GENDERAND GENETIC RESOURCES: JUXTAPOSING FOR JUSTICE AND EQUALITYUNDER ACCESS AND BENEFIT SHARING LEGAL SYSTEM IN INDIA

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Abstract

Since the emergence of human societies and family systems, men and women have safeguarded nature and natural resources essential for community livelihoods. Within Indigenous and other communities, both genders play vital role in preserving local genetic resources and associated traditional knowledge, demonstrating extensive expertise in domestic and wild plants, horticulture, agricultural practices, and bio-cultural customs. Their cultural and spiritual connections to forests and biodiversity are evident in rituals venerating water, soil, plants, and wildlife as sacred entities. In comparison to males, female's deeper engagement with forests, land, and agriculture underpins the life, livelihood, and lifestyle of families and societies. Despite promoting conservation and sustainable resource use for decades, feminist engagement and participation in benefit-sharing arrangements remain underappreciated. This article examines the existing access and benefit-sharing system for justice and equality from a gender perspective while protecting genetic resources and associated traditional knowledge in India.

Keywords: *Gender, Genetic Resource, Traditional Knowledge, Access and Benefit Sharing, Biodiversity Law and Policy.*

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I. Introduction

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THROUGHOUT HISTORY, both men and women have played an essential role in protecting and nurturing nature and its resources for the consumption and occupations of their communities and countries.[1] However, their knowledge regarding biodiversity conservation and management is different due to different attitudes, roles, and responsibilities allocated to them. Also, women are more engaged in exploitation and experiment with agricultural and horticulture practices than men.[2] Their roles have evolved ever since men started to migrate to urban areas, and the burden of food production fell on women. Gender relations play important role in biodiversity conservation. Women and nature both, support life and protect livelihoods.[3]Their livelihoods in turn support the family welfare.[4]Generally, in the division of labour between men and women, monotonous, time-consuming activities are often distributed to women.[5]Women, especially in indigenous and local communities, depend heavily on genetic resources and the associated traditional knowledge which is shaped by their distinct languages, customs, and cultural practices.[6]It is admitted that "women play a vital role in maintaining and protecting local genetic resources and hold extensive knowledge of domestic and wild plants, agricultural practices, local species, and animals to sustain their livelihoods, communities, and traditional territories."[7] Gender has always been an important part of environmental justice, even though it wasnotproperly recognized. It has become even more essential to address this in future frameworks.[8] Hence, it is necessary to examine the gender-specific role, knowledge, management strategies, and activities relating to access and benefits sharing of the genetic resources and associated traditional knowledge under the Access and Benefit Sharing (ABS) System in India.

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[1] Convention on Biological Diversity, "Biodiversity, Gender and Climate Change" (2011), *available at*: https://www.cbd.int/climate/doc/biodiversity-gender-climate-change-en.pdf(last visited onJuly 30, 2025).

[2]Prasanna Samal and Pitamber Dayani, "Gender in Management of Indigenous Knowledge: Reflections from Indian Cultural Himalaya," 19, *Current Science,* 104–108 (2006).

[3] Luca Valera, "Françoise d'Eaubonne and Ecofeminism: Rediscovering the Link between Women and Nature" in D.A. Vakoch, M. Sam (eds.), *Women and Nature? Beyond Dualism in Gender, Body, and Environment,* 10 (Routledge, Oxon, 2018).

[4] P.L. Howard-Borjas and W. Cuijpers, "Gender Relations in Local Plant Genetic Resource Management and Conservation," 14,*Encyclopedia for Life Support Systems: Biotechnology,4* (2002).

[5]*Supra* note 2.

[6] International Centre for Integrated Mountain Development (ICIMOD), "Gender Perspective in Mountain Development: New Challenges and Innovative Approaches," 57, *Sustainable Mountain Development,*16 (2010).

[7]*Ibid.*

[8] Julie Sze, "Gender and Environmental Justice" in Sherilyn MacGregor (ed.), *Routledge Handbook of Gender and Environment* 159–168 (Routledge, London, 2017).

Despite the recognition of gender-specific role in biodiversity conservation at international level, particularly under the Convention on Biological Diversity and the Nagoya Protocol, its integration under Access and Benefit Sharing (ABS) frameworks of India remains limited. These frameworks do not address structural inequalities that affect women's participation and access to benefits. In view of this, this article evaluates Indian ABS regime through international obligations such as CBD and Nagoya Protocol, constitutional equality under Articles 14, 15 and 21 and through 73rd and 74th Amendment. The authors have preferred a doctrinal study with a deductive method for writing this article.Primary sources referred includes national and international legal instruments, rules and guidelines. Secondary resources such as books, articles, journals, and reports have also been referred. Thisarticleincludes analytical black letter approach toexamine the existing access and benefit sharing system with a gender perspective. Itadvocatesfordue recognition of contributions and responsibilities of womenaddressing justice and equalityduring protection of the genetic resources and associated traditional knowledge. The article argues that although India has developed a comprehensive legal framework for ABS, it does not adequately incorporate gender-specific considerations. For legal inquiry,this article is structured in five parts, including an introduction and a conclusion. The central parts include the subject matter of genetic resources with physical diversity and utilityin India; the intersection of gender and genetic resources for its conservation and management in India; and the gender-specific role in the ABS regime in India. This article seeks to contribute in existing feminist legal scholarships by juxtaposing the gender and genetic resources for justice and equality in emerging ABS legal system under biodiversity law in India.

II. Genetic Resources and India: Physical Status and Diversity within Biological Realms

Genetic diversity is decisive in improving a country's economic, social, and ecological development. India's climatic, soil, geological, and other conditions make it habitable for diverse ethnic-cultural groups and support various plant species, animals, crops, and other genetic resources. All genders including women have played an essential role in conserving and managing these diverse genetic resources in India. Indian legal instruments also recognize their role in this regard, and further advocate for equitable access and benefit sharing of genetic resources to both men and women on the basis of ownership, custodianship, and partnership. In this context, it is important to know the status of genetic resources in India. It has been already reported that "India is one of the 12 mega-biodiversity

countries of the world. With only 2.5% of the land area, it accounts for 8% of the world's recorded species, including millions of races, subspecies, and local species variants."[9] India is also very rich in genetic diversity due to its unique geographical location, climate situations, and diverse ecosystems. India lies at the crossroads of three major biological realms as indicated: "Indio-Malayan, Euro-Asian, and Afro-Tropical adorned with ten distinct biogeographic zones and twenty-six biotic provinces, many of which are nestled in the ecologically rich Hindu-Kush Himalayan region."[10]India hosts around 45,000 plant species, making up nearly 11% of the world's flora. This includes about "17,500 species of flowering plants, 48 gymnosperms, 1,200 pteridophytes, 1,980 mosses, 845 liverworts, 6,500 algae, 2,050 lichens, 14,500 fungi, and 850 bacterial species".[11]India is home to an estimated 89,450 animal species, which include "372 species of mammals, 1,230 species of birds, 428 species of reptiles, over 300 species of amphibians, and 500 species of molluscs".[12]Today, India recognizes and uses "about 166 crop species and well over 324 species of wild relatives of crop plants" for food production.[13]In India, wild edible plants make up nearly 1,000 species. These include "145 used as roots or tubers, 526 as vegetables or greens, 101 for buds and flowers, 647 for fruits, and 18 for seeds and nuts" used for various purposes.[14]India's cultural and ethnic richness includes "over 550 tribal communities belonging to 227 ethnic groups, spread across 5,000 villages."[15]These communities have traditionally safeguarded biodiversity, protected plant varieties, and passed down valuable ecological knowledge.Across the country, "more than 50,000 sacred groves" have been identified. These groves serve as vital habitats for numerous species of flora and fauna.[16]Various landscapes have been recognized as "pilgrimage sites', 'areas of taboo', 'sacred groves', and 'sacred

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[9] K. Venkataraman, "Access and Benefit Sharing and Biological Diversity Act of India: A Progress Report" 10(3) *Asian Biotechnology &Devlopment Review,* 69 (2010).

[10]*Ibid.,* 70.

[11] K. Venkataraman, "India's Biodiversity Act, 2002 and Its Role in Conservation" 50 (1) *Tropical Ecology,* 23-30 (2009).

[12]*Ibid.*

[13]*Id.*

[14]*Id.*

[15] K. Venkatraman, "Conservation of Forest Diversity in India" (*Proceedings of the National Conference on Forest Diversity: Earth Living Treasures*, 20 May 2013), *availableat*: https://www.upsbdb.org/pdf/Souvenir2011/1.pdf (last visited on 30 July 2025).

[16] Manohar Khadhka and Ritu Verma (eds.), *Gender and Biodiversity Management in the Greater Himalayas: Towards Equitable Mountain Development* (International Centre for Integrated Mountain Development, Kathmandu, 2012).

sites."[17] One such example is Mount Kailash, a sacred site, which has around 20 religiously protected plant species.[18]A strong link between nature and culture is evident in India's diverse landscapes, where ecological richness is closely tied to traditional beliefs and practices.

India's physical features and climate have created a wide range of ecological habitats. These include forests, wetlands, mangroves, islands, coral reefs, and marine, mountain, and desert ecosystems. Such diverse landscapes support rich genetic diversity. Alongside this, India has a deep-rooted tradition of conserving and sustainably using genetic resources. Many communities worship trees, forests, rivers, ponds, and mountains. Animals and birds are often linked to gods and goddesses, showing how nature is woven into cultural life. India's cultural and ethnic diversity also plays a vital role in conservation. According to the 2011 Census of India, the population classified as Scheduled Tribes, commonly referred to as Adivasis, "consisting of approximately 104 million, representing about 8.6% of the national population."[19]In the northeastern states, over 54% of the population, especially in hill areas, belongs to tribal communities.[20] They have long contributed to conserving genetic diversity in crops like coir, jute, sugarcane, rice, soybean, maize and various beans. These communities follow cultural and spiritual beliefs that assign specific roles and duties for managing natural resources. Their knowledge has been passed down for generations and continues to guide traditional ecological practices. From a gender perspective, women and men play important roles in conserving genetic resources and protecting traditional knowledge. However, feminist engagement and contribution need greater recognition in India's laws and policies, appreciating their unique role and responsibility in biodiversity conservation and management in India.

III. Gender and Genetic Resources: Role and Responsibility for Biodiversity Conservation and Management in India

[17]Danica M. Anderson, Jan Salick, *et. al. "*Conserving the Sacred Medicine Mountains: A Vegetation Analysis of Tibetan Sacred Sites in Northwest Yunnan"14 *Biodiversity and Conservation,*3065–3091 (2005).

[18]International Centre for Integrated Mountain Development, *Kailash Sacred Landscape Conservation Initiative: Feasibility Assessment Report* (July, 2011); *availableat*: https://lib.icimod.org/records/32paf-d9r47.pdf(last visited on July 31, 2025).

[19]Office of the Registrar General & Census Commissioner, *Census of India 2011: Primary Census Abstract for Total Population* (Government of India, 2011), *available at*: https://censusindia.gov.in/nada/index.php/catalog/42579 (last visited on July 31, 2025).

[20]*Ibid.*

Although both gender men and women, take part in conserving and managing genetic resources and associated traditional knowledge, the degree and frequency of their engagement varies in diverse societies and communities. In agricultural activities, the gender-based division of labor has been attributed to different knowledge and conservation practices. Based on gender and age, "the use and extent of traditional knowledge varies, with women often possessing deeper reservoirs of ecological know-how."[21]Empirical studies in Uttaranchal confirm that "women hold more extensive indigenous practices, spanning rain-fed agriculture to medicinal healthcare, rendering their knowledge both ecologically practicable and economically viable."[22]Women are conserving a wide range of agricultural crops, seeds, genetic resources, forests, animals, and water springs. They do not act only for household needs, but also for social, cultural, economic, and environmental reasons.[23]Women share a unique and close relationship with biodiversity which makes their role in biodiversity conservation especially important and active.[24]On the other hand, men are generally engaged in off-farm and cash-based activities.[25] These include contract work, wage labour, formal employment, and occupations that often require migration to other regions. Women are more dependent on local biodiversity rich in nutritional and medicinal value for household food and the physical health issues of their families. Women inculcate the love for Nature in their children through folklore or oral traditions, which signify the worship of trees, herbs, animals, rivers, and mountains as gods and goddesses. Not only that, they also have a strong cultural and spiritual connotation with biodiversity.

Women have knowledge regarding seed selection, processing, and storage maintenance of a diverse pool of genetic resources.[26]These preferences reflect the different social roles and responsibilities assigned to men and women in Indian society. Additionally, as many men migrate to urban areas or abroad for work, women are increasingly taking on greater

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[21] J. Gurung, "Gender Dimension of Biodiversity Management: Cases from Bhutan and Nepal" 31 *Sustainable Mountain Development,* 6–7 (1998).

[22]*Supra* note 2.

[23]*Ibid.*

[24] Tara Devi Dhakal, Brigitte Leduc, "Women Role in Biodiversity Management in Himalayas," 57 *Sustainable Mountain Development,* 16-17 (2010).

[25] United Nations Development Programme and Food and Agriculture Organization, "Gender and Biodiversity Management in India: Examples of Successful Initiatives in Agriculture and Rural Development in the South (2001)"*available at:* http://www.ssc.undp.org/uploads/media.gender.pdf (last visited on July 30, 2025).

[26] *Ibid.*

responsibility in agricultural production and biodiversity management.[27] It has been well observed that "Another woman's task tied closely to biodiversity is collecting medicinal plants, larvae, eggs, and birds' nests from the forests. Women also take charge of many agricultural works i.e. soil, weed, hoe, and bind the stalks while executing and supervising the farming. Women farmers are also responsible for the improvement and adaptation of many plant varieties in traditional methods."[28]Indigenous communities, including women living in the western states, have played a key role in preserving and maintaining a wide range of crops.[29]The indigenous knowledge of Indian women in areas like food preparation, yeast making, varietal selection, seed preservation, and wild plant care is vast.[30] This knowledge is traditionally passed down from older to younger women. In other words, these cultural and culinary practices by women play a vital role in preserving and maintaining the genetic diversity and associated traditional knowledge. This necessitates that lawmakers should take the contributions of women into consideration while making laws, policies, rules, and regulations to secure their rights and interests over genetic resources and associated traditional knowledge in India.

IV. Access and Benefits Sharing for Genetic Resources: Engendering Biodiversity Law and Policy with a Gender Perspective in India.

India has established an access and benefit sharing system backed by robust enforcement and strong institutions for the last two decades. The prevalent system has been structured with norms, practices, and institutions that facilitate and execute the ABS practices and procedures for genetic resources and associated traditional knowledge. For biodiversity management, involving both men and women in decision-making not only ensures equality, but is crucial for long-term conservation outcomes.[31] India has always been at the forefront in formulating and implementing international and national norms, policies, and programs relating to biodiversity conservation and environmental protection. Under the Constitution of India, State has been directed to provide equal representation and ensure active participation of women in law and policy making. Besides, India has also signed multilateral environment

[27] *Id.*

[28] *Supra* note 9.

[29] *Ibid.*

[30] *Id.*

[31] Kariuki Muigua, "Gender Perspectives in Biodiversity Conservation," 7(4) *Journal of Conflict Management and Sustainable Development,* 77–93 (2021).

agreements for conservation, access and benefits sharing over genetic resources that call for effective women's contribution and participation. Especially, the Convention on Biological Diversity (CBD), in its preamble recognizes" the vital role played by women in the conservation and sustainable use of biological diversity and also affirms the need for the full participation of women at all levels of policy-making and implementation for biological diversity conservation."[32]

Not only this, Preamble of its Nagoya Protocol also reiterates that the women play a vital role in access and benefit sharing and further affirms that "there is need for full participation of women at all levels of policy-making and implementation for biodiversity conservation, including the participation in decision making process on the use of genetic resources and traditional knowledge associated with genetic resources, such as prior informed consent and MAT."[33]The Nagoya Protocol includes several provisions aimed at ensuring the effective participation and capacity building of women from Indigenous and local communities. These provisions support their involvement in ABS negotiations related to traditional knowledge associated with genetic resources. Such references appear in Articles 12(3), 22(3) and (5) and in 25(3) under this Nagoya Protocol. Article 12(3) obligates the parties to strive to support and develop indigenous and local communities, including women within these communities.[34] Article 22(3) states that parties should identify the needs and priorities of indigenous and local communities, especially those of women, and help them in meeting those needs.[35]Article 22(5)(j) of the Nagoya Protocol provides that special measures should be taken to enhance the capacity of Indigenous and local communities, with particular emphasis on increasing the capacity of women within those communities. This relates specifically to their participation in matters concerning access to genetic resources and traditional knowledge associated with those resources.[36]Article 25(3) of the Nagoya Protocol emphasizes the importance of raising the capacity building of Indigenous peoples and local communities, with particular attention to women within these communities.[37] This reflects the Protocol's commitment to inclusive and equitable participation in access and benefit-

[32]*The Convention on Biological Diversity*,1760 U.N.T.S. 69 (June 5, 1992), preamble.

[33] *The Nagoya Protocol on Access and Benefit-sharing*, UNEP/CBD/COP/DEC/X/1 (October 29, 2010), preamble.

[34] *Ibid,* art. 12(3).

[35]*Id*, art. 22(3).

[36]*Id,* art. 22(5) (j).

[37]*Id*, art. 25(3).

sharing frameworks. The mainstreaming of gender in ABS governance insists that even limited numerical participation of women must be bolstered by mechanisms safeguarding their substantive interests.[38] International legal regime on benefit-sharing should explicitly recognize women's special ecological understanding to avoid discrimination and foster equitable ABS outcomes.[39] Besides, 'IUCN's 2018 Gender Equality and Women's Empowerment Policy' requires a proactive, gender-responsive approach across all conservation programming—embedding gender analyses, setting targets for women's representation, and tracking gender indicators at every stage of project and policy cycles.[40]Similarly, the IUCN framework on mainstreaming gender in ABS governance calls for women's targeted capacity-building in PIC/MAT processes and explicit gender clauses in benefit-sharing agreements—mechanisms absent from India's Biodiversity Rules (2004), meaning domestic ABS practice falls short of global norms.[41]Food and Agriculture Organization (FAO) guidance underscores the need for gender-integrated ABS implementation plans, recommending gender assessments at project outset, sex-disaggregated monitoring data, and dedicated resource allocations for women's capacity building.[42]

India being part of these international treaties has implemented these in its domestic jurisdiction to protect and manage biodiversity. 'Forest Conservation Act, 1980'[43] along with 'National Forest Policy (NFP), 1988'[44] are meant for the conservation of the country's forests by men and women alike. The Joint Forest Management (JFM) under the policy supports the participation of local communities, including women, in forest conservation.[45]However,

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[38] Fatima Alvarez Castillo, "Making Access and Benefit Sharing Regime Equitable to Women," 10(3) *Asian Biotechnology and Development Review*, 85–94 (2008).

[39]Elisa Morgera, *Fair and Equitable Benefit-sharing in International Law* (Oxford University Publication, Oxford, 2024).

[40] International Union for Conservation of Nature, *Gender Equality and Women's Empowerment Policy: Mainstreaming gender-responsiveness within the IUCN programme of work* (IUCN Council Decision C/95/8, October 2018) (2018), *available a*t: https://www.iucn.org/sites/default/files/2022-05/iucn-policy-on-gender-equity-and-equality-october-2018-english-only.pdf (last visited on July 30, 2025).

[41] International Union for Conservation of Nature (IUCN), *Mainstreaming Gender in Access and Benefit Sharing Governance* (2020), *available at:* https://www.iucn.org/theme/business-and-biodiversity/our-work/gender-and-biodiversity (last visited on 30 July 2025).

[42] Food and Agriculture Organization (FAO), *The State of Food and Agriculture 2010–2011: Women in Agriculture: Closing the Gender Gap for Development* 45–47 (2011), *available at:*http://www.fao.org/3/i2050e/i2050e.pdf (last visited July 30, 2025).

[43] The Forest (Conservation) Act, 1980 (Act 69 of 1980).

[44]Government of India, *National Forest Policy* (Ministry of Environment and Forests, 1988)*available at*: https://moef.gov.in/forest_conservation/policy.pdf (last visited on 30 July 2025).

[45]*Ibid.*

JFM's default assumption, that 'heads of households' (i.e. men) speak for all, effectively excludes women from committee membership and decision-making, limiting their ability to influence benefit sharing and resource governance.[46] 'Environment Protection Act, 1986' was enacted for the protection and improvement of the environment by men and women as well. 'National Environment Policy (NEP) 2006' also articulates the spirit of gender participation and engagement for environmental protection.[47] The Wild Life (Protection) Act, 1972 was enacted to protect the wild life by Indian citizens effectively and to control poaching, smuggling and illegal trade in wildlife. It also established the Wildlife Crime Control Bureau and implemented a wildlife management program with effective participation of women.[48]The enactment of the Biological Diversity Act, 2002 was aimed at the conservation of biological resources and called for the vital role of women in this regard. The National Biodiversity Action (NBA) Plan was also formulated in year 2008 to support this purpose.[49] Besides, 'Protection of Plant Varieties and Farmers Rights Act, 2001'; 'Panchayats (Extension of Scheduled Area) Act (PESA), 1996'; and 'Scheduled Tribes and other Traditional Forest Wellers (Recognition of Forest Rights) Act, 2006', provide certain rights and roles to the women for protection of genetic resources and associated traditional knowledge.[50]Notably, a community related legislation does *not* mandate any minimum reservation or quota for women in Gram Sabhas or Panchayats in Scheduled Areas, leaving local decision-making bodies overwhelmingly male dominated.[51]

Access and Benefit Sharing (ABS) over genetic resources in India is governed by the Biological Diversity Act, 2002[52] and the Biological Diversity Rules, 2004[53]. These legal instruments aim to ensure the conservation and sustainable use of biological resources while promoting fair and equitable benefit sharing. The Act requires that access agreements and

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[46]Bina Agarwal, "Participatory Exclusions, Community Forestry, and Gender: An Analysis for South Asia and a Conceptual Framework," 29 *WorldDevelopment,* 1623 (2001).

[47] Government of India, *National Environment Policy* (2006), *available at*: https://moef.gov.in/environment-protection/policy.pdf (last visited on 30 July 2025).

[48] The Wildlife (Protection) Act, 1972 (Act 53 of 1972).

[49] Government of India, *National Biodiversity Action Plan* (2008), *available at*: https://moef.gov.in/biodiversity.pdf (last visited on 30 July 2025).

[50]The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (Act 2 of 2007).

[51] Panchayats (Extension to Scheduled Areas) Act, 1996 (Act 40 of 1996), s. 4.

[52]Biological Diversity Act, 2002 (Act No. 18 of 2003).

[53]Biological Diversity Rules, 2004.

mutually agreed terms must include appropriate benefit-sharing provisions. This applies to the access, use, or transfer of biological resources and associated traditional knowledge occurring in or sourced from India, whether for commercial use, bio-surveys, bio-utilization, or any activity involving monetary benefits.[54]The Act empowers the National Biodiversity Authority (NBA) to determine equitable benefit sharing. It authorizes the NBA to set terms and conditions between the applicant seeking approval and the concerned local bodies or benefit claimers, including women. This ensures that all stakeholders, especially women in Indigenous and local communities, receive fair benefits from the use of biological resources and associated knowledge.[55]While the Biological Diversity Act, 2002 does not contain explicit gender-specific provisions, it indirectly supports inclusive participation through its mandate on equitable benefit sharing and community representation. The Act does not mention women directly in any of its provisions, but leaves room for participatory mechanisms that can and often do include women from Indigenous and local communities in decision-making processes related to biodiversity access and benefit sharing. Similarly, the Biological Diversity Rules, 2004, framed under Section 62 of the Act, also lack any direct gender-specific rules or obligations. The Rules require the constitution of Biodiversity Management Committees (BMCs) at the local level, and although the Rules do not mandate gender quotas, public policy norms such as Panchayati Raj reservation ensure that one-third of local governance seats are held by women, thereby creating potential for women's indirect representation in BMCs.[56]Although gender is not explicitly mentioned, women may participate in BMCs and claim benefits through these decentralized institutional frameworks. Additionally, the NBA and State Biodiversity Boards have, in practice, occasionally issued guidelines or supported projects encouraging women's participation in ABS-related activities.[57]Nevertheless, this remains discretionary and not legally mandated. The 73rd and 74th Amendment to the Constitution institutionalized Panchayati Raj Institutions and Urban Local Bodies.[58] They mandated reservation for women thereby increasing their participation

[54]*Supra* note, s. 21.

[55] *Ibid.*

[56]*Supra* note 53, rule 22.

[57]UNDP BIOFIN, "Women Leading Science and Conservation in India", *BIOFIN*, Feb. 11, 2022, *available at*: https://www.biofin.org/news-and-media/women-leading-science-and-conservation-india (last visited on July 31, 2025).

[58]73rd and 74th Amendment to the Constitution of India, 1992.

in decision making. However, their participation remains indirect and procedural due to socio-cultural factors, limited awareness and other factors.

The Protection of Plant Varieties and Farmers' Rights (PPVFR) Act, 2001 provides for the manner in which benefit sharing is to be determined in relation to registered plant varieties.[59] The PPVFR Authority is empowered to assess claims and decide the quantum of benefit to be shared with individuals or communities who have contributed to the development or preservation of such varieties.[60] Further, Rules 40 to 44 of the PPVFR Rules, 2003 lay down the detailed procedure for filing claims and determining benefit sharing.[61] These rules ensure that the benefits arising from the commercial exploitation of registered varieties are equitably shared among contributors, including both men and women from farming and Indigenous communities.Under the Act**,** any farmer, including women, as well as village communities, institutions, or organizations involved in breeding, evolving, or developing a plant variety may apply for its registration.[62] The Act recognises the contributions of individual farmers and local communities, ensuring they have legal rights over the varieties they have conserved or developed, regardless of gender or institutional affiliation.[63]applicant seeking registration of a plant variety to disclose details regarding the use of genetic material conserved by any tribal or rural families, including women, during the breeding or development process. This provision ensures recognition of traditional knowledge and contributions made by Indigenous and local communities. After verification of such claims, the PPVFR Authority may determine and grant an appropriate amount of compensation. This compensation may be awarded to an individualsuch as a woman farmer, a group of persons, or even a government or non-governmental organization that has made a valid claim.[64]Any such compensation granted by the PPVFR Authority must be deposited by the breeder of the registered variety into the GeneFund, which is constituted under the PPVFR Act, 2001.[65]This fund is specifically intended for supporting the rights and interests of the farming communities. The amount deposited is subsequently disbursed to the

[59] The Protection of Plant Varieties and Farmers' Rights Act, 2000 (Act 53 of 2001).

[60]*Ibid,* s. 26-27.

[61] The Protection of Plant Varieties and Farmer's Right Rules (2003), rules 40-44.

[62]*Supra* note 58, s. 16 (1).

[63]*Supra* note 58, s. 18.

[64] *Id,* ss. 18, 41.

[65]*Id.*ss. 45, 46.

concerned local communities, including women, who have conserved or contributed genetic resources or traditional knowledge used in the development of the variety.

'The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006', commonly known as the Forest Rights Act (FRA), includes provisions that recognise the rights of forest-dwelling communities over biodiversity and associated traditional knowledge.[66] Specifically, it affirms the right to access biodiversity and community rights over intellectual property related to traditional knowledge and cultural diversity of forest-dwelling Scheduled Tribes and other traditional forest dwellers, including women, on all forest lands. The Forest Rights Act, 2006 empowers the holders of forest rights, including women, to protect and regulate access to community forest resources. This includes the authority to prevent or stop any activity that may harm wildlife, forests, or the genetic diversity within their traditional territories. Such powers are vested in the Gram Sabha, which plays a central role in managing and conserving community forest resources in a sustainable and culturally appropriate manner.[67]The Provisions of the PESA Act, 1996 have given constitutional recognition to tribal rights to men and women residing in the notified schedule areas and empowered them to take decisions based on their customary rights and self-rule of their traditional territories. The provisions of this Act provide them the rights over their territories, land, and forests and provide access to, use, and disposal of the genetic resources under their control and custody.[68]

Indian Courts recognize community rights but ignore gender within community. In *Niyamgiri Case*[69], Supreme Court recognized cultural and religious rights but there was no gender specific reference. In Samantha Case[70], tribal rights over land and resources were recognized but did not address how such control is exercised within communities.

India has developed a comprehensive legal and institutional framework for Access and Benefit Sharing (ABS) of genetic resources, consistent with its international commitments under instruments like the CBD and the Nagoya Protocol. It has enacted key laws such as the Biological Diversity Act, 2002, the Protection of Plant Varieties and Farmers' Rights Act, 2001, the Forest Rights Act, 2006, and the PESA Act, 1996. These laws collectively aim to

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[66] The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (Act 2 of 2007), s. 3.

[67] *Ibid*, s.5.

[68]The Panchayats (Extension to Scheduled Areas) Act, 1996 (Act 40 of 1996), ss. 4(a), (d), (k).

[69]*Orissa Mining Corporation Ltd. v. Ministry of Environment & Forests &Ors*. (2013) 6 SCC 476.

[70]*Samantha v. State of Andhra Pradesh &Ors*. (1997) 8 SCC 191.

conserve biodiversity, regulate access to genetic resources, and ensure equitable benefit sharing. However, gender-specific provisions within this framework are largely absent or indirect. While the CBD and the Nagoya Protocol explicitly recognize the crucial role of women in biodiversity conservation and stress the need for their full participation in policy-making and implementation, Indian laws often adopt gender-neutral language without enforceable requirements for women's inclusion.

India relies on mechanisms like Biodiversity Management Committees and Gram Sabhas which provide opportunities for participation, but the inclusion of women often depends on general reservation policies rather than specific legal mandates. Many BMCs have remained inactive or symbolic. They have limited technical and financial capacity. People's Biodiversity Registers improve documentation of local knowledge but they rarely translate into enforceable rights or benefit-sharing outcomes. Though the National Biodiversity Authority and some State Biodiversity Boards have encouraged women's participation in ABS processes through guidelines and projects, these efforts remain discretionary and inconsistently applied. Reports of National Biodiversity Authority indicate that number of ABS agreements have increased, yet their implementation remains uneven across states and sectors.[71] However, these reports do not provide gender-disaggregated data within ABS implementation. This makes it difficult to assess whether women are actual beneficiaries of ABS arrangements. Indian Courts have treated communities as internally uniform and overlooked the structural barriers that limit effective participation of women in decision-making and benefit sharing processes. Women, particularly those from Indigenous and local communities, often lack formal recognition and access to decision-making platforms or benefit-sharing arrangements. Their involvement often remains indirect and constrained by socio- cultural norms. The implantation of ABS in India remains limited by institutional weakness, lack of accountability and absence of gender-sensitive mechanisms. To ensure meaningful and equitable implementation of ABS in India, gender considerations must be explicitly integrated into national laws and policies. This includes developing mandatory gender-sensitive procedures, targeted capacity-building measures for women, and ensuring their direct access to benefits arising from the use of genetic resources and associated knowledge.

V. Gender and Access and Benefit Sharing System: Juxtaposing for Justice and Equality in India

[71]National Biodiversity Authority, "Annual Report 2021-2022" (Government of India, 2022).

India is rich in biodiversity with its genetic resources because of its diverse geographical location and climate conditions. Many tribal and ethnic groups have traditionally protected national biodiversity in India. The culture of conserving and sustainably using genetic resources has been prevalent in India. Both men and women have done the task of conservation and management of genetic resources. Their knowledge and degree of involvement varies in respective societies and communities. They share a unique relationship with Nature as they have played active roles as wild plant gatherers, home gardeners, plant demonstrators, herbalists, and seed custodians. The responsibilities and roles played by women, such as preparing the field and sowing the seeds, increased their interest and role in the conservation of biodiversity. Females are more dependent on local biodiversity rich in nutritional and medicinal value for household, food and health of their families. They inculcate the love for Nature in their children through folklore or oral traditions, which signify the worship of trees, herbs, animals, rivers, and mountains as gods and goddesses. Not only that, they also have a strong cultural and spiritual connotation with biodiversity. In view of this, integration of women with ABS system is essential to achieve the gender justice and equality in prevalent legal regime in India.

To dispense gender justice under ABS legal system, the CBD and its Nagoya Protocol both recognize the vital and catalyst role of women in access and benefit sharing and their participation in policy-making and decision-making processes for biodiversity conservation. India has implemented these international treaties in its domestic laws by enacting laws for forest conservation, environment protection, wildlife protection, scheduled tribes and other traditional forest dwellers. All these acts are enacted for both men and women as stakeholders to achieve environmental and gender justice. The Biological Diversity Act and its Rules specifically address issues related to bio-resources and associated traditional knowledge and equitable access and benefits sharing. For the vital role of women, the PPVER Act and its Rules provide manners and procedures for determining benefit sharing for improved plant varieties among communities. The Forest Rights Actrecognizes the rights of traditional forest dwellers, including women, to access forest resources and hold community rights over traditional knowledge related to forest produce and biodiversity.ThePESA Act recognizes tribal rights of both men and women and empowers them for decision-making according to their customary rights and traditional practices. Besides legal norms and practices, India also has a well-established institution for implementing and enforcing the ABS regime with equal and active participation and involvement of women. Further, there are other institutions like research institutions, universities, industries, association of indigenous peoples and NGOs are

also coordinated with them for awareness raising, capacity building and funding for the ABS system.

To strengthen gender equity in India's ABS framework, the government should mandate a minimum thirty three percent reservation for women in all forest and biodiversity governance bodies, such as Biodiversity Management Committees under the Biodiversity Act, integrate explicit gender clauses into ABS agreements by allocating dedicated budgets for women's capacity building and requiring sex-disaggregated reporting on benefits and participation, and establish regular, independent gender audits of conservation and ABS programs to monitor outcomes, identify gaps, and guide policy refinements. Even though India has a well-established legal and institutional framework for the ABS regime, there still needs to be more acknowledgment of women's role in the conservation of genetic resources. Disregarding the women's role as preservers of traditional knowledge, skills, and experiences may prove to be fatal for biodiversity in India, which is a hotspot of biodiversity and traditional knowledge. There is a need to deal with policy-making and decision-making from a gender perspective to make international and national law-making more participative and inclusive. Indigenous women, who play a significant role in biodiversity conservation and management, need to be given more representation in decision and policy-making in local institutions responsible for resource management. This will, in turn, make laws related to ABS, equal and equitable bringing transformative socio-legal change in India.

VI. Conclusion

Biodiversity law in India entails the fair and equitable benefit sharing for utilization of genetic resources and associated traditional knowledge for last two decades. Existing literatures and reports have clearly indicated that gender specific contributions and engagements for conservation and benefit sharing practices are not equally balanced and equitably supported in India. This research found proved that although India has developed a comprehensive legal and institutional framework for ABS, it does not adequately incorporate gender-specific considerations in domestic implementation and enforcement. In India, ABS law and practice has adopted gender perspective rarely in its rules, regulations, and guidelines for conservation and management of genetic resources. The gender-specific ABS programs are occasionally organized with active engagement and involvement of women especially representing from indigenous and rural communities in India. Therefore, it becomes necessary to recognize the gender perspective taking into account the roles, responsibilities, preferences and limitations of women and men to promote justice and

equality in India. This article makes minimal effort to enrich the existing feminist legal scholarships by juxtaposing the gender and genetic resources for fair justice and equality under the Indian ABS legal system. However, the other legal aspects under ABS regime still remains unexplored for doing further research in future so as to promote the gender justice and equality in India.