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Evaluating India's Legal Framework for Access and Benefit Sharing under the Nagoya Protocol: Challenges and Prospects in Uttarakhand

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ABSTRACT

Access and benefit sharing (ABS) is a policy concept that the Nagoya Protocol seeks to promote by securing fair and equitable access to genetic resources and the equitable sharing of benefits arising from their utilisation. India is a party to the Protocol and has developed domestic mechanisms to support ABS. This paper takes Uttarakhand, one of India's most biodiverse states, as a case study. It argues that, despite successive reforms, the ABS regime as applied in the state continues to attract criticism. Accordingly, the paper critically examines the legal framework governing ABS in India and Uttarakhand and identifies the difficulties that framework encounters, including inconsistency across jurisdictions, weak enforcement and limited community participation. On the basis of these observations, the paper offers practical recommendations for overcoming existing limitations and strengthening the future of ABS through wider recognition of traditional knowledge and closer cooperation between government authorities and local stakeholders. The paper aims to contribute to scholarship and practice on the improvement of the ABS regime in India, and in Uttarakhand in particular, and to suggest workable measures for the sustainable management of genetic resources.

Keywords: Nagoya Protocol, Access and Benefit Sharing, Uttarakhand, Genetic Resources, Biological Diversity Act.

I. INTRODUCTION

The Nagoya Protocol is a supplementary agreement to the Convention on Biological Diversity (CBD)¹ and was established to provide a framework for the fair and equitable access to, and benefit sharing (ABS) arising from, the use of genetic resources and associated traditional knowledge. It came into force in October 2014² and seeks to ensure that the benefits of the

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¹ Convention on Biological Diversity, opened for signature June 5, 1992, 1760 U.N.T.S. 79 (entered into force Dec. 29, 1993).

² Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity, adopted Oct. 29, 2010 (entered into force Oct. 12,

utilisation of biodiversity are distributed to the countries and communities that are the sources of such resources. The Protocol also aims to support the conservation of biodiversity by promoting the sustainable use of genetic resources while simultaneously safeguarding the rights of indigenous populations. Its overarching objectives are that there be transparency in the use of genetic resources, effective sharing of the benefits that arise from research and development, and the return of those benefits to the provider countries and local communities.³ The Nagoya Protocol also seeks to counter biopiracy by giving effect to the principle of fairness through standards on prior informed consent (PIC) and mutually agreed terms (MAT).⁴

A. India and the Nagoya Protocol

India has demonstrated its commitment to global biodiversity conservation by signing the Nagoya Protocol and adapting its national legislative framework to the provisions of the Protocol.⁵ India became a signatory to the Protocol in 2012 and thereafter aligned its national rules with the requirements of ABS. The Indian ABS system is founded upon the *Biological Diversity Act, 2002* (BDA) and its subsequent amendments. The Act provides for the establishment of the National Biodiversity Authority (NBA) and State Biodiversity Boards (SBBs) to monitor and regulate ABS activities so that genetic resources and traditional knowledge are used in a manner beneficial to the nation and to local communities.⁶ The ABS regime in India aims to protect biodiversity, advance innovation and establish fair relationships among public bodies, private industry and local communities, although it remains challenging to administer and is not applied consistently across the country.⁷

B. The significance of Uttarakhand's biodiversity

Uttarakhand is a state in northern India endowed with rich biodiversity and an ecosystem that ranges from the plains up to the high-altitude Himalayas. It is home to a wide variety of species of flora and fauna of medical, agricultural and economic value. The state is regarded as a hotspot of plant resources, with many species of medicinal plants, herbs and trees that are of interest to pharmaceutical and biotechnology companies.⁸ This biological richness is a defining feature of the state's economy, underpinning tourism, agriculture and herbal medicine. The state is also

2014).

³ *Id.* arts. 5-7; Convention on Biological Diversity, *supra* note 1, arts. 8(j), 15.

⁴ Nagoya Protocol, *supra* note 2, arts. 6-7.

⁵ The Biological Diversity Act, 2002, No. 18 of 2003, Acts of Parliament, 2003 (India).

⁶ *Id.* ss. 3, 4, 8, 22.

⁷ The Biological Diversity Rules, 2004 (India); Guidelines on Access to Biological Resources and Associated Knowledge and Benefits Sharing Regulations, 2014 (India).

⁸ Convention on Biological Diversity, *supra* note 1, arts. 1, 8; Forest Survey of India, India State of Forest Report 2021 (MoEFCC, Gov't of India 2021).

central to the ABS framework because its ecological richness means that it holds a substantial portion of India's natural wealth. Uttarakhand illustrates how ABS mechanisms may create value from genetic resources without excluding the local communities who are their traditional custodians. The incorporation of local indigenous knowledge into ABS processes is particularly important in Uttarakhand, where communities have highly developed practices for resource management.⁹

Despite the elaborate legal and regulatory framework provided by the *Biological Diversity Act, 2002* and India's adherence to the Nagoya Protocol, the ABS process in Uttarakhand has been marred by challenges. One of the primary problems is the lack of adequate awareness and understanding of ABS regulations among local communities, particularly indigenous communities, and among the stakeholders involved in biodiversity preservation. This lack of awareness has led to difficulties with informed consent and with the fair sharing of benefits. Moreover, the state institutions implementing ABS are not as robust as they should be, and this weakens the position of the legal framework in securing the fair utilisation and preservation of genetic resources.¹⁰

This paper critically reviews the existing legal framework of ABS in Uttarakhand and identifies the key challenges facing stakeholders, including local communities, the government and private-sector actors. Legislation such as the *Biological Diversity Act, 2002* and related rules are examined in detail to demonstrate the gaps in policy, institutional capacity and implementation. The paper also considers how far a functioning ABS system can ensure that the benefits arising from the utilisation of Uttarakhand's genetic resources are equitably distributed among local communities, the state government and external parties.¹¹

In order to address these problems, the paper offers recommendations on how the existing legal framework may be strengthened, including how the relationship between national and local authorities may be improved, how stakeholder consultation may be deepened and how the guidelines on benefit-sharing mechanisms may be clarified. The paper thereby contributes to the wider discussion of ABS in India and offers policy recommendations to improve the ABS

⁹ Michael Heinrich et al., *Access and Benefit Sharing Under the Nagoya Protocol--Quo Vadis? Six Latin American Case Studies Assessing Opportunities and Risks*, 11 FRONTIERS IN PHARMACOLOGY 765 (2020), <https://doi.org/10.3389/fphar.2020.00765>.

¹⁰ *Comparative Study of India's Biological Diversity Act, 2002 and the CBD: Convergences and Divergences*, DE FACTO L.J. (2025), <https://defactolawjournal.org/papers/comparative-study-of-indias-biological-diversity-act-2002-and-the-convention-on-biological-diversity-cbd-convergences-and-divergences/>.

¹¹ Uttarakhand State Biodiversity Board, Uttarakhand Biological Diversity Rules, 2015 and Access and Benefit Sharing (ABS) Mechanism, <https://sbb.uk.gov.in/abs/> (last visited May 21, 2026).

process in Uttarakhand in a manner that reconciles biodiversity conservation with broader social benefit.¹²

II. INTERNATIONAL ACCESS AND BENEFIT SHARING: THE NAGOYA PROTOCOL

Prior to the Nagoya Protocol, access and benefit sharing (ABS) was fragmented and uneven across countries. This was because no binding international regime existed, which led to a lack of coordination and to the inequitable distribution of the benefits of genetic resources, often manifesting as biopiracy. In the first half of the 1990s, countries began to take the first steps in regulating ABS, but these measures were weak and lacked common standards. The Convention on Biological Diversity (CBD), adopted in 1992 at Rio de Janeiro during the Earth Summit, was one of the most significant precursors to the Nagoya Protocol.¹³ The CBD provided a comprehensive instrument for the conservation of biodiversity and the sustainable use of its components, including the fair distribution of benefits arising from the exploitation of genetic resources. However, the regulatory and legal systems needed to give full effect to these principles were not fully operational or implemented at the global level.¹⁴

In 2014, the Nagoya Protocol came into force, marking a significant change in the ABS system. It created legally binding commitments requiring States to establish national legislation to regulate access to genetic resources, to secure prior informed consent (PIC) from providers of genetic resources, and to give effect to mutually agreed terms (MAT) for benefit sharing. The Protocol also provides for the establishment of mechanisms to ensure transparency in ABS transactions and the equitable distribution of the benefits arising from the use of genetic resources, including the profits of biotechnological innovation. Since the adoption of the Nagoya Protocol, States have worked to align their national laws with its provisions. The Protocol has acted as a catalyst worldwide for fairness and equity in the use of biodiversity, particularly with respect to the rights of local and indigenous communities, who are the custodians of such resources.¹⁵

A. Comparative analysis of ABS frameworks in other countries

A number of countries have developed ABS systems on the basis of the Nagoya Protocol. A case in point is the ABS framework in Brazil, which is comprehensive in that it provides for the

¹² Pallavi Mishra, *The Biological Diversity (Amendment) Act, 2023: A Gateway to Sustainable Access?*, 27 ENVTL. L. REV. 31 (2025), <https://doi.org/10.1177/14614529251328784>.

¹³ Convention on Biological Diversity, Nagoya Protocol on Access and Benefit-Sharing, <https://www.cbd.int/abs/> (last visited May 21, 2026).

¹⁴ Convention on Biological Diversity, History and Background of Access and Benefit-Sharing (ABS), <https://www.cbd.int/abs/background/> (last visited May 21, 2026).

¹⁵ Convention on Biological Diversity, About the Nagoya Protocol, <https://www.cbd.int/abs/about/default.shtml> (last visited May 21, 2026).

participation of local and indigenous communities in ABS negotiations and recognises their rights over genetic resources and associated traditional knowledge.¹⁶ The Government of Brazil has developed a sound regulatory framework that includes a national registry of biodiversity products and services, which brings transparency to benefit sharing. Other jurisdictions have adopted a more explicitly community-based approach. In countries such as Kenya and South Africa, the legal framework accords greater priority to the community in managing biodiversity and resources, including traditional knowledge. This is intended to ensure that the benefits directly derived from these resources pass directly to local societies and that those societies have a means of defending their intellectual property on an equal footing.¹⁷

Other countries, such as Japan¹⁸ and Australia,¹⁹ have established specific guidelines governing the access of foreign parties to genetic resources, with particular emphasis on compliance with international law and on the effective negotiation and implementation of benefit-sharing arrangements. These countries have also worked to improve their internal systems of governance in order to prevent or discourage illegal bioprospecting, while making access to genetic resources more straightforward for scientists and corporations wishing to use them. These global trends reflect a rising tendency to integrate local community involvement and legal protection into national ABS systems, though the emphasis differs according to each country's priorities and legal traditions.

III. THE INDIAN ACCESS AND BENEFIT SHARING LEGAL FRAMEWORK

A. Examination of the Biological Diversity Act, 2002

India's commitment under the Nagoya Protocol is given effect through the *Biological Diversity Act, 2002* (BDA), the principal object of which is to provide a legal framework for the conservation, sustainable use and fair sharing of benefits of biodiversity. The Act establishes the National Biodiversity Authority (NBA) as the central body regulating access to genetic resources in India. The BDA requires any organisation wishing to use Indian biological resources or associated traditional knowledge to obtain the prior informed consent (PIC) of the

¹⁶ Henry Novion & Jorge Cabrera Medaglia, *Access, Benefit Sharing and Biodiversity Conservation in Brazil: An Assessment of the Current Regulatory Framework and Its Impacts* (CISDL 2023), <https://www.cisd.org/wp-content/uploads/2023/03/ABSinBrazilHenry-NovionJorgeCabreraMedaglia.pdf> (last visited May 23, 2026).

¹⁷ *Id.*

¹⁸ Ministry of the Environment, Government of Japan, *The ABS Guidelines: Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization*, <https://policies.env.go.jp/nature/biodiversity/abs/english.html> (last visited May 23, 2026).

¹⁹ Natural Resource Management Ministerial Council, *Nationally Consistent Approach for Access to and the Utilisation of Australia's Native Genetic and Biochemical Resources* (endorsed Oct. 11, 2002), <https://www.dcccew.gov.au/environment/biodiversity/publications/nationally-consistent-approach-access-and-utilisation-australias-native-genetic> (last visited May 23, 2026).

NBA or the relevant State Biodiversity Board (SBB), depending on the nature and origin of the resource.²⁰

B. Three-tier institutional structure

The Act further empowers the NBA and the SBBs to oversee the fair and equitable sharing of benefits generated from the use of genetic resources.²¹ This is achieved through a fair-compensation mechanism designed to ensure that a portion of the profits realised from biotechnological research and development using Indian genetic resources is reallocated to the local communities that provide them.²²

Consistent with the objectives of the Nagoya Protocol, the BDA further provides that all ABS agreements must be formalised through mutually agreed terms (MAT) between the resource user and the provider. Other provisions of the framework include the establishment of national- and state-level biodiversity funds to finance conservation initiatives, sustainable development projects and capacity-building programmes for local communities engaged in biodiversity management.²³

C. The role of the National Biodiversity Authority and State Biodiversity Boards in regulating ABS

Access and benefit sharing (ABS) represents the third pillar of the CBD, mandating that benefits derived from genetic resources be shared equitably with provider countries and with the local communities that have conserved those resources. India's ABS regime operates through a distinctive three-tier institutional structure, comprising the National Biodiversity Authority (NBA) at the central level, the State Biodiversity Boards (SBBs) at the state level, and the Biodiversity Management Committees (BMCs) at the local level.²⁴

Institution	Level	Role
National Biodiversity Authority (NBA)	National (Chennai)	Issues approvals for foreign access, bio-survey, commercial utilization, IP applications, third-party transfers under Section 3
State Biodiversity Boards (SBBs) / UT Biodiversity Councils	State/UT level	Approves commercial utilization by Indian entities under Section 7;

²⁰ The Biological Diversity Act, 2002, No. 18 of 2003, Acts of Parliament, 2003 (India), <https://www.indiacode.nic.in/handle/123456789/2046> (last visited May 23, 2026).

²¹ Press Information Bureau, Gov't of India, Biological Diversity Act, 2002 (explaining the mandate of Biodiversity Management Committees (BMCs) to prepare People's Biodiversity Registers (PBRs) and the role of local bodies such as Panchayats).

²² The Biological Diversity Act, 2002, No. 18 of 2003, s. 21 (India).

²³ *Id.*.

²⁴ National Biodiversity Authority, Biodiversity Management Committees and People's Biodiversity Registers Framework (under the Biological Diversity Act, 2002, No. 18 of 2003 (India)).

Institution	Level	Role
		disburses benefits
Biodiversity Management Committees (BMCs)	Local (Panchayat level)	Prepared People's Biodiversity Registers (PBRs) by BMCs under section 41 represent local communities in ABS negotiations; receive benefit-sharing

D. Legal and institutional framework

The *Biological Diversity Act, 2002* provides the statutory foundation for India's ABS regime. Its key provisions include the following.²⁵ Section 6 prohibits any application for intellectual property rights (IPR) in respect of inventions based on Indian biological resources without NBA approval. Section 7 requires Indian persons to give prior intimation to the SBBs before obtaining biological resources for commercial utilisation. Section 19 mandates NBA approval for foreigners, non-resident Indians (NRIs) and foreign-controlled entities seeking to access Indian biological resources. Section 21 empowers the NBA to determine equitable benefit-sharing terms. Section 22 provides for the establishment of State Biodiversity Boards. Section 27 requires that ABS amounts be channelled back to the identified beneficiaries, and Section 32 provides for a National Biodiversity Fund for conservation activities.

The BDA derives its constitutional authority from several provisions.²⁶ Article 51A(g) of the INDIA CONST. imposes a fundamental duty to protect and improve the natural environment; Article 48A is a Directive Principle requiring the State to protect the environment; and Article 21, the right to life, has been read to include the right to a healthy environment. The Seventh Schedule further supports state and central competence over the subject matter through the Concurrent List (List III), Entry 17A (Forests) and Entry 17B (Protection of wild animals and birds).

²⁵ The Biological Diversity Act, 2002, No. 18 of 2003, ss. 6, 7, 19, 21, 22, 27, 32 & 41 (India).

²⁶ INDIA CONST. arts. 21, 48A, 51A(g); *id.* sched. VII, List III, entries 17A & 17B.

E. Core ABS-related functions

The NBA's primary ABS function is to regulate access to biological resources by foreign citizens, non-resident Indians (NRIs), bodies corporate not incorporated in India, and Indian-registered companies with foreign participation in their capital or management. These entities cannot access biological resources or associated knowledge for research, commercial use, bio-survey or bio-utilisation without prior approval from the NBA.²⁷ At the national level, the NBA plays a significant role in the management of ABS by processing applications for access to genetic resources and by ensuring that the national and international laws protecting biodiversity are not violated. The NBA's mandate is to secure the equitable distribution of the benefits accruing from the use of genetic resources, to settle disputes, and to ensure that projects involving the use of biodiversity comply with the requirements of the *Biological Diversity Act, 2002*.²⁸

At the state level, the State Biodiversity Boards (SBBs) are responsible for implementing the BDA and for giving effect to ABS processes locally. They work with local communities, particularly those in biodiversity hotspots, to raise awareness of the communities' rights and to secure their participation in the process of accessing and using their genetic resources.²⁹ The NBA and the SBBs have, however, experienced difficulties arising from scarce resources, weak coordination and limited local implementation capacity, all of which obstruct the effective governance of ABS. Strengthening the involvement of local communities and stakeholders in decision-making is therefore a matter of considerable importance.³⁰

²⁷ The Biological Diversity Act, 2002, No. 18 of 2003, ss. 3, 4 & 19 (India); Convention on Biological Diversity, *supra* note 1; Nagoya Protocol, *supra* note 2.

²⁸ The Biological Diversity Act, 2002, No. 18 of 2003, ss. 18, 19, 20, 21 & 50 (India).

²⁹ The Biological Diversity Act, 2002, No. 18 of 2003, ss. 7, 22 & 23 (India).

³⁰ The Biological Diversity Act, 2002, No. 18 of 2003, ss. 8, 18, 23 & 41 (India).

F. Key provisions on access and benefit sharing

The Convention on Biological Diversity (1992) established the foundational principles of ABS.³¹ The CBD set out these principles through three core provisions.³² The Nagoya Protocol on ABS (2010) serves as a supplementary agreement to the CBD, providing a legally binding international instrument that operationalises ABS implementation.³³ Article 5 of the Protocol, on fair and equitable benefit sharing, provides that benefits from the utilisation of genetic resources must be shared with the providing Party; that this coverage extends to benefits from subsequent applications and commercialisation; and that implementation occurs through mutually agreed terms (MAT) established between the user and the provider.³⁴ Article 6, on access to genetic resources, requires the establishment of legal requirements for access, mandates the issuance of prior informed consent (PIC) before access, and ensures clarity and predictability for both providers and users.³⁵

Principle	Article	Description
National Sovereignty	Article 15(1)	States have sovereign rights over their own genetic resources.
Access Conditionality	Article 15(5)	Access provided subject to prior informed consent of Contracting Party.
Benefit-Sharing Obligation	Article 15(7)	Benefits shared fairly and equitably on mutually agreed terms.

Under the BDA, provision is made for the establishment of an Access and Benefit Sharing Fund (ABSF), which is intended to direct the benefits arising from the use of genetic resources in India towards biodiversity conservation and sustainable development projects. The ABSF is designed to ensure that the benefits of commercialising genetic resources, such as those used in the pharmaceutical and biotechnology industries, are fairly shared with the local communities and indigenous individuals who provide those resources.³⁶

The key provisions of the Act are focused on equity in ABS dealings, compliance with international agreements and the introduction of a regulatory framework to prevent the unlawful harvesting and use of genetic material. The effectiveness of the ABSF has nevertheless been questioned, owing to administrative inefficiency and to difficulties in ensuring that funds reach

³¹ Convention on Biological Diversity, *supra* note 1 (opened for signature June 5, 1992, at Rio de Janeiro; entered into force Dec. 29, 1993).

³² Convention on Biological Diversity, *supra* note 1, art. 15(1), (5) & (7).

³³ Nagoya Protocol, *supra* note 2 (adopted Oct. 29, 2010, at Nagoya; entered into force Oct. 12, 2014).

³⁴ Nagoya Protocol, *supra* note 2, art. 5.

³⁵ *Id.* art. 6.

³⁶ The Biological Diversity Act, 2002, No. 18 of 2003, ss. 21, 27, 44 & 45 (India).

the communities they are intended to benefit. The ABSF would require greater supervision and accountability if it is to ensure that the returns from ABS are felt at the grassroots.³⁷ In sum, notwithstanding the established legal framework for ABS, the implementation of the Nagoya Protocol in India continues to be hampered by problems of enforcement, stakeholder participation and transparency. A careful assessment and restructuring of the framework should be carried out to improve its operation and to deliver the equitable sharing of the proceeds of India's rich biodiversity.³⁸

IV. THE BIODIVERSITY AND GENETIC RESOURCES OF UTTARAKHAND

Uttarakhand, a mountainous state in the north-western Himalayas of India, stands as one of the world's most biologically rich regions. Although the state occupies only about 1.6 per cent of India's total geographical area, it harbours a disproportionately large share of the country's recorded species. This extraordinary concentration of biodiversity makes Uttarakhand a critical repository of biological and genetic resources not only for India but for the global community.³⁹

Important genetic resources present in Uttarakhand and of interest to access and benefit sharing (ABS) systems include species such as *Withania somnifera* (ashwagandha), *Valeriana jatamansi* (Indian valerian), *Swertia chirayita* (chirayita), and species of *Berberis*, *Rheum* and *Picrorhiza*. These plants are used in traditional medicine, and their bioactive compounds are the subject of investigation on account of their medicinal value. Endangered wildlife species in the state include the Himalayan musk deer, the tiger and the Asiatic black bear, whose genetic resources are of importance in conservation and biotechnological research.⁴⁰

A. Biodiversity regulation and practice in the state

Uttarakhand has adopted rules and regulations, in line with the broader regulatory framework of India, to achieve the sustainable use of its biodiversity and the equitable distribution of the benefits arising from it. The state's legal framework on ABS is governed by the *Biological Diversity Act, 2002* together with the specific rules developed by the Uttarakhand State Biodiversity Board (SBB). It is the role of the Uttarakhand SBB to enforce the provisions of the *Biological Diversity Act, 2002*, in particular by controlling access to genetic resources and

³⁷ The Biological Diversity Act, 2002, No. 18 of 2003, ss. 15, 32 & 45 (India).

³⁸ Nagoya Protocol, *supra* note 2, arts. 5, 6, 12 & 13.

³⁹ Uttarakhand State Biodiversity Board, About Uttarakhand: Biodiversity Profile of Uttarakhand, <https://sbb.uk.gov.in/about-department/about-uttarakhand/> (last visited May 26, 2026).

⁴⁰ R.S. Rawal & U. Dhar, Biodiversity of the Indian Himalaya: Conservation and Utilization (G.B. Pant Inst. of Himalayan Env't & Dev., Almora).

by ensuring that any use is consistent with the principles of prior informed consent (PIC) and mutually agreed terms (MAT).⁴¹

These rules are state-specific and are directed towards the preservation of the state's biodiversity, including its medicinal plants and wildlife, and they set out the procedure for obtaining permits to access genetic resources. They stipulate that any bioprospecting within the state must be undertaken in consultation with local communities and must include provisions for sharing the benefits derived from the resources. The SBB is responsible for overseeing and regulating ABS activities so as to ensure that stakeholders comply with the regulations and that the benefits arising from the use of genetic resources are equitably shared.⁴²

B. The role of the State Biodiversity Board of Uttarakhand in monitoring and regulating ABS

The Uttarakhand State Biodiversity Board (SBB) is crucial to the effective enforcement of ABS regulations. The SBB is charged with managing the sustainable utilisation of the state's genetic resources, granting permits for research, and enforcing the *Biological Diversity Act, 2002*. It collaborates with local communities, non-governmental organisations, research organisations and industry in order to help them understand their roles within the ABS system. In addition to overseeing ABS activities, the SBB is tasked with maintaining a register of genetic resources accessed within the state, so as to make the process transparent. The Board also makes capacity-building programmes available to local communities and stakeholders so that they understand their rights and responsibilities in relation to the use of genetic resources. Through awareness campaigns and training on the relevance of ABS, the SBB seeks to encourage a more inclusive and participatory approach to biodiversity conservation.⁴³ The SBB plays a particularly important role in Uttarakhand because the state is home to many indigenous communities whose traditional knowledge is essential to the conservation and sustainable use of genetic resources. The participation of these communities in the work of the Board serves to safeguard their rights over their biodiversity and traditional knowledge and to ensure that they enjoy the benefits of the use of these resources.⁴⁴

⁴¹ Nagoya Protocol, *supra* note 2, arts. 5, 6, 7 & 12.

⁴² Uttarakhand State Biodiversity Board, Biodiversity Management Committees (BMCs) and People's Biodiversity Registers (PBRs) Framework.

⁴³ T.K. Sreedharan, *Access and Benefit Sharing in India: Enforcement and Capacity Building Issues*, J. ENVTL. L. & POL'Y (2018).

⁴⁴ *Id.*

V. OBSTACLES TO THE SUCCESSFUL IMPLEMENTATION OF ABS IN UTTARAKHAND

A. Awareness and capacity building

One of the major obstacles to the effective implementation of the access and benefit sharing (ABS) framework in Uttarakhand is the lack of education and awareness of ABS regulations, especially at the grassroots. Most local communities, particularly the indigenous communities that preserve the state's rich biodiversity, are typically unaware of the ABS framework and of their rights and duties within it. This lack of awareness prevents them from participating in the ABS process and from negotiating fair terms for the use of their genetic resources and traditional knowledge.⁴⁵ The communities concerned may not realise that their resources are being accessed or misused, and are therefore in no position to defend their interests or to obtain fair compensation. Beyond the local communities, many stakeholders, including government officials, researchers and industry, also lack full knowledge of ABS regulations and procedures. Government officials in particular are often not trained to monitor and enforce ABS mechanisms, resulting in inefficient implementation and higher rates of non-compliance with the legal framework. There is therefore an urgent need for capacity-building programmes to inform local communities, government bodies, researchers and businesses about ABS regulations. Such programmes should aim to improve stakeholders' understanding of their roles, responsibilities and the benefits they may receive by engaging with ABS frameworks. These efforts should include cooperation with local NGOs, environmental organisations and universities so that all interested parties are engaged and acquire the knowledge required to contribute to the ABS process.⁴⁶

B. Regulatory and institutional problems

A number of institutional obstacles affect the application of ABS regulations in Uttarakhand, including a lack of coordination among the various agencies and stakeholders involved in the management of biodiversity and the fragmentation of jurisdiction. The regulatory system tends to be distributed across various levels of government and among numerous bodies, such as the Uttarakhand State Biodiversity Board (SBB), the National Biodiversity Authority (NBA), local

⁴⁵ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Access and Benefit Sharing (ABS) Partnership Project, Indo-German Biodiversity Programme (2022), <http://indo-germanbiodiversity.com/pdf/publication/publication24-05-2022-1653388066.pdf>.

⁴⁶ C.A. Reddy, Challenges in Implementing ABS Mechanism: Indian Experience, Presentation at the IAC Meeting on Capacity Building for Implementation of the Nagoya Protocol, Montreal, Canada (Sept. 15-17, 2015), Convention on Biological Diversity, <https://www.cbd.int/doc/meetings/abs/absbiac-2015-01/other/absbiac-2015-01-presentation-india-en.pdf>.

forest departments and other regulatory organisations. This division can cause confusion, inefficiency and delay in the processing of ABS permits and agreements. Moreover, the institutional capacity of these agencies, especially at the state level, is weak. They are frequently understaffed and under-equipped, and thus find it difficult to monitor compliance with ABS regulations, to track how genetic resources are used, and to ensure that benefit-sharing agreements are properly enforced.⁴⁷ The SBB, as the regulator of ABS in the state, is further challenged by the large and geographically varied terrain of Uttarakhand. Without sufficient personnel or financial resources, there is little opportunity to manage access to genetic resources or to address the conflicts that may arise from their use. In addition to the lack of coordination among regulatory authorities, local communities and stakeholders are usually not sufficiently involved in decision-making. This disconnection between regulators and the individuals whose resources are being accessed may result in mistrust and in a failure to comply with ABS laws. In order to address these institutional problems, it is important to strengthen coordination among the different agencies involved in the regulation of ABS. Establishing a more centralised governance structure for ABS may streamline the process and ensure that the regulations are applied consistently throughout the state.⁴⁸

C. Inefficiencies in monitoring and enforcement mechanisms

The proper monitoring and enforcement of ABS regulations are critical to securing lawful access to genetic resources and the equitable sharing of benefits. Uttarakhand, however, faces a significant problem of inefficiency in its monitoring and enforcement systems. A key difficulty is the absence of a comprehensive monitoring regime capable of tracking the utilisation of genetic resources, especially in remote or ecologically sensitive regions. The lack of tracking systems means that, in many cases, illegal bioprospecting activities go undetected and the benefits associated with the use of genetic resources are not transferred to local communities as the law prescribes.⁴⁹ Penalties for non-compliance with ABS regulations are also ineffective. Even where illegal activities are detected, there are few consequences for breaching the conditions of ABS agreements, including the failure to share benefits. Ineffective enforcement of the ABS regime undermines its legitimacy and offers stakeholders little incentive to engage with it, since compliance with the legal obligations is not seen to be worthwhile. To improve

⁴⁷ Press Information Bureau, Gov't of India, State Biodiversity Boards and Union Territory Biodiversity Councils in FY 2025-26, Press Release (Feb. 10, 2026), <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2226567> (last visited May 26, 2026).

⁴⁸ *Id.*

⁴⁹ Robert F. Service, *Amendments to Indian Biodiversity Laws Could Open Doors to Exploitation*, SCIENCE (Aug. 10, 2023), <https://www.science.org/content/article/amendments-indian-biodiversity-laws-could-open-doors-exploitation> (last visited May 26, 2026).

the efficiency of ABS implementation in Uttarakhand, it is necessary to strengthen monitoring systems, to reinforce penalties for non-compliance, and to promote greater transparency in the use of genetic resources.⁵⁰

D. Complications of benefit sharing

Designing equitable and fair benefit-sharing arrangements is one of the most difficult tasks in the implementation of ABS in Uttarakhand. Benefit sharing concerns the division, among all interested parties, of the financial or non-financial benefits obtained from the use of genetic resources. It is, however, highly complex to design models of benefit sharing that are transparent, fair and acceptable to all parties.⁵¹

In Uttarakhand, the difficulty of defining what may be regarded as fair and equitable sharing is compounded by the diversity of stakeholders. These include local communities, indigenous peoples, private industry (such as pharmaceutical and biotechnology companies), research institutions and government agencies. These stakeholders may have differing expectations, priorities and interests, which makes the negotiation of benefit-sharing agreements more complicated. For example, local communities may prioritise social and environmental benefits, such as improved healthcare, whereas industry may be interested in financial compensation or research opportunities.⁵²

Moreover, the distribution of benefits may become more complex where resources are shared among several communities or regions. This is especially so in Uttarakhand, where areas of rich biodiversity are often spread across several districts and the extraction of genetic resources may affect multiple communities. It thus becomes very difficult to design a transparent system for distributing benefits fairly, since different communities may assert claims to the same resources and may hold divergent views on how the benefits should be distributed.⁵³

A further difficulty concerns the distinction between short-term and long-term benefits. Although short-term financial incentives are likely to appeal to industry, local communities generally prefer lasting and sustainable advantages, including capacity-building programmes, improved access to healthcare services and conservation efforts. The best way to bridge these

⁵⁰ ABS Biotrade, Progress Report 2019: ABS Capacity Development Initiative (2019).

⁵¹ Uttarakhand State Biodiversity Board, Science-Policy Interface Focussing on Access & Benefit Sharing (ABS) and Trans-boundary Issues (Dehradun 2025), <https://sbb.uk.gov.in/publication/science-policy-interface-focussing-on-access-benefit-sharing-abs-and-trans-boundary-issues/> (last visited May 26, 2026).

⁵² *Id.*.

⁵³ *Divya Pharmacy v. Union of India*, 2018 SCC OnLine Utt 1035 (India).

differing interests is to establish a well-organised, transparent and flexible mechanism of benefit sharing capable of accommodating different needs and priorities.⁵⁴

E. Problems of sharing benefits among multiple stakeholders

The division of benefits among various stakeholders creates additional complications, especially where the current legal framework provides little clarity on how the benefits are to be distributed. The presence of different stakeholders, such as local communities, government and privately owned industry, makes it difficult to determine what constitutes a fair distribution. Different stakeholders may hold different expectations as to how benefits should be structured: an industry may seek monetary benefit from a project, whereas a local community may seek community development projects or other benefits, such as healthcare or education.⁵⁵

Benefit distribution is also a complex process that can give rise to disagreement among stakeholders, especially where benefits are not delivered in a timely manner or are perceived to be distributed unfairly. Some may feel marginalised or excluded from the benefits derived from the use of their resources, while others may consider that the benefits do not justify the environmental or social cost incurred. These difficulties may be aggravated by a lack of transparency and open communication among the stakeholders.⁵⁶

In order to overcome these challenges, it is important to develop a common, transparent and inclusive benefit-sharing mechanism. Stakeholders should be involved from the initial stage of the ABS process, and the terms of benefit-sharing agreements should be clearly defined so as to prevent misunderstanding or conflict. The creation of an independent monitoring body would further facilitate the fair distribution of benefits and the observance of agreements.

In sum, the obstacles to the successful implementation of ABS in Uttarakhand are multifaceted and can be traced to limited awareness, weak institutional capacity and the complexity of benefit-sharing arrangements. Overcoming these challenges requires a holistic approach, encompassing capacity building, the reinforcement of enforcement mechanisms, and the development of more transparent and fair benefit-sharing models.⁵⁷

⁵⁴ *Id.*

⁵⁵ Sankalpa Gramin Vikas Sansthan, Transforming Livelihood of Forest Communities in Uttarakhand (Dehradun 2024), <https://sankala.org/wp-content/uploads/2025/01/Livelihood-Uttarakhand-Report-2024-PDF.pdf> (last visited May 26, 2026).

⁵⁶ *Id.* at 17.

⁵⁷ C.A. Reddy, Challenges in Implementing ABS Mechanism: Indian Experience, Presentation at the IAC Meeting on Capacity Building for Implementation of the Nagoya Protocol, Montreal, Canada (Sept. 15-17, 2015), Convention on Biological Diversity, <https://www.cbd.int/doc/meetings/abs/abscbiac-2015-01/other/abscbiac-2015-01-presentation-india-en.pdf> (last visited May 26, 2026).

F. Community-based management of genetic resources

Community-based management of genetic resources is one of the most promising means of enhancing the process of access and benefit sharing (ABS) in Uttarakhand. Indigenous communities have traditionally been the custodians of the state's rich biodiversity, and enabling them to play an active role in the management and use of these resources can produce more sustainable and equitable outcomes. Community-led management would place the interests of those who have direct access to, and knowledge of, genetic resources at the centre of decision-making. This would not only make biodiversity conservation more effective but also strengthen the social fabric of these communities by giving them a stake in the utilisation of their resources. Such models of community-based benefit sharing have been effectively adopted in other regions of the world, where local communities have shared in the profits made from the use of their genetic resources. These models may be adapted in Uttarakhand, especially in areas where local communities maintain a close association between traditional knowledge and biodiversity. They typically involve the development of local institutions, such as community-based organisations or cooperatives, that enter into ABS agreements with external parties. These institutions can act as intermediaries to ensure that the benefits of ABS arrangements are equitably shared and that local communities are not disadvantaged. Communities may thereby receive not only monetary benefits but also non-monetary benefits, such as capacity-building programmes, healthcare services and sustainable livelihood opportunities. In addition, the incorporation of traditional ecological knowledge (TEK) into the ABS process may enhance the value of these resources and ensure that communities are properly rewarded and credited for their contributions. A community-based model of this kind would foster a more inclusive and equitable ABS structure in Uttarakhand. To implement ABS effectively in the state, it is essential to strengthen the prevailing legal and institutional framework.⁵⁸

VI. CONCLUSION

This paper has examined the obstacles and prospects facing Uttarakhand in adopting the access and benefit sharing (ABS) framework of the *Biological Diversity Act, 2002*. The state's high biodiversity, especially its flora and fauna, is of great significance for both conservation and economic development. The implementation of ABS has nevertheless been delayed by a number of important problems, including insufficient awareness among local communities and stakeholders, the fragmentation of institutional frameworks, and the ineffectiveness of enforcement mechanisms. The absence of a smooth and coordinated process among national,

⁵⁸ Sankalpa Gramin Vikas Sansthan, *supra* note 56.

state and local authorities has complicated the equitable sharing of the benefits arising from the use of genetic resources. The complexity of benefit-sharing agreements, especially where more than two stakeholders are involved, is a further major challenge.

Alongside these difficulties, however, certain opportunities may be identified. The experience of other Indian states, such as Kerala and Sikkim, suggests that community-driven models, a transparent legal system and the participation of local communities in the process contribute to the better implementation of ABS. In addition, the success of ABS in Uttarakhand depends on the recognition and protection of traditional knowledge, so that indigenous communities are fairly rewarded for their contribution.

To address the challenges identified in this paper, several recommendations may be made for strengthening the ABS framework in Uttarakhand. First, policy reforms are urgently needed to make the procedures of prior informed consent (PIC) and mutually agreed terms (MAT) more transparent and to establish clearer benefit-sharing procedures. Second, there should be greater coordination among the various regulatory bodies, such as the Uttarakhand State Biodiversity Board (SBB), the National Biodiversity Authority (NBA) and the local communities, in order to make the ABS system more coherent and efficient. This coordination should be reinforced by establishing a centralised platform for conducting ABS transactions, so as to ease communication among stakeholders at the national, state and local levels. Third, capacity-building initiatives should be enhanced in order to raise the awareness of local communities, researchers, businesses and government officials regarding ABS regulations. Such programmes should aim to educate indigenous communities and to inform them of their rights and of the potential advantages of engaging with ABS structures. NGOs and locally based organisations can be of great assistance in delivering such training and in developing dialogue between communities and the wider world.
