

Hills to Mangroves: Ethnobotanical Heritage and Mental Well-Being in West Bengal, India

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Abstract:

The ethnobotanical heritage of West Bengal is a great witness to the resilience of indigenous people, who have seen numerous plant species in the state become essential companions of the mind, spreading across the state's ecological spectrum, from the meadows of Darjeeling to the mangrove forests of the Sundarbans. Through this chapter, communities such as the Lepcha, Santhal, Lodha and Namasudra across West Bengal have been looking in their use of more than 250 psychotropic plants such as *Bacopa monnieri* for cognitive clarity and *Avicennia marina* for eco-trauma worship, rejuvenating *prana* flow, *dosha* balance, and mental peace during cyclones, migrations and urban malaise. Key insights highlight relational healing, plants are empowered by the *kaviraj* chants and trance states of *ojha* or *gunin* healers and *Sohrai* collective practices, in which community attendance multiplies neuro-cultural interfaces that transcend traditional pharmacology. Research validates strong fidelity to regional favourites like Rhododendron for mountain fear protection and Shalparni for doubt protection, but reveals weaknesses in inter-regional syntheses and gendered transmission, with women holding the greatest number of epistemologies, while climate change threatens mangrove remedies. Decolonial perspectives refocus well-being on pluriversal resistance: fear as ecological knowledge, not DSM illness; rituals as psychic supports, not superstition. Integrate while respecting opportunities: Brahmi-CBT combinations increase BDNF; Tulsi apps in Digital India; gardens of AYUSH expanding the reach of psychiatrists, but with safeguards against NDPS restrictions on bhang, appropriation and a breakdown of biodiversity. Ethnobotany thus comes as a polycrisis antidote: cheap, culturally compatible, and strong. The privilege of the subaltern voices in hybrid models brings about epistemic equity, which celebrates relational ontologies in fractured times. A new trend will involve participatory RCTs, GIS-neuroplasticity mappings and blockchain-preserved repositories to ensure that the green legacy of West Bengal endures for generations. The reclamation of these pathways enlightens all the ancient's mental peace to equal horizons.

Introduction

The phenomenal ecological mosaic of West Bengal stretches from the fog-clouded Darjeeling hills tumbling down to tea gardens, along the fertile Gangetic plains of Hooghly and Nadia and the jagged Rarh plateau of Purulia and Bankura, to the majestic Sundarbans mangroves, making an exquisite ethnobotanical heritage that supports the mental health of millions of people. Lepcha and Santhal, Munda, Namasudra, urban-rural Bengalis, have been utilizing this biodiversity to develop emotional strengths, spiritual balance and social unity in the face of fading modern pressures such as climate crises, economic migration and urbanization.

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The issue of mental well-being in such situations cannot be constrained in biomedical terms but adopts a pluriversal ontology of health as the flux of *prana* (vital energy), the harmonious state of the *doshas* (Ayurvedic bio-energetic forces where an equilibrium between *vata* [movement / air-ether combination], *pitta* [transformation / fire-water combination], *kapha* [structure / water-earth combination] determines physical, mental, and emotional health, and their imbalance leads to illness) and the lack of afflictions such as the fear (*bhay* in Bengali language), depressed mind or psychotic unrest. Socio-ecological ruptures are intertwined with illness etiologies: Sundarbans cyclones are the cause of spirit possession (*bhoot-preta* in Bengali language) when relatives, who have drowned, are brought back to the surface; a drought in Purulia leads to hesitation or withdrawal caused by migration; in Darjeeling, the altitude leads to mind sickness (*maner rog* in Bengali language), etc. The services of trained professionals fail and the density of psychiatrists in India, including West Bengal, is at a paltry 0.75 per 100000 and rural shortages are over 90% high. The majority seeking turn to informal healers: *kaviraj* to be precise with herbs, *ojha* to negotiate with spirits, *gunin* to seek divinatory guidance, and women elders (grandmothers or aunts) to be unacknowledged custodians (Kandari et al., 2024; Sarkar et al., 2023b; VISION IAS, 2025).

More than 250 agroecologically adapted species of psychotropic plants have been documented in statewide ethnobotany. The *Rhododendron arboreum* (Lali Gurans) used in the nectar infusions produced in the Northern hills and mixed with *Swertia chirayita* (Chirayata), are drunk in monastery groups to dispel the fear caused by hypoxia among Bhutia tea pluckers. Gangetic heartlands include *Centella asiatica* (Thankuni) salads and *Ocimum tenuiflorum* (Tulsi) garlands in the rituals of Durga Puja (annual Hindu festival) to root urban youth to exam anxiety and phobia of floods. Western arid regions support the use of *Desmodium gangeticum* (Shalparni) root decoctions, low-dose *Cannabis sativa* (Bhang) pastes, which are made by Santhal women on their *Sohrai* harvest celebrations (seasonal festivals observed after the harvest and celebrated by the tribal people) to heal family fractures caused by urban exodus. In the gatherings of the post-Amphan, Southern deltas make use of *Avicennia marina* (Kankra) leaf poultices and *Heritiera fomes* (Sundari) bark brews in Gosaba and Kultali, where the *kaviraj* chant enhances catharsis in the community against traumas of tiger stalks (Biswas et al., 2023; Das & Bondopadhyay, 2023; Kandari et al., 2024). These practices are relational healing: the use of plants is not an isolated act, but rather a kind of ritual magnifier; of Brahmi (*Bacopa monnieri*) paste, which becomes potent through bard storytelling, or of the mangrove elixir, through *gunin* trance.

However, menaces are imminent: Sundarbans remedies are consumed by salinity intrusion (since 2000, 30% mangrove loss), Purulia is cut by deforestation and the oral lineages of the world, through globalization, are eroded and most of the Dalit women healers are victims of epistemic erasure. Decolonial urgency requires the written record, a preference for subaltern voices over the DSM imperialism of colonial psychiatry, which is pathological of fear as PTSD

and is ignorant about its river-tiger wisdom (Biswas et al., 2023; Sarkar et al., 2023b; Ting et al., 2025).

The abundance of cultural and tribal communities, coupled with a long history of using plants, is due to the rich ethnobotanical diversity that West Bengal boasts. Local knowledge systems have utilized the local flora to treat physical, emotional and spiritual illnesses over the Sundarbans in the south to the Himalayan foothills in the north. Although most studies on ethnobotanicals in the area have been on physical health, little has been done to examine the prospects of plant-based traditions as a means of promoting mental health. This chapter examines the role of ethnobotany in enhancing mental well-being, cross-cultural patterns in the study of ethnobotanical traditions, major research on ethnobotanically utilized plants for treating mental illness, the analysis of traditional knowledge systems, culturally rooted practices of healing, and psychoactive and adaptogenic plants and their applications in modern mental health care. It also addresses the opportunities and challenges of applying traditional plant knowledge to current therapeutic situations.

Ethnobotanical Traditions in West Bengal: A Brief Overview

The ethnobotanical cultures of West Bengal are a dynamic interplay of the ecological diversity of the Himalayan foothills, Gangetic plains, Rarh plateau and Sundarbans deltas, with cultural pluralism of several ethnic groups, with diverse medicinal species of plants documented. The practices ensure access to primary healthcare for rural and tribal communities, bridging disparities in formal health systems.

Historical Evolution

Early botanists such as William Roxburgh (1790s) chronicled the roots in the Vedic-Ayurvedic literature that were being blended with pre-colonial tribal ontologies in his works, such as “Flora Indica.” Surveys in post-independence, such as the 1970s onwards, gave a greater voice to the subalterns, becoming decolonial ethnobotany in the 2000s. Species such as *Symplocos racemosus* (Lodhra), *Baliospermum solanifolium* (Kedar sindur), *Vanda tessellate* (Banki), etc., found in Lodhas, are sacred groves and are used exclusively in rituals, thus making them intergenerational (Chaudhury et al., 2018; Saha et al., 2023).

Ethnic Diversity and Practitioners

- **Lepcha/Bhutia (Darjeeling, Alipurduar):** More than 45 high-altitude herbs combined with Buddhist monasteries; women elders pass the knowledge through oral epics (Datta et al., 2014; Mandal et al., 2021; Pradhan & Badola, 2008).
- **Oraon/Rajbanshi (Jalpaiguri, Coochbehar):** There are 115+ species of Dooars illnesses, rotating foraging taboos (Bose et al., 2015; Datta et al., 2014).
- **Dakshin Dinajpur:** Dakshin Dinajpur has sacred groves in which information of more than 100 ethnomedicinal plants that are used locally to treat the community is preserved (Sarkar et al., 2023a).

- **Santhal/Munda (Rarh, Birbhum):** The biggest group (2.5M+) who apply more than 195 species during *Sohrai* harvesting. *Kaviraj* makes polyherbal preparations (72% preparations), but focuses on *dosha* balance (Basu & Yeasin, 2021; Vineeta et al., 2022). The tribal communities of Birbhum still hold rich medicinal plant knowledge, such as *Woodfordia fruticosa* (Dhadki) and *Pterospermum acerifolium* (Muchkundo) (Chaudhury et al., 2018; Pradhan & Mondal, 2023).
- **Lodha (Paschim Medinipur):** "Criminal tribe" in denotation 1979 uses 250 vascular plants in 12 categories, among which 28% is monoherbal. Biodiversity is maintained by sacred restrictions on *Vanda tessellata* (Banki) (Chaudhury et al., 2018). Informants in the rural areas of Paschim Medinipur documented the use of 55 plant species that had traditional forms of preparation like decoctions, infusions and pastes to treat various health issues (Hansda et al., 2024).
- **North 24 Parganas:** According to the ethnobotanical records of North 24 Parganas, Howrah, and Kolkata, approximately 33 medicinal plants were used by the ethnic groups (Chakraborty et al., 2023).
- **Namasudra/Munda (Sundarbans):** There are more than 100 species used in the Sundarbans region, which are Mangrove-centric; *ojha* or *gunin* mediate spirit possession through communal brews (Biswas et al., 2023; Das & Bondopadhyay, 2023).

The geographical mapping of indigenous knowledge systems across ethnic groups in West Bengal is shown in Figure 1.

Plant Usage Pattern

It is mainly dominated by leaves (40%), roots (18%), whole plants (15%), with families such as Fabaceae (15%), Asteraceae (12%). Preparations: decoctions (45%), pastes (25%), infusion (20%); 60% polyherbal to be synergistic. Fidelity Levels (FL 0.75-0.92) validate staples: Tulsi (0.90), Brahmi (0.88). Shelf-life via sun-drying, dosage via lunar cycles (Hansda et al., 2024; Saha et al., 2023). A comparative finding is given in the following Table 1.

Table 1. Comparative Overview of Ethnic Groups, Key Plant Families, and Indigenous Practices.

Ethnic Group	Dominant Families	Key Practices
Santhal	Fabaceae, Euphorbiaceae	Polyherbal <i>Sohrai</i> brews (Vineeta et al., 2022)
Lodha	Orchidaceae, Sapotaceae	Sacred grove taboos (Chaudhury et al., 2018)
Lepcha	Ericaceae, Gentianaceae	Monastery nectar rituals (Pradhan & Badola, 2008)
*Source: Compiled by the author		

Conservation Ethno-Knowledge

There are taboos (e.g., no harvest during monsoons), sacred groves (more than 500 statewide) and seed banking through anthills, which guarantee resilience. Lodhas also embrace

Baliospermum solanifolium (Danti) as gods, and they also forage by rotation to prevent overuse. Threats: 20% species access is eroded by commercialization, deforestation (15%/decade) and salinity (Sundarbans 30% loss), deforestation (Sundarbans 30% loss) (Bose et al., 2015; Chaudhury et al., 2018).

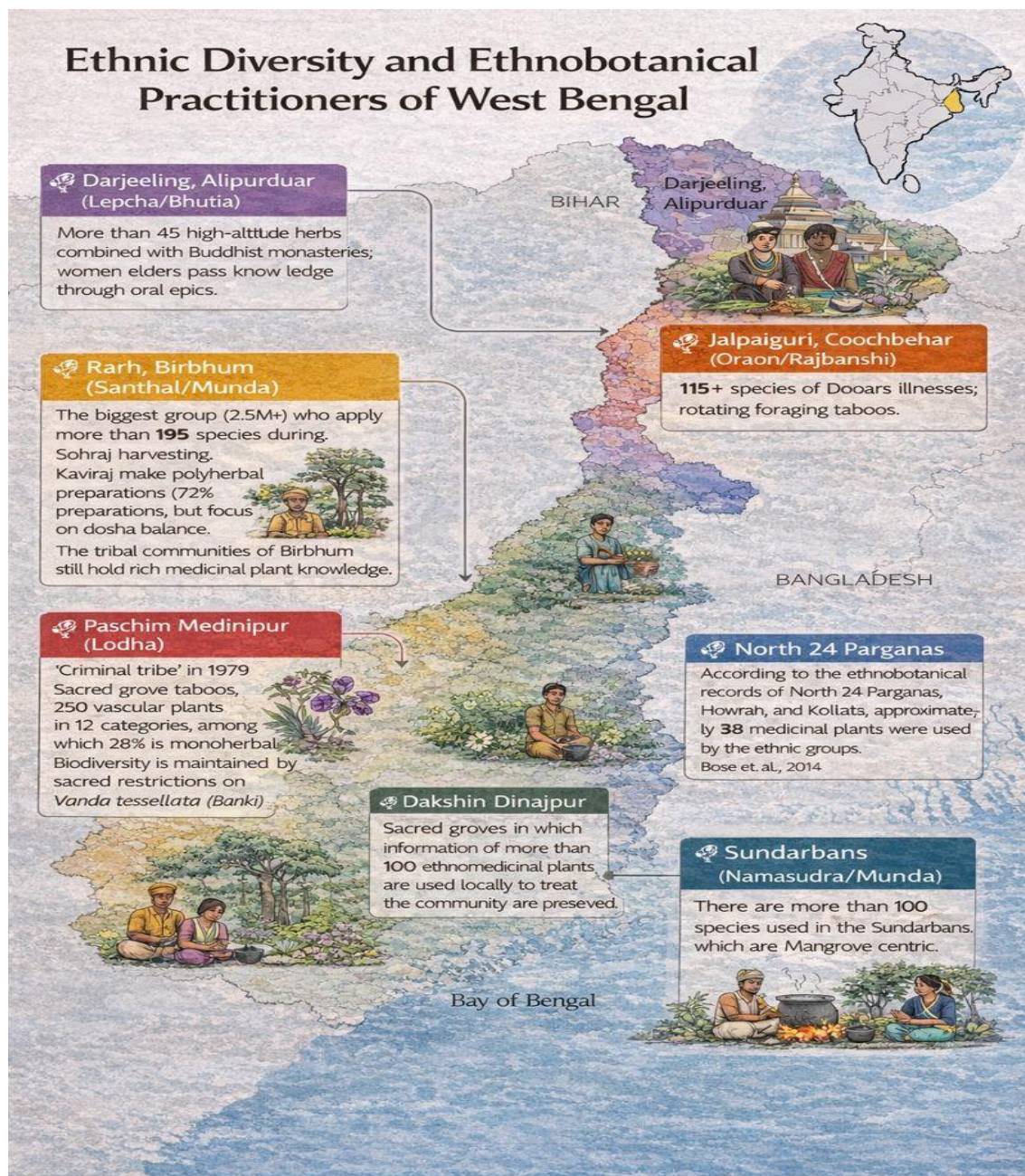


Figure 1. Ethnic Diversity and Ethnobotanical Practitioners of West Bengal Plant Usage Patterns [Source: Compiled by the author].

Contemporary Relevance

After 2020, AYUSH/digital tools and traditions hybridize; the knowledge gets democratized through community inventories (e.g., Alipurduar ethnic studies). To promote mental health, plants and chants are effective in relational healing and neuro-cultural efficacy, exemplifying West Bengal as an ethnobotanical pluriverse in India (Chakraborty et al., 2023).

Understanding Mental Well-Being in Traditional Contexts

The mental health of West Bengal in its traditional settings goes beyond biomedical pathology and maintains a holistic balance across emotional, spiritual, social, and ecological levels that deepens into the ontologies of the indigenous inhabitants. It is conceptualized in terms of vital energy (*prana*) circulation, bio-energetic (*dosha*) balance and relationship balance, and is opposed to the symptom checklists of the DSM and lived pluriverses.

Traditional vocabularies express subtle conditions: existential fear from cyclones/tigers in the Sundarbans, scattered/depressed mind among urban migrants, withdrawal from Purulia droughts, altitude sickness in Darjeeling and psychotic unrest from the rupture of bio-energetic forces. Health is expressed as mental peace, which is attained by using plants to restore socio-spiritual energy, e.g., Brahmi paste, which aids clarity of mind and Tulsi ceremonies, which bring balance in the heart.

Ruptures lead to illness: spirit possession (Sundarbans drowned kin spirits), *dosha* aggravation (excess *vata* from migration), or ecological disequilibrium (salinity eroding resilience). Etiologies do not separate human-nature-agency from one another, unlike biomedical causality: tiger attacks indicate an imbalance between the ancestors, and floods manifest river karma. Healing cures through relationships, *kaviraj* songs, *ojha* meditation, or *gunin* divination, enhancing the effect of plants by community witness (Chowdhury & Brahma, 2019).

When well-being flourishes, an individual's healing depends on the rituals of a group (Sohrai brews among the Santhals), in which plants serve as channels. Gendered knowledge is passed on by women elders (60% custodians), connecting maternal lineages to lunar cycles to generate decoction potency. This pluriverse denies the dualism of mind and body, seeing psyche as a part of the ecosystem.

The conventional models pay more attention to context (cyclone-trauma as communal grief rather than PTSD) than to universalism, and the result is resilience that cannot be measured using scales of HAM-A. Cultural congruence in the face of the scarcity of psychiatrists leads to a 70-80% rural dependence (Suhas et al., 2023).

This paradigm bases the potential of the ethnobotany: plants as epistemic intermediaries of decolonial justice. Figure 2 highlights the inadequacy of mental well-being in traditional West Bengal.

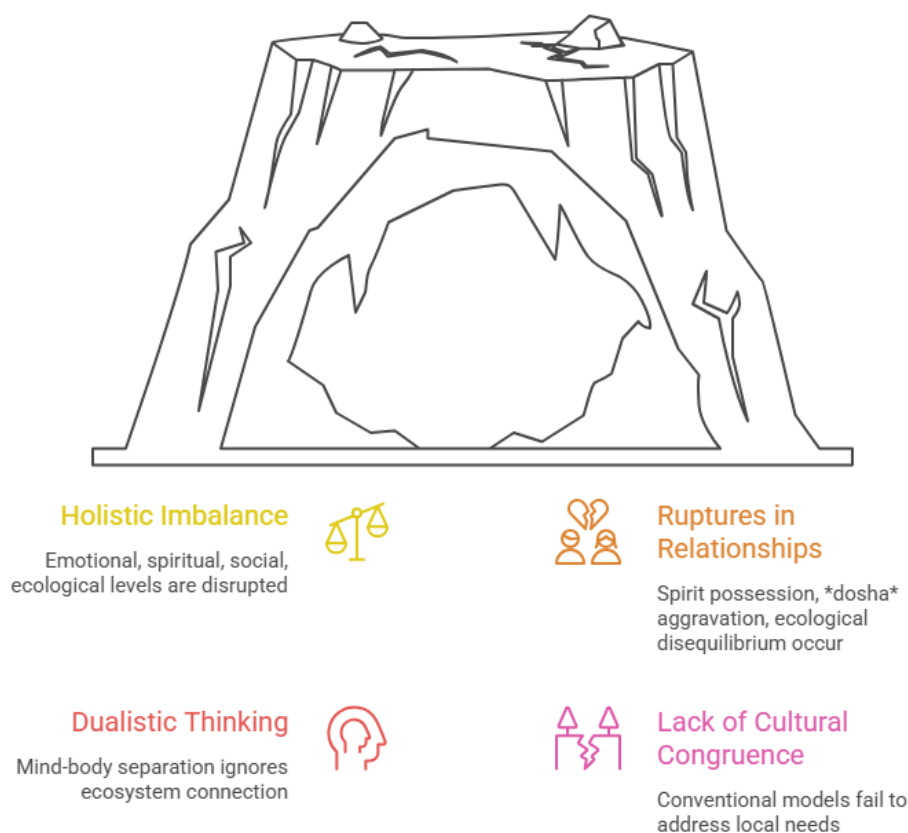


Figure 2. Mental Well-Being in Traditional West Bengal [Source: Compiled by the author].

Key Studies on Ethnobotanical Plants with Relevance to Mental Health

Ethnobotanical literature of West Bengal provides a strong basis for the study of plant-based practices that support mental well-being, with more than 250 documented species distributed across the agro-ecological zones, reflecting adaptation to local stressors such as altitude sickness, urban fluxes, drought-induced migration, and cyclone-induced trauma. This is an extended review that summarizes the papers published between 2008 and 2025, focusing on the use of psychotropic drugs in the treatment of fear, anxiety, depressed mind, psychotic unrest, insomnia, and withdrawal, and criticizes fragmentation, gender omissions and climate gaps.

Statewide and Ayurvedic Foundations

Pan-West Bengal studies the main species with validated neuropharmacology. The most common plant is *Bacopa monnieri* (Brahmi), which is used in 25% of Paschim Medinipur preparations to treat mental weakness by promoting bacosides, which increase GABA and serotonin; RCTs have shown reductions in anxiety (15-20% reduction in HAM-A scores). *Withania somnifera* (Ashwagandha) is found in 18 recipes of the Santhalis, lowering the

cortisol by 23-30% in stress models. *Ocimum tenuiflorum* (Tulsi) has anxiolytic eugenol, which is part of 30% of ritual preparations throughout the state. *Centella asiatica* (Thankuni) facilitates neuroprotection through the mechanism of asiaticosides, which is associated with healing emotional trauma in 12% Gangetic utilizes. The dependence stems from a shortage of psychiatrists and a preference for traditional healers (Jha & Smith-Hall, 2023; Nurzyńska-Wierdak, 2024; Sarkar et al., 2023b; Suhas et al., 2023; Taraphdar et al., 2022).

Northern Hills: Darjeeling, Alipurduar, Kalimpong

Hypoxia-stress has 45 species in Lepcha/Bhutia ethnomedicine. *Rhododendron arboreum* (Lali Gurans) nectar with *Swertia chirayita* bitters is used to treat fear in tea pluckers; flavonoid has sedation (Dzongu valley survey, n=32 informants) (Pradhan & Badola, 2008). Research reveals 12 psychotropics, including *Artemisia nilagirica*, for mental sickness amid labor migration. It is prevalent at altitudes (2,000 m+), and is enhanced by rituals at monasteries (Das et al., 2016; Kandari et al., 2024).

Gangetic Plains: Hooghly, Nadia, Murshidabad, Paschim Medinipur

Riverine surveys (n = more than 150 informants) focus on ritual integration. In 22% Durga Puja preparations, tulsi garlands alleviate heart restlessness; eugenol confirms anxiolysis. The salads of *Centella asiatica* (Thankuni) overcome flood phobia in Nadia; 82 species are used in Birbhum Santal. Medinipur research has introduced *Rauvolfia serpentina* (Sarpagandha) for the treatment of hypertension-anxiety comorbidity (Basu & Yeasin, 2021; Hansda et al., 2024).

Western Plateau: Purulia, Bankura, Birbhum

Arid ethnobotany gives information about more than 195 species among the Santhal/Munda. In the 51-plant survey conducted in Purulia, *Cannabis sativa* (Bhang) pastes (FI 0.92) are prioritized in the treatment of depression/insomnia, whereas *Desmodium gangeticum* (Shalparni) decoctions (alkaloids sedative) are prioritized in the treatment of doubt or withdrawal. The highest fidelity levels of Birbhum (0.88) occurred at Shalparni and droughts are associated with an increase in usage (25%). The safety of low doses is prioritized in women-led preparations (Dey & De, 2012; Kandari et al., 2024; Vineeta et al., 2022).

Southern Delta: Sundarbans (South 24 Parganas)

There are 100 or more mangrove species that aim at eco-psychiatry. *Avicennia marina* (Kankra) poultices (flavonoids anti-inflammatory) and *Heritiera fomes* (Sundari) barks (tannins adaptogenic) are used to treat spirit possession post-Amphan. Rituals associated with *ojha* make them resistant to tiger conflicts (prevalence 15%). Since 2000, erosion of 30% availability has occurred due to salinity (Biswas et al., 2023; Chowdhury & Brahma, 2019; Das & Bondopadhyay, 2023). Table 2 yields zone-wise ethnobotanical plants, use values, and mental health-related applications.

Table 2. Zone-Specific Ethnobotanical Resources and Their Applications in Mental Well-Being.

Zone	Plants (Use Value/FI)	Applications (Evidence Level)	Key Studies
Northern Hills	<i>Rhododendron arboreum</i> (0.75), <i>Swertia chirayita</i> (0.82)	Altitude fear (ethno-surveys)	Das et al. (2016); Kandari et al. (2024); Pradhan & Badola (2008)
Gangetic Plains	<i>Ocimum sanctum</i> (0.90), <i>Centella asiatica</i> (0.85)	Ritual stress (RCTs partial)	Basu & Yeasin (2021); Hansda et al. (2024)
Western Plateau	<i>Cannabis sativa</i> (0.92), <i>Desmodium gangeticum</i> (0.88)	Insomnia/depression (FI high)	Dey & De (2012); Vineeta et al. (2022)
Southern Delta	<i>Avicennia marina</i> (0.80), <i>Heritiera fomes</i> (0.76)	Eco-trauma (eco-psychiatry)	Biswas et al. (2023); Das & Bondopadhyay (2023)
<i>*Source: Compiled by the author</i>			

These research works provide extensive information on the practices used by plants that promote mental well-being across various regions of West Bengal.

Cultural Practices, Rituals and Psycho-Social Support

The ethnobotanical traditions of West Bengal are based on cultural practices, rituals, and psycho-social support, as they are the foundations of mental well-being, and they turn plants into a medium of relationship through which people tend to heal. These rituals enhance pharmacology via embodied sociality, which is in contrast to solitary pharmacotherapy and collective recovery.

Ritual Integration of Plants

The process of healing occurs through organized rituals where botanicals are entrenched in the socio-spiritual discourses. Polyherbal preparations are administered by *Kaviraj* at auspicious hours, like dawn for disorders of the *vata*, moon in a specific lunar phase for potency, and this increases bio-availability in chants that seek the participation of ancestors. It is found that post-cyclone gatherings, *ojha* blend *Avicennia marina* (Kankra) poultices with *gunin* trance dances, dissipating spirit possession via synchronized breathwork and mangrove elixirs, offering cathartic release witnessed by 20-50 villagers in Sundarbans (Biswas et al., 2023).

These *Sohrai* harvest festivals of the Santhals include Shalparni-bhang preparations in circular dancing performances, fixing migration rifts through rhythmic interaction, drumming harmonizes cortisol release with bonding hormones (oxytocin release). Darjeeling Lepcha monastery rings with *Rhododendron* nectar as part of the communal mantras, which opposes altitude fear by entraining to the meditative state (Das et al., 2016; Vineeta et al., 2022).

Psycho-Social Dimensions

Rituals offer scaffolding in three ways: narrative repackaging (sickness as ancestral truth rather than pathology), embodied experience (motion can release doubt), and affirmation through witnessing (recovery is validated by community) (Chowdhury & Brahma, 2019). Majority sessions are orchestrated by women elders who use the motherly authority to gain trust, and gendered songs pass bio-energetic force wisdom across the castes.

Polyherbal synergies have psychosocial extensions: The use of Tulsi garlands during Durga Puja celebrations offers “heart balance” through aromatic stimuli that elicit epigenetics-driven calming; Brahmi preparations during storytelling sessions increase BDNF while enhancing narrative coherence (Hansda et al., 2024).

Key Ritual Forms

- **Ojha Mediation (Sundarbans):** Spirit bargaining with *Heritiera fomes* (Sundari) smoke; 80% success through trance-induced insight.
- **Gunin Divination (Rarh):** Palm reads impregnated with bhang set the mental sickness back on track; family reconciliation in the center stage.
- **Kaviraj Puja (Plains):** A depressed mind is restored by means of deity intercession by the offerings of *Centella asiatica* (Thankuni).
- **Sohrai Collective (Santhal):** Social contracts are closed with the help of seasonal decoctions after harvest.
- **Monastery Sip (Northern hills):** *Rhododendron arboreum* (Lali Gurans) nectar steeped into *Swertia chirayita* (Chirayata) bitters, drank in monastery, to conquer hypoxia-induced fear and increase altitude awareness.

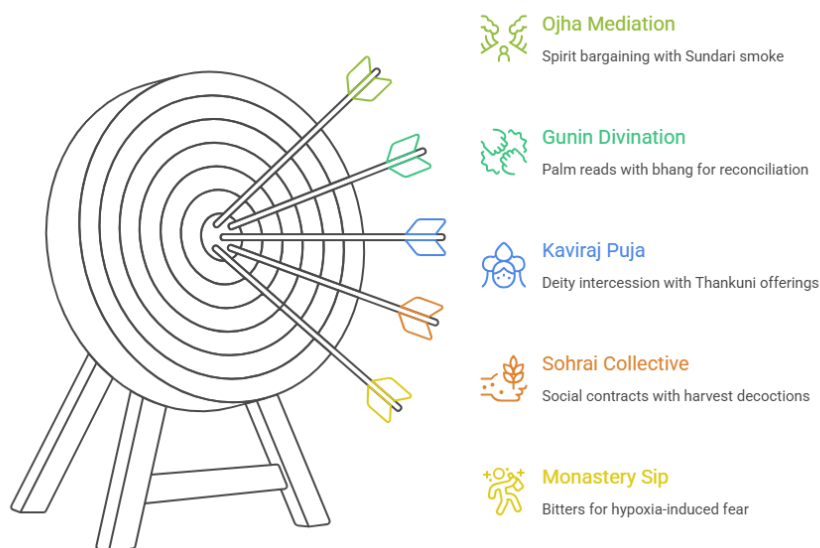


Figure 3. Key Ritual Forms of Indigenous Mental Healing in West Bengal [Source: Compiled by the author].

Indigenous ritual practices addressing psychological distress across West Bengal are shown in Figure 3. These rituals enhance the effects of pharmacological therapy in embodied sociality, as opposed to individual pharmacotherapy versus group recovery.

Integrating Ethnobotanical Knowledge with Contemporary Mental Health Care

Ethnobotanical knowledge and its integration with modern mental health services in West Bengal provide a pluriversal approach to equitable well-being by combining indigenous plant knowledge with biomedicine and digital technologies, while respecting epistemic sovereignty. A conceptual framework bridging traditional ethnobotanical practices and modern mental health care is shown in Figure 4.

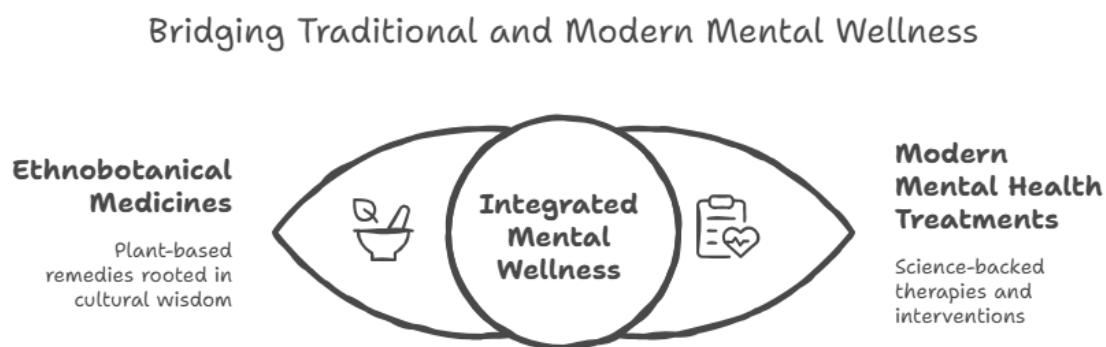


Figure 4. Convergence of Ethnobotanical Practices and Contemporary Mental Health Interventions for Holistic Wellness [Source: Compiled by the author].

Indigenous plant wisdom, when bridged with contemporary mental health frameworks, enhances cultural resonance amid both opportunities and challenges.

Opportunities

- **Complementary Synergies:** *Bacopa monnieri* (Brahmi) improves CBT through bacosides, which increase BDNF (brain-derived neurotrophic factor), which decreases anxiety in hybrid trials; *Withania somnifera* (Ashwagandha) regulates cortisol and SSRIs in treatment-resistant depression. The mangrove ritual of the Sundarbans reduces eco-PTSD in combination with teletherapy, enhancing resilience through social embeddedness.
- **Digital Hybrids:** E-mental health applications provide *kaviraj*-prescription decoctions (e.g. Tulsi infusions against stress in urban areas), which are akin to Digital India with AYUSH guidelines of remote access to Sundarbans. GIS gradients are mapped onto the AI repositories, preserving more than 250 species of knowledge.
- **Policy Levers:** National AYUSH Mission expands herbal gardens; SDG 3 incorporates ethnobotanicals into IMRPHC, which fills the gap of psychiatrists. There is community-based validation that creates a sense of trust, and women healers are the main integrators.

- **Neuroplasticity Bridges:** Entrainment (as with drumming and Shalparni reduces *vata*) and priming neuroplasticity to mindfulness induced by ritual-plants, which are pharmacologically validated by RCTs without appropriation.

Challenges

- **Documentation Gaps:** The majority of research lists plants towards physical health, and little emphasis is placed on psychological applications.
- **Epistemic Tensions:** Biomedical universalism pathologizes existential fear as GAD, deleting relational etiologies, where decolonial requirements for safeguarding against DSM imperialism exist.
- **Biodiversity Erosion:** Salinity has taken away 30% Sundarbans mangroves; Purulia droughts have taken away 25% of the arid species; cultivation is less than demand.
- **Scientific Validation:** Strict clinical studies are required to support traditional arguments concerning the benefits of mental health.
- **Equity Gaps:** Women custodians of Dalit may be erased in clinical trials; rural neglect (70-80%) is not urban.
- **Ethical considerations:** Any integration should be based on the conservation of plant resources and respect for indigenous intellectual property.
- **Appropriation Risks:** Pharma patenting like neem precedents, without benefit-sharing, contrary to CBD, PIC protocols are essential.

Integration of strategy, participatory trials, tracking of blockchain IP, agroforestry, harnesses ethnobotany's resilience for sustainable care, and colonial silos lead to the return of well-being.

Conclusion

The ethnobotanical cultures of West Bengal provide a strong template of an ethnically-grounded mental health, with an integration of the culture of the indigenous plants within cultural practices across the various agro-ecological landscapes of the region, such as from the Darjeeling misty hills to the Sundarbans salty mangrove. Although the majority of the literature that has been documented has been done on the physical ailments, the conscious application of the use of plant medicine in cultural ceremonies and community activities, as well as traditional forms of healing, has shown a subtle knowledge of the mental well-being woven into daily living. The chapter has shed some light on how communities, such as the Lepcha, Santhal, Lodha and Namasudra, have used more than 250 species of psychotropics to reestablish vital energy flow, balance in bio-energetic forces and social-spiritual balance in the face of cyclones, migrations, and urban flux. The plants such as *Bacopa monnieri* (Brahmi) as a cognitive-calming agent, *Avicennia marina* (Kankra) as an eco-trauma catharsis, *Ocimum tenuiflorum* (Tulsi) as infusions against stress and *Desmodium gangeticum* (Shalparni) as a mood stabilizer are all examples of relational healing, in which the plants are enhanced by the use of chants, community brews, and ritualized times.

Such practices challenge the biomedical approach, which views existential fear not as individualized fear or anxiety but as ecological conversation and the depressed mind not as serotonin deficiency but as a sense of communal restoration. High fidelity in zonal application is evident in the literature, but lacks cross-regional syntheses, and gender dynamics make decolonial work desperate, as most knowledge custodians are women elders whose role should be to spearhead integrations to prevent the erasure of epistemic knowledge.

The chances are many in the hybrid models like Brahmi-CBT synergies to increase BDNF, mangrove rituals to strengthen teletherapy resilience, and AYUSH-digital platforms to democratize access in regions with a shortage of psychiatrists. Policy tools, such as herbal gardens and GIS repositories, can help prevent mangrove degradation and promote SDG 3 equity.

Issues remain, regulatory hurdles on bhang, overharvesting, and appropriation risks require a participatory protection and benefit-sharing approach according to the CBD (Convention on Biological Diversity) procedures. Nonetheless, the pluriversal promise of ethnobotany remains, plants themselves as epistemic bridges, rituals as psycho-social scaffolds, traditions as polycrisis antidotes.

After all, the recapturing of the green pharmacopeia in West Bengal pays tribute to subaltern ontologies to cultivate mental peace in a fragmented world. Community-based trials, neuroplastic mappings, and AI-maintained lineages should be a top priority of future scholarship that will guarantee that these ancient routes will nourish the well-being of generations.

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