

**ENVIRONMENTAL TOXICITY IN THE PERSPECTIVE OF AGAD TANTRA: A  
CONCEPTUAL CORRELATIVE REVIEW****<sup>1</sup>\*Dr. Ojaswini Jain, <sup>2</sup>Dr. Vijay Kanno, <sup>3</sup>Dr. Urmila Shukla, <sup>4</sup>Dr. Sunita Rajput**<sup>1,2</sup>MD Scholar Department of Agad Tantra Evum Vidhi Vaidyaka Pt. Khushilal Sharma Govt. Ayurvedic College & Institute, Bhopal (M.P.)<sup>3</sup>Professor MD, PhD, HOD Department of Agad Tantra Evum Vidhi Vaidyaka Pt. Khushilal Sharma Govt. Ayurvedic College and Institute, Bhopal (M.P.)<sup>4</sup>Lecturer MD, Department of Agad Tantra Evum Vidhi Vaidyaka Pt. Khushilal Sharma Govt. Ayurvedic College & Institute, Bhopal (M.P.)**\*Corresponding Author: Dr. Ojaswini Jain**

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**ABSTRACT**

Environmental toxicity has emerged as one of the most significant public health challenges of the modern era due to rapid industrialization, chemicalization of agriculture, urban expansion, environmental pollution, and ecological imbalance.<sup>[1]</sup> Continuous exposure to environmental pollutants such as heavy metals, pesticides, industrial effluents, air pollutants, and synthetic chemicals has resulted in increasing incidence of chronic diseases affecting multiple organ systems.<sup>[2]</sup> Modern toxicology mainly focuses on identification, quantification, and symptomatic treatment of toxic agents, but it often lacks a comprehensive preventive, regenerative, and holistic framework. *Ayurveda*, through the specialized branch of *Agad Tantra* (Ayurvedic toxicology), offers a systematic and integrated approach to understanding toxins (*Visha*), their biological behavior, accumulation patterns, chronic persistence, and long-term disease manifestation. Classical concepts such as *Visha*, *Gara Visha*, and *Dushi Visha* demonstrate strong conceptual similarity with contemporary ideas of chemical mixtures, bioaccumulation, and chronic toxicity. Classical texts describe environmental degradation under the concept of *Janapadodhwamsa* (destruction of communities), emphasizing that disturbance in natural elements inevitably results in mass illness. This conceptual review correlates environmental toxicity with *Agad Tantra* principles and presents a structured integrative framework combining classical *Ayurvedic* toxicology with modern environmental health science. The study elaborates on classification of toxins, pathogenesis, diagnostic approaches, therapeutic strategies, detoxification procedures, rejuvenation therapies, preventive models, and public health relevance, highlighting the contemporary importance of *Agad Tantra* in addressing environmental health challenges.

**KEYWORDS:** Environmental Toxicity, Dushi Visha, Janapadodhwamsa, Bioaccumulation, Chronic Toxicity, Pollution, Preventive Medicine, Environmental Health.**1. INTRODUCTION**

The relationship between human health and the environment has been recognized since ancient times. Air, water, soil, food, climate, and ecosystems collectively influence physical, mental, and social well-being. In the modern era, unprecedented industrial development, excessive chemical use, urbanization, and technological expansion have drastically altered natural

environments. Industrial waste, agricultural chemicals, plastic pollutants, heavy metals, pharmaceutical residues, air pollutants, and toxic effluents have become an inseparable part of the ecosystem.<sup>[3]</sup> These toxic substances gradually enter the human body through inhalation, ingestion, and skin contact, leading to progressive biological damage.

Unlike acute poisoning, environmental toxicity usually does not present with immediate dramatic symptoms. Instead, it produces slow, progressive, and cumulative damage, often manifesting years later in the form of chronic diseases such as respiratory disorders, cardiovascular diseases, neurological degeneration, metabolic syndromes, autoimmune disorders, infertility, endocrine dysfunctions, immune suppression, and malignancies.<sup>[4]</sup> This silent progression makes environmental toxicity a hidden epidemic.

In *Ayurveda*, toxicology is systematized under the discipline of *Agad Tantra*, one of the eight classical branches of *Ashtanga Ayurveda*. Traditionally, *Agad Tantra* focused on animal venoms, plant poisons, mineral toxins, food contamination, and deliberate poisoning. However, its theoretical framework is universal and not limited to specific historical substances. The principles of *Agad Tantra* are applicable to any toxic exposure that disrupts biological balance. Therefore, modern environmental toxins can be interpreted as contemporary expressions of *Visha* described in classical *Ayurvedic* literature.

*Agada Tantra*, also dealing with poisons and toxins, extends beyond acute poisoning to encompass chronic, cumulative, and environmental toxic exposures. Concepts such as *Dushivisha* (latent or cumulative toxicity) and *Janapadodhwamsa* demonstrate the depth of *Ayurvedic* ecological awareness. These principles suggest that unethical conduct (*adharma*), intellectual errors (*prajnaparadha*), and excessive greed disrupt natural harmony, leading to widespread disease.<sup>[5]</sup>

## 2. MATERIALS AND METHODS

This study is a conceptual review conducted using the following sources:

### 1. Classical Ayurvedic Texts

Charaka Samhita (Chikitsa Sthana and Viman Sthana),  
Sushruta Samhita (Kalpa Sthana)  
Ashtanga Hridaya (Uttara Sthana).

### 2. Classical Commentaries

Chakrapani Datta, Dalhana, Arundatta.

### 3. Secondary Sources

Published research articles on environmental health  
Standard textbooks of toxicology for conceptual correlation

## 3. CONCEPT OF POISON (*VISHA*) IN AYURVEDA

In *Ayurvedic* philosophy, *Visha* is not limited to fatal poisons alone. Any substance that disrupts bodily balance, damages tissues, and disturbs physiological

harmony is considered toxic.<sup>[6]</sup> *Ayurveda* classifies poisons based on origin and nature:

### 3.1 Natural Poisons (*Akritrima Visha*)

These include toxins derived from plants, animals, and minerals, such as snake venom, poisonous herbs, and heavy metals.

### 3.2 Artificial Poisons (*Kritrima Visha*)

These are man-made toxic substances, including chemical compounds, synthetic drugs, and industrial toxins.

### 3.3 Compound Poisons (*Gara Visha*)

These are substances that are not individually toxic but become harmful when combined. This concept strongly parallels modern chemical mixtures and pollutant combinations.

### 3.4 Latent Poisons (*Dushi Visha*)

*Dushi Visha* refers to toxins that remain in the body in small quantities, accumulate over time, and slowly damage tissues and organs. This concept directly reflects modern ideas of chronic toxicity, bioaccumulation, and long-term environmental exposure.

## 4. ENVIRONMENTAL TOXICITY: A MODERN PERSPECTIVE

Environmental toxicity refers to harmful effects caused by toxic agents present in air, water, soil, and food. These toxins may originate from:

Industrial emissions, Agricultural chemicals, Heavy metals, Plastic and synthetic materials, Vehicle pollution, Waste disposal systems, Household chemicals.

Exposure to these substances is associated with chronic respiratory diseases, neurological disorders, endocrine dysfunction, reproductive problems, immune suppression, cancer, and metabolic disorders.

Unlike acute poisoning, environmental toxicity usually develops slowly, making diagnosis difficult and allowing disease to progress silently. This pattern strongly matches the *Ayurvedic* concept of chronic and latent poisoning.

Environmental pollution primarily behaves like *Dushi Visha* — slow, hidden, cumulative, and long-acting.

**Conceptual Framework**<sup>[7,8,9]</sup>

S.No.	Ayurvedic Types	Description	Environmental correlation
1	Sthavara Visha	Plant and mineral poisons	Soil and water pollutants, heavy metals
2	Jangama Visha	Animal and mobile poisons	Air pollution, microbial toxins
3	Kritrima Visha	Artificial/man-made poisons	Industrial chemicals, pesticides
4	Gara Visha	Toxic combinations	Chemical mixtures, food additives
5	Dushi Visha	Latent, cumulative toxins	Chronic pollution exposure, bioaccumulation

**5. CONCEPT OF ENVIRONMENTAL TOXICITY IN AYURVEDA****5.1 Dushi Visha: Concept of Chronic Environmental Toxicity**<sup>[10,11]</sup>

*Dushi Visha* refers to poisons that lose their acute potency but persist in the body due to incomplete metabolism or elimination. Classical descriptions state that these toxins remain dormant and manifest disease when aggravated by factors such as weakened digestion, seasonal variation, or stress.

**Environmental Correlates of Dushi Visha**

Chronic exposure to air pollutants and industrial emissions

Heavy metals such as lead, mercury, and arsenic

Persistent pesticide residues in food and water

**Clinical Manifestations**

*Ayurvedic* texts describe manifestations such as skin disorders (*Twak Vikara*), respiratory illnesses (*Shwasa*, *Kasa*), digestive disturbances (*Ajeerna*, *Grahani*), anemia (*Pandu*), and generalized debility (*Daurbalya*). These features suggest multisystem involvement consistent with modern descriptions of chronic toxicity.

**5.2 Garavisha: Artificial and Man-Made Toxicity**<sup>[12,13]</sup>

*Garavisha* is described as artificially prepared or combined toxins that exert slow but progressive pathological effects. These substances disturb *Agni* and lead to metabolic derangements and toxin accumulation (*Ama*).

In the modern context, *Garavisha* may be correlated with food adulterants, synthetic preservatives, artificial colorants, industrial chemicals, and plastic-derived toxins.

**5.3 Environmental Vitiating and Janapadodhwamsa**

The concept of *Janapadodhwamsa* describes widespread disease caused by vitiation of air (*Vayu*), water (*Jala*), land (*Desha*), and seasonal rhythms (*Kala*).<sup>[14]</sup> Such environmental derangements affect entire populations irrespective of individual constitution.

This concept parallels modern environmental epidemiology, where large-scale pollution and ecological imbalance result in mass morbidity and mortality.<sup>[13]</sup>

*Acharya Charaka* describes four primary environmental determinants whose vitiation leads to mass destruction:

**Air Pollution (*Vayu Dushti*)**<sup>[16]</sup>**Ayurvedic Understanding**

Vitiated air is described as abnormal in movement, temperature, moisture, odor, and sound, often laden with smoke, dust, and toxic fumes. Classical texts note that such air causes respiratory disorders, eye diseases, headaches, and even sudden death of birds—an observation strikingly similar to modern ecological indicators.

*Ayurveda* recommends *dhoopana karma* (herbal fumigation) using medicinal plants like *Haridra*, *Guggulu*, *Devadaru*, and *Nimba* to purify air. These practices are not merely ritualistic but have demonstrated antimicrobial and detoxifying properties. Ritualistic fires such as *Agnihotra* are also considered ecological detoxifiers, symbolizing a blend of spiritual and environmental health.

**Contemporary Reflection**

In today's context, these practices can be viewed as early forms of bio-fumigation and indoor air purification. Integrating such eco-friendly measures alongside modern pollution control strategies can reduce chemical dependence and promote sustainable living.

**Water Pollution (*Jala Dushti*)**<sup>[17]</sup>**Ayurvedic Perspective**

Water is revered as *praninam prana*—the life force of all beings. Polluted water is described as slimy, foul-smelling, frothy, and lifeless, causing gastrointestinal disorders, skin diseases, fever, anemia, and poisoning.

**Purification Methods**

Water purification techniques:

Use of herbal ashes (*jala shodhana*)

Storage in copper or silver vessels

Heating, sun exposure, and filtration through natural materials

Use of herbs like *Kataka*, *Tulsi*, *Amalaki*, and *Neem*

**Contemporary Reflection**

Modern research increasingly validates these methods, especially copper's antimicrobial properties. Promoting such low-cost, traditional techniques can be

transformative for rural and resource-limited communities.

### Land Pollution (*Desha Dushti*)<sup>[18]</sup>

#### Classical Description

Polluted land is characterized by abnormal color, smell, vegetation loss, excessive insects, distressed animals, and frequent natural calamities. Prolonged exposure leads to skin disorders, hair loss, edema, and systemic toxicity.

Land purification involves sprinkling herbal decoctions and selecting uncontaminated soil for medicinal plant cultivation. Ayurveda also emphasizes ethical agriculture and sustainable land use—principles aligning closely with modern environmental ethics.

#### Modern Correlation

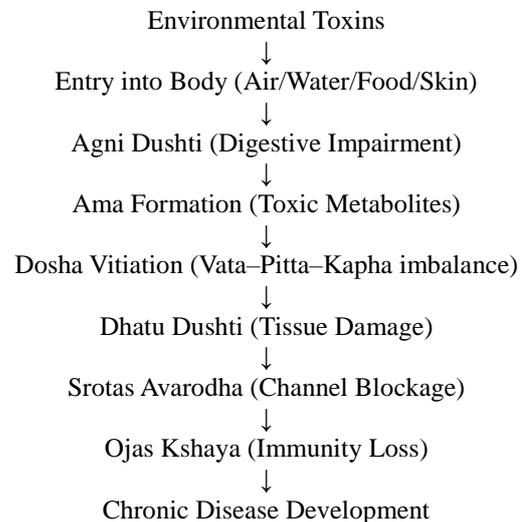
The Ayurvedic concept resonates with phytoremediation, where plants like *neem* and *tulsi* absorb heavy metals and detoxify soil, offering a green solution to land degradation.

### Seasonal Disturbances (*Kaala Dushti*)<sup>[19,20]</sup>

Seasonal irregularities such as untimely rains, extreme heat, or prolonged cold are considered the most dangerous form of environmental toxicity. Ayurveda warns that disturbance in *kaala* destabilizes all other elements, leading to epidemics and weakened immunity.

The COVID-19 pandemic has renewed global interest in such concepts, reinforcing Ayurveda's emphasis on adaptation through *ritucharya* (seasonal regimen) and immune modulation.

## 6. SAMPRAPTI (PATHOGENESIS) OF ENVIRONMENTAL TOXICITY



This Ayurvedic model explains the slow, cumulative, and systemic nature of environmental toxicity.

## 7. ORGAN SYSTEM IMPACT (AGAD TANTRA CORRELATION)<sup>[20]</sup>

S. No.	System	Environmental effect	Ayurvedic Explanation
1.	Respiratory system	Asthma, COPD	Pranavaha Srotas Dushti
2.	Nervous system	Neurotoxicity	Majja Dhatu Dushti
3.	Liver	Toxic hepatitis	Yakrit Dushti
4.	Blood	Anemia, toxicity	Rasa-Rakta Dushti
5.	Skin	Dermatitis	Rakta Dushti
6.	Immunity	Recurrent infections	Ojas Kshaya

## 8. Management of Environmental Toxicity<sup>[21]</sup>

### A. Shodhana (Detoxification Therapy)

S. No.	Therapy	Function	Environmental Relevance
1.	Vamana (therapeutic emesis)	Respiratory and upper GI toxin removal	Air pollution detox
2.	Virechana (purgation)	Liver, blood, and metabolic detoxification	Chemical detox
3.	Basti (medicated enema)	Systemic detox	Chronic toxicity
4.	Nasya	Head and nervous system detoxification	Neurotoxicity

### B. Samana chikitsa - vishaghana dravyas.

S. No.	Herb	Action
1.	Haridra	Antioxidant, detox
2.	Tulsi	Respiratory detox
3.	Guduchi	Immunomodulator
4.	Manjistha	Blood detox
5.	Neem	Blood purifier
6.	Triphala	Digestive detox

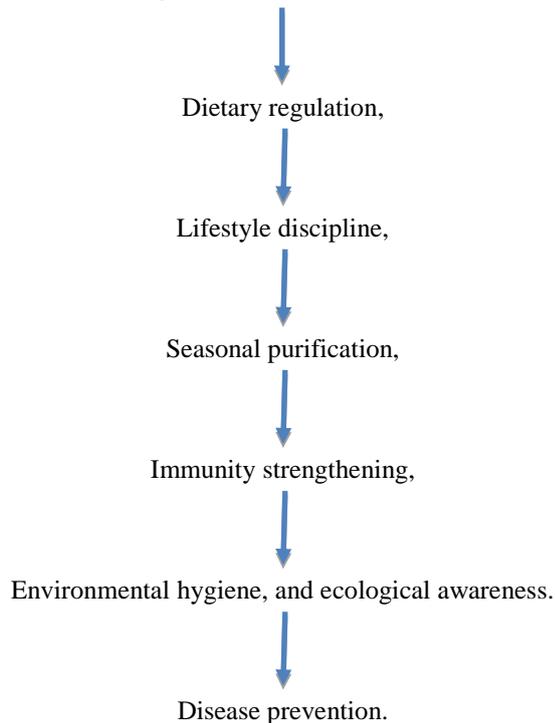
### C. Rejuvenation Therapy (Rasayana)

After detoxification, Rasayana therapy is essential to restore tissue strength, immunity, and resilience against future toxin exposure.

### 9. Preventive Model<sup>[22]</sup>

Prevention is central to Agad Tantra. Preventive strategies include

Nidan Parivarjana (avoidance of causative factors)



### 10. DISCUSSION

Environmental toxicity behaves biologically as chronic latent toxicity, which is identical to the concept of Dushi Visha described in Ayurveda. Modern medicine increasingly recognizes the importance of chronic low-dose toxin exposure, bioaccumulation, and long-term health effects.<sup>[23]</sup> Agad Tantra already provides a comprehensive framework for understanding these phenomena. Unlike conventional toxicology, Agad Tantra does not focus only on chemical elimination but emphasizes biological resilience, metabolic balance, immunity strengthening, and ecological harmony. This integrative model offers a sustainable solution for modern environmental health challenges.

### 11. CONCLUSION

Environmental toxicity represents a modern manifestation of classical Visha described in Agad Tantra. Ayurvedic toxicology offers a complete framework for understanding, diagnosing, managing, and preventing chronic pollution-related diseases. Concepts such as Dushi Visha, Gara Visha, Shodhana, Rasayana, and Nidan Parivarjana provide a scientifically coherent and holistic approach to environmental health. Integrating Agad Tantra principles with modern environmental science can create a comprehensive, preventive, regenerative, and sustainable healthcare model capable of addressing present and future environmental health challenges.

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