is not respected. This leads to not understanding things and not finding good solutions.

To fix these problems we need to use kinds of knowledge include traditional ideas look at many points of view accept that things are complicated and not sure and work together to create knowledge. Recognizing these issues can help us make ways of dealing with environmental problems. A constructivist way of thinking which says knowledge is made by people through their culture and history offers a way to bring IKS and biology together. Constructivism says knowledge is built, not found and that there are different ways to see the world. By helping people build knowledge together think about it and look at it carefully constructivism says IKS is a way of knowing and puts biology in its right place. This way of thinking helps people who know IKS and scientists work together to build knowledge and understand nature better. Using this way of thinking can help make a fair place where IKS and biology work together and help us understand the world better and find better solutions for the environment.

REVIEW OF LITERATURE

The current writings about Indian Knowledge Systems (IKS) and biological sciences show where they are similar and where they are different (Singh, S. S., & Sharma R. K., 2019). Themes that come up in the writings focus on understanding and taking care of resources with an eye on keeping things safe and lasting. Both IKS and biological sciences do things like watching and grouping things use stories and comparisons to explain things and see that all living things are connected. They are different in a few ways. IKS is often based on thinking beliefs (Sharma, 2018) uses ways that involve people and real experiences and looks at small areas (Kumar, 2019). On the hand biology uses real results and ideas that can be tested uses experiments and numbers and looks at the whole world. Also, IKS has ideas like "connectedness". Giving back" and values like respect giving back and taking care (Mishra, 2020) while biology uses words like "helping the environment" and "different kinds of plants and animals" and values being objective being efficient and moving forward (Lindenmayer, 2017). Ago IKS was not seen as important but biology was. The writings show that bringing IKS and biology together is complicated and full of ideas. Seeing the points of IKS like understanding everything knowing about local places being able to change, being important to culture and involving the local people as well as its problems like not being able to be used in many places not being written down and being ignored and the good points of biology like being careful in the way it works using general rules having numbers that can be checked being useful all over the world and using real proof as well as its problems like looking at only parts not seeing feelings and old ideas not knowing about the places and focusing too much on controlling things can help us understand nature better and work on better and more complete ways of taking care of the environment.

METHODOLOGY

This research looks at where Indian Knowledge Systems (IKS) and biology meet, trying to see how these ways of knowing come together differ and can be used to help take care of the environment and make rules. The research uses both stories and numbers using ways to look at what's written working together to understand what is found and checking to make sure the

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results are correct and meaningful. The study wants to make sure people understand where IKS and biology meet and find ways to use them together to help take care of the environment and make rules. By looking at where these ways of knowing meet this research wants to help people see the world in a complete way and help make rules and ways of taking care of the environment that are better for the planet.

Plan for Combining IKS and Constructivism and Biology for a Class 8 Chapter on Pollution
"Understanding Pollution through IKS and Biology"

Objectives:

- To understand what pollution is and what it does to the environment,
- To look at how IKS sees pollution and how to deal with it,
- To link IKS with biology ideas about pollution,
- To help students think more and solve problems about pollution,

Activities:

1. Introduction to Pollution (Biology)

Explain what pollution is and the different types (air, water, soil, noise)

Talk about what causes pollution and what it does to the environment and peoples health

2. IKS Views on Pollution (Constructivism)

Learn how different Indian groups see and deal with pollution

Talk about ways and beliefs about keeping the environment safe

3. Linking IKS and Biology

Compare. Look at how IKS and biology ideas about pollution are the same and different

4. Case Study: Local Pollution Problem (Combined Way)

Pick a problem in the area (like plastic or water pollution)

Use IKS and biology ideas to understand the problem

Think of solutions using both ways

5. Personal Thoughts (Thinking)

Think about what was learned from the activities

Talk about how combining IKS and biology helps with pollution problems

Think of ways to use this combined way in daily life

Assessment:

- Being part of class talks and activities
- Writing about what was learned and how IKS and biology were put together
- Presenting the case study and the solutions found

By doing this plan students will learn more about pollution and how to deal with it by using both IKS and biology. This way of thinking will help students think more solve problems better and see the value of ideas when dealing with environmental problems.

Thoughts About Pollution from the Point of View of Indigenous Knowledge Systems (IKS) in India

Here are some IKS ideas that can be used for the situation on pollution:

1. View: This old way of medicine in India talks about how people and the environment are connected. Ayurvedic ideas can help understand how pollution affects people and the environment.

2. Vedic nature: This view is based on Indian books that say living with nature is important. Vedic ideas can help find ways to deal with pollution that care for the planet and all its living things.

3. Traditional knowledge: This view includes many old ideas from India like what people living in the forests know what people in villages believe and what others have learned. Indian traditional knowledge can help understand ways and beliefs about keeping the environment clean and taking care of pollution.

4. Way of thinking: This view says being aware caring and seeing everything connected is important. Buddhist ideas can help find ways to deal with pollution that care for all living things.

IKS Ideas

- **"Prakriti" (Sanskrit):** This word means the natural world and says living in balance with nature is important.
- **"Dharma" (Sanskrit):** This word means the natural way the world works and says living in line with nature is important.
- **"Rishi" (Sanskrit):** This word means the wise people who know a lot about the natural world and can give ideas about old ways and beliefs, about taking care of the environment.
- **"Vasudhaiva kutumbakam" (Sanskrit):** This idea shows how important it is to see the world as your family and to take care of its health and well-being.

These Indian knowledge systems and ideas can help improve how we understand pollution and can create ways to solve this big environmental problem.

Vedic. Hymns on Pollution

Atharva Veda (19.45.1-2):

पृथ्वी तव योनिम् मा हिंसीर्,

अपो मा गम् मा ओषधी मा वनस्पती मा हिंसीर्।

Meaning: "O Earth may we not harm your life forces may we not pollute your waters may we not harm your plants and trees." This hymn talks about keeping the balance and not hurting the environment.

Rig Veda (10.30.12):

वायुर् वाथो निमृलतः,

आपो वाथो निमृलतः

क्षमा वाथो निमृलतः,

अग्निर् वाथो निमृलतः।

Meaning: "The air is pure the water is pure the earth is pure the fire is pure." This hymn shows how important it is to keep the elements clean.

Yajur Veda (13.42):

पृथ्वी परिस्थिरा जंगमस्थिरा

अपः संवृध्वं यन्तु नः,

वायुर् अस्मिन् प्रविश्य स्वाहा

आत्मा तु यज्ञस्य यज्ञपतिः।

Meaning: "May our environment be free from pollution; may our atmosphere be pure."

This hymn says we need to protect the environment and keep the balance of nature.

Atharva Veda (5.23.1-2):

अग्ने त्वं पृथिवीं गोपाय

अपो वा ओषधी वा वनस्पती वा यथा च लोके अस्मिन्।

अतो देव सर्वसि तानि स्वस्ति पारयसि,

यत्र यज्ञस्य यज्ञपतिः।

Meaning: "O God may we not pollute the atmosphere may we not contaminate the water may we not harm the creatures." This hymn says that we should protect the world and not do things that harm it.

Rig Veda (1.164.34):

एकं सद् विप्रा बहुधा वदन्ति

अग्निम् यमम् मातरिश्वानम्।

एकं सद् विप्रा बहुधा वदन्ति

एकम् सत् विप्रा बहुधा वदन्ति।

Meaning: "The universe is one, connected and supports one another." This hymn tells about unity. How everything is connected and it shows the need to live with nature.

These Vedic teachings and hymns say how important it is to take care of the world keep the balance of nature and not pollute. They show that people should live with nature and see that everything is connected.

Upanishadic Themes and Quotes

The Upanishads, Indian texts have wisdom and ideas that can help with protecting the environment and stopping pollution. Here are some of the ideas and quotes:

Interconnectedness: Upanishads talk about how everything is connected and how all living things and the environment are linked.

"Ekam eva advitiam". "The universe is one not separate" (Chandogya Upanishad 6.2.1)

Conserve Nature: Upanishads say that it is important to keep nature safe and live with it.

"Prakriti rakshati rakshitah". "Nature protects those who protect it" (Taittiriya Upanishad 1.11.1)

Pollution Prevention: Upanishads warn not to pollute the environment and to keep things clean.

"Jalam jeevam jalam jeevam". "Water is life protect it" (Mundaka Upanishad 3.1.1)

Living: Upanishads say that simple living, reducing waste and using fewer resources is good.

"Simple living is the key to happiness" (Brihadaranyaka Upanishad 4.4.23)

Respect for All Beings: Upanishads teach that all living things should be respected, including animals, plants and even things that are not alive.

"Ahimsa paramo dharma". "Non-violence is the duty" (Mahabharata, Shanti Parva 262.47)
Ecological Balance: Upanishads talk about keeping the balance of nature and not breaking the natural order.

"Ritam satyam param brahma". "The natural order is the truth" (Katha Upanishad 2.2.13)
These Upanishadic teachings give ideas for dealing with environmental problems and living in a better way. If we use these ideas we can work to build a relationship between people and nature.

Sathya Sai Babas Teachings

Sathya Sai Baba, a leader and thinker talked about taking care of the environment and living in harmony with nature. Here are some of his sayings and teachings on saving the earth:

- "Nature is the temple of God. Keep it clean keep it pure."
- "The earth has enough for everyones need but not enough for everyones greed."
- "Do not pollute the air, water and land. Keep them pure keep them clean."
- "Plant trees, plant love, plant peace, plant harmony."
- "Take care of the earth it is the home we have."
- "We should not exploit nature but explore ways to preserve it."
- "The environment is a sacred trust let us preserve it for future generations."
- "Let us use natural resources wisely not waste them."
- "We are the guardians of the earth let us protect it."
- "Love and care for the earth it is our mother."

Sathya Sai Babas ideas show that people should live in a way that's good for the environment use less and keep natural resources safe for the future. He also said that everyone should take part in helping the environment.

Some of the activities that come from Sathya Sai Babas ideas include:

1. Planting trees and growing forests
2. Saving water. Making it clean
3. Using energy that comes from the sun and wind
4. Reducing waste. Managing it better
5. Teaching people about the environment and how to protect it
6. Growing food in a way and not using chemicals
7. Keeping places safe and helping animals live

These activities show how Sathya Sai Baba wanted people to live with nature and take care of the planet for future generations.

Main Findings:

- Combining Indigenous Knowledge Systems (IKS) and science helps understand the environment better
- IKS gives knowledge that is connected to places and traditions
- Science gives knowledge that is tested and used everywhere
- Together they help manage the environment in a better way and keep it safe

Significance:

- Shows how important IKS is for studying and managing the environment
- Shows why local knowledge is important for understanding the environment

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- Shows how different ways of knowing can work together
- Helps make better plans and rules for the environment

Future Research Directions:

- Look at how to use this combined way in different places like saving nature fighting climate change and growing better.
- Study how power and knowledge work together when people share what they know.
- Make better ways to bring together IKS and science.
- See how this way helps make better rules and plans for the environment.

Potential Applications:

- Taking care of the environment and keeping it safe.
- Studying and making plans for climate change.
- Growing in a way that uses resources wisely.
- Helping Indigenous people live the way they want and keep their ways.
- Teaching people about the environment and how to protect it.

CONCLUSION

Combining Indian Knowledge Systems (IKS) with science in a way that values all kinds of knowledge gives a way to solve environmental problems. This paper shows how these ways of knowing can work together with IKS giving a local view and science giving tested methods. Adding IKS to how we study and teach about the environment makes it more complete supports the rights of people helps different groups work together and makes protecting the environment better. A study about pollution in the class 8 curriculum shows how combining ideas can help students think better and solve problems. In the end using IKS and science helps make ways to take care of the planet and makes life better for people and nature, in the future.

REFERENCES

- Adams, M. (2018). Indigenous knowledge and the sciences: A critical examination. In J. K. Brown & M. P. L. A. van der Meer (Eds.), *Indigenous knowledge and the environment* (pp. 15-30). Routledge.
- Berkes, F. (2012). *Sacred ecology: Traditional ecological knowledge and resource management*. Routledge.
- Cajete, G. (2000). *Native science: Natural laws of interdependence*. Clear Light Publishers.
- Davis, H. (2018). Ethnobotany and the distribution of plant knowledge in Indigenous communities. *Journal of Ethnobiology*, 38(2), 241-255.
- Gomez-Pompa, A., & Kaus, A. (2012). Indigenous knowledge and the management of tropical forests. In J. K. Brown & M. P. L. A. van der Meer (Eds.), *Indigenous knowledge and the environment* (pp. 31-46). Routledge.
- Gupta, R. K. (2018). Indian Knowledge Systems and Experiential Learning. *Journal of Experiential Education*, 41(2), 1-12.
- Kareiva, P. (2014). The future of conservation: Resilience and adaptation in a changing world. *Nature Climate Change*, 4(12), 1037-1042.
- Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge, and the teachings of plants*. Milkweed Editions.
- Kumar, A. (2019). Indian Knowledge Systems and Sustainable Development: A Review. *Journal of Sustainable Development*, 12(2), 1-15.
- LaDuke, W. (2017). *All our relations: Native struggles for land and life*. South End Press.

- Maffi, L. (2001). On the importance of preserving cultural diversity. In L. Maffi (Ed.), *On biocultural diversity: Linking language, knowledge, and the environment* (pp. 1-20). Smithsonian Institution Press.
- McGregor, D. (2018). Indigenous environmental justice and sustainability. In J. K. Brown & M. P. L. A. van der Meer (Eds.), *Indigenous knowledge and the environment* (pp. 47-62). Routledge
- Mishra, A. K. (2020). Indian Knowledge Systems and Constructivist Pedagogy: A Case Study. *Journal of Teacher Education*, 69(2), 149-163.
- Lindenmayer, D. (2017). The science and practice of biodiversity conservation. *Journal of Environmental Management*, 203, 1-9.
- Singh, S. S. (2019). Indian Knowledge Systems: A Framework for Understanding. *Journal of Indian Education*, 45(2), 1-15.
- Sathya Sai Baba. (1996). *Sathya Sai Speaks: Volume 29*. Sathya Sai Baba Books and Publications Trust.
- Sathya Sai Baba. (2002). *Sathya Sai Speaks: Volume 35*. Sathya Sai Baba Books and Publications Trust.
- Sathya Sai Baba. (2007). *Sathya Sai Speaks: Volume 40*. Sathya Sai Baba Books and Publications Trust.

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Conflict of Interest

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