



Can Ayurveda Contribute to Climate-Resilient Healthcare? A Perspective on Medicinal Plants, Prevention, and Sustainability

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Perspective

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Abstract

Climate change is increasingly influencing human health through heat exposure, changing infectious-disease patterns, food insecurity, environmental degradation, and disruption of health systems. At the same time, healthcare itself faces the challenge of becoming more environmentally sustainable. Ayurveda, with its emphasis on prevention, lifestyle, natural resources, and individualized approaches to health, offers perspectives that may be relevant to the development of climate-resilient healthcare. Medicinal plants constitute an important component of Ayurvedic practice, but their increasing demand creates concerns regarding biodiversity loss, habitat degradation, adulteration, and unsustainable harvesting. Consequently, the future role of Ayurveda in climate resilience should extend beyond the use of traditional remedies. It should include responsible cultivation and sourcing of medicinal plants, conservation of biodiversity, sustainable production, prevention-oriented healthcare, and research into environmentally appropriate models of clinical practice. This Perspective proposes that Ayurveda could contribute to climate-resilient healthcare if traditional principles are combined with ecological responsibility, scientific evaluation, and contemporary public-health strategies.

Keywords: Ayurveda; Climate Change; Climate-Resilient Healthcare; Medicinal Plants; Sustainability; Biodiversity; Preventive Healthcare; Traditional Medicine; Environmental Health

Introduction

Climate change is no longer exclusively an environmental concern. Rising temperatures, extreme weather events, changing rainfall patterns, ecosystem disruption, and deterioration of air and water quality can influence multiple dimensions of human health. Vulnerable populations may experience increasing risks from heat-related illness, nutritional insecurity, infectious diseases, respiratory problems, and interruptions in healthcare delivery.

These developments require healthcare systems to consider not only treatment capacity but also prevention,

resource use, environmental sustainability, and resilience. Within this context, traditional systems of medicine such as Ayurveda may offer useful perspectives. Ayurveda has historically emphasized prevention, daily routines, diet, seasonal adaptation, and the relationship between human health and the surrounding environment.

However, presenting Ayurveda as inherently “climate-friendly” would be premature. Its contemporary contribution must be evaluated scientifically, particularly with regard to resource consumption, medicinal-plant sustainability, safety, accessibility, and measurable health outcomes [1].

Medicinal Plants Under Climate Pressure

Medicinal plants represent an important link between Ayurveda and environmental sustainability. Climate change can influence plant growth, distribution, reproductive cycles, phytochemical composition, and availability of species used in traditional medicine. Habitat loss and excessive harvesting can intensify these pressures.

Growing global demand for herbal products creates a dual responsibility. Healthcare systems must ensure continued access to medicinal resources while avoiding practices that damage the ecosystems on which those resources depend [2].

Sustainable cultivation can reduce pressure on wild populations, provided that agricultural practices preserve soil quality, water resources, genetic diversity, and appropriate botanical identification. Conservation programs should prioritize threatened species and encourage responsible cultivation of medicinal plants with documented therapeutic importance.

From Harvesting to Responsible Supply Chains

Climate resilience requires attention to the complete medicinal-plant supply chain. Authentication of plant materials, geographic traceability, appropriate harvesting, post-harvest handling, storage, and processing can influence both product quality and environmental impact [3].

Digital traceability systems may provide opportunities to document the movement of medicinal plants from cultivation or collection sites to manufacturers and healthcare providers. Such systems could improve quality assurance while supporting responsible sourcing.

Research should also investigate whether different cultivation environments or processing methods alter phytochemical profiles and therapeutic properties. Sustainability and pharmacological quality should therefore be treated as interconnected research questions rather than separate subjects [4].

Ayurveda and Prevention-Oriented Healthcare

One potentially relevant feature of Ayurveda is its strong preventive orientation. Concepts associated with daily and seasonal routines emphasize regularity in sleep, diet, physical activity, hygiene, and adaptation to environmental conditions.

Modern public health similarly recognizes prevention and health promotion as essential components of resilient

healthcare systems. However, traditional recommendations should not automatically be interpreted as proven climate-adaptation interventions. Their potential contribution should be tested through contemporary research examining outcomes such as heat-related health behaviors, sleep, nutrition, physical activity, stress management, and community resilience [5].

This creates an opportunity for interdisciplinary studies involving Ayurvedic practitioners, environmental-health researchers, epidemiologists, nutrition scientists, and public-health professionals.

Designing Environmentally Responsible Ayurvedic Healthcare

Climate resilience should also be considered within Ayurvedic healthcare facilities. Responsible use of water, energy, medicinal plants, packaging materials, and clinical waste management can reduce environmental pressures.

Herbal medicine production may involve substantial agricultural, processing, packaging, and transportation requirements. Therefore, “natural” should not automatically be equated with “sustainable.” Environmental assessments are needed to identify which practices genuinely reduce ecological burdens.

Local sourcing, where scientifically and ethically appropriate, may reduce transportation requirements and strengthen regional supply chains. Nevertheless, local production should never compromise botanical quality, conservation, or patient safety [1-5].

Research Priorities

A climate-focused Ayurvedic research agenda should extend across several areas. First, researchers should document how climate variables affect the availability and chemical characteristics of important medicinal plants. Second, conservation studies should identify vulnerable species and develop sustainable cultivation models. Third, life-cycle assessments could evaluate the environmental footprint of Ayurvedic products from cultivation through disposal [2].

Fourth, clinical and public-health research should determine whether selected Ayurvedic preventive practices can improve adaptation to climate-related health risks. Finally, economic studies should assess whether sustainable Ayurvedic healthcare can remain accessible to communities with limited resources.

Importantly, research should avoid making broad claims based solely on traditional descriptions. Climate resilience is a measurable public-health objective and therefore requires measurable outcomes.

An Opportunity for Cross-Disciplinary Collaboration

The climate-health challenge provides an opportunity to expand collaboration between traditional medicine and environmental science. Ayurveda researchers can contribute knowledge concerning medicinal plants, preventive practices, dietary traditions, and health behavior, while environmental scientists can provide methods for evaluating biodiversity, ecological risk, resource use, and climate exposure [3].

Such collaboration could produce new models of healthcare that consider the patient, community, environment, and supply chain as interconnected components.

Conclusion

Ayurveda may contribute to climate-resilient healthcare, but its potential should be approached as a research opportunity rather than an established conclusion. Its preventive orientation and extensive knowledge of medicinal plants provide valuable starting points, while its future sustainability depends on responsible resource management and scientific evaluation. Protecting medicinal-plant biodiversity, developing sustainable supply chains, reducing environmental burdens, and evaluating prevention-oriented practices could allow Ayurveda to participate meaningfully

in climate-health strategies. The most useful path forward is neither to romanticize traditional medicine nor to dismiss it, but to investigate where Ayurvedic knowledge can provide practical, evidence-informed, and environmentally responsible solutions. A climate-resilient Ayurveda should ultimately protect both human health and the ecological systems that support it.

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