

Integrating Human Resource Innovation For Sustainable Bioresource-Based Enterprises: A Review Of Global Practices And Tribal Community Experiences In India

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Abstract

Sustainable bioresource enterprises are a keyway to promote inclusive growth, ecological resilience, and rural empowerment. In areas where forestry, non-timber forest products (NTFPs), agriculture, and herbal medicine are the main ways people make a living, the success of these businesses depends a lot on the people who work for them. This review critically analyzes global practices in human resource (HR) innovation and situates them within the tribal and rural communities of India. The results show that HR innovations like personalized skill development, organizational empowerment, integrating indigenous knowledge, and ICT-enabled training are key factors in making businesses sustainable and competitive. Community forestry in Nepal, cooperative NTFP ventures in Latin America, and women-led value chains in Africa are all examples from around the world that show how investing in people's skills can improve both their lives and the management of natural resources. The Van Dhan Vikas Yojana and Gram Mooligai are two examples of community-owned businesses in India that show how structured training, cooperative governance, and knowledge co-creation have turned tribal households from resource gatherers into entrepreneurs. Comparative evidence shows that income generation, market access, gender inclusion, and biodiversity stewardship have all gotten better. But there are still problems, such as low literacy rates, poor infrastructure, limited access to financial services, and the need for long-term support from institutions. The review contends that sustainable HR innovation not only enhances organizational performance but also fortifies socio-cultural identity and resilience in marginalized areas. It concludes that scaling up such models necessitates policy alignment, enhanced financial frameworks, and the acknowledgment of indigenous knowledge as a valid foundation of innovation. Rural bioresource businesses can connect economic growth with social justice and environmental sustainability by putting people first as agents of change.

Keywords: Human Resource Innovation, Bioresource Enterprises, Global Best Practices, Rural India Experiences, Community-Based Enterprise

INTRODUCTION

Businesses that use renewable biological resources, like agriculture, forestry, non-timber forest products (NTFPs), and herbal medicines, are important for rural development and taking care of the environment. More than 2.5 billion people around the world depend on community-managed natural resources, or "commons," to make a living [1]. There are more than 104 million indigenous tribal communities in India alone (about 8.6% of the population), and they are often found in rural areas with a lot of biodiversity [2, 3]. These communities depend a lot on forests and farming for food. About 275 million rural and tribal Indians rely on NTFPs (wild plant/forest products) for their daily needs and income [4, 5]. Despite having a lot of resources, rural tribal areas are still socio-economically disadvantaged, with higher poverty rates and less access to education and markets [3, 6]. To reach the Sustainable Development Goals (SDGs) of "leaving no one behind" and to make growth more inclusive, this gap needs to be closed.

Incorporating human resources (HR) innovation into sustainable bioresource businesses is a good way to give these communities more power. In this context, human resource innovation means new ways of building capacity, teaching, organizing, and managing people that help rural people run businesses that depend on natural resources. The World Economic Forum says that investing in people through education, training, and health care makes the

workforce more productive and creative [9]. On the other hand, ignoring human capital has been a big reason why rural areas haven't developed as quickly as they could have [10, 11]. Government reports have made it clear that tribal communities need targeted help to build skills, improve literacy, and make local institutions stronger [3, 6].

Recent research highlights that innovative HR practices can substantially enhance organizational performance. For instance, research in Thailand's small businesses shows that adding new HR practices (like training and incentive programs) makes them better at coming up with new ideas and gives them an edge over their competitors, which in turn boosts productivity and profits for SMEs. [12, 13]. In India, case studies have demonstrated that rural livelihood programs with robust skills-development components improved participants' capabilities and diminished vulnerability to poverty in tribal areas. [15]. Some of the most important HR innovations are personalized skills training, leadership development, inclusive decision-making, and knowledge integration. All of these can help rural entrepreneurs manage bioresources in a way that lasts [16, 17]. This review looks at the best ways to use HR innovation to make bioresource businesses more sustainable around the world. It also looks at how India, especially tribal communities, has used these methods.

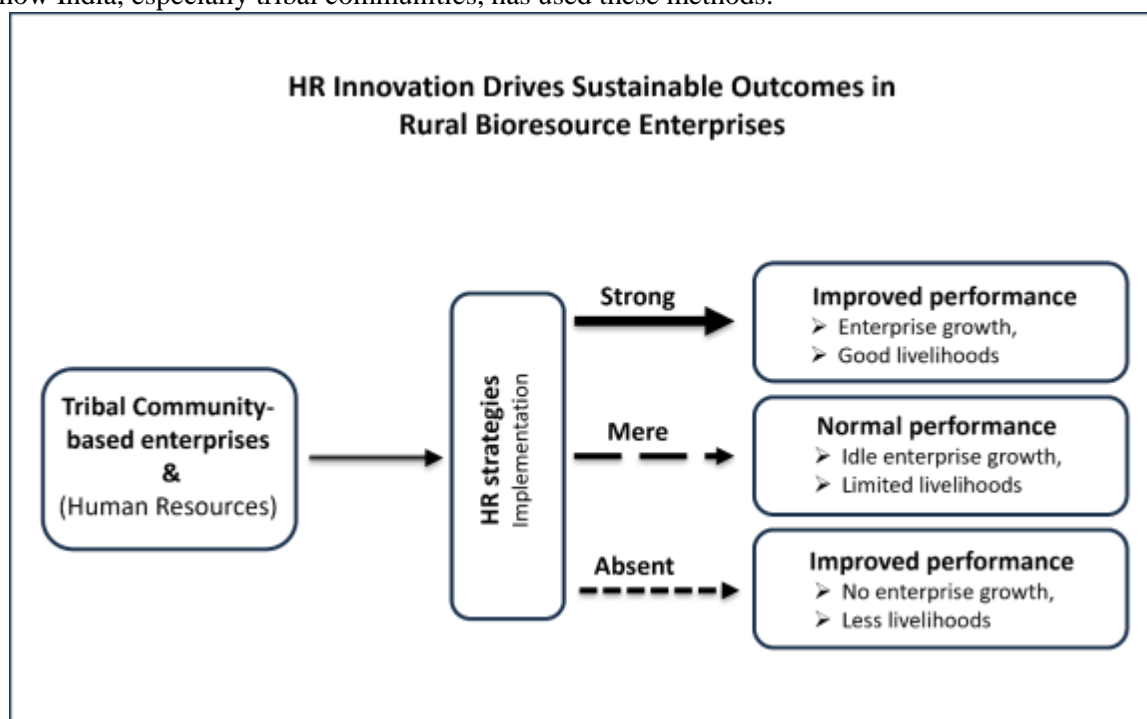


Figure 1: Conceptual framework linking human resource innovation to sustainable rural bioresource enterprise outcomes.

Global HR Innovation in Sustainable Bioresource Enterprises

Sustainable bioresource businesses are at the crossroads of economic growth and environmental protection. In this case, the most important thing that decides whether a person succeeds or fails is their knowledge, skills, and motivation. Traditional top-down or purely extractive approaches often did not help rural communities, which shows how important it is to come up with new ideas that put people first. Sustainable Human Resource Management (HRM) has arisen as a framework prioritizing enduring social and ecological objectives in personnel management [19, 20]. This method brings HR policies in line with sustainability. It goes beyond traditional methods and into what some scholars call "Common Good HRM," which is HRM that helps employees, the community, and the environment at the same time [19, 21]. In rural business settings, this means supporting local talent, valuing indigenous knowledge, and making sure everyone has a fair chance to participate.

One important new idea is to teach people skills that are useful in their area. Rural bioresource businesses often have a skills gap, which means that their workers don't know how to do things like modern processing, marketing, or quality control [22, 16]. Targeted programs to help people learn these skills have worked. A study conducted in India across various states revealed that offering locally pertinent technical training such as sustainable harvesting methods, product processing, and business acumen significantly enhanced the productivity and income

of bioresource-based enterprises [16, 17]. In Bangladesh, providing agroforestry training and support to tribal farmers, who had previously practiced shifting cultivation, improved their livelihood security and the amount of forest cover at the same time [23, 24]. These examples show that training that is tailored to the local language and builds on what people already know makes it easier for rural entrepreneurs to adopt sustainable innovations. Another new thing in HR is building up the skills and leadership of people in the area. Sustainable projects don't depend on outside groups; instead, they help community leaders grow who can organize and run group projects. For example, leadership workshops and mentoring for young people in a tribal district of Odisha, India, led to the rise of a new group of local entrepreneurs who are now running community businesses in forestry and agriculture [14, 15]. In a Native American tribal school in South Dakota (USA), a culturally tailored mentorship model enhanced students' educational achievements and aspirations by incorporating tribal elders and alumni as exemplars [25, 26]. These examples show that giving local people more power through mentorship, peer learning, and recognizing local champions builds social capital and confidence, which are both important for long-term business success.

Combining traditional knowledge with modern methods is a type of HR innovation that is very important for bioresource businesses. Tribal and rural communities frequently hold extensive traditional knowledge regarding biodiversity, medicinal flora, ecological agriculture, and similar topics. Instead of ignoring this, successful projects combine it with scientific and market knowledge. In agriculture, for instance, "Indigenous Agri-Tech" models have developed that integrate community knowledge (such as climate-resilient crop varieties and organic practices) with technology (like mobile apps for weather or prices and better tools) to enhance productivity [27, 28]. A case study in the Social Innovations Journal from India talks about tribal farmers using both their tried-and-true seed varieties and new agri-tech tools (like drip irrigation and soil testing) to get better yields and be more resistant to climate change [27, 28]. For this kind of integration to work, HR needs to document traditional practices, teach scientists and locals how to work together, and hold workshops where everyone can learn from each other. When done right, it leads to the co-creation of new ideas, like new agroforestry systems that are both cutting-edge and culturally appropriate [29, 30].

Another part of HR is employee engagement and incentive alignment. Even small businesses in rural areas can benefit from things like profit-sharing, performance-based bonuses, and a friendly workplace [16, 31]. For instance, many community forestry groups around the world have clear rules about how to share benefits (for example, those who do more patrolling or processing get slightly larger shares). This encourages members to work hard [32, 33]. A study of community enterprises in Nepal, Mexico, and other nations indicated that explicitly delineating members' rights and benefits was essential for maintaining participation. So, treating community members like important employees or owners of the business, with fair pay, a say in decisions, and the chance to grow, is what makes the business successful in the long run.

Lastly, digital and remote learning innovations are becoming more and more important. The growth of mobile connectivity in rural areas makes it possible for creative HR solutions like e-learning modules for farmers, mobile advisory services, and digital marketplaces. During COVID-19, a lot of Indian rural business owners learned through video calls and WhatsApp groups, which made it much cheaper and easier to get to them. [36, 37]. The government and NGOs have made smartphone apps in local languages that share best practices for sustainable harvesting, legal rights (like forest rights), and connect producers with buyers. Such ICT-enabled HR development expands the reach of capacity-building efforts and helps rural businesses keep up with new ideas.

Table 1: Global Examples of HR Innovation in Sustainable Bioresource Enterprises (Literature Survey)

Country/Region	Sector & Initiative	HR Innovation	Outcomes
Nepal (South Asia)	Community Forestry User Groups (national program)	Decentralized community management; training in silviculture & enterprise; benefit-sharing frameworks	22,000+ community groups managing forests; reduced deforestation; ~\$10m annual income to communities [40, 41].
Mexico/Guatemala (LAC)	Maya Biosphere Reserve community concessions	Capacity-building in sustainable logging & NTFP processing; legal	Deforestation halted in concession areas; communities earn revenue from timber/food/medicine sustainably [42, 41].

Country/Region	Sector & Initiative	HR Innovation	Outcomes
		rights granted to communities	
Tanzania/Namibia (Africa)	Community conservancies & CBNRM partnerships	Training for wildlife monitoring, business skills (ecotourism, honey, etc.); public-private mentorship	80+ conservancies managing 163,000 km ² ; improved incomes (honey, tourism), better wildlife outcomes [43, 44].
Indonesia (SE Asia)	<i>Duanu Tribe</i> local fisheries management (Riau)	Indigenous wisdom integrated with modern conservation; youth apprenticed to elders in sustainable fishing	Preservation of fish stocks; Duanu tribal livelihood sustained via community rules despite modernization [45, 23].
Bangladesh (South Asia)	Tribal Farmer Agroforestry Initiative (Modhupur)	Training in agroforestry (mixed tree-crop farming); formation of cooperatives for knowledge exchange	Increased crop diversity and yields; higher household income; enhanced forest cover in farmland mosaics [23, 24].
Global (various)	Shea Network (W. Africa) & other women-led NTFP enterprises	Capacity building for women's cooperatives (quality processing, finance); partnerships with private sector (cosmetic companies)	Thousands of women trained; higher product value (certified shea butter); attracted climate finance and fair trade investments [46, 47].

Table 1 shows some examples of Global HR Innovation, how investing in human capital and community capacity leads to sustainable enterprise success. Key themes include training in sustainable practices, securing community land/resource rights, inclusive governance, and linking communities with external expertise and markets. These practices have improved both livelihoods and resource conservation across diverse contexts.

Tribal Community Experiences in India

India's tribal communities provide valuable examples of how to combine new HR practices with the responsible use of natural resources. As mentioned, a lot of India's tribal people live in rural areas with a lot of trees. They used to make a living by farming, gathering food, making crafts, and using herbal medicine [48, 49]. After independence, though, these groups were pushed to the edges of society. They had trouble getting an education, were forced to leave their forests, and were not allowed to sell their goods in formal markets [50, 51]. In the last few decades, changes in policy and grassroots efforts have tried to give tribals more power by helping them build their skills and start businesses. The Forest Rights Act, 2006 (FRA) and the Panchayats Extension to Scheduled Areas (PESA), 1996, gave tribal communities the legal right to use forest resources and govern themselves. This made it possible for community-run businesses to start up [52, 53]. Also, government programs like the Skill India Mission and the National Rural Livelihoods Mission have special parts for teaching tribal people how to start their own businesses and learn new skills [14, 15]. In this context, a number of new models have come up:

1. Tribal Businesses Based on NTFPs: The Van Dhan Yojana: The Pradhan Mantri Van Dhan Vikas Yojana (PMVDY), which started in 2018, is a flagship program that uses HR development to turn people who collect forest products into business owners [54, 55]. This program sets up Van Dhan Kendras (VDKs) all over the country. These are value-addition centers run by tribal Self-Help Groups. Each VDK trains and equips a group of about 300 tribal members to better process NTFPs (fruits, nuts, medicinal plants, etc.), package them, and sell them [56, 57]. The goal is to help tribal people move up the value chain from collecting raw materials to making finished goods. By 2021, 33,360 Van Dhan Kendras had been approved, with over 660,000 forest dwellers taking part [58, 59]. The plan's goal is to build 50,000 VDKs across the country, which will help about 1,000,000 tribal business owners [56, 60]. Innovation in HR is key: members learn how to handle products, keep things clean, add value, run a business, and market online [61, 62]. They also learn how to form cooperatives and federations to save money. [63, 64]. Early results are promising. In states like Manipur, more than 100 VDK clusters have created more than 30,000 jobs, many of which are for women. They have also made profitable products, like wild fruit jams, spices, and herbal teas that are now sold in cities and online [65, 66]. PMVDY is an example of an investment

in human capital that leads to sustainable livelihoods and less reliance on exploitative middlemen. It does this by combining traditional knowledge of forest products with new skills and market connections. A report from the Press Information Bureau (2021) says that this program, along with other measures like the Minimum Support Price for minor forest produce, has turned tribal resource use into a community-driven business model in many areas [67, 65].

2. Herbal medicine businesses owned by the community: Tribal HR innovation also works well in the area of herbal products and medicinal plants. Tribes all over India, such as the Gond and Korku in central India, have a lot of knowledge about ethnobotany [69, 70]. The Gram Mooligai Company Limited (GMCL) was started in Tamil Nadu as India's first community-based herbal business. Women who gather herbs in tribal areas own GMCL, which is a public limited company [71, 72]. More than 4,000 rural women who own shares have learned how to grow, gather, and process medicinal plants in a way that doesn't hurt the environment [71, 73]. NGOs and experts taught the women how to make Ayurvedic products and how to check their quality. The women taught them how to heal in their own way [74, 75]. Some new ideas in HR here are a training program that involved women who could read and write teaching other women, and a shareholding model that made illiterate rural women feel like they owned the business and were in charge of it. Because of this, GMCL's members not only made more money (they got much higher prices for herbs than before), but they also became more confident in their business skills and learned how to lead [74, 75]. Vijayalakshmi (2003) recounts the transformation of a 40-year-old tribal healer, who previously sold herbs by the roadside with minimal profit, into a stakeholder in GMCL, resulting in enhanced fortunes through access to formal markets and improved pricing [74, 75]. GMCL's success has been recognized as a "alternative bioprospecting model," illustrating that equipping local communities with training and equity in enterprises can harmonize conservation and commercial utilization of medicinal biodiversity [77, 78]. The model has been replicated in other areas, such as herbal cooperatives in Rajasthan and Northeast India. This shows how important it is to develop human resources (especially for women and young people) to make the most of traditional medicinal knowledge for sustainable business.

3. Traditional Crafts and Small Industries: HR innovation is helping tribals keep traditional crafts (like handlooms, bamboo work, and metalwork) going as businesses, in addition to forest products. A study in Odisha looked at the Kisan tribe's efforts to promote their handicrafts. It found that teaching artisans design skills, branding, and e-commerce helped them reach a much bigger market [81, 82]. The project helped the Kisan artisans modernize their product styles without losing their cultural authenticity by pairing young tribal artisans with professional designers in workshops and giving them business training. This led to better sales and better living conditions for the artisans [81, 82]. Researchers have even suggested a "Global Handicraft Index" to measure how sustainable and welcoming craft industries are. They say that giving artisan communities management skills and market knowledge is the most important thing for their long-term survival [83, 84]. Many tribal crafts, which were once fading, are now coming back to life because of these HR efforts. For instance, in the Rajbanshi community in West Bengal, women have been able to keep traditional weaving and fiber crafts alive by forming cooperatives and getting training in micro-entrepreneurship, which has allowed them to get microcredit and sell their goods in cities [85, 86]. These examples show that tribal entrepreneurship development needs more than just money; it also needs investments in people's skills (like design, quality, and business literacy) and social capital (like cooperatives and collectives) [87, 88].

4. Agriculture and Related Areas: Tribal communities practice different types of farming, such as terrace farming in the Northeast and shifting cultivation in central India. However, their productivity is often low because they don't have access to modern tools. HR innovation is also making progress here. Integrated sustainable development projects in the Eastern Himalayas have provided tribal farmers with technical training on better farming methods, such as the SRI method for paddy, horticulture, and livestock care. This has led to better yields and new ways to make a living besides subsistence farming [89, 90]. Choudhury et al. (2023) say that training programs on organic farming and farm entrepreneurship have helped tribal families in Sikkim and North Bengal grow a wider range of crops and sell them, which has raised their incomes while also protecting the environment [89, 90]. Farmer Producer Organizations (FPOs) have been a useful HR innovation in agriculture. By putting tribals into FPOs, agencies have been able to give them group training, pool their crops for sale, and give them more power in negotiations. Bain & Company, a consulting firm, says that FPOs in India's rural economy are becoming important places to share information and resources with farmers. They need more support for

governance and training [91, 92]. The government has recently been trying to set up 10,000 FPOs, many of which are in tribal areas. The main goal is to help people learn how to run businesses together. Early signs point to these efforts making it easier for remote tribal villages to get into the market. For example, tribal coffee and spice growers in Andhra Pradesh were trained to process and brand their goods, and now they export niche goods directly [93, 94].

5. Health, education, and cross-cutting programs: Interventions in education and health, though not enterprises in themselves, significantly enhance human resource preparedness for enterprise. The Tribal Health Collaborative (THC) in India is a good example of this because it chose to include traditional healers (vaidyas) in the public health system instead of pushing them aside [95, 96]. The THC created a program to test and certify tribal healers' knowledge of medicinal plants. They also gave them more training in basic modern healthcare, making them accredited community health workers [97, 98]. This action took advantage of the trust and cultural capital that healers have in their communities, which led to better health outcomes and the preservation of important knowledge about medicinal resources [95, 96]. It indirectly opened up opportunities for those healers to branch out into other jobs that are related to their work, like growing medicinal plants or making herbal products to sell, with help from the AYUSH ministry. This shows a bigger idea: respecting and officially recognizing indigenous knowledge (through certification, documentation, and IP rights) is a new way to use human resources that can give tribal people the power to be knowledge-bearers and entrepreneurs. Table 2 provides an overview of major tribal community enterprise initiatives in India and their HR innovation features.

Table 2: Tribal Community Enterprise Initiatives in India – HR Innovations and Outcomes

Initiative (Sector)	Location/Community	Key HR Innovations	Outcomes
Van Dhan Vikas Yojana (NTFP processing)	All-India (forest tribes)	Skill training in value addition; Tribal SHG clusters (300 members) with mentorship by TRIFED; Market linkage support	3,300+ Van Dhan Kendras established in 23 states; ~9.5 lakh (950k) tribals earning 20-30% higher incomes; improved sustainable harvesting practices [58, 65].
Gram Mooligai Company (Herbal products)	Tamil Nadu (Madurai)	Women-led SHG federation as shareholders; Training in medicinal plant cultivation, pharma-grade processing, business management; Culturally tailored extension services	4,000+ tribal women integrated into formal supply chains; household incomes up by 50+%; traditional knowledge monetized sustainably; model replicated in 5 states [71, 72].
Tribal Handicraft Promotion (ODOP)	Odisha (Kisan tribe)	Design & marketing workshops for artisans; Formation of cooperatives; E-commerce training (digital literacy)	Revival of traditional crafts with modern appeal; 60% increase in artisan earnings; youth engagement in crafts (curbing migration) [81, 99]
NE Farmers Producer Co-ops (Agriculture)	Northeast India (various tribes)	Formation of FPOs; Training in organic farming, post-harvest handling; Cooperative governance and financial literacy programs	Dozens of tribal FPOs marketing organic produce (tea, fruits, spices); better prices (10-15% higher) due to quality and certification; enhanced food security in remote villages [91, 93].
Tribal Health Collaborative (Healthcare)	India (central tribal belt)	Certification and training of tribal healers (vaidyas); Integrating healers into public health outreach; Cross-	15,000+ healers assessed, ~10% certified as competent; improved trust in healthcare (increase in clinic referrals by healers); preservation of

Initiative (Sector)	Location/Community	Key HR Innovations	Outcomes
		training in basic medicine and traditional practices	ethnomedical knowledge [97, 98].

Table 2, HR Innovation in Indian Tribal Enterprises, shows each initiative illustrates how investing in human capacity through training, organizational development, and recognition of indigenous expertise leads to concrete socio-economic gains for tribal communities. From forest product clusters to cooperatives and healthcare integration, the common thread is empowering local people as *drivers* of sustainable enterprise, rather than passive beneficiaries. These approaches also reinforce community bonds and cultural identity, making development more inclusive and resilient.

AERF Case Study from Maharashtra:

Since its inception in 1994, the Applied Environment Research Foundation (AERF) has advanced conservation in ecologically fragile regions of the Western Ghats, India. Its strategy, termed *Conservation on the Ground*, emphasizes community-based conservation that combines ecological integrity with livelihood security. Through five interlinked programmes viz. Sacred Grove Conservation, Communities Conservation & Climate Change, Energy and Biodiversity, Applied Biodiversity Research, and Business and Biodiversity, AERF has developed scalable models linking biodiversity management with rural entrepreneurship. Demonstrated impacts include enhanced community participation, transparent value chains, and long-term partnerships with ethical enterprises, notably the UK-based company Pukka Herbs. Importantly, AERF is the first South Asian organization to achieve FAIRWILD certification for NTFP-based supply chains, thereby ensuring ecological and social sustainability. AERF is working in two locations (Figure 2), using an innovative model using Access and Benefit Sharing (ABS) mechanism (Figure 3), which is helping local tribal communities for the increased and sustainable livelihood.



Figure 2: Enterprise locations of the organisation AERF

A) AERF – Pune: Ambegaon (Bhimashankar) Hirda project model

Since 2006, AERF has engaged with communities in Bhimashankar Wildlife Sanctuary (BWS), an Important biodiversity rich area. The initiative centers on the sustainable harvest of *Terminalia chebula* (Hirda) fruits, traditionally collected across generations. Local practices distinguish between high-value immature fruits (*Bal Hirda*, ₹60–100/kg) and low-value mature fruits (*Motha Hirda*, ₹5–12/kg). Recognizing inequities in market transactions, AERF facilitated the establishment of Nature Connect, a community-owned enterprise that sets purchase prices, manages processing (seed deseeding, drying), and ensures supply chain transparency. FAIRWILD

certification and international procurement agreements enabled local producers to access premium markets. This model redefined community perceptions of forests, shifting focus from timber extraction to long-term, value-added biodiversity use, while ensuring equitable revenue-sharing and ecological safeguards.

B) AERF – Ratnagiri: Sangameshwar (Devrookh) Behada project model

In Sangameshwar (Devrookh), Ratnagiri District, AERF applied a parallel model to *Terminalia bellirica* (Behada), a keystone species of Sacred Groves. AERF intervened by creating certified supply chains for Behada fruit collection, executed through village-appointed collectors remunerated by honoraria. Unlike Bhimashankar's joint venture, this model operates through an independent local company, with semi-processed material reaching Bengaluru-based intermediaries supplying Pukka Herbs. This intervention revitalized Sacred Grove conservation, provided financial incentives for sustainable practices, and reduced destructive logging pressures.

In summary, the AERF case studies demonstrate that community-driven, certified value chains for NTFPs can simultaneously secure biodiversity conservation and rural livelihoods. By embedding local knowledge into international market frameworks, AERF has created replicable conservation models that reinforce socio-ecological resilience. These initiatives highlight an additional income generation for the local tribes and the transformative potential of enterprise-led conservation for biodiversity hotspots globally.

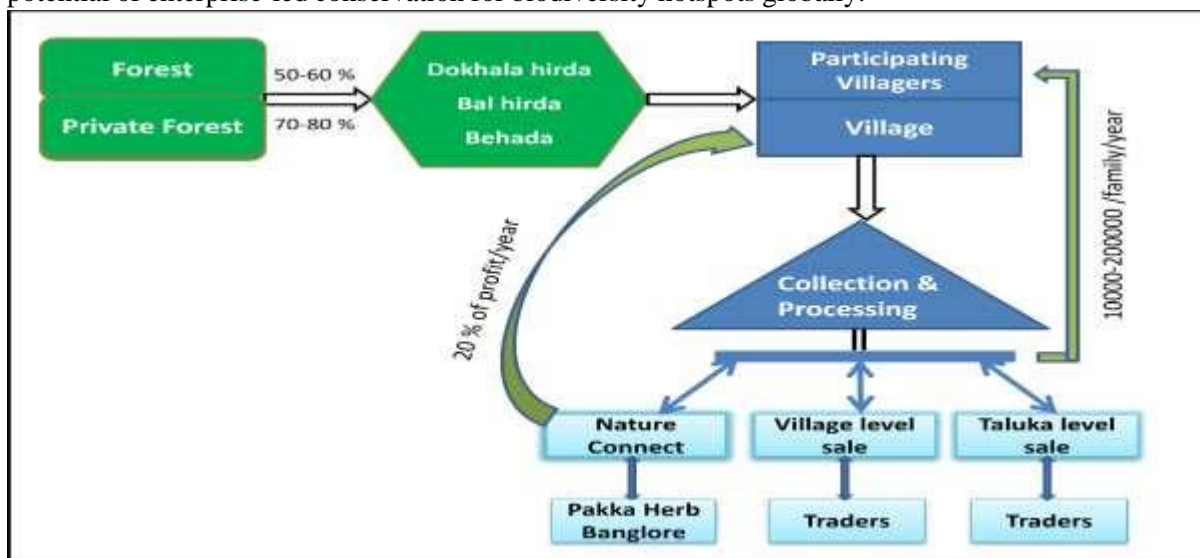


Figure 3: Working model of AERF using Access and Benefit Sharing (ABS) mechanism with local tribal communities

Challenges and Way Forward

The cases mentioned above are promising, but there are still many problems that need to be solved in order to spread human resource innovations to all tribal and rural communities. Illiteracy and gaps in education are still high in many tribal areas because they were neglected in the past. This makes it harder to set up large-scale training programs [3, 6]. For example, some tribes have less than 30% of women who can read and write, which makes it harder for women to start their own businesses [87, 88]. To bridge this gap, we need more than just adult education and training materials that are specific to each language. We also need to help communities that have been pushed to the edges feel more confident. Also, the lack of infrastructure (like roads, electricity, and internet) in remote areas makes HR interventions less effective. For example, digital training modules or market linkages through e-commerce can only work if there is connectivity. So, we need to work on both "hard" resources like rural infrastructure and "soft" resources like HR development at the same time [100, 101]. Another problem is making sure that the results of the business last. HR innovation isn't something that happens once; it's an ongoing process. Over time, skills need to be updated, new leaders need to be mentored, and organizations need to be nurtured. Some cooperative projects fail after they start to do well because of changes in leadership or disagreements. This shows how important it is to keep getting help and support from institutions. Government groups like TRIFED and NGOs can help a lot in this area: One way to give long-term support and monitoring is through TRIFED's model of using mentors and setting up regional resource agencies for Van Dhan Kendras [102,

103]. Regular refresher courses, visits between communities, and networks of tribal entrepreneurs can help keep the momentum going and encourage learning from each other.

Financial inclusion is both a problem and a part of HR. Many tribal entrepreneurs still can't get credit, insurance, or capital because they don't have any collateral or a bank nearby. To help businesses grow, new microfinance and self-help group savings models need to be expanded. One suggestion is to connect Van Dhan groups with micro-credit and working capital (as a UN DESA partnership suggests, each group should bring in a small amount of working capital to help the government use its funds) [104, 105]. Technical training should go hand in hand with learning about money and how to plan a business. Many programs now include lessons on basic accounting, pricing, and planning for new businesses [106, 107].

From a policy point of view, an enabling environment is very important. The government has said that tribal development is important in national strategy documents [6, 8]. The NITI Aayog (a group of people who think about policy) said that its plan for New India should focus on improving tribal human development indices through education, skill development, and support for livelihoods [39]. The Ministry of Tribal Affairs has started programs like Eklavya Model Residential Schools (for education) and Tribal Sub-Plan schemes to put money into building capacity. But these efforts need to work together better at the local level. In some states, strong coordination between departments has been a key to success. For example, in Jharkhand, the state rural livelihood mission, the forest department, and the tribal department worked together to teach tribal self-help groups how to grow lac (a resin harvested from forests) and connect them to markets. This led to a big increase in income for 5,000 families in a pilot project (cited in a 2019 MoTA report) [40]. Replicating such convergence models will assist in meeting the diverse needs of tribal enterprises, encompassing land rights, skill development, credit, and marketing.

India can learn from and help improve best practices around the world. The world is starting to recognize the role of indigenous peoples in sustainability. The IPCC's most recent report (2022) says that indigenous knowledge is very important for adapting to climate change and calls for these communities to be given more power as partners in conservation and development [108]. India's experience with programs like Van Dhan Yojana, which got a million forest dwellers to start green businesses, could be a good example for other countries with populations that depend on forests. On the other hand, Latin America's long-standing community forestry and Africa's community conservancies show India how to protect land ownership and share profits in a way that India could use more of [100, 40].

In short, adding new ideas about human resources to sustainable bioresource businesses is not only a way to make money, but also a way to change society and culture. It gives poor rural communities a say in their own development, makes sure that the people who know the most about natural resources are in charge of them, and builds strong local economies. The journey has begun. Today, tribal artisans, farmers, and forest gatherers in India are organizing, learning, and coming up with new ideas on a scale never seen before. This review has demonstrated that global practices, ranging from community-led forestry to women's cooperatives, underscore the principle that investing in individuals produces enduring results. The tribal experiences in India exemplify the potential and challenges of applying this principle across varied local contexts.

CONCLUSION

In areas with a lot of natural resources, new ideas in human resources are the key to long-term growth in rural areas. When we give people skills, a voice, and the power to make their own decisions, we start a virtuous cycle: communities adopt sustainable practices, businesses do well, and the benefits (money, health, and education) make human capital even stronger. Community forests in Nepal, indigenous agroforestry in Bangladesh, and women-led Shea butter collectives in Africa are all examples of how giving local people knowledge, rights, and organizational support can help them do things that outside, extractive methods can't do. India's work with its tribal groups shows this to be true. Tribal entrepreneurs are starting to pop up all over India, from the faraway hills of the Northeast to the forests of Central India. Women are selling herbal teas online, young people are running community ecotourism centers, and cooperatives are branding organic spices. They are all carrying on their traditions and hopes for a better future.

To fully realize this vision, stakeholders must address remaining gaps: improving rural education and connectivity, ensuring policy consistency and funding for HR programs, and fostering partnerships between communities,

government, academia, and markets. It is just as important to honor and learn from the strength and wisdom of indigenous communities, treating them as equal partners in knowledge. Elinor Ostrom's research showed us that with the right help, communities can govern commons in a way that lasts through collective action. Therefore, development strategies ought to integrate traditional institutions (such as village councils and sacred groves management) within contemporary enterprise frameworks.

In conclusion, combining new ideas in human resources with eco-friendly bioresource businesses is a great way to get three wins: economic growth, social inclusion, and environmental protection. People used to think that India's tribal heartlands were poor and cut off from the rest of the world, but they are slowly becoming centers of social innovation and green business. Rural communities can not only improve their own health by following this path and expanding what works, but they can also make a big difference in the country's climate and sustainable development goals. The lessons learned from India and other parts of the world are clear: if you invest in people, they will come up with new ideas that help people and the planet.

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