

# A REVIEW ON IMPORTANCE OF SAL TREE (*SHOREA ROBUSTA*) AS AN INTERMINABLE WOOD

SHEETAL, VIKRAM SINGH\*, VISHAL JOHAR AND ABHISHEK DHYANI

Department of Horticulture, School of Agriculture,  
Lovely Professional University, Phagwara 144 411, Punjab, India

(Received 24 October, 2023; Accepted 22 December, 2023)

*Key words: Sal, Importance, Cultural, Timber, Economical and medicinal etc.*

**Abstract**– The Sal tree which is native to the Indian subcontinent, has gained significant attention in recent years due to its multifaceted importance. It has values such as economic, medicinal, religious, and cultural importance which contributes to various sectors including forestry, timber production, non-timber forest products (NTFPs), employment generation, and ecological services. Timber derived from Sal tree is also a valuable source which is used in construction, agricultural tools and wooden furniture due to its strength, durability and sustainability. Furthermore, Sal plays a crucial role in supporting livelihoods and various industries, balancing economic development and environmental conservation. This review paper offers valuable insights into the significance of Sal and the necessity for sustainable practices to maximize its benefits while preserving the ecosystems it depends on.

## INTRODUCTION

Agroforestry, a sustainable land management approach, involves concurrently cultivating annual crops and perennial trees (Muhie *et al.*, 2022). This integrated strategy offers a powerful solution to reconcile the conflicting demands of human society and the need for biodiversity conservation. The multifaceted advantages of agroforestry have garnered recognition from both forestry authorities and researchers (Pörtner *et al.*, 2021). It encompasses a range of ecosystem services, serving as avenues for income generation, cultural enrichment sources, employment opportunity providers, and habitats for humans and diverse wildlife species (Mankhin *et al.*, 2023). In the geographic region spanning longitudes 75° to 95° E and latitudes 20° to 32° N, Sal (*Shorea robusta*), a significant timber species, thrives under the influence of climatic and soil-related factors (Belbase *et al.*, 2022). This species occupies a pivotal position in the economic landscape of Nepal, valued for its application in construction timber. However, its importance transcends economic aspects, as it occupies a critical position in rural economies, functioning as a primary income source and offering diverse employment prospects (Aryal *et al.*, 2023). Within the strategic framework of Nepal, the assessment of

Sal tree forest volumes is integral, aligning harmoniously with the government's strong endorsement of scientific forest management practices (Paudel *et al.*, 2022). This overarching approach, aimed at enhancing forest productivity, carries the potential to tangibly elevate human well-being and propel the nation towards heightened economic growth (Baral *et al.*, 2020).

## Sal tree

Sal, scientifically known as *Shorea robusta*, is found on the southern slopes of the Himalayas in Nepal, India, and Bangladesh. In India, Sal trees are located in both the northern and central regions, with the Gangetic Plain serving as a natural boundary between them. In Nepal, the Terai region, which is the lowland area, is recognized as the primary region where Sal trees are grown (Rahman *et al.*, 2023).

## Economic Importance

The influence of ecological processes on human social and economic systems is evident across various scales, from local to global levels. In the central region of the country, the Sal forests stand as a distinctive ecosystem of remarkable economic and ecological importance (Karmakar *et al.*, 2023). These forests are home to approximately 40,000 residents,

including ethnic minority groups, with 5,000 households relying entirely on forest resources for their sustenance (Islam *et al.*, 2021). Agroforestry systems can bring several benefits such as protecting soil erosion, producing bioenergy, fixing carbon, creating tree-diverse agricultural landscapes, and offering sustainable land management techniques. These systems also provide natural pest control and habitat for biological diversity. The farmers in the country need to understand the potential and expertise of agroforestry and work towards making it economically and environmentally viable for global farmers (Singh *et al.*, 2021). For tribal communities, the collection of NTFPs from these forests is an integral part of their daily livelihoods. In India, a significant rural population resides in close proximity to forests, with their lives intricately linked to the forest ecosystem (Chand *et al.*, 2023). NTFPs play a pivotal role in the income generation of households living in and around forested areas, contributing 40 to 60% of their overall earnings (Mukul *et al.*, 2016). These activities create job opportunities for approximately two million individuals annually, making a substantial contribution to the rural economy (Islam *et al.*, 2015). Among the diverse array of NTFPs, Sal leaves hold special significance among ethnic communities in Jharkhand. Sal trees are revered by the ethnic population for their multiple contributions, and the Sarhul festival is celebrated when new Sal flowers bloom (Singhal *et al.*, 2021). Sal leaves are expertly crafted into plates that are not only affordable and disposable but also environmentally friendly, serving as eco-friendly alternatives to thermocol and plastic plates. These Sal leaf plates are widely used in local establishments, including shops, small eateries, temples, weddings, festivals and more. Their popularity among environmentally conscious individuals has led to both domestic and global demand for these sustainable products (Mathura *et al.*, 2022).

### Sal timber Importance

Sal timber, derived from the Sal tree, serves a wide range of valuable purposes owing to its exceptional strength, durability, and aesthetic appeal (Silwal *et al.*, 2017). This versatile resource is highly regarded in multiple industries. In the construction sector, Sal timber is a fundamental material for buildings, bridges, and infrastructure projects. Its resilience guarantees the stability and long-lasting nature of these structures (Bischetti *et al.*, 2021). In rural areas,

salwood is used for crafting agricultural tools such as ploughs, yokes, and carts, contributing to the livelihoods of many in rural communities (Mekie *et al.*, 2023). Salwood's efficiency in burning also makes it a valuable source of firewood and charcoal, used for heating, cooking, and industrial applications (Parihar *et al.*, 2023). It is important to emphasize that while Sal timber is incredibly versatile, responsible harvesting practices and conservation efforts are essential to ensure the long-term sustainability of the Sal tree species and the ecosystems it supports.

### Medicinal Importance

The Sal tree is not only valued for its timber and cultural significance but also possesses a range of medicinal properties that have been recognized and utilized in traditional systems of medicine for centuries. Its various parts, such as leaves, bark, resin, and oil, contain compounds with therapeutic benefits (Mishra *et al.*, 2020). Its extracts also have anti-inflammatory properties due to the presence of bioactive compounds. These properties make it useful in the treatment of inflammatory conditions, including arthritis and other joint disorders (Chavda *et al.*, 2015). The resin (Sal gum or Guggul) obtained from the Sal tree has been used for its wound-healing properties. It can promote the regeneration of skin tissue and accelerate the healing process (Gupta *et al.*, 2014). The stem bark of the Sal tree has been used for oral care. Chewing on a piece of Sal tree bark is believed to strengthen gums, whiten teeth, and help with oral hygiene (Gamage *et al.*, 2022). Studies suggest that Sal tree extracts may have anti-diabetic properties. They may help regulate blood sugar levels and improve insulin sensitivity. However, more research is needed in this area (Chatterjee *et al.*, 2019). The Sal tree extracts are sometimes used in traditional medicine to address respiratory issues. The leaves and bark may be used to prepare herbal remedies to alleviate coughs and respiratory discomfort (Yadav *et al.*, 2023). The Sal tree extracts have been traditionally used to address gastrointestinal problems. They may help in managing conditions like diarrhoea, dysentery, and indigestion. Sal tree oil and extracts sometimes are applied topically to relieve pain, such as muscular pain and joint pain. The bark and resin of the Sal tree contain antiseptic compounds that have been used to treat wounds and prevent infections. In Ayurvedic Medicine Sal tree resin, known as "Guggul," is an essential component of many

Ayurvedic formulations (Chandra *et al.*, 2023).

### Religious Importance

The Sal tree holds profound religious and cultural significance in the Indian subcontinent, particularly in India, Nepal, and Bhutan. Its influence is deeply intertwined with the traditions, beliefs, and practices of the region (Rawal *et al.*, 2013). Here, we delve into the multifaceted religious and cultural importance of the Sal tree. In Hinduism, the Sal tree plays a pivotal role in Hindu mythology and religious rituals (Bharne *et al.*, 2014). According to Buddhist tradition, Queen Maya Devi, the mother of Siddhartha Gautama (who later became Lord Buddha), gave birth to him while holding onto the branch of a Sal tree in Lumbini, Nepal. This event is commemorated at the sacred Lumbini Garden, which is considered the birthplace of Lord Buddha (Poudel *et al.*, 2023). This tree is revered in Buddhist pilgrimages and signifies the transformative power of enlightenment. Buddhists revere the Sal tree for its connection to the life and teachings of Lord Buddha, and it is often featured in Buddhist shrines and monastic settings (Halifax *et al.*, 2004).

### Cultural Importance

In traditional and indigenous beliefs many indigenous and tribal communities in the Indian subcontinent also hold the Sal tree in high regard (Mathur *et al.*, 2008). It is an integral part of their cultural heritage and belief systems. Sal groves are often considered sacred by these communities, and various rituals, ceremonies, and gatherings take place under the canopy of Sal trees (Khan *et al.*, 2008). The recognition of these areas as sacred has often resulted in their protection from deforestation and habitat destruction (Parween *et al.*, 2021). Many conservation efforts in the region are guided by the dual aim of preserving biodiversity and respecting the cultural and religious importance of these forests (Kothari *et al.*, 2012). Sal tree is featured in numerous rituals and ceremonies across the Indian subcontinent. Weddings, religious festivals, and other celebrations often incorporate the presence of the Sal tree or its leaves in various customs and practices (Chauhan *et al.*, 2019). Sal tree leaves are used as offerings in many religious rituals and ceremonies, symbolizing purity and devotion. In Sacred Groves Sacred groves, areas of forest or natural vegetation protected due to their religious or cultural importance, frequently feature Sal trees. These groves are considered sanctuaries for local

flora and fauna and serve as biodiversity hotspots (Manna *et al.*, 2021).

### CONCLUSION

Despite their economic and cultural importance, Sal forests face substantial challenges. Activities such as logging, grazing, and deforestation are taking a toll on these invaluable ecosystems. The increasing population growth exacerbates the pressure on these forest resources, as the livelihoods and economic well-being of local communities are highly dependent on them. Therefore, it is crucial to implement sustainable practices in the utilization of these fertile land resources. Recognizing the significance of Sal trees, the government of India has implemented various agricultural policies and strategies aimed at enhancing overall agricultural productivity. Achieving this goal requires efficient land management through the adoption of diverse agricultural techniques, ultimately benefiting rural communities. Therefore, the conservation and sustainable utilization of Sal trees and their associated resources are essential not only for economic prosperity but also for preserving cultural traditions and ecological balance.

### REFERENCES

- Aryal, K., Awasthi, N., Maraseni, T., Laudari, H. K., Gotame, P. and Bist, D.B. 2023. Calibrating Nepal's scientific forest management practices in the measure of forest restoration. *Land Use Policy*. 127: 106586.
- Baral, S., Neumann, M., Basnyat, B., Gauli, K., Gautam, S., Bhandari, S.K. and Vacik, H. 2020. Form factors of an economically valuable Sal tree (*Shorea robusta*) of Nepal. *Forests*. 11(7): 754.
- Belbase, K., Chhetri, S. G., Upadhaya, S. and Poudel, A.S. 2022. Understanding the Impacts of Forest Management in Sal (*Shorea robusta*) Dominant Forest Stands in the Western Lowlands of Nepal. *Small-scale Forestry*. 1-13.
- Bharne, V. and Krusche, K. 2014. *Rediscovering the Hindu temple: the sacred architecture and urbanism of India*. Cambridge Scholars Publishing.
- Bischetti, G. B., De Cesare, G., Mickovski, S. B., Rauch, H. P., Schwarz, M. and Stangl, R. 2021. Design and temporal issues in Soil Bioengineering structures for the stabilisation of shallow soil movements. *Ecological Engineering*. 169: 106309.
- Chandra, V., Yadav, P. and Raghuvanshi, V. 2023. Diabetes and Ethnomedicine: A Comprehensive Review of Scientific Literature on Traditional Medical Practices.
- Chatterjee, K. and Ganguly, C. 2019. Significance of *Shorea robusta* (Sal Tree) and prospects of its Assisted

- Natural Regeneration (ANR) for empowering the local inhabitants of the lateritic region of West Bengal. *Chavda, V.* 2015. Cannonball tree": The alchemist plant. *Innorig. Int. J. Sci.* 2: 6-9.
- Gamage, D.G.N.D., Dharmadasa, R.M., Abeysinghe D.C., Wijesekara R.G.S., Prathapasinghe G.A. and Someya, T. 2022. Global perspective of plant-based cosmetic industry and possible contribution of Sri Lanka to the development of herbal cosmetics. *Evidence-Based Complementary and Alternative Medicine*.
- Gupta, P., Sharma, V. K., Sharma, S., Gupta, P., Sharma, V.K. and Sharma, S. 2014. Traditional Herbalists. *Healing Traditions of the Northwestern Himalayas*. 83-120.
- Halifax, J. 2004. *The fruitful darkness: A journey through Buddhist practice and tribal wisdom*. Grove Press.
- Islam, K.K. and Hyakumura, K. 2021. The potential perils of Sal forests land grabbing in Bangladesh: an analysis of economic, social and ecological perspectives. *Environment, Development and Sustainability*. 23(10): 5368-15390.
- Islam, M.A., Quli, S.M.S., Rai, R. and Singh, P.K. 2015. Livelihood promotion through value addition to household traditional Sal (*Shorea robusta* Gaertn.) leaf plate making in Jharkhand, India.
- Karmakar, M., Banerjee, M. and Ghosh, D. 2023. Formulation of Geotourism Development Strategies for Potential Geoheritage Sites in Subarnarekha-Kangsabati Interfluvial Zone Using Tourist Assessment Value and SWOT-AHP Hybrid Model. In *Environmental Management and Sustainability in India: Case Studies from West Bengal* (pp. 579-601). Cham: Springer International Publishing.
- Kothari, A. 2012. Community conserved areas. In *Managing Protected Areas* (pp. 579-603). Routledge.
- Mankhin, B., Khan, M.A., Begum, M.E.A. and Hossain, M.I. 2023. Market attractiveness of pineapple and banana agroforestry systems of Madhupur Sal (*Shorea robusta*) forest: a sustainable way of generating income and conserving forests. *Journal of Agriculture and Food Research*. 11: 100475.
- Manna, S. and Roy, A. 2021. Indian sacred groves: Floristic diversity, Ecology and conservation. *International Journal of Chemical and Environmental Sciences*. 3(1): 32-45.
- Mathur, N. 2008. Chanted narratives of indigenous people: Context and content. *Asian Ethnology*. 67(1): 103.
- Mathura, R., Gunwala, I., Chitrakhab, P., Magoc, P., Gulatib, S. and Katyalb, R. 2022. Biodiversity conservation of plants: the role of ethnic and indigenous populations. *Ann. For. Res.* 65(1): 5613-5656.
- Mekie, T.M., Dessie, A.B. and Andargie, A. A. 2023. Economic contribution of forest products to household income in Metema district, Ethiopia. *Letters in Spatial and Resource Sciences*. 16(1): 9.
- Mishra, G., Meena, R.K., Pandey, S., Kant, R. and Bhandari, M.S. 2020. A century old regeneration problem of Shorearobusta Gaertn. F. in south Asia: SWOT analysis. *Annals of Silvicultural Research*. 46(1): 10-12899.
- Muhie, S.H. 2022. Novel approaches and practices to sustainable agriculture. *Journal of Agriculture and Food Research*. 100446.
- Mukul, S.A., Rashid, A.M., Uddin, M.B. and Khan, N.A. 2016. Role of non-timber forest products in sustaining forest-based livelihoods and rural households' resilience capacity in and around protected area: a Bangladesh study. *Journal of Environmental Planning and Management*. 59(4): 628-642.
- Parween, R. 2021. *Traditional Knowledge and Practices, Sacred Spaces and Protected Areas: Their Success in Conserving Biodiversity* (Doctoral dissertation, University of York).
- Paudel, G.P. 2023. *The absence of community in community forestry: the politics of science and ethics in Nepali forestry policy* (Doctoral dissertation, UNSW Sydney).
- Pörtner, H.O., Scholes, R.J., Agard, J., Archer, E., Arneeth, A., Bai, X. and Ngo, H.T. 2021. IPBES-IPCC co-sponsored workshop report on biodiversity and climate change. *IPBES and IPCC*, 10.
- Poudel, P.C. 2022. Lumbini, Nepal: The Birthplace of Buddha and the Powerful Place of Pilgrimage in the World. In: *Practising Cultural Geographies: Essays in Honour of Rana PB Singh* (pp. 403-429). Singapore: Springer Nature Singapore.
- Rahman, M.M. 2023. Assessing the change in biodiversity of Dewapara Sal (*Shorea robusta*) Forests of Bangladesh. Available at SSRN 4410316.
- Rawal, R. S., Bhatt, I. D., Sekar, K.C. and Nandi, S.K. 2013. The Himalayan biodiversity: richness, representativeness, uniqueness and life-support values. *GB Pant Institute of Himalayan*
- Silwal, R., Baral, S. K. and Chhetri, B. B. K. 2017. Modeling Taper and Volume of Sal Trees Growing in the Western Terai Region of Nepal. In: *First National Silviculture Workshop* (p. 231).
- Singh, V., Johar, V., Kumar, R. and Chaudhary, M. 2021. Socio-economic and Environmental Assets Sustainability by Agroforestry Systems: A Review. *International Journal of Agriculture, Environment and Biotechnology*. 14(04): 521-533.
- Singhal, V., Ghosh, J. and Bhat, S. S. 2021. Role of religious beliefs of tribal communities from Jharkhand (India) in biodiversity conservation. *Journal of Environmental Planning and Management*. 64(13): 2277-2299.
- Yadav, P. and Antil, R. S. 2023. Utilizing the Multi-Faceted Potential of *Shorea robusta*: A Comprehensive Review.