Disaster Prediction through Animal Behaviour in the Indian Knowledge System: Insights from Varāhamihira's Bṛhatsaṃhitā

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Abstract

Disaster management is an important multidisciplinary field encompassing disaster prediction, preparedness, mitigation and risk reduction. Although modern scholarship has extensively examined its scientific, technological, social and economic dimensions, the contribution of ancient Indian knowledge traditions to disaster management remains comparatively underexplored. Ancient Indian literature, particularly Varāhamihira's Bṛhatsaṃhitā, preserves valuable observations concerning natural calamities, environmental changes and unusual animal behavior associated with impending disasters. The present study critically examines the traditional concepts of disaster prediction reflected in the Bṛhatsaṃhitā with special reference to the behavioral patterns of animals and birds. It analyses the significance of the Sanskrit term Utpāta and investigates descriptions of unusual activities of crows, frogs, snakes, dogs, elephants, horses, cows, jackals, deer and other birds and wild animals as traditional indicators of famine, drought, excessive rainfall, fire, earthquakes and other calamities. The primary objective of this research is to investigate the concepts, principles, and practices of disaster management reflected in the ancient Indian sources. The study also seeks to compare these historical approaches with contemporary disaster management frameworks and critically evaluate their relevance in the light of modern scientific knowledge.

Keywords - bṛhatsaṃhitā, varāhamihira, utpāta, indian knowledge system, animal behavior, disaster prediction, environmental observation, natural calamities.

Disaster management has emerged as a distinct field of study in the modern academic world. Its scope extends beyond technological and scientific concerns to encompass important social, political, economic, and cultural dimensions. Countries across the world have developed various mechanisms, institutional frameworks, and human resource capabilities to prevent disasters, reduce their impact, and facilitate recovery. Numerous books, research articles, policy documents, and conference proceedings have explored disaster management in relation to technological advancement, social preparedness, and sustainable development. However, comparatively limited scholarly attention has been devoted to understanding the

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concepts and practices of disaster management in ancient India. Ancient Indian literary traditions, archaeological evidence, and epigraphic records reveals numerous references to natural calamities, human suffering, preventive measures, and strategies for mitigating disasters. Although some accounts are presented through mythical, religious, or supernatural narratives, they may also preserve valuable insights into early Indian perceptions of environmental hazards and community protection. In Vedic literature and later Vedic literature period and the Purāṇic tradition provide further material for investigating the consequences of calamities and the responsibilities of rulers and communities during periods of crisis. Among the important technical works, Kauṭilya's Arthaśāstra and Varāhamihira's Bṛhatsaṃhitā offer significant discussions relevant to disaster preparedness, risk reduction, and the management of natural hazards.

Bṛhatsaṃhitā, composed by Varāhamihira in the sixth century CE, stands out as an encyclopaedic work reflecting the scientific knowledge and cultural life of the Gupta period. Varāhamihira combined traditional wisdom with astronomical calculations, mathematical reasoning, and systematic observations of natural phenomena. His remarkable contribution established him as one of the foremost scholars of ancient India. The Bṛhatsaṁhitā is particularly significant for studying early Indian concepts of disasters and their management, as it discusses various calamities, famines, and methods of predicting them through observations of meteorological phenomena. Although some explanations are influenced by astrological and supernatural beliefs, the text also preserves rational observations and interpretations of natural events. Therefore, it offers valuable insights into the relationship between traditional knowledge, environmental observation, disaster prediction, and early Indian approaches to disaster management.

The Sanskrit terminology associated with disasters, including its etymological interpretations in grammatical treatises, lexicons, and technical texts of ancient India, provides valuable insight into traditional Indian approaches to calamities. The term utpāta is used frequently for natural calamities. In Monier Monier-Willams Sanskrit English Dictionary, उत्पात (utpāta) is explained as "a sudden event, unexpected appearance; an unusual or startling event boding calamity; a portent, prodigy, phenomena; any public calamity. The Students' Sanskrit-English Dictionary of V.S. Apte refers the term as "a portent, any portentous or unusual phenomena boding calamity. The term उत्पात (utpāta) can be better understood with the help of 'उत्पातेन ज्ञापिते च' ('utpātena jñāpite ca'), चतुर्थी सम्प्रदाने, अष्टाध्यायी-2.3.13 (caturthī sampradāne, aṣṭādhyāyī-2.3.13). The Tattvabodhinī commentary on Pāṇini's Aṣṭādhyāyī explains the term as "प्राणिनां शुभाशुभसूचकभूतविकारः उत्पातः" ("prāṇināṁ śubhāśubhasūcakabhūtavikāraḥ utpātaḥ").(चतुर्थी सम्प्रदाने, अष्टाध्यायी-2.3.13). The example "वाताय कपिला विद्युत् आतपायाति लोहिनी/ पीता वर्षाय विज्ञेया दुर्भिक्षाय सिता भवेत्" ("vātāya kapilā vidyut ātapāyāti lohinī/ pītā varṣāya vijñeyā durbhikṣāya sitā bhavet") can be referred as natural precursor for disaster. Sometimes the term īti used to denote disaster also means calamities like plague, distress, drought, excessive rain, swarm of rats, foreign invasion etc. The Śabdakalpadruma defines utpāta as - "उत्पतति अकस्मादायाति यः, प्राणिनां शुभाशुभसूचकमहाभूतविकारभूकम्पादिः" ("utpatati akasmādāyāti yaḥ, prāṇināṁ subhāsubhasūcakamahā-bhūtavikārabhūkampādiḥ") (Shabdakalpadruma, cons. Sruti Jha, Ed. Madanmohan Jha, available at Google Play store) Before examining the predictions of natural disasters

mentioned in the Bṛhatsaṃhitā, some reported instances of unusual animal behaviour preceding natural calamities may be considered.

i. Snake Behaviour Before the 1976 Haicheng Earthquake: The Haicheng earthquake in China occurred in February 1976, during winter, when snakes generally remain in hibernation. However, both local observers and official sources reported an unusual increase in snake sightings in the weeks preceding the earthquake.

ii. Animal Responses Before the 2004 Indian Ocean Tsunami: When the tsunami struck South Asian countries in 2004, it caused extensive human casualties. However, reports indicated that several wild animals, including elephants, flamingos and bears, had moved away from their usual habitats before the disaster. Ravi Corea, President of the Sri Lanka Wildlife Conservation Society, reported that no animal carcasses were found in Yala National Park. Similarly, reports from Cuddalore beach in India indicated that livestock survived despite significant human fatalities, while birds in the Calimere Wildlife Sanctuary also reportedly escaped harm.

iii. Olive Ridley Turtles and Cyclone Fani in Odisha: Olive Ridley turtles traditionally arrive at the Rushikulya rookery in Ganjam district, Odisha, for their annual mass-nesting season. However, during the period discussed in the original account, only around 3,000 nests were recorded, compared with the usual figure of up to 500,000. Some Indian scientists speculated that the turtles might have sensed environmental changes associated with the approaching Cyclone Fani, one of the most severe cyclones to affect Odisha in the preceding two decades.

The traditional beliefs recorded in the Bṛhatsaṃhitā, small animals such as ants, toads, lizards, and birds are often believed to indicate impending natural disasters through changes in their behaviour. The following examples illustrate how bird behaviour has been traditionally associated with disaster prediction.

Crows

Crows have been considered potential indicators of impending natural calamities. The author of the Bṛhatsaṃhitā describes the following omen related to disaster prediction based on crow behaviour: Prediction of Famine: If a crow builds its nest in a damaged, thorny, or dried-up tree during the month of Vaiśākha, it is believed to foretell the possibility of famine in that region.

वैशाखे निरुपहते वृक्षे नीडः सुभिक्षशिवदाता

निन्दितकण्टकिशुष्केष्वसुभिक्षभयानि तद् देशे ॥ (Bṛhatsaṃhitā - 95.02)

[vaiśākhe nirupahate vṛkṣe nīḍaḥ subhikṣaśivadātā

ninditakaṇṭakiśuṣkeṣvasubhikṣabhayāni tad deśe ||(Bṛhatsaṃhitā - 95.02)]

If a crow builds its nest among reeds, sacred grains, bushes, creepers, crops, temples, houses, or in pits, it is believed to foretell the devastation of the country due to robbery, drought, and disease.

शरदर्भगुल्मवल्लीधान्यप्रासादगेहनिम्नेषु

शून्यो भवति स देशश्चौरानावृष्टिरोगार्तः॥ (Bṛhatsaṃhitā - 95.05)

[śaradarbhagulmavallīdhānyaprāsādagehanimneṣu

śūnyo bhavati sa deśaścaurānāvṛṣṭirogārtaḥ|| (Bṛhatsaṃhitā - 95.05)]

If the crow's fledgling is coraka (dark) in colour, it signifies trouble from robbers.If it is multicoloured, it indicates death. If it is white, it foretells danger from fire. If it is deformed or has defective limbs, it signifies the fear of famine.

चौरकवर्णैश्चौराश्चित्रैर्मृत्युः सितैस्तु वह्निभयम्

विकलैर्दुर्भिक्षभयं काकानां निर्दिशेच्छिशुभिः ॥ (Bṛhatsaṃhitā - 95.07)

[caurakavarṇaiścaurāścitrairmṛtyuḥ sitaistu vahnibhayam

vikalairdurbhikṣabhayaṃ kākānāṃ nirdiśecchiśubhiḥ || (Bṛhatsaṃhitā - 95.07)]

If crows gather unexpectedly in the middle of a village and caw loudly, it is considered an omen of famine. If they fly in a circular formation, it signifies the possibility of the village being besieged. If they appear in several separate groups, it is believed to foretell a disaster.

अनिमित्तसंहतैर्ग्राममध्यगैः क्षुद्भयं प्रविरुवद्भिः

रोधश्चक्राकारैरभिघातो वर्गवर्गस्थैः ॥ (Bṛhatsaṃhitā - 95.08)

[animittasaṃhatairgrāmamadhyagaiḥ kṣudbhayaṃ praviruvadbhiḥ

rodhaścakrākārairabhighāto vargavargasthaiḥ || (Bṛhatsaṃhitā - 95.08)]

The unusual behaviour of crows before natural disasters has also been reported in modern times. Before the 1995 Kobe earthquake in Japan, crows were reportedly seen moving towards a bamboo grove at midnight, cawing loudly and behaving restlessly. They subsequently moved towards the suburbs, away from the earthquake's epic centre. Such observations reflect traditional beliefs about animal behaviour as a possible warning sign of natural disasters; however, they do not establish that crows can reliably predict earthquakes.

Frogs and snakes

Indian epics, classical literature, and traditional folk traditions contain accounts of predicting natural calamities through the behaviour of reptiles and insects. The Bṛhatsaṃhitā describes certain unusual changes in the population of creatures such as insects, rats, flies, and snakes as possible precursors of impending events. According to the text, the effects associated with an increase in these creatures are believed to become evident within three months.

कीटाखुमक्षिकोरगबाहुल्यं मृगविहङ्गविरुतं च

लोस्टस्य चाप्सु तरणं त्रिभिरेव विपचयते मासैः ॥ (Bṛhatsaṃhitā - 97.07)

[kīṭākhumakṣikoragabāhulyaṃ mṛgavihaṅgavirutaṃ ca

losṭasya cāpsu taraṇaṃ tribhireva vipacayate māsaiḥ || (Bṛhatsaṃhitā - 97.07)]

Dogs

Dogs are widely known for their loyalty to humans and their ability to detect unusual activities in their surroundings. Their highly developed sense of smell enables them to identify certain substances and environmental changes that may escape human notice. Specially trained dogs are employed by investigative and security agencies to detect explosives and other hazardous materials. The Bṛhatsaṃhitā also records traditional omens associated with canine behaviour, reflecting ancient Indian attempts to interpret animal activities as indicators of impending events. According to the Bṛhatsaṃhitā, a dog's barking in particular directions and at specific times was traditionally interpreted as an omen of impending danger. South-east direction: If a dog barks while standing in the south-east and facing the sun, it signifies a possible threat from thieves or fire. Midday barking at noon is believed to foretell a fire outbreak or death caused by fire. Afternoon barking during the afternoon is interpreted as a sign of violent conflict or bloodshed.

सूर्योन्मुखः श्वानलदिक्स्थितश्च चौरानलत्रासकरोऽचिरेण

मध्याह्नकालेऽनलमृत्युशंसी सशोणितः स्यात् कलहोऽपराह्णे (Bṛhatsaṃhitā - 89.03)

[sūryonmukhaḥ śvānaladiksthitaśca caurānalatrāsakaroscireṇa

madhyāhnakālesnalamṛtyuśaṃsī saśoṇitaḥ syāt kalahosparāhṇe (Bṛhatsaṃhitā - 89.03)]

If dogs repeatedly bark together in the centre of a village or town, the text interprets this behaviour as an indication of difficulties for the local ruler or authority. Wild dogs are considered separately in the traditional system of omens.

ग्रामस्य मध्ये यदि वा पुरस्य भषन्ति संहत्य मुहुर्मुहुर्ये

ते क्लेशमाख्यान्ति तदीश्वरस्य श्वारण्यसंस्थो मृगवद्विचिन्त्यः ॥ (Bṛhatsaṃhitā - 89.18)

[grāmasya madhye yadi vā purasya bhaṣanti saṃhatya muhurmuhurye

te kleśamākhyānti tadīśvarasya śvāraṇyasaṃstho mṛgavadvicintyaḥ || (Bṛhatsaṃhitā - 89.18)]

During the rainy season, if rainfall is absent and a dog bathes in water, repeatedly moving from side to side and shaking its body, or drinks water by lapping it up, rainfall is predicted to occur after twelve days.

प्रावृट्कालेऽवग्रहेऽम्भोऽवगाह्य प्रत्यावर्तै रेचकैश्चाप्यभीक्ष्णम् ।

आधुन्वन्तो वा पिबन्तश्च तोयं वृष्टिं कुर्वन्त्यन्तरे द्वादशाहात् ॥ (Bṛhatsaṃhitā - 89.07)

[prāvṛṭkāle'vagrahe'mbho'vagāhya pratyāvartai recakaiścāpyabhīkṣṇam |

ādhunvanto vā pibantaśca toyaṃ vṛṣṭiṃ kurvantyantare dvādaśāhāt || (Bṛhatsaṃhitā - 89.07)]

Modern observations have also drawn attention to changes in animal behaviour before certain natural disasters. Stanley Coren has discussed the sensory abilities and behavioural responses

of dogs, while reports concerning the 1995 Kobe earthquake in Japan describe unusual restlessness and frantic barking among some dogs before the event. Similar accounts mention fear-related behaviour in goats and other animals. Such reports are of interest when compared with ancient literary descriptions; however, they do not establish that dogs can reliably predict earthquakes.

Elephants

According to the Bṛhatsaṃhitā, If an elephant suddenly stops while walking, ceases to move its ears, places its trunk on the ground in a deeply distressed manner, breathes slowly and deeply, and exhibits a bewildered expression with half-closed eyes, it is considered an ominous sign. Other alarming symptoms include lying down for an unusually long time, walking backwards, consuming inedible substances, and frequently passing blood-mixed faeces. Such signs are regarded as portents of impending danger.

स्खलितगतिरकस्मात् त्रस्तकर्णोऽतिदीनः

श्वसिति मृदु सुदीर्घं न्यस्तहस्तः पृथिव्याम्

द्रुतमुकुलितदृष्टिः स्वप्नशीलो विलोमो

भयकृदहितभक्षी नैकशोऽसृक्शकृत्कृत् ॥ (Bṛhatsaṃhitā - 94.12).

[skhalitagatirakasmāt trastakarṇo'tidīnaḥ

śvasiti mṛdu sudīrghaṃ nyastahastaḥ pṛthivyām

drutamukulitadṛṣṭiḥ svapnaśīlo vilomo

bhayakṛdahitabhakṣī naikaśo'sṛkśakṛtkṛt || (Bṛhatsaṃhitā - 94.12)]

These descriptions demonstrate the attention given in ancient Indian literature to the physical condition and behavioural changes of elephants. From a modern perspective, several of these symptoms may indicate illness, stress, injury, or environmental disturbance rather than the prediction of a natural calamity. Accounts of elephants surviving the Indian Ocean tsunami of December 2004 have also attracted public interest. Such observations have encouraged comparisons between traditional animal omens and modern discussions of animal responses to environmental hazards.

Horses

The Bṛhatsaṃhitā describes certain unusual occurrences involving horses as unfavourable omens, A horse's following behaviours are considered inauspicious: refusing grass and water without any apparent reason, falling down, sweating, trembling, bleeding from the mouth, remaining awake at night as if hostile towards someone, sleeping during the day, showing laziness and anxiety, becoming lethargic, lowering its head, and repeatedly looking upwards.

प्रद्वेषो यवसाम्भसां प्रपतनं स्वेदो निमित्ताद्विना

कम्पो वा वदनाच्च रक्तपतनं धूमस्य वा सम्भवः ।

अस्वप्नश्च विरोधिनां निशि दिवा निद्रालसध्यानता

सादोऽधोमुखता विचेष्टितमिदं नेष्टं स्मृतं वाजिनाम् ॥ (Bṛhatsaṃhitā - 93.05)

[pradveṣo yavasāmbhasāṃ prapatanaṃ svedo nimittādvinā

kampo vā vadanācca raktapatanaṃ dhūmasya vā sambhavaḥ |

asvapnaśca virodhināṃ niśi divā nidrālasadhyānatā

sādosdhomukhatā viceṣṭitamidaṃ neṣṭaṃ smṛtaṃ vājinām || (Bṛhatsaṃhitā - 93.05)]

Cows

If a cow lows without any apparent reason, it is interpreted as a sign of impending adversity, while such behaviour occurring at night is regarded as a warning of impending danger and possible misfortune.

अकारणे क्रोशति चेदनर्थो भयाय रात्रौ वृषभः शिवाय

भृशं निरूद्धा यदि मक्षिकाभिस्तदाशु वृष्टिं सरमात्मजैर्वा ॥ (Bṛhatsaṃhitā -92.02)

[akāraṇe krośati cedanartho bhayāya rātrau vṛṣabhaḥ śivāya

bhṛśaṃ nirūddhā yadi makṣikābhistadāśu vṛṣṭiṃ saramātmajairvā || (Bṛhatsaṃhitā -92.02)]

The text also mentions the condition of insects and their possible relationship with weather conditions. In modern observations, changes in the behaviour of domestic animals—such as reduced milk production in cows, failure of hens to lay eggs, or bees abandoning their hives—have sometimes been reported before hurricanes, earthquakes, and tsunamis.

Jackals

The Bṛhatsaṃhitā interprets the sounds and appearance of jackals as indicators of different kinds of fortune and misfortune. If a jackal (Śivā) cries once and then falls silent, it indicates tranquillity; if it cries twice and then becomes silent, it signifies the hearing of welcome news; if it cries three times, it indicates financial gain; if it cries four times, it signifies the arrival of a beloved person; if it cries five times, it indicates anxiety or agitation; if it cries six times, it signifies discord among prominent persons; and if it cries seven times, it indicates prosperity. Any number of cries beginning with eight is considered unacceptable for interpretation. When the cries occur in the southern direction, all the aforementioned results should be interpreted in reverse, except the fifth and sixth results. Thus, one cry indicates agitation, two cries foretell the hearing of unwelcome news, three cries indicate financial loss, four cries signify separation from a beloved person, five cries indicate agitation, six cries signify discord among prominent persons, and seven cries indicate the loss of prosperity.

अक्षोभः श्रवणं चेष्टं धनप्राप्तिः प्रियागमः

क्षोभः प्रधानभेदश्च वाहानानां च सम्पदः ॥(Bṛhatsaṃhitā - 90.09).

फलमासप्तमादेतदग्राह्यं परतो रुतम्

याम्यायां तद्विपर्यस्तं फलं षट्पञ्चमादृते ॥(Bṛhatsaṃhitā - 90.10)

[akṣobhaḥ śravaṇaṃ ceṣṭaṃ dhanaprāptiḥ priyāgamaḥ

kṣobhaḥ pradhānabhedaśca vāhānānāṃ ca sampadaḥ ||(Bṛhatsaṃhitā - 90.09)

phalamāsaptamādetadagrāhyaṃ parato rutam

yāmyāyāṃ tadviparyastaṃ phalaṃ ṣaṭpañcamādṛte ||(Bṛhatsaṃhitā - 90.10)]

Deer and Other Wild Animals

Ancient Indian literature pays considerable attention to the behaviour of deer and other wild animals. Their movements, cries, and responses to their surroundings are interpreted in the Bṛhatsaṃhitā as possible signs of danger. If a deer repeatedly producing loud and terrifying cries is believed to foretell the destruction of a village. If it faces the sun, stands to the south of an army, and cries loudly, the text associates its behaviour with the destruction of that army.

सीमागता वन्यमृगा रूवन्तः स्थिता व्रजन्तोऽथ समापतन्तः

सम्प्रत्यतीतैष्यभयानि दीप्ताः कुर्वन्ति शून्यं परितो भ्रमन्तः ॥ (Bṛhatsaṃhitā -91.01)

[sīmāgatā vanyamṛgā rūvantaḥ sthitā vrajantostha samāpatantaḥ

sampratyatītaiṣyabhayāni dīptāḥ kurvanti śūnyaṃ parito bhramantaḥ || (Bṛhatsaṃhitā -91.01)]

Movement near settlements: Wild animals crying near the burning or exposed boundary of a town or village are interpreted as signs of danger during the same day. Animals moving away from the boundary are taken to indicate that the danger has passed, while those approaching it signify impending danger. Animals moving around the settlement are believed to foretell its abandonment.

ते ग्राम्यसत्त्वैरनुवाश्यमाना भयाय रोधाय भवन्ति वन्यैः

द्वाभ्यामपि प्रत्यनुवाशितास्ते वन्दिग्राहायै च मृगा रूवन्ति ॥ (Bṛhatsaṃhitā -91.02)

[te grāmyasattvairanuvāśyamānā bhayāya rodhāya bhavanti vanyaiḥ

dvābhyāmapi pratyanuvāśitāste vandigrāhāyai ca mṛgā rūvanti || (Bṛhatsaṃhitā -91.02)]

A wild animal standing at a town gate is interpreted as a sign of siege. Its entry into the town is associated with destruction, its giving birth with death, and its death with danger. If it enters a house, the text predicts the imprisonment of the householder.

वये सत्त्वे द्वारसंस्थे पुरस्य रोधो वाच्यः सम्प्रविष्टे विनाशः

सूते मृत्युः स्याद्भयं संस्थिते च गेहं याते बन्धनं सम्प्रदिष्टम् ॥ (Bṛhatsaṃhitā - 91.3)

[vaye sattve dvārasaṃsthe purasya rodho vācyaḥ sampraviṣṭe vināśaḥ

sūte mṛtyuḥ syādbhayaṃ saṃsthite ca gehaṃ yāte bandhanaṃ sampradiṣṭam || (Bṛhatsaṃhitā - 91.3)]

These descriptions show that the Bṛhatsaṃhitā considered the relationship between wildlife and human settlements an important part of its system of omens. Although animals may respond to changes in their environment, the specific predictions recorded in the text require independent scientific verification.

Other Animals and Birds

The Bṛhatsaṃhitā also records numerous omens based on unusual bird and animal movements. These prescriptions demonstrate the importance of observing departures from ordinary patterns of animal behaviour. Birds normally associated with towns entering forests, or forest birds entering towns without apparent fear, are regarded as signs of impending danger. Similarly, daytime birds flying at night and nocturnal birds appearing during daylight are considered inauspicious.

सन्ध्याद्वयेऽपि मण्डलमाबध्नन्तो मृगा विहङ्गा वा

दीप्तायां दिश्यथवा क्रोशन्तः संहता भयदाः ॥ (Bṛhatsaṃhitā - 46.67)

[sandhyādvayespi maṇḍalamābadhnanto mṛgā vihaṅgā vā

dīptāyāṃ diśyathavā krośantaḥ saṃhatā bhayadāḥ || (Bṛhatsaṃhitā - 46.67)]

Unusual cries of birds at dawn while facing the Sun are considered an omen of a country's destruction. Similarly, if birds cry with their faces illuminated by sunlight while standing to the south of a city, it is believed to foretell the city's capture by enemy forces.

दीप्तमृगाण्डजविरुता प्राक् सन्ध्या देशनाशमाख्याति

दक्षिणदिक्स्थैर् विरुता ग्रहणाय पुरस्य दिप्तास्यैः ॥ (Bṛhatsaṃhitā - 30.5)

[dīptamṛgāṇḍajavirutā prāk sandhyā deśanāśamākhyāti

dakṣiṇadiksthair virutā grahaṇāya purasya diptāsyaiḥ || (Bṛhatsaṃhitā - 30.5)]

If birds cry ominously at a particular junction and unusual phenomena such as rod-like formations, dust, crossbars, or similar signs appear, it is considered an indication of impending calamity. Similarly, if the Sun displays an abnormal appearance repeatedly, it is believed to foretell the destruction of the kingdom, the ruler, and agricultural crops.

दिप्तविहङ्गशिवामृगघुष्टा दण्दरजः परिघ्वादियुता च

प्रत्यहम् अर्कविकारयुता वा देशनरेशसुभिक्षवधाय ॥ (Bṛhatsaṃhitā - 30.30)

[diptavihaṅgaśivāmṛgaghuṣṭā daṇḍarajaḥ parighvādiyutā ca

pratyaham arkavikārayutā vā deśanareśasubhikṣavadhāya || (Bṛhatsaṃhitā - 30.30)]

The birds can produce the effect of the disaster on the 8th day, if not the same day

तस्मिन् एव दिनेऽष्टमेऽथ विहगाः सप्ताहपाका मृगाः (Bṛhatsaṃhitā - 30.31)

[tasminn eva dineṣṭamestha vihagāḥ saptāhapākā mṛgāḥ (Bṛhatsaṃhitā - 30.31)]

When birds or wild animals assemble in circles at dawn or dusk, or cry together while facing a particular direction, their behaviour is interpreted as a warning of danger. The cries of eagles, the loud howling of jackals near city gates, and the entry of pigeons or owls into a royal palace are regarded as ominous signs

श्येनाः प्ररूदन्त इव द्वारे क्रोशन्ति जम्बुका दीप्ताः

प्रविशेन्नरेन्द्रभवने कपोतकः कौशिको यदि वा ॥ (Bṛhatsaṃhitā - 46.68)

[śyenāḥ prarūdanta iva dvāre krośanti jambukā dīptāḥ

praviśennarendrabhavane kapotakaḥ kauśiko yadi vā || (Bṛhatsaṃhitā - 46.68)]

Cocks crowing in the evening, cuckoos calling at an unusual season, and vultures or other predatory birds circling in the sky in an unusual direction are associated with impending misfortune.The congregation of birds on houses, sacred trees, ornamental arches, and gateways is interpreted as a sign of destruction affecting the locality.

कुक्कुटरूतं प्रदोषे हेमन्तादौ च कोकिलालापाः

प्रतिलोममण्डलचराः श्येनाद्याश्चाम्बरे भयदाः ॥ (Bṛhatsaṃhitā - 46.69)

गृहचैत्यतोरणेषु द्वारेषु च पक्षिसङ्घसम्पातः

मधुवल्मीकाम्भोरूहसमुद्भवश्चापि नाशाय ॥ (Bṛhatsaṃhitā - 46.70)

[kukkuṭarūtaṃ pradoṣe hemantādau ca kokilālāpāḥ

pratilomamaṇḍalacarāḥ śyenādyāścāmbare bhayadāḥ || (Bṛhatsaṃhitā - 46.69)

gṛhacaityatoraṇeṣu dvāreṣu ca pakṣisaṅghasampātaḥ

madhuvalmīkāmbhorūhasamudbhavaścāpi nāśāya || (Bṛhatsaṃhitā - 46.70)]

Taken together, these accounts demonstrate that the Bṛhatsaṃhitā developed an extensive traditional framework for interpreting animal behaviour in relation to public safety, political stability, and natural calamities. The text is valuable as a source for the history of Indian observational traditions. However, a scholarly assessment should distinguish its historical beliefs from modern scientific evidence concerning animal responses to environmental changes.

Comparative table based on the Bṛhatsaṃhitā

Table - I

(Animal behavior, traditional interpretation and possible scientific explanation)

Sl. No.	Animal	Reference in Bṛhatsaṁhitā	Behavior described in the text	Traditional prediction / interpretation	Possible modern scientific explanation

01	Owls (Ulūka)	Chapter-88 Chapter-30 Chapter-46	Abnormal cries, repeated vocal -isations and unusual sounds at night	Different vocal patterns are classified as auspicious or inauspic -ious; some are associated with conflict and misery	Changes in calling behavior may reflect territorial activity, reproductive behavior, disturbance, food availability and responses to environment -tal noise
02	Cuckoo (Kokila)	Chapter-88 Chapter-30 Chapter-46	Different types of vocalisation, including unusual calls	Particular calls are associated with prosperity, wealth or adverse outcomes	Cuckoo vocalisations are influenced by breeding cycles, seasonal changes, photoperiod, temperature and ecological conditions
03	Crane (Krauñca)	Chapter-88 Chapter-30 Chapter-46	Changes in calls, including calling together with a mate or calling separately	Certain calls are considered auspicious, while others are interpreted as unfavourable	Changes in calling and group behaviour may reflect reproductive activity, disturbances, habitat changes and environmental stress
04	Cock / Rooster (Kukkuṭa)	Chapter-88 Chapter-30 Chapter-46	Unusual or fearful crowing at night, as well as changes in the normal morning call	Abnormal night calls are regarded as inauspicious, whereas a natural, strong morning call is associated with prosperity	Roosters respond to light, circadian rhythms, artificial illumination, predators and disturbances in their surroundings
05	Dove / Pigeon (Kapota)	Chapter-88 Chapter-30 Chapter-46	Hiding in unusu -al places, enteri -ng flowers and displaying unu-sual behavior	Such unusual activities are interpreted as signs of impending misfortune	Changes in roosting and shelter-seeking behaviour may result from predators, temperature, storms, habitat disturbance and changes in food availability
06	Snake (Sarpa)	Chapter-88	Unusual movement towards a traveller and abnormal movement patterns	Certain movements are interpreted as signs of danger, imprisonment and misfortune	Reptile activity is strongly influenced by temperature, humidity, rainfall, ground conditions and seasonal changes. Flooding and habitat disturbance can displace snakes

07	Hare (Śaśaka)	Chapter-97	Unusual movement and vocalisation at night	Particular movements and calls are associated with favourable or unfavourable outcomes	Hares may alter their movement in response to predators, noise, habitat disturbance and environmental stress
08	Monkey (Kapi)	Chapter-88	Unusual vocalisations	Particular calls are interpreted as unfavourable for travellers	Monkeys use alarm calls and group vocalisations in response to predators, threats, social disturbances and changes in their environment
09	Donkey (Gardabha)	Chapter-88	Abnormally prolonged or unusual braying	Particular sounds and directions are interpreted as favourable or unfavourable	Vocalisation may change due to social communication, distress, reproductive behaviour, pain and environmental disturbance
10	Cat (Mārjāra)	Chapter-88	Characteristic vocalisation and appearance during travel	Its sound is generally interpreted as auspicious for a traveller	Cats respond to auditory stimuli, unfamiliar sounds, movement, social interactions and environmental changes
12	Dogs (Śvan)	Chapter-89	Unusual activities, movements, urination patterns and scratching behaviour	Various signs are interpreted as indications of danger, success, disgrace and misfortune	Dogs possess sensitive hearing and smell. They may respond to unfamiliar sounds, vibrations, chemical odours, changes in animal activity and environmental disturbances
13	Jackal (Śivā)	Chapter-90 Chapter-91	Unusual, repeated, high-pitched and abnormal howling; cries in different directions and at different times	Certain cries are associated with danger, fire, death and calamity affecting a town or region	Jackals may alter their vocalisation in response to territorial conflicts, mating, predator presence, habitat disturbance and environmental stress
14	Wild animals (Mṛga)	Chapter-90 Chapter-	Wild animals entering villages, remaining near	Their movements are interpreted as indications of present, past or	Habitat disturbance, food scarcity, flooding, drought, forest fires, human encroachment and

		91	boundaries, moving around settlements, approaching or leaving inhabited areas	impending danger; widespread movement around settlements is considered particularly inauspicious	displacement may cause wildlife to enter human settlements
15	Cows (Go)	Chapter-92	Weakness, restlessness, striking the ground with heels, excessive crying, watery eyes and unusual fear	Weakness and abnormal behaviour are associated with disease, misfortune and danger; crying without disturbance is interpreted as an ominous sign	Livestock may respond to illness, heat stress, insects, pain, changes in atmospheric conditions, contaminated water and environmental disturbances
16	Horses (Aśva)	Chapter-93	Unusual physical conditions and abnormal signs involving different body parts; the chapter also discusses fire-like appearances and smoke	Different signs are associated with defeat, imprisonment, prosperity and misfortune affecting the ruler or kingdom	Horses are sensitive to environmental stress, sound, vibration, temperature changes, smoke and disturbances in their surroundings. The text's fire-related omens should not be equated directly with scientifically verified earthquake indicators
17	Elephants (Hasti)	Chapter-94	Abnormalities involving tusks, including breaking, dropping, thinning and loss of colour	Certain tusk-related signs are interpreted as indications of misfortune affecting rulers, armies, families and kingdoms	Tusks may show physical injury, nutritional problems, disease, trauma and environmental stress. Such changes are primarily veterinary indicators, not established disaster predictors
18	Crows (Vāyasa)	Chapter-95	Abnormal nesting locations, unusual collective movements, repeated cries, swarming and flying in	Nesting in particular locations is associated with rainfall, famine, disease and prosperity; unusual collective behaviour is associated with public distress	Nest selection and collective behaviour may be influenced by weather, wind direction, temperature, food availability, predators and habitat conditions

			circles		

Table – II

(Animal behavior and specific natural disasters)

Sl No.	Natural disaster	Animal behavior described	Reference in Bṛhatsaṁhitā	Possible scientific explanation
01	Earthquake	Restlessness, unusual movement, sudden escape from habitats and abnormal vocalisation	Chapter- 88 Chapter- 91	Animals may detect ground vibrations, including early seismic P-waves, before stronger shaking reaches humans. Longer-term precursory behaviour remains scientifically unconfirmed
02	Tsunami	Animals moving towards higher ground or leaving coastal habitats	Chapter- 88 Chapter- 91	Animals may respond to falling sea levels, unusual waves, ground shaking, environmental noise and changes in habitat
03	Cyclone	Birds changing flight patterns, livestock becoming restless and animals seeking shelter	Chapter- 88 Chapter- 92 Chapter- 95	Changes in wind speed, atmospheric pressure, rainfall, temperature and humidity can influence animal activity
04	Heavy rainfall	Unusual movements of animals, changes in bird nesting and increased activity of certain species	Chapter- 88 Chapter- 95	Humidity, temperature, pressure, insect activity and water availability can influence animal behaviour
05	Flood	Snakes, rodents and other terrestrial animals leaving low-lying areas	Chapter- 88 Chapter- 91	Rising water levels, soil saturation and loss of shelter force animals to move towards higher ground
06	Drought	Animals gathering near water sources, increased migration and changes in feeding patterns	Chapter- 91 Chapter- 95	Reduced water availability, vegetation loss and food scarcity alter animal movement and habitat selection

07	Forest fire	Wild animals fleeing forests, unusual vocalisation and movement towards settlements	Chapter- 90 Chapter- 91	Smoke, heat, gases, sound and habitat destruction cause animals to escape affected areas
08	Volcanic eruption	Animal agitation, habitat abandonment and unusual movement	Chapter- 91	Ground tremors, gas emissions, heat, ash and changes in water quality may affect animals

Conclusion -

The present study establishes that Varāhamihira's Bṛhatsaṃhitā represents a significant intellectual contribution to the history of environmental observation and traditional disaster awareness in ancient India. Its extensive descriptions of unusual behavioural patterns among birds, reptiles, domestic animals and wild creatures demonstrate an attempt to interpret relationships between living organisms, environmental disturbances and impending calamities. Varāhamihira's descriptions encompass domestic animals, wild mammals, reptiles, insects, and birds, with particular attention to unusual calls, movements, feeding patterns, and changes in habitat. Some of these observations invite comparison with modern studies of animal responses to environmental disturbances. The scholarly significance of the Bṛhatsaṃhitā, therefore, lies not merely in its recorded predictions but also in its preservation of indigenous environmental knowledge and observational practices. Integrating critical textual analysis with contemporary ecological, zoological and geophysical research may provide new interdisciplinary perspectives on disaster studies. Ultimately, the text deserves recognition as an important historical source for reconstructing India's traditional approaches to environmental awareness, risk perception and disaster preparedness, while maintaining a clear distinction between historical knowledge, cultural interpretation and scientifically established evidence.

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