Chapter 7

Who Owns the Heat? Navigating Subsurface Rights via Indian Law

Arkaja Singh and Ushashi Datta, Council on Energy, Environment and Water (CEEW)

There is a compelling case for India to revise legal frameworks to recognise geothermal heat as a public resource held in trust—subject not to unfettered private appropriation but to public stewardship. Making such a change would help reduce the risks and uncertainties of investment in geothermal development.

Over the past decade or so, the oil and gas industry has developed technology that can now be used to access geothermal resources that have been historically considered unreachable. As this report makes clear, there are abundant geothermal resources across India that could be deployed for clean, always-on, and secure electricity generation and direct-use industrial heat and building cooling. To build out a strong geothermal industry, however, it is important to have a clear legal framework governing the resources. India has laws and precedents it can build on to establish such a framework, but decisions have to be made.

The issues at hand for a geothermal industry in India are as follows:

- Establish the roles of the central and state governments with respect to geothermal energy.
- Distinguish between regulatory power (including the power to decide how the resource can be developed), who gets to develop a resource, and who owns a resource.
- Get clarity on the question of ownership of the surface land and subsurface resources, the laws governing the use of underground resources, and how laws or regulations classify geothermal resources.

In a perfect world, the details of these issues would be clear so that public and private entities could access and use subsurface resources without confusion. India's National Policy on Geothermal Energy recognises

geothermal energy can be used as an energy source and for heat processes; the policy has also been formulated for the exploration and development of geothermal resources in India.[1] However, it lacks clarity on who has the authority to legislate issues related to geothermal resources and how such resources should be regulated. (India follows a federal structure in which legislative powers are divided between the centre and the states. The constitution of India's Seventh Schedule contains three lists—Union List, State List, and Concurrent List—that enumerate the subjects on which each level of government can legislate.)

This chapter examines how Indian law can accommodate geothermal resources by situating them within established legal categories. We employ four lenses: (i) the classification of geothermal as a public resource; (ii) its potential treatment as a unique natural resource; (iii) whether geothermal should or could be included under current mineral law; and (iv) a comparison of geothermal with established groundwater jurisprudence. The chapter also addresses the intersection of statutory property rights with community and customary claims to subsurface thermal resources. Discussion on how these findings impact policy can be found in Chapter 8, "Policy and Regulatory Pathways to Catalyse Geothermal in India," which outlines ideas for how to revise India's legal frameworks to better facilitate geothermal growth.

THE POTENTIAL CLASSIFICATION OF GEOTHERMAL AS A PUBLIC RESOURCE

It is important to look at the history of property law in India as a foundation for answering the question of whether geothermal should be held in private or considered a public resource. The primary legislation that governs ownership of property in India is the Transfer of Property Act, 1882. Although the word *property* is not defined in any legislation in India, from judicial analysis it is commonly understood as a "bundle of rights," and in the case of tangible property, it would include the "right of possession, the right to enjoy, the right to retain, the right to alienate, and the right to destroy."[2]

The term *property* includes corporeal and incorporeal property. Corporeal property refers to the right of ownership in material things, whereas incorporeal property concerns any other proprietary right made against or affecting a thing (for example, patent rights and rights of way). Corporeal property is always visible and tangible, while incorporeal property is not.

Property can be movable and immovable. Movable property is understood as property not fixed to the Earth.[3] Immovable property includes land; benefits coming from the land; and things attached to the Earth,[4] such as buildings, hereditary allowances, lights, ferries, and fisheries. Immovable property also includes all things permanently fastened to anything attached to the Earth.[5] (On the other hand, standing timbre, growing crops, and grass are not considered immovable property.[6])

The right to property was originally guaranteed as a fundamental right under the Constitution of India in the 1950s. Following the 44th Constitutional Amendment, 1978, the right to property was reclassified as a constitutional right under Article 300A[7] and is governed by various statues. Although they are no longer fundamental rights, property rights are legally enforceable, meaning that a person can approach civil courts for protection or restitution of their property. However, these rights are not absolute and are subject to state regulation, zoning laws, environmental regulations, and customary rights. The state retains the power of eminent domain and can acquire private property for public purposes.[8]

There is also a social and cultural aspect of property rights in India. Customary and community-based property rights are recognised under laws such as Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, and Panchayats (Extension to Scheduled Areas) Act, 1996, reflecting India's pluralistic and inclusive approach to property regimes. Many customary claims are recognised in Indian legal systems, but a vast number of claims remain undocumented. For this reason, and to minimise social and ecological impacts, all land-based projects should account for social and economic impacts in a more holistic sense to include land-dependent communities.

In common law systems, land ownership has historically extended vertically upwards and downwards, a concept captured by the *ad coelum* doctrine: "He who owns the land owns up to the sky and down to the centre of the earth."[9] In India, however, this principle is significantly restricted by statute. Over time, several laws have

Natural resources are public goods in India, and the state is the legal owner of the natural resources as a trustee of the people. Legal jurisprudence has made it clear that the ambit of public resources is not restricted to traditional common resources like air, water, and forests but extends to intangibles such as subterranean resources (for example, minerals).

carved out exceptions to private subsurface ownership, vesting certain underground resources in the state or union government.

So ultimately the question is, where should the ownership of geothermal resources—which are not clearly addressed in any Indian statute—fall under Indian law?

IS GEOTHERMAL ENERGY A PUBLIC RESOURCE?

Natural resources are public goods in India,[10] and the state is the legal owner of the natural resources as a trustee of the people. Legal jurisprudence has made it clear that the ambit of public resources is not restricted to traditional common resources like air, water, and forests but extends to intangibles such as subterranean resources (for example, minerals).[11] In this context, geothermal resources—subterranean and potentially strategic energy resources—could reasonably be classified as a public resource. If so, it would, by legal extension, fall within the ambit of the public trust doctrine. The public trust doctrine requires the state—as the trustee of natural resources—to preserve them for public use and enjoyment. These resources cannot be converted into private ownership.[12] Although this doctrine originates from Roman law, it has been firmly entrenched in Indian law through landmark judgments such as *M. C. Mehta v. Kamal Nath*,[13] where the Supreme Court stated the following: "The State is the trustee of all natural resources which are by nature meant for public use and enjoyment. The public at large is beneficiary of the sea-shore, running waters, airs, forests and ecologically fragile lands. The State as a trustee is under a legal duty to protect the natural resources. These resources meant for public use cannot be converted into private ownership."

Similarly, in *Fomento Resorts & Hotels Ltd. v. Minguel Martins*,[14] the court reiterated this principle, holding that both renewable and non-renewable resources fall within the public trust doctrine: "[R]esources, associated uses, ecological values or objects in which the public has a special interest (i.e. public lands, waters, etc.) are held subject to the duty of the State not to impair such resources ... even if private interests are involved."

The doctrine imposes a fiduciary duty on the state to protect, preserve, and manage such resources for the benefit of present and future generations. Its application has expanded to cover even groundwater,[15] notably reinforcing the doctrine's applicability to subterranean resources. Therefore, geothermal energy could very well be subsumed under this jurisprudence, which would make it consistent with the evolving global understanding of geothermal governance in places such as Iceland,[16] New Zealand,[17] and Kenya,[18] where geothermal is owned by the state and treated as a public resource. There is a compelling legal rationale for recognising geothermal as a public resource held in trust—subject not to unfettered private appropriation but to public stewardship, as it would allow the state to establish a stable regulatory framework and might help reduce the risks and uncertainties of investment in geothermal development.

The public trust doctrine requires the state—as the trustee of natural resources—to preserve them for public use and enjoyment. These resources cannot be converted into private ownership.

Treatment as a Sui Generis Natural Resource

Another alternative is to treat geothermal as a unique natural resource—distinct from conventional categories such as minerals, groundwater, or hydrocarbons and thus requiring a tailored legal and regulatory framework.

In *Centre for Public Interest Litigation v. Union of India*,[19] the Supreme Court observed the following: "[E]ven though there is no universally accepted definition of natural resources, they are generally understood as

elements having intrinsic utility to mankind. ... Natural resources belong to the people but the State legally owns them on behalf of its people and from that point of view natural resources are considered as national assets."

This expansive conception enables the recognition of unclassified or emerging resources—such as geothermal—as national assets, particularly where they hold strategic environmental and economic value. A compelling parallel can be found in the treatment of natural gas. In *Reliance Natural Resources Ltd. v. Reliance Industries Ltd.*,[20] the Supreme Court recognised natural gas as a resource of national importance governed under a special statutory regime—the Petroleum and Natural Gas Rules, 1959. The court stated that "national assets belong to the people. The Government holds such natural resources in trust. ... The Government owns the gas till it reaches its ultimate consumer."

Geothermal shares several defining characteristics with hydrocarbons: It is subterranean and technically inaccessible without intervention; it possesses significant public utility as a low-carbon energy source; and its extraction requires caution to avoid depletion and ecological harm. However, unlike oil and gas, there is not yet specific legislation for geothermal resources. India's legislative history offers multiple precedents for creating sui generis legal regimes to govern complex or strategically sensitive resources. The Atomic Energy Act, 1962[21] (for nuclear energy), and the Offshore Areas Mineral (Development and Regulation) Act, 2002[22] (for offshore minerals), were designed to address jurisdictional and strategic sensitivities. Similarly, the Protection of Plant Varieties and Farmers' Rights Act, 2001,[23] represents a deliberate attempt to create a distinct legal architecture for plant genetic material that acknowledges its socio-economic and ecological uniqueness.

It is important to remember that sui generis legislation typically governs the use of extracted resources rather than the extraction process itself. For example, while uranium extraction is regulated under the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act), its use for nuclear energy falls under the Atomic Energy Act, pursuant to Entry 6 of the Union List. Similarly, offshore mineral resources require stand-alone legislation due to the explicit constitutional mandate under Article 297.

In the case of geothermal resources, a more constitutionally coherent and administratively efficient approach may be to amend the MMDR Act to explicitly cover geothermal resource extraction and immediate management—such as defining geothermal wells and regulating drilling processes—within the existing mineral development framework. Stand-alone sui generis legislation may only become necessary at a later stage to govern the specific applications of geothermal energy (for example, electricity generation or direct heat use), much like the Atomic Energy Act complements the MMDR Act in the nuclear sector. Thus, while downstream use may warrant distinct treatment, the extraction phase is more appropriately addressed through amendments to the MMDR Act.

In the case of geothermal resources, a more constitutionally coherent and administratively efficient approach may be to amend the MMDR Act to explicitly cover geothermal resource extraction and immediate management—such as defining geothermal wells and regulating drilling processes—within the existing mineral development framework.

Inclusion Under Mineral Law

Should Geothermal Energy Be Treated Akin to a Mineral Oil?

In India, minerals are governed by the MMDR Act. Notably, the act does not define the term *mineral* in a general sense, but instead it operates through a list of major and minor minerals that are listed in schedules to the act. The central government is empowered to add additional minerals to this list by notification.[24] The only explicit statutory position is that *mineral* excludes mineral oil,[25] which includes petroleum and natural gas—placing hydrocarbons outside the scope of the MMDR Act and instead under the Petroleum and Natural Gas Rules, 1959.

A Broad Definition of *Mineral*

A broader definition of *mineral* appears in the Mines Act, 1952. Section 2(jj) of the Mines Act defines *minerals* as "all substances which can be obtained from the earth by

Geothermal energy currently lies outside the regulatory scope of the MMDR Act and cannot be subjected to its extraction, leasing, or royalty provisions unless there is specific legislative or administrative action to bring it within the framework.

mining, digging, drilling, dredging, hydraulicing, quarrying or by any other operation and includes mineral oils (which in turn include natural gas and petroleum)."[26]

From this definition, it can be argued that because geothermal energy is obtained by drilling into the Earth's crust to access naturally occurring thermal energy, this method would align with the modalities listed in Section 2(jj), particularly "drilling" and "any other operation." Therefore, geothermal arguably satisfies the threshold of being "a substance obtained from the Earth" through the processes addressed in the Mines Act. However, it is critical to note that inclusion under the Mines Act does not imply legal recognition as a mineral under the MMDR Act. The Mines Act is primarily concerned with regulating mine safety, labour conditions, and the physical processes of extraction. By contrast, the MMDR Act determines ownership, commercial rights, leasing, and royalties. In other words, if geothermal activity is subject to the operational regulatory framework of the Mines Act, this does not automatically subject it to the governance, revenue, or licensing provisions of the MMDR regime.

In *Bharat Coking Coal Ltd. v. State of Bihar*,[27] the Supreme Court addressed whether coal slurry deposited on riverbeds constituted a mineral and observed the following: "[T]he slurry flows into the river and is deposited on the river bed, which is later on collected and used as fuel after it is formed into briquettes. The deposit which is collected from the river bed continues to be carbonaceous in character having all the elements of coal. Thus, the slurry is coal in liquid form. ... In our opinion the slurry coal deposited in the river bed or land, in substance as well as in its character, continues to be coal."

Therefore, the term *mineral* connotes a tangible, naturally occurring substance—typically solid or liquid—that is physically extracted from the Earth for economic use. This definition does not automatically extend to geothermal, which is an intangible form of thermal energy rather than a material substance. It is worthwhile to mention that the MMDR Act does not envision geothermal energy, nor has it been notified under the statute as of yet.[28] As a result, geothermal energy currently lies outside the regulatory scope of the MMDR Act and cannot be subjected to its extraction, leasing, or royalty provisions unless there is specific legislative or administrative action to bring it within the framework.

Policymakers could explore amending the MMDR Act to explicitly classify geothermal resources under a new Part E of Schedule I, recognising their unique nature as a combination of subsurface heat and potentially extractable minerals within geothermal fluids. They could also amend Section 2(i) of the Mines Act to define a geothermal well as a type of mine, akin to the existing classification of an oil well. These changes would enable Parliament to either introduce a new section—similar to Section 8A added by the 2015 Amendment—or expand the scope of the existing Section 8A to cover geothermal energy. This section could be useful because it would provide a clear statutory basis for central regulation of geothermal extraction sites.

By-Product Extraction

An additional dimension of geothermal exploration is the extraction of mineral by-products (from the subsurface fluid) such as silica, borax, cesium, lithium, and other alkali minerals. This "incidental activity" is recognised in the National Policy on Geothermal Energy, which specifies that the extraction of such minerals will be subject to the rules and royalty payments under the MMDR Act.[29]

Defining *Mineral Oil*

Before considering whether geothermal energy could be treated akin to a "mineral oil," it is necessary to note how that term is defined under the Oilfields (Regulation and Development) Act, 1948 (ORDA). Prior to its amendment, mineral oils were understood to include only petroleum and natural gas. However, the Oilfields (Regulation and Development) Amendment Act, 2025,[30] substituted this definition to mean "any naturally occurring

while its extraction involves similar well-based drilling and fluid-handling operations, geothermal energy does not fall within the statutory meaning of mineral oils under ORDA and cannot be governed by that regime without legislative amendment.

hydrocarbon, whether in the form of natural gas or in a liquid, viscous or solid form, or a mixture thereof," and expressly includes crude oil, natural gas, condensate, coal-bed methane, shale oil and gas, tight oil and gas, and gas hydrates, while excluding coal, lignite, and helium. The common element across both versions is the hydrocarbon character of the resource. Geothermal, by contrast, is the manifestation of subsurface thermal energy, not a hydrocarbon substance. Accordingly, while its extraction involves similar well-based drilling and fluid-handling operations, geothermal energy does not fall within the statutory meaning of *mineral oils* under ORDA and cannot be governed by that regime without legislative amendment.

The National Policy on Geothermal Energy provides for geothermal energy development by prioritising the retrofitting of inactive or unproductive oil and gas wells. The conversion of such abandoned wells into geothermal plants is a principal focus area for the Ministry of New and Renewable Energy (the nodal agency for the exploration, development, and production of new and renewable energy sources in India), through collaborative ventures involving the Ministry of Petroleum and Natural Gas, the Directorate General of Hydrocarbons, and oil companies.[31]

The policy also mentions that ORDA and its amendments will apply depending on the location of the project. While the geothermal policy's reference to ORDA indicates a degree of regulatory alignment with the union's hydrocarbon framework, this does not automatically extend the ownership regime of mineral oils to geothermal. The naming of ORDA appears to ensure the continuity of technical, safety, and operational standards in projects where geothermal energy is extracted from retrofitted oil and gas wells. In such cases, the wells themselves remain under the administrative jurisdiction of the Ministry of Petroleum and Natural Gas and the Directorate General of Hydrocarbons, which justifies applying ORDA's procedural controls. However, the underlying geothermal resource accessed through these wells is not legally vested in the union under the present statutory framework. Its proprietary status therefore remains indeterminate, pending explicit legislative clarification on whether geothermal energy will be treated as a union or state resource.

The lack of clarity raises the possibility of developing a dedicated regulatory framework for geothermal resources, one that draws upon the operational principles of the Petroleum and Natural Gas Rules, 1959, while accounting for the distinct character of geothermal energy. Such a framework would also clarify institutional roles and could influence which ministry—Ministry of New and Renewable Energy, Ministry of Petroleum and Natural Gas, or the Ministry of Mines—ultimately oversees resource allocation, licensing, and revenue-sharing mechanisms, as foreshadowed in the geothermal policy itself.[32]

The lack of clarity raises the possibility of developing a dedicated regulatory framework for geothermal resources, one that draws upon the operational principles of the Petroleum and Natural Gas Rules, 1959, while accounting for the distinct character of geothermal energy.

IS GEOTHERMAL ANALOGOUS TO GROUNDWATER?

One approach to classifying geothermal resources under Indian law is to examine whether a resource is functionally analogous to groundwater. Both resources are subsurface, fluid-based, and accessed through boreholes or wells. Moreover, like groundwater, geothermal is often embedded in hydrothermal reservoirs that may span multiple land parcels and could potentially be vulnerable to temporary depletion.[33] However, this analogy must be carefully assessed in light of the legal, hydrological, and thermodynamic differences between the two. The extent to which geothermal parallels groundwater in Indian law—and whether groundwater jurisprudence can offer regulatory guidance—remains an important line of inquiry.

The main statutory mention of groundwater rights in India is found in Section 7 of the Indian Easements Act, 1882, which implies a right to extract water as an incident of land ownership. This statutory mention is limited, however, and does not define groundwater rights comprehensively. Scholars and policymakers often refer to this legislation when discussing groundwater rights, even though "the right in groundwater can by no means be defined as an easement."[34] The foundational legal principles governing groundwater allocation were shaped by English common law, especially in the context of land use for mining and industry.

In *Chasemore v. Richards*,[35] groundwater was distinguished from surface water by holding that water "percolating through underground strata, which has no certain course, no defined limits, but which oozes through the soil in every direction in which the rain penetrates," is not governed by the same rules as flowing water. This finding established the principle that percolating groundwater is legally distinct from defined surface water.

Similarly, in *Acton v. Blundell*,[36] the court articulated the dominant rule as follows: "The person who owns the surface may dig therein, and apply all that is there found to his own purposes at his free will and pleasure; and that if, in the exercise of such right, he intercepts or drains off the water collected from underground springs in his neighbour's well, this inconvenience to his neighbour falls within the description of *damnum absque injuria*, which cannot become the ground of an action."

This precedent established that landowners have virtually unrestricted rights to groundwater beneath their property, with no duty owed to neighbours affected by extraction. Over time, courts have increasingly recognised that unregulated extraction can deplete shared aquifers, harm ecosystems, and infringe on community rights, so the state bears an obligation to regulate use in the public interest.[37] This principle may be particularly instructive for geothermal governance. Like groundwater, geothermal reservoirs can span multiple landholdings. The extraction of geothermal resources can induce significant externalities, including land subsidence, reservoir cooling, and

seismicity. Moreover, excessive withdrawal may render the resource thermally or economically unrecoverable over time.

Despite these similarities, geothermal is not merely a hydrological resource; it is a thermodynamic one. Unlike groundwater, which is part of the hydrological cycle and recharges relatively predictably, geothermal systems—especially enhanced or dry rock geothermal—may not replenish within meaningful time frames. Moreover, geothermal development often requires complex infrastructure, including reinjection systems and pressure management, and poses distinct environmental risks.

In light of this fact, the analogy between geothermal resources and groundwater offers a useful starting point for legal classification, particularly in recognising the shared risks of unregulated extraction and the value of collective stewardship. However, geothermal energy's scientific distinctiveness, slower replenishment, and technical risks justify the development of a tailored legal framework drawing from, but not duplicating, groundwater law.

COMMUNITY AND CUSTOMARY CLAIMS TO SUBSURFACE ENERGY

India's geothermal landscape is deeply intertwined with its sacred geography. Many geothermal springs such as Tapt Kund in Badrinath (Uttarakhand), Manikaran (Himachal Pradesh), Bakreshwar (West Bengal), and Unapdev (Maharashtra) are not merely geological features but revered religious sites as well. Historically associated with ritual purification, healing, and pilgrimage, these hot springs raise an important legal question: Who owns and governs the subsurface energy in these sacred geothermal sites?

Temple Trusts and Religious Endowments

Many geothermal sites in India are situated adjacent to or within temple precincts and are managed by religious trusts. These sites are regulated by specific legal regimes applicable to religious properties. This point becomes particularly pertinent in the event that geothermal is treated as property owned by a religious institution or entity. Under Indian law, temple trusts are legal entities empowered to hold immovable property, including land and natural appurtenances, for religious purposes. In *Deoki Nandan v. Murlidhar*,[38] the Supreme Court elucidated the nature of temple endowments: "Though under Hindu law an idol is a juristic person capable of holding property, and the properties endowed for the temple vest in it, it can have no beneficial interest in the endowment, and the true beneficiaries are the worshippers, as the real purpose of a gift of properties to an idol is not to confer any benefit on God, but the acquisition of spiritual benefit by providing opportunities and facilities for those who desire to worship."

This principle implies that any use of temple property, including subsurface resources such as geothermal, must align with the religious objectives of the trust and benefit the worshippers.

Furthermore, in *Tilkayat Shri Govindlalji Maharaj v. State of Rajasthan*,[39] the court emphasised the custodial role of temple managers: "The Tilkayat Maharaj for the time being is merely a Custodian, Manager and Trustee of the said property for the shrine of Shri Nathji and that the Udaipur Darbar has absolute right to supervise that the property dedicated to the shrine is used for legitimate purpose of the shrine."

Therefore, it is indicative that temple managers cannot exploit temple properties, including geothermal resources, for purposes that are inconsistent with the trust's religious objectives. In light of the findings in these cases, where geothermal sites are located on temple trust lands (or any other equivalent religious sites in India), the energy beneath may fall within the trust's custodianship. Moreover, such custodianship is not absolute: It is constrained by the religious purposes of the trust, subject to applicable religious law. A holistic geothermal governance framework must navigate this additional cultural dimension of the ownership question.

Tribal Governance and Customary Claims in Scheduled Areas

Many geothermal zones also intersect with Scheduled Areas as defined under the Fifth Schedule of the Constitution. In these areas, tribal communities may have customary and cultural claims to geothermal sites, particularly where such features are treated as sacred. The legal framework governing tribal rights in such areas includes the Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA),[40] and the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA).[41]

In *Samatha v. State of Andhra Pradesh*,[42] the Supreme Court—while opining on leasing tribal lands in Scheduled Areas to non-tribal entities for mining purposes—ruled that leasing these lands went against the tribes' fundamental rights enshrined in the constitution. The case established a clear precedent that tribal communities possess inherent rights over their traditional lands and resources and any development on these lands requires their prior informed consent and adherence to environmental regulations.

Similarly, in *Orissa Mining Corporation v. Ministry of Environment and Forests*,[43] the court upheld the right of Gram Sabhas to withhold consent for mining projects in sacred forests of the Dongria Kondh tribe, affirming the binding nature of customary and religious claims over land and resources.

Where geothermal sites are located within community forest lands or sacred tribal sites, tribal communities may assert community forest resource rights under the FRA and prior informed consent requirements under PESA and jurisprudence. These customary claims are not merely economic or administrative—they are cultural, spiritual, and constitutional. Any policy governing geothermal in Scheduled Areas must account for these plural legal orders and proceed with informed consent, cultural sensitivity, and constitutional compliance.

CONCLUSION

This chapter has covered the legal complexities surrounding the ownership and classification of geothermal resources in India, an essential foundation for their future governance and development. While the analysis has explored multiple legal characterisations that could apply to geothermal under the existing Indian legal framework, it does not—and cannot—claim to offer a definitive placement within current law. A clear tension that runs through this inquiry is whether geothermal energy should be treated as a private property right connected with the ownership of land or as a public resource. Additionally, policymakers may prefer to subsume geothermal resources under existing legal regimes to avoid lengthy parliamentary processes and to expedite development. On the other hand, experts may argue that geothermal energy's use warrants sui generis treatment to ensure it is effectively regulated and sustainably managed. There is a third perspective, a contextual one: Where geothermal resources are found—on a petroleum site, on a religious site, or in tribal areas—imbues the ownership question with a specific contextual legal regime, rights, and a governance framework. Ultimately, because the legal characterisation of geothermal intersects with multiple regimes and institutional mandates, it is a matter of policy that the government must decisively address.

RECOMMENDATIONS

- **Recognise subsurface geothermal energy as a national resource rather than as private property**, even if surface rights remain privately or communally held. Doing so will remove the present legal ambiguity around this question.
- **Conduct a comparative legal analysis** of integrating geothermal resources into existing regimes (such as the MMDR Act, the Mines Act, and the Petroleum Act) rather than adopting a sui generis legal framework, assessing the administrative, economic, and legal trade-offs of each.
- **Evaluate contextual dimensions** of where geothermal resources are located to determine applicable legal regimes, governance frameworks, and benefit-sharing mechanisms.

CHAPTER REFERENCES

1 Ministry of New and Renewable Energy, Geothermal Energy Division. (2025). *National Policy on Geothermal Energy*. Government of India. https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2025/09/20250915213671166 8.pdf

2 *Guru Dutt Sharma v. State of Bihar*, 1961 AIR 1684; *Saraswatibai Bishwambarlal Charity Trust, thr. Sudarshan Malpani and Ors. v. Gopal Traders Pvt. Ltd.* (2023), AO-1152-2022-FC.

3 Section 3(36), General Clauses Act, 1897.

4 Section 3(26), General Clauses Act, 1897.

5 Section 2(6), Registration Act, 1908.

6 Section 3, Transfer of Property Act, 1882.

7 Constitution of India, 1950.

8 Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

9 *Asha Johri v. Neerja Rajput & Anr.*, RFA (OS) 75/2014; *Barasat-Basirhat Light Railway Co. Ltd. v. Nrisingha Charan Nandi Chaudhuri, I.L.R.* (1943) 1 Cal. 173.

10 *Fomento Resorts and Hotels Ltd. v. Minguel Martins* (2009) 3 SCC 571; *Reliance Natural Resources Limited v. Reliance Industries Limited* (2010) 7 SCC 1.

11 In re: Natural Resources Allocation, In re: Special Reference No. 1 or 2012.

12 *M. I. Builders v. Radhey Shyam Sahu* AIR 1999 SC 2468, 2498; *Fomento Resorts and Hotels Ltd. v. Minguel Martins* (2009) 3 SCC 571, 614; *Centre for Public Interest Litigation v. Union of India* (2012) 3 SCC 1; *Association for Environment Protection v. State of Kerala* (2013) 7 SCC 226, 229; *Tata Housing Development Company Ltd. v. Aalok Jagga* (2020) 15 SCC 784.

13 *M. C. Mehta v. Kamal Nath* (1997) 1 SCC 388.

14 *Fomento Resorts & Hotels Ltd. v. Minguel Martins* (2009) 3 SCC 571.

15 *Perumatty Grama Panchayat v. State of Kerala*, 2004 (1) KLT 731.

16 Ministry of the Environment, Energy and Climate. (n.d.). *Geothermal*. Government of Iceland. https://www.government.is/topics/business-and-industry/energy/geothermal/

17 New Zealand Geothermal Association. (n.d.). *Māori & geothermal*. https://www.nzgeothermal.org.nz/geothermal-in-nz/maori—geothermal/

18 Republic of Kenya. (2012). *Geothermal Resources Act, no. 12 of 1982* (rev. ed.). National Council for Law Reporting.

19 *Centre for Public Interest Litigation v. Union of India* (2012) 3 SCC 1.

20 *Reliance Natural Resources Ltd. v. Reliance Industries Ltd.* (2010) 7 SCC 1.

21 Atomic Energy Regulatory Board. (1962). *The Atomic Energy Act, 1962*. Government of India. https://www.aerb.gov.in/images/PDF/Atomic-Energy-Act-1962.pdf

22 Ministry of Mines. (2002). *The Offshore Areas Mineral (Development and Regulation) Act, 2002*. Government of India. https://mines.gov.in/admin/download/642d05c52d8361680672197.pdf

23 Ministry of Agriculture and Farmers Welfare. (2001). *The Protection of Plant Varieties and Farmers' Rights Act, 2001*. Government of India. https://www.indiacode.nic.in/bitstream/123456789/1909/1/A2001-53.pdf

24 Section 3(e), Mines and Minerals (Development and Regulation) Act, 1957.

25 Section 3(ad), Mines and Minerals (Development and Regulation) Act, 1957.

26 Government of India. (1952). *The Mines Act, 1952*. https://kanoongpt.in/bare-acts/the-mines-act-1952/chapter-i-section-2-e72dc4eab5a937d5

27 *Bharat Coking Coal Ltd. v. State of Bihar (1990)* AIR 1990 SC 1955.

28 *Bharat Coking Coal Ltd. v. State of Bihar* at 29, Section 3(ea).

29 Ministry of New and Renewable Energy, Geothermal Energy Division, "National Policy on Geothermal Energy," 2025, p. 6.

30 Ministry of Law and Justice. (2025). The Oilfields (Regulation and Development) Amendment Act, 2025. *The Gazette of India*. https://egazette.gov.in/WriteReadData/2025/262080.pdf

31 Ministry of New and Renewable Energy, Geothermal Energy Division, "National Policy on Geothermal Energy," 2025, p. 7.

32 Ministry of New and Renewable Energy, Geothermal Energy Division, "National Policy on Geothermal Energy," 2025.

33 Yuan, W., Zhang, D., Zhang, Y., Gao, J., Liu, T., Zhai, H., Jin, G., Wang, G., & Zhang, B. (2021). Performance of multi-well exploitation and reinjection in a small-scale shallow geothermal reservoir in Huailai County. *Frontiers in Earth Science*, *9*. https://doi.org/10.3389/feart.2021.786389

34 Vani, M. S. (2009). Groundwater law in India: A new approach. In R. R. Iyer (Ed.), *Water and the laws in India* (pp. 435–474). Sage.

35 *Chasemore v. Richards* [1859] 7 HLC 349.

36 *Acton v. Blundell* [1843] 152 ER 1223.

37 *Perumatty Grama Panchayat vs State of Kerala* (2004) (1) KLT 731.

38 *Deoki Nandan v. Murlidhar* (1957) AIR 1957 SC 133.

39 *Tilkayat Shri Govindlalji Maharaj v. State of Rajasthan* (1963) AIR 1963 SC 1638.

40 Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA), 4(d): "Every Gram Sabha shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity, community resources and the customary mode of dispute resolution."

41 Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA) Section 3(1)(j): "... rights which are recognised under any State law or laws of any Autonomous District Council or Autonomous Regional Council or which are accepted as rights of tribals under any traditional or customary law of the concerned tribes of any State; ...(l) any other traditional right customarily enjoyed by the forest dwelling Scheduled Tribes or other traditional forest dwellers, as the case may be, which are not mentioned in clauses (a) to (k) but excluding the traditional right of hunting or trapping or extracting a part of the body of any species of wild animal."

42 *Samatha v. State of Andhra Pradesh* (1997) AIR 1997 SC 3297.

43 *Orissa Mining Corporation v. Ministry of Environment and Forests* (1997) (8) SCC 191.