



## Importance of ITKs in cost-effective livestock health management: An opportunities and challenges

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Indigenous technical knowledge refers to the traditional, local, and often informal knowledge systems developed by indigenous communities over generations to address their specific needs and challenges, encompassing practices, skills, techniques, and innovations related to agriculture, medicine, ecology, architecture, and more. It helps people use their reasoning and creative thinking to solve the majority of their problems, also known as Farmers Wisdom or Farmers Knowledge, Indigenous Knowledge System (IKS), Local Knowledge (LK), Traditional Knowledge (TK), and Indigenous Technical Knowledge. This is a functional knowledge system that is centred on communities and has been developed, maintained, and improved over generations through interactions, observations, and experiments with the environment. In rural areas, especially in farming communities, ITK plays a big role in people's lives. The farming community continues to have a strong belief in its traditional knowledge despite advancements in technology. This knowledge is primarily communicated orally among members of specific cultures and is expressed through myths, stories, songs, rituals, beliefs, etc.

Livestock is one of the important sectors in our country contributes a major share to the GDP from the overall agricultural GDP. It contributed about 6.17 percent and 30.87 percent, respectively, to the national and agricultural Gross Value Added (GVA) in 2020-21. Thus, dairy sector proves to be the backbone of rural economy. In this, livestock management aims to improve animal health sector, by means of implementation of vaccination towards various diseases of livestock & poultry, capacity building, disease surveillance and strengthening of veterinary infrastructure. So among the management practices to improve animal health, ITKs plays an important role. But, since scientific methods are much more "tried and true" in terms of plausibility, the younger generation is



growing less and less confident in ITK over time. People store their knowledge about ITKs in their minds, and it is typically challenging to explore.

After independence, the need to switch from traditional to contemporary methods resulted in a lack of attention to this uncharted area of study. Furthermore, there has been a reduced dissemination of information by extension agencies to livestock farmers, as evidenced by data showing that only 5% of Indian farm households have access to information about livestock, compared to 40.4% for crop farming. Today, dairy development cannot function without the use of modern technology. But in order for development to be sustainable, indigenous technical knowledge (ITK) is vital and cannot be undervalued. It makes sense for us to start by firmly establishing our existing knowledge. It's time to consider other options in order to preserve the environment and continue producing enough food and dairy products to feed the population for the foreseeable future. In order to increase production without negatively impacting the environment or the ecosystem, it is imperative to make use of indigenous knowledge.

### **Importance of ITKs in cost-effective livestock health management**

- **Eco-friendly practices** - Indigenous technical knowledge often incorporates practices that are deeply rooted in harmony with the environment. Traditional methods passed down through generations are often sustainable, using locally available resources and minimizing ecological impact.
- **Cost-effectiveness** - Indigenous technical knowledge tends to be cost-effective because it often relies on locally available and affordable resources. Traditional methods are developed based on the community's needs and resources, minimizing the reliance on expensive external inputs.
- **Local availability of herbs** - ITK equips indigenous communities with the expertise to identify, cultivate, and sustainably harvest herbs endemic to their region, ensuring a stable and accessible supply for medicinal purposes.
- **Lesser side effects** - Herbal remedies tend to have fewer adverse reactions. This is because they are often used in their whole, natural form, containing a complex array of compounds that work synergistically within the body.
- **Pollution prevention** - Indigenous technical knowledge often emphasizes sustainable and environmentally friendly practices, contributing to pollution prevention. Traditional methods typically involve minimal use of harmful chemicals, efficient waste management, and a deep understanding of ecosystems.
- **Location specificity** - Indigenous technical knowledge is often location-specific



because it is developed and refined based on the unique environmental conditions, resources, and cultural contexts of a particular region. The practices and techniques are finely tuned to the local geography, climate, and available materials.

- **Simple preparation and administration** - Unlike many pharmaceutical drugs, which require complex manufacturing processes and precise dosing, herbal remedies derived from ITK often involve simple preparations such as teas, infusions, poultices, or tinctures. Additionally, the knowledge of administration methods is often shared openly within the community, making it easier for individuals to self-administer treatments and provide care without specialized medical training.
- **Sustainability and biodiversity conservation** - ITK promotes sustainable livestock production by aligning practices with local ecosystems. This approach reduces the environmental impact of farming and contributes to the long-term health of both livestock and the surrounding environment.
- **Resilience to climate variability** - Indigenous practices are often adapted to local climates and weather patterns. This understanding allows developing resilient livestock systems capable of withstanding changing environmental conditions.
- **Economic benefits** - Contributes to national economy through various means such as eco-tourism, health care practices, natural resource management, cultural heritage etc.
- **Local empowerment** - The transmission of ITK from one generation to the next fosters local empowerment. Communities are equipped with the knowledge and skills to independently manage their livestock, reducing dependence on external interventions.
- **Increase the profitability of livestock farming** - Indigenous communities have developed time-tested methods for breeding, feeding, and managing livestock that are adapted to local environmental conditions and cultural contexts. These practices often prioritize sustainability, resilience, and low-input farming techniques, reducing reliance on expensive external inputs. By integrating ITK into livestock farming practices, farmers can enhance productivity, reduce production costs, and improve the overall profitability of their operations while preserving indigenous cultural heritage and biodiversity.
- **No milk withdrawal** - Milk withdrawal concept mainly associated with conventional veterinary treatments where a waiting period is recommended before milk from treated animals can be consumed to ensure absence of residues/potential contaminants. But in EVM, practices less likely to be interfere with the normal



physiology of the animal. So, no perceived need for a withdrawal period.

- **Reduced antibiotic residues/ other drugs in milk** - Indigenous Technical Knowledge (ITK) can reduce antibiotic residues in milk through practices like incorporating herbal supplements, employing traditional animal healthcare methods, and emphasizing proper withdrawal periods after treating animals. Additionally, community-based surveillance and sustainable livestock management contribute to minimizing antibiotic use, ensuring healthier milk production with lower residues.
- **Better product quality & better health** - ITK contributes to better product quality and improved customer health by incorporating sustainable and traditional practices. For instance, in agriculture, traditional farming methods enhance soil health and crop diversity, leading to higher-quality produce. In healthcare, the use of herbal remedies and preventive measures from indigenous knowledge promotes holistic well-being, contributing to healthier products and improved customer health.
- **Better prospects in international market** - It is mainly through cultural understanding, sustainable practices, resource efficiency, innovation & uniqueness, intellectual property advantage. Integrating Indigenous Technical Knowledge into economic development strategies can unlock better prospects in the international market by leveraging cultural heritage, fostering innovation.
- **Help to tackle AMR** - Indigenous Technical Knowledge aids in tackling antimicrobial resistance by providing alternative medicinal practices, such as herbal remedies, and promoting holistic, community-based approaches that emphasize disease prevention and sustainable resource use, reducing reliance on antimicrobials. Additionally, traditional livestock management practices and a One Health approach contribute to minimizing the overuse of antibiotics in both medical and agricultural contexts.

### Opportunities for use of ITKs in livestock health management

- **Integration of ITK with Modern Practices:** Integration with modern practices presents a significant opportunity for Indigenous technical knowledge (ITK) to thrive and evolve. Indigenous communities have cultivated deep-rooted knowledge systems over generations, encompassing sustainable resource management, ecological preservation, and resilient technologies tailored to their environments. By integrating these traditional practices with modern techniques, such as incorporating ITK into conservation efforts, renewable energy projects, or sustainable agriculture, there's potential for synergistic outcomes. This integration not only enhances the effectiveness of

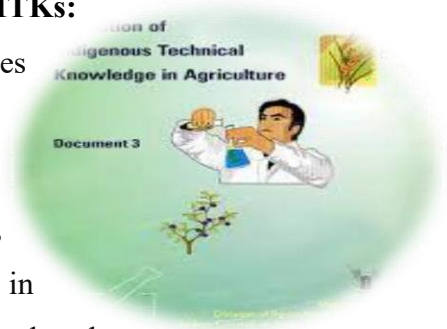




modern initiatives but also ensures the preservation and revitalization of Indigenous wisdom, fostering cultural pride and promoting equitable partnerships between Indigenous peoples and wider society.

□ **Documentation and Preservation of proven ITKs:**

Documentation and preservation represent crucial opportunities for Indigenous technical knowledge (ITK) to be recognized, respected, and safeguarded for future generations. Through systematic documentation of traditional practices, technologies, and ecological wisdom, ITK can be preserved in a tangible and accessible manner, preventing its loss due to cultural erosion or external influences. Emphasizing documentation and preservation not only honors the rich heritage of Indigenous communities but also contributes to the broader diversity of knowledge systems, offering valuable insights for addressing contemporary challenges in sustainable development, environmental conservation, and societal resilience.



□ **Recognition and Support to utilize ITKs:** Through formal acknowledgment and endorsement, governments and institutions can validate the significance of ITK, elevating its status as a legitimate knowledge system deserving of respect and protection. This recognition opens avenues for financial investment, policy integration, and collaborative partnerships, empowering Indigenous communities to leverage their expertise in addressing pressing societal challenges, such as climate change adaptation, biodiversity conservation, and sustainable development. By actively engaging with Indigenous knowledge holders, governments and institutions can foster inclusive decision-making processes that honor diverse perspectives and promote social equity, ultimately leading to more effective and culturally sensitive solutions for the benefit of all stakeholders.

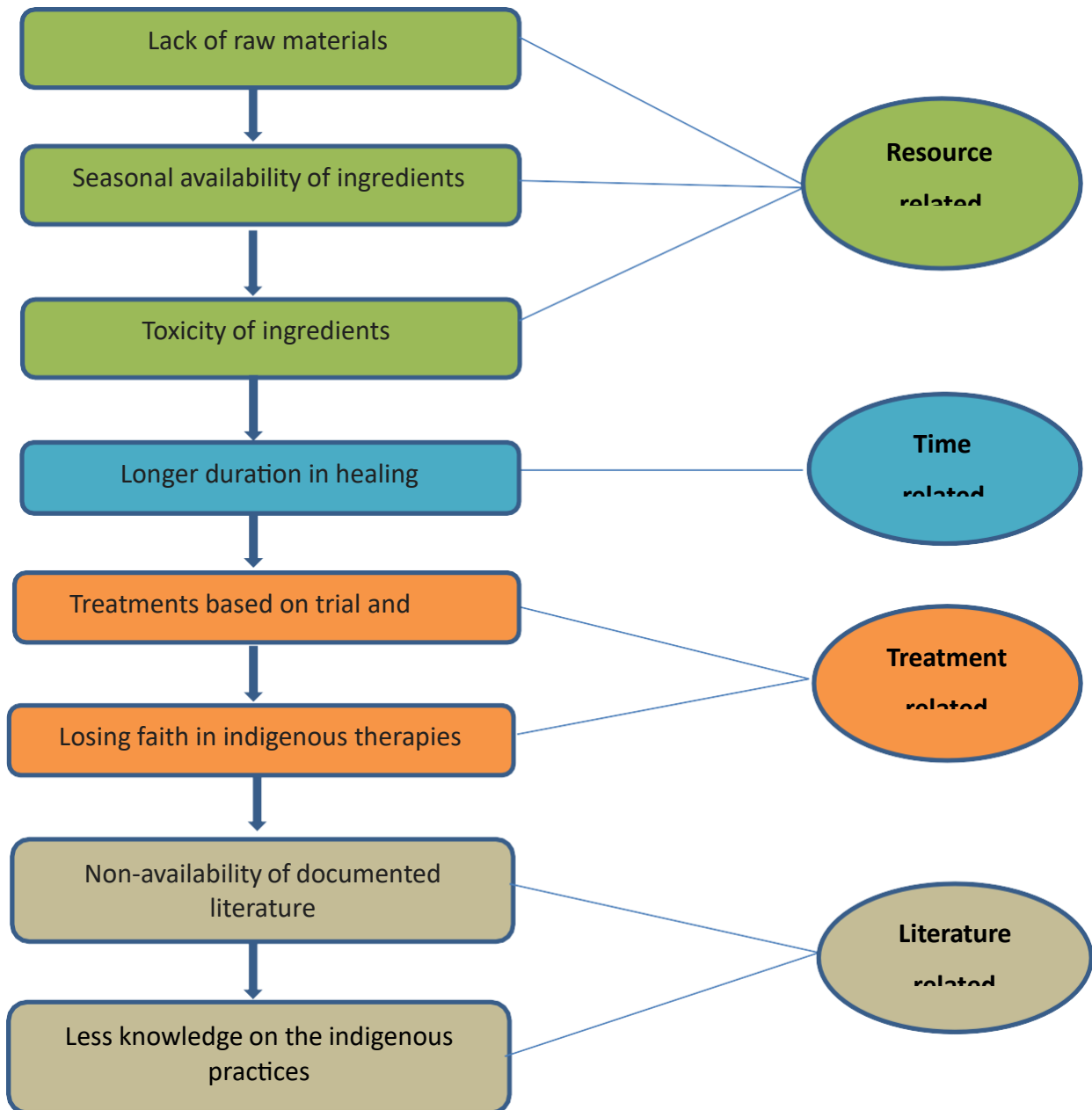


□ **Research and Innovation:** can tap into centuries-old wisdom, unique insights, and locally adapted technologies that Indigenous communities have developed to sustainably manage their environments and address complex challenges. Furthermore, by integrating ITK into innovation processes, there's potential to develop culturally appropriate solutions to contemporary issues, ranging from



healthcare and agriculture to environmental stewardship and renewable energy. Embracing Indigenous knowledge in research and innovation endeavors not only honors Indigenous peoples' contributions but also promotes holistic and sustainable approaches to problem-solving that benefit society as a whole.

**Challenges in using ITKs for livestock health management**



This above flowchart illustrates the interconnected challenges occur in utilizing Indigenous Technical Knowledge in management of livestock health. Each node represents a distinct challenge, and the arrows indicate the relationships between them. This format provides a visual representation of the complex factors influencing the adoption and efficacy of ITK in livestock health management.



- **Seasonal availability of ingredients** - Many indigenous practices are deeply rooted in seasonal rhythms, relying on specific plants, herbs, and natural materials that flourish during particular times of the year. However, fluctuations in climate patterns, including unpredictable weather events and shifting growing seasons, can disrupt these natural cycles, leading to inconsistencies in the availability of essential resources.
- **Longer duration in healing** - While indigenous remedies often offer holistic approaches to health and well-being, their efficacy may require more time for noticeable effects to manifest. Additionally, traditional healing methods often involve gradual processes of detoxification, rebalancing, and strengthening the body's natural defenses, which may extend the duration of treatment. So it is not a preferred choice for the acute and emergency cases.
  - **Toxicity of ingredients** - The toxicity of ingredients poses a significant challenge when employing indigenous technical knowledge (ITK) in traditional healing practices. While indigenous remedies often rely on natural ingredients sourced from local environments, some of these substances may contain compounds that can be harmful if not used correctly. Traditional healers possess intricate knowledge of plant properties and preparation methods to mitigate these risks, but improper harvesting, processing, or dosage can still lead to adverse effects.
  - **Lack of raw materials** - Indigenous communities often rely on locally available resources for their traditional practices, including medicinal herbs, plants, and natural materials. However, factors such as habitat destruction, overharvesting, climate change, and urbanization can lead to the depletion or scarcity of these vital raw materials.
  - **Treatments based on trial and error** - Traditional healing practices often involve experimentation and observation over generations, with remedies refined through practical experience rather than scientific validation. While this experiential learning can yield valuable insights, it also carries the risk of inefficacy or adverse reactions in some cases.
  - **Less knowledge on the indigenous practices** - Traditional knowledge systems are often passed down orally through generations, relying on experiential learning and cultural transmission. However, as modernization and globalization reshape societies, there is a risk of erosion and loss of this valuable knowledge. This lack of comprehensive documentation and recognition hinders efforts to preserve, share, and integrate indigenous practices into broader healthcare systems, limiting their potential to address contemporary health challenges and contribute to sustainable



development.

- **Losing faith in indigenous therapies** - Modernization and globalization has led to the dominance of Western biomedical models, often overshadowing or delegitimizing traditional healing practices. This loss of faith may stem from misconceptions about the efficacy and safety of indigenous therapies, as well as cultural biases that prioritize Western scientific approaches over indigenous knowledge systems.
- **Non-availability of documented literature** - Indigenous knowledge systems are often transmitted orally across generations, with practices, beliefs, and techniques passed down through storytelling, rituals, and cultural traditions. However, this oral tradition may not always be captured in written form, leading to a scarcity of accessible literature on indigenous practices. This lack of documentation poses barriers to sharing, preserving, and validating indigenous knowledge, hindering efforts to integrate ITK into broader healthcare systems and educational curricula.

## Conclusion

The dissemination of modern technologies has caused indigenous practices to become less relevant and more eroded to a significant degree. Even though there are more developments in conventional veterinary medicine, a large number of populations in developing countries still depend on traditional healing methods and medicinal plants for the daily medical needs of their animals. In terms of protecting and maintaining biodiversity, boosting the national economy, granting patents for native recipes, and other areas, the documentation of ITKs can be extremely beneficial. However, a greater focus on contemporary technologies results in a decreased awareness of traditional customs. The lack of documentation and preservation of ITK are the major issues concealing the benefits of traditional medicine. For the benefit of humanity, a greater variety of novel concepts and methods can be developed through the integration of traditional and contemporary scientific knowledge to increase the profitability of livestock farmers and lowering their cost of production. It is important to educate them about these practices and guide them in spreading them among farmers.

## References

- Biradar N, Tirlapur L, Kerur A, Chand K and Raghuprasad K P, 2022, Documentation and validation of scientific rationality of ITKs relating to fodder management and livestock health. *Range Management and Agroforestry*, 43(2): 317-325.
- Dutta P, Hari Kumar A V, Mahajan A C, Shroff S, Rana S K and Sahariah P J, 2022, Management of common ailments of dairy animals with ethno-veterinary herbal preparations in Gujarat. *Pharma Innov J SP-9* (8): 67-70.
- Shubeena S, Hai A, Hamdani S A, Akand A H, Thahaby N, Rasool S, Iyman N and Amin B



- Y, 2022, Role of Indigenous Technical Knowledge (ITK's) in Growth and Production of Livestock Sector. *Journal ISSN*, 2766: 2276.
- Shubeena S, Hai A, Hamdani S A, Akand A H, Shafiq S, Bulbul K H, Nisa S S, and Qureshi A I, 2018, Awareness and adoption of indigenous technical knowledge in management of surgical conditions in livestock. *Journal of Entomology and Zoology Studies*, 6(4):1205-1208.
- Vishwatej R, Kadian K S, Kartik D and Raja L, 2018, Perceived Effectiveness of Improved Indigenous Knowledge (IK) Treatments among Livestock Farmers. *Int. J. Pure App. Biosci*, 6(2):1331-1336.