# ii. Protection of Traditional Knowledge System (TKS)...

ii. Protection of Traditional Knowledge System (TKS), prevention of bio-piracy and bio- prospecting, benefits to national economy, conservation of environment, protection of livelihood of TK stake- holders, TKS and innovation in Indian medicine system

# Protection of Traditional Knowledge Systems (TKS)

### **Definition and Characteristics of TKS**

### 1. Conceptual Scope

- Traditional Knowledge (TK) includes know-how, skills, practices, innovations, and cultural expressions developed, sustained, and passed on within indigenous or local communities.
- Commonly tied to biodiversity (medicinal plants, ethnopharmacology, agricultural techniques), linguistic and ritual contexts, and ancestral heritage.

### 2. Holistic Framework

- Unlike discrete scientific patents, TKS often manifests as multi-layered, collective knowledge repositories.
- Transmission through **oral traditions** (folklore, stories, rites) or deeply embedded local institutions (village healers, midwives, clan-based guardians of seeds).

#### 3. Vulnerabilities

Threats include cultural erosion, out-migration, modernization pressures, and lack of legal recognition
of collective ownership structures.

### **Existing Mechanisms for TKS Protection**

### 1. Customary Laws and Community Protocols

- Many indigenous societies have internal norms for knowledge sharing, resource stewardship, and benefit distribution.
- o Formal legal systems often undervalue or do not integrate these internal customary frameworks.

### 2. Defensive Protection

- Tools like **Traditional Knowledge Digital Library (TKDL)** in India document Ayurvedic, Unani, Siddha, Yoga knowledge. Patent examiners can search TKDL to reject novelty claims on pre-existing TK.
- Discourages bio-piracy (illegitimate patents claiming "new" uses or formulations actually known in TK).

### 3. Positive Protection

- Legal frameworks or sui generis legislation granting collective rights to communities over their knowledge.
- **Benefit-sharing** obligations for commercial entities using or adapting TK (e.g., Access and Benefit-Sharing [ABS] arrangements under CBD/Nagoya Protocol).

# 4. Documentation vs. Secrecy Debate

- Some argue for codification and digital libraries to protect from misappropriation. Others fear exposing sacred/secret knowledge, risking commodification.
- Balancing transparency for defensive IP with respecting community autonomy remains complex.

# Prevention of Bio-piracy and Bio-prospecting

# **Bio-piracy: Definition and Illustrative Cases**

#### 1. Bio-piracy

- Unauthorized commercial exploitation of biological materials and associated TK (e.g., taking medicinal plant knowledge from an indigenous group without fair compensation).
- Famous controversies: Neem patent by a US company, Turmeric wound-healing patent in the US, Ayahuasca patent in the US, all eventually challenged and revoked due to prior art from local communities or TK.

### 2. Bio-prospecting

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- The exploration of biodiversity for new biological resources of social or commercial value (pharmaceutical leads, agricultural traits).
- Ethical issues arise when **bio-prospecting** becomes exploitative, ignoring **prior informed consent** (PIC) and **equitable benefit-sharing** with the source communities.

# **Legal Instruments and Protocols**

#### 1. Convention on Biological Diversity (CBD)

- Recognizes sovereign rights of states over biological resources, mandates Access and Benefit-Sharing (ABS)
- Encourages prior informed consent from communities, ensuring some compensation or co-ownership of IP if TK is commercialized.

## 2. Nagoya Protocol on ABS

- Specific addendum to CBD detailing frameworks for mutually agreed terms between resource providers and users
- Provides guidelines on compliance, monitoring use of genetic resources, ensuring equitable distribution of benefits.

### 3. National Regulations

- India's **Biological Diversity Act (2002)**, the **National Biodiversity Authority (NBA)** oversees foreign use of Indian biological resources, and requires benefit-sharing.
- Patent legislation requiring disclosure of origin of genetic resources/TK used in inventions.

# **Operational Challenges**

#### 1. Enforcement

- o Tracking cross-border flows of genetic materials and intangible knowledge is difficult.
- o Resource-poor communities often lack legal capacity to pursue infringement claims in international courts.

## 2. Industrial and Academic Partnerships

- Tensions exist between large pharmaceutical or biotech companies seeking robust IP protection vs. local communities seeking recognition and fair compensation.
- Good practices include joint R&D agreements, prior informed consent, equitable licensing, capacity-building programs.

# Benefits to National Economy and Conservation of Environment

# **Economic Advantages of TK Protection**

### 1. Sustainable Livelihoods

- Traditional healers, craftspeople, and small-scale harvesters can commercialize ethically if given IP recognition or brand identity (e.g., GI tags for local herbal products).
- Prevents undervaluing of local resources and fosters local entrepreneurship.

### 2. Innovation and Bio-based Industries

- o TK-based leads can accelerate drug discovery, nutraceuticals, cosmeceuticals.
- Agro-biodiversity knowledge (seed selection, pest-resistant cultivars) can boost agricultural resilience, reduce input costs, and contribute to national food security.

### 3. Eco-Tourism and Cultural Tourism

- Preserving unique TK-based traditions can draw cultural or medical tourists (Ayurveda, Panchakarma retreats).
- $\circ\;$  Revitalizes rural economies while maintaining ecological landscapes.

# **Environmental Conservation**

### 1. Eco-friendly Practices

- Many indigenous systems revolve around sustainable harvest cycles, sacred groves, taboo species protection, ensuring minimal ecological impact.
- Officially recognizing TK can scale up such low-impact resource management strategies, aligning with biodiversity conservation goals.

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#### WHERE CLASSICAL WISDOM MEETS INTELLIGENT LEARNING

### 2. Custodians of Genetic Diversity

- Communities that steward old varieties of crops (landraces) or rare medicinal plants can maintain gene pools crucial for climate adaptation.
- Empowering them through IPR-based or Access-Benefit Sharing frameworks encourages continued conservation.

### 3. Integration with Modern Ecosystem Restoration

- Restoration ecology can incorporate indigenous fire regimes, agroforestry schemes, or ethnobotanical knowledge.
- o Enhances reforestation success rates, soil fertility, pollinator habitats.

# **Protection of Livelihood of TK Stakeholders**

# **Importance of Livelihood Security**

#### 1. Equitable Benefit Sharing

- Ensures communities that have conserved knowledge for generations receive monetary or in-kind returns (royalties, capacity building, better infrastructure).
- Mitigates exploitation, fosters trust, motivates continued stewardship.

# 2. Empowerment and Capacity Building

- Involving local practitioners in the IP filing or licensing process (with interpreters, legal advisors) reduces power imbalances.
- o Training in product development, marketing, certification (organic, fair trade) adds value to local products.

### 3. Community IP Models

- Collective trademarks, GIs (Geographical Indications) for region-specific crafts or herbal formulations protect group rights over brand identity.
- E.g., "Chulli oil" from Himalayan communities, "Phulkari" embroidery from Punjab. Communities collectively enforce standards and deter misrepresentation.

# Resilience in a Changing World

### 1. Adaptive Governance

- Encouraging local governance councils, synergy with government agencies, or public-private partnerships, ensures participatory management of resources.
- Communities can better cope with climate unpredictability, market volatility, or disease outbreaks when their knowledge and rights are institutionally recognized.

# 2. Cultural Continuity

- Maintaining TK as a livelihood fosters youth interest, language preservation, cross-generational transfer of intangible heritage.
- o Minimizes rural out-migration caused by lack of opportunities, thereby sustaining community cohesion.

# TKS and Innovation in Indian Medicine System

# Synergy Between Ayurveda and Modern Science

### 1. Codified vs. Non-Codified Knowledge

- Ayurveda has classical texts (Charaka Samhita, Sushruta Samhita) forming a codified system. Yet, a wealth
  of non-codified folk traditions remain unrecorded in remote villages.
- Digital documentation (TKDL) and research institutes (e.g., CCRAS) serve to standardize knowledge, protect it from misappropriation, and spur integrative research.

# 2. Phytopharmaceutical Developments

- Convergence of advanced analytical chemistry with TK-based leads yields novel drug formulations (e.g., standardized extracts, polyherbal formulations with clinically tested efficacy).
- Patents for novel extraction processes, synergy-based compositions while ensuring compliance with priorinformed consent if local knowledge was involved.

### 3. Regulatory Changes and Recognition

o AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, Homoeopathy) Ministry in India fosters mainstream

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#### WHERE CLASSICAL WISDOM MEETS INTELLIGENT LEARNING

- integration of traditional medicine.
- Good Manufacturing Practices (GMP) for Ayurvedic pharmaceuticals ensure quality, authenticity. IP protection of brand-names or trade secrets can incentivize further R&D.

### **Potential of TKS in Healthcare Innovation**

### 1. Multi-Target Therapeutics

- Ayurvedic multi-herb formulations often exhibit pleiotropic activity (immune modulation, antioxidant, anti-inflammatory).
- Systems biology approaches can unravel synergy, leading to new combination therapies for chronic diseases (e.g., metabolic syndrome, neurodegeneration).

# 2. Diagnostic Protocols

- Integrating Ayurvedic diagnostic frameworks (Nadi Pariksha, Tri-Dosha concept) with modern tools (biomarkers, imaging) can open novel integrative diagnostic standards, subject to validation.
- Patentable aspects might include novel devices for reading pulse patterns or customized digital health applications.

### 3. Ethical and Legal Safeguards

- Ensuring that any new formulations or software deriving from TKS yield **benefit-sharing** for the community of origin.
- o Collaboration with local healers to co-own or co-author patents, upholding moral rights and recognition.

# **Concluding Remarks**

**Protection of Traditional Knowledge Systems (TKS)** is integral not only for **preventing bio-piracy** but also for **unlocking socioeconomic benefits**, **conserving biodiversity**, and **uplifting the livelihoods** of indigenous and local stakeholders who have safeguarded these knowledge pools for generations. In India, where **traditional medicine** (Ayurveda, Unani, Siddha) is deeply interwoven with cultural identity and healthcare, preserving TKS is paramount to ensuring:

- Innovation: Ethnobotanical leads fuel new drug discoveries and integrative therapies.
- Cultural Continuity: Communities maintain autonomy and pass on intangible heritage, fostering resilience.
- **Economic and Ecological Sustainability**: Equitable benefit-sharing can align resource stewardship with climate adaptation and rural development.

Moving forward, collaborative frameworks that merge IP laws, community protocols, and scientific validation—supported by robust policy enforcement and capacity building—remain crucial. In doing so, TKS can evolve into a modern yet culturally respectful pillar for advancing healthcare, biodiversity conservation, and socioeconomic well-being in the global arena, especially for a mega-diverse nation such as India.

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