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ARTICLES

சங்க இலக்கியமும் ஈரோடு மாவட்ட உள்ளூர் அறிவு மரபுகளும் வெளிப்படுத்தும் பாரம்பரியக் காலநிலை அறிவு: மழை, பருவநிலை, இயற்கை முன்னறிகுறிகள், தொடர்ச்சி மற்றும் சமகாலப் பயன்பாடுகளை மையப்படுத்திய இலக்கிய–கள ஆய்வு

Traditional Climate Knowledge in Sangam Literature and the Local Knowledge Traditions of Erode District: A Literary–Field Study on Rain, Seasonality, Natural Omens, Continuity and Contemporary Applications

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ABSTRACT

As climate change disrupts the pattern of rainfall and the onset of the seasons, local and traditional knowledge has drawn renewed attention as a resource for adaptation. This study compares the knowledge of rain, seasons and natural omens recorded in Sangam literature with the traditional understanding of climate in the agrarian communities of Erode District, Tamil Nadu. Its data comprise an analysis of primary sources such as Tolkappiyam, a secondary synthesis of field studies conducted in the neighbouring districts of Coimbatore and Salem, and the official profile of Erode District. Sangam climate knowledge is organised within the framework of tiṇai and poḻutu (landscape and time). The tradition of treating flowering, the behaviour of birds and animals, and observations of the sky and planets as omens of rain continues today, showing structural parallels in how weather is observed, named and converted into agricultural decisions. This knowledge is, however, under strain from the decline in the number of rainy days, untimely seasons and a widening generational gap in its transmission. The paper argues that combining documented traditional indicators with scientific forecasts will benefit adaptation, and it proposes the next stage: the collection of primary field data for Erode District.

ஆய்வுச் சுருக்கம்

காலநிலை மாற்றத்தால் மழையின் முறைமையும் பருவங்களின் தொடக்கமும் சீர்குலைந்து வரும் சூழலில், உள்ளூர் மற்றும் மரபுவழி அறிவு தகவமைப்புக்கான ஆதாரமாகக் கவனம் பெற்றுள்ளது. சங்க இலக்கியம் பதிவுசெய்துள்ள மழை, பருவம், இயற்கை முன்னறிகுறிகள்

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தொடர்பான அறிவையும், ஈரோடு மாவட்ட வேளாண் சமூகச் சூழலில் நிலவும் மரபுவழிக் காலநிலைப் புரிதலையும் இவ்வாய்வு ஒப்பிட்டு ஆராய்கிறது. இதற்குத் தொல்காப்பியம் முதலிய மூலநூல்களின் பகுப்பாய்வு, அண்டை மாவட்டங்களான கோவை, சேலம் ஆகியவற்றில் நடத்தப்பட்ட கள ஆய்வுகளின் இரண்டாம்நிலைத் தொகுப்பு, ஈரோடு மாவட்டத்தின் அதிகாரப்பூர்வச் சுயவிவரம் ஆகியவை தரவுகளாகக் கொள்ளப்பட்டன. சங்கக் காலநிலை அறிவு திணை–பொழுது என்ற கட்டமைப்புக்குள் முறைப்படுத்தப்பட்டுள்ளது. மலர்தல், பறவை–விலங்கு நடத்தை, வான்–கோள் அவதானிப்பு ஆகியவற்றை மழையின் முன்னறிகுறிகளாகக் கொள்ளும் மரபு இன்றும் தொடர்கிறது. மழைபொழியும் நாட்கள் குறைவது, பருவம் தவறுவது, தலைமுறை இடைவெளி ஆகியவற்றால் இவ்வறிவு நெருக்கடியைச் சந்திக்கிறது. ஆவணப்படுத்தப்பட்ட மரபுவழிக் குறிகாட்டிகளை அறிவியல் முன்னறிவுடன் இணைப்பது தகவமைப்புக்குப் பயனளிக்கும். மேலும், ஈரோட்டுக்கான முதன்மைக் களத்தரவுத் திரட்டலுக்கான அடுத்த கட்டமும் முன்மொழியப்படுகிறது.

திறவுச் சொற்கள்: சங்க இலக்கியம்; மரபுவழிக் காலநிலை அறிவு; மழை; பருவநிலை; இயற்கை முன்னறிகுறிகள்; ஈரோடு மாவட்டம்; காலநிலைத் தகவமைப்பு

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1. Introduction

As the amount of rainfall, the distribution of rainy days and the onset of the seasons change, adaptation has become a daily necessity for communities that depend on agriculture and drinking water. In this context, the Intergovernmental Panel on Climate Change has recognised in its assessments that local and Indigenous knowledge is one of the resources that can support adaptation (IPCC, 2022).

In the Tamil tradition, the oldest written records of such knowledge are found in Sangam literature. Because *Tolkappiyam* establishes land and time as the primary element (*mutaṟporuḷ*), climate in Tamil poetics is not ornament; it is the foundation of the structure. Even today, the agrarian communities of Tamil Nadu assess the coming of rain from the sky, living beings and flowering trees. Erode District is an excellent setting in which to view these two traditions together. Part of the ancient Kongu region, it is a landlocked district with a dry climate and low rainfall, dependent on the Cauvery, Bhavani and Noyyal rivers and on well and canal irrigation.

There are many Tamil studies of the ecological dimensions of Sangam literature, and there are also field studies documenting the traditional weather knowledge of Tamil Nadu. In the literature search undertaken for this study, however, no study was found that compares the two traditions together with a focus on Erode District. This paper is an attempt to fill that gap.

The significance of the study can be seen at three levels. At the literary level, it widens the opportunity to read Sangam literature not only aesthetically but also as a document of ecological knowledge. At the social level, it emphasises the need to record oral weather knowledge that is rapidly disappearing. At the policy level, it offers a preliminary road map of how local knowledge can support adaptation planning in a low-rainfall district.

1.1 Objectives of the Study

1. To explain the structure of the knowledge of rain, seasons and natural omens recorded in Sangam literature.
2. To set out the nature of the traditional knowledge of rain, seasons and natural signs in Erode District, with the help of recent regional field studies.
3. To compare the similarities, differences, continuity and change between these two traditions.
4. To assess the potential applications of this knowledge in the context of climate change.

1.2 Approaches of the Study

1. Literary-analytical approach
2. Astronomical and climate-knowledge approach
3. Traditional ecological knowledge approach
4. Ecological approach
5. Natural-omen approach
6. Literary–field comparative approach
7. Historical-continuity approach
8. Agro-ecological approach
9. Contemporary-application approach



Figure 1. Tamil traditional knowledge and modern science in climate adaptation (infographic; labels mainly in Tamil)

Figure 1 explains the importance of combining ancient Tamil literary knowledge with modern scientific technologies in coping with climate change. Its foundations are the *tiṇai* theory of Sangam literature, traditional weather forecasting and field evidence from the regions around Erode. Through it we can understand the contribution of Tamil traditional knowledge to adapting to climate change, and the benefits of combining that knowledge with modern technologies.

2. Climate and Seasonal Change

Our planet today faces many severe weather changes. As departures from the usual seasonal cycle, rain in winter, dew in summer and intense heat in the rainy season are observed. Such unnatural weather events are regarded as early warnings of environmental damage that may occur in the future.

Among the major environmental challenges facing the nations of the world today, rising temperatures and the increasing impact of heat are prominent. The intensity of the sun and the rise in temperature can affect not only human beings but also animals, plants, agriculture and the entire earth system.

Against this general background of climate change, it becomes necessary to consider the climate of Erode District as well. Erode District is generally described as a region of low rainfall and dry climate. Although the first two months of the year are relatively pleasant, the impact of heat increased from March to May, and intense heat prevailed in April and May. In the past, heat would ease somewhat between June and August; this year, however, it did not. It is therefore doubtful whether there will be significant rainfall during the north-east monsoon season from September to December.

It is thus important to consider together the weather changes seen globally and the seasonal variations in temperature and rainfall seen in Erode District. There is now a need to study the impacts on the intensity of heat, rainfall variability, seasonal change, the state of water resources, agriculture and the life of living beings.

Records of sun, heat, rain, seasons and natural change are also found in our ancient Tamil literature. In Sangam literature in particular, nature, seasons, rain, heat, wind, water bodies, plants, animals and human life are recorded as interconnected. By comparing these literary records with the present-day local knowledge of climate and ecology in Erode District, we can understand the links between the ancient Tamils' knowledge from observing nature and today's context of climate change.

2.1 Climate Knowledge in Sangam Literature

Climate knowledge in Sangam literature not only names the seasons but also shows that people lived by observing natural events such as rain, heat, cold, dew, wind, the change of day and night, the flowering of plants and the movements of animals.

நெடுநல் வாடைக் குன்றம் போலும்

இன்னா தம்ம இந்நெடுநல் ஊரே

Like a hill in the long, chill north wind,

how harsh, alas, is this town!

— Nedunalvadai

From this poem we learn that the *vāṭai* wind blows from the north.

மடவ வாழி, மஞ்ஞை! மாயோள் படாஅப்

பைங்கண் பாஅய் … கார்வந் தன்றே

Foolish you are, O peacocks! …

… [as if] the rainy season had come.

— Kuruntokai 251

In this *Kuruntokai* poem, the arrival of the rainy season is known from the peacock spreading its plumes and dancing.

Tolkappiyam sets out the major seasons and the divisions of the day as follows:

காரும் மாலையும் முல்லை

குறிஞ்சி கூதிர் யாமம் என்மனார் புலவர்

பனி எதிர் பருவமும் உரித்து என மொழிப
வைகறை விடியல் மருதம்
எற்பாடு நெய்தல் ஆதல் மெய்பெறத் தோன்றும்
நடுவுநிலைத் திணையே நண்பகல் வேனிலொடு
முடிவுநிலை மருங்கின் முன்னிய நெறித்தே
பின்பனிதானும் உரித்து என மொழிப

The rainy season and evening belong to Mullai.
Kurinji, the poets say, is the cold season and midnight;
the season of early dew, too, is proper to it, they declare.
Pre-dawn and daybreak are Marutham;
sunset, it is clearly seen, is Neithal.
The middle tiṇai keeps to midday together with summer,
following the path laid down at the end;
the late-dew season, too, is proper to it, they declare.

— Tolkappiyam, Akattinaiyiyal 6–12

It thus classifies the year into six seasons: *kār*, *kūtir*, *muṉpaṉi*, *piṉpaṉi*, *iḷavēṉil* and *mutuvēṉil*. This is basic evidence that seasonal changes were systematically observed.

The day was divided into six periods: evening (*mālai*), midnight (*yāmam*), pre-dawn (*vaikaṟai*), morning (*kālai*), midday (*naṇpakal*) and sunset (*eṟpāṭu*). In this way, the way of life was linked with the changes of temperature, light and darkness through the day.

2.2 Astronomical Knowledge in Sangam Literature and the Local Knowledge of Erode District

Weather refers to the short-term state of the atmosphere, and climate to the long-term trend. Although the Sangam poets did not explain these differences in the terminology of modern science, they expressed daily events and annual cycles separately in their poems.

The records of nature in Sangam literature reveal the Tamils' knowledge of astronomy, climate and geography. The poems of *Purananuru* in particular record astronomical events and the natural environment associated with them very precisely:

செஞ்ஞாயிற்றுச் செலவும், அஞ்ஞாயிற்றுப் பரிப்பும்,
பரிப்புச் சூழ்ந்த மண்டிலமும், வளி திரிதரு திசையும்,
வறிது நிலைஇய காயமும், என்று இவை சென்று
அளந்து அறிந்தோர் போல

As though they had gone and measured and known
the course of the red sun, the motion of that sun,
the orb that its motion encircles, the quarters where the winds roam,

and the sky that stands supportless …

— Purananuru 30

2.3 Knowledge of the Planets and Stars

The Sangam people's understanding of the planets moving in the sky is beautifully expressed in *Pattinappalai*:

நீல்நிற விசும்பின் வலன்ஏர்பு திரிதரும்

நாள்மீன் விராஅய கோள்மீன் போல

Like the planets mingled with the stars

that rise and wheel to the right across the blue sky.

— Pattinappalai 67–68

In these lines, the objects seen in the sky are clearly distinguished as *nāḻmīṉ* (stars) and *kōḻmīṉ* (planets). We thus learn that an advanced knowledge that identifies stars and planets separately is recorded in Sangam literature. Such evidence indicates that the people of that time had a broad knowledge of the sun, the moon (*tiṅkaḷ*), the stars and other celestial bodies.

According to the researcher Geethanjali (2020), the ancient Tamils reckoned seasonal change, planetary motion and the pattern of rainfall very finely. Although this may be accepted as a hypothesis, Jaishankar (2023) points out that numerical evidence would be needed to assert it fully as "precise reckoning". He also explains the ancient Tamils' practice of cultivating according to the rainy season, and of storing water and using it when needed, as excellent ecological thinking. From these it becomes clear that the climate knowledge of the Sangam age functioned not merely as theory but as practical knowledge, such as water management and the choice of agricultural seasons.

நிலம் தீ நீர் வளி விசும்போடு ஐந்தும்

Earth, fire, water and wind, together with the sky – all five.

— Tolkappiyam, Marapiyal

The theory of the five great elements (*aimperumpūtam*), which divides nature in this way, is a mark of the Tamils' broad vision, which sees rain, wind and sky not separately but as a single ecological whole.

3. Knowledge of Rain in Sangam Literature

Sangam literature regards rain as the very basis of human life. It may be said that the failure to conserve rainwater is a major cause of today's severe water shortage. The use of many words – *maḻai*, *māri*, *peyal*, *puyal*, *taḷi*, *tuḷi* – shows how finely the linguistic environment of that time distinguished kinds of rain.

A scientific view of the water cycle is also clearly expressed in the Sangam poems. At the opening of *Mullaippattu*, the cloud that drinks sea water, rises wheeling to the right and pours down rain is beautifully portrayed. The metaphor of a cloud heavy with water like a woman in the last month of pregnancy – "*kamañcūl māmaḻai*" – is widely used in the *akam* poems. In the Sangam poems, natural events such as rain, heavy rain and floods are closely related to the circumstances of human life. That dense clouds that have drawn water from the sea pour down rain is mentioned in *Mullaippattu*:

பாடு இமிழ் பனிக் கடல் பருகி, வலன் ஏர்பு,

கோடு கொண்டு எழுந்த கொடுஞ்செலவு எழிலி

The swift-moving cloud that, having drunk of the cool, roaring sea,

rose wheeling to the right and climbed upon the peaks.

— Mullaippattu

and in *Natrinai*:

நளி கடல் முகந்து செறிதக இருளி கனைபெயல் பொழிந்து

Having drawn from the vast sea and darkened densely, it poured down heavy rain.

— Natrinai

Further, the gathering of clouds over the hills and the downpour that follows are described very precisely by Marungurpattinathu Senthan Kumaranar:

வளி பொரு மின்னொடு வான் இருள் பரப்பி,

விளிவு இன்று கிளையொடு மேல்மலை முற்றி,

தளி பொழி சாரல் தமர் மலர் தாஅய்

Spreading darkness across the sky with wind-struck lightning,

gathering ceaselessly with its kin upon the western hills,

it strewed the flowers of the rain-drenched slopes.

— Patirruppattu

References to "*arumaḻai*" (rare, precious rain) are also found in *Kalittokai*:

அருமழை தரல் வேண்டில் தருகிற்கும் பெருமையளே

She is of such greatness that, if rare rain is wished for, she can bring it.

— Kalittokai 105

From these we can understand how closely rain was bound up with human life, land and water resources.

The opening of Kaniyan Poongundranar's lines

மின்னொடு வானம் தண்துளி தலைஇ

The sky, with its lightning, pouring down cool drops …

— Purananuru 192

rests on the scene of rain falling with lightning, swelling into the flood of a great river that carries a raft along its course. This is excellent evidence that the poet had seen for himself, and clearly understood, the natural cycle by which rivers are formed from rain.

In the *akam* poems, the hero's promise "I shall return in the rainy season" and the heroine's grief when the rainy season comes but the hero does not are recurrent themes. These scenes reveal a general social expectation that the rainy season would come without fail at its proper time, and that the arrival of rain served as a reliable calendar marker. Knowing the rain was therefore not merely knowledge of nature; it also served admirably as the time reckoning of the society of that age.

3.1 Knowledge of the Failure of Rain

The ancient Tamils' awareness of the failure of rain is also noteworthy. They believed that there were signs of natural change even in the sky. In particular, *Pattinappalai* links the deviation of a star from its course with the absence of rain. The lines of *Pattinappalai* that speak of the planet Venus changing its course and of drought read:

வசையில் புகழ் வயங்கு வெண்மீன்

திசை திரிந்து தெற்கு ஏகினும்

Even if the bright white star of flawless fame

strays from its course and moves to the south …

— Pattinappalai

These lines explain that even if planets such as Venus stray from their course and drought follows, the prosperity of the Chola country watered by the Kaviri will not diminish.

Even if Venus (*veṇmīṉ*) strays south and local rain fails, *Pattinappalai* proudly praises the abundance of the Kaviri, which "does not fail" (*tāṉ poyyā*). Because the Kaviri is filled by rain that falls in the Western Ghats, the poet of that time had a deep scientific understanding that it would flow without drying up even when local rain failed.

The same truth applies to Erode District. The Cauvery forms the boundary of the district, and the Bhavani River too receives its water mostly from the south-west monsoon. The *Thirukkural*, a work of the immediate post-Sangam period, directly links the absence of rain with famine:

விண் இன்று பொய்ப்பின் விரிநீர் வியனுலகத்து

உள் நின்று உடற்றும் பசி

If the sky should fail, hunger will torment from within

this vast world girdled by the wide sea.

— Thirukkural 13

That is, it warns that if rain fails, hunger will greatly afflict the world. In today's modern context, however, events such as El Niño cause drought and severe water shortage.

El Niño is a natural climatic phenomenon in which the sea water of the central and eastern Pacific Ocean becomes warmer than usual. It can cause major changes in rainfall and temperature in many parts of the world.

The irregularity of rainfall in Erode District in 2026, and the rainfall deficits in some periods, have created a situation that can directly affect water resources, soil moisture and agriculture. Even so, not every climatic change seen in Erode can be regarded entirely as a direct effect of El Niño.

3.2 The Present-Day Astronomical and Ecological Knowledge of Erode District

The local knowledge of the people of Erode District is not confined to astronomical events; it is closely bound up with the weather, seasonal change, the arrival of rain, the direction of the wind and present-day agricultural planning.

Erode District lies in the Cauvery basin and contains rivers such as the Bhavani, Noyyal and Amaravathi and various irrigation systems. Although its climate is generally dry, the south-west and north-east monsoons are its main sources of rainfall. In this natural setting, farmers use traditional local knowledge that closely observes the

arrival of rain, changes in wind direction, the nature of cloud masses and variations in temperature in planning their agricultural work.

By comparing the astronomical knowledge in the poems of *Purananuru* with the local knowledge of present-day Erode farmers, based on seasons and natural signs, we can clearly understand the view of nature that has continued from the Sangam age to the present and the changes that have occurred in our tradition of knowledge.

> *"Throughout history it can be seen that Tamil poets and their poverty were used in the tragedy by which a knowledgeable Tamil society was pushed back, through the formation of the state, into a society of ideas (imagination)."*

So observes Dr M. Ramachandran in his article "*Maḻaiyum tamiḻar cintaṉai māṟṟap pōkkukaḷum*" ("Rain and the changing trends of Tamil thought"), published in *KALANJIYAM – International Journal of Tamil Studies*.

When we reflect on the rain-related sayings and proverbs of rural people, we realise that they are mostly expressions of their daily labour. The following folk proverbs show this very well:

- **"Only when the frog croaks will it rain!"**
- **"If winged termites rise at dusk, a downpour is assured!"**
- **"Rain in Mārkaḻi is no use to the soil!"**
- **"Rain in Tai is rain of ghee!"**
- **"Dry land lives by the rain, wet land by the sluice!"**
- **"Land is ruined by standing water; the tank is ruined when water does not stand!"**

Rain is an important natural event that directly improves people's economic life. A way of thinking based on the benefits that rain brings, together with the realities of social life, is an excellent sign of the deep political, economic and cultural life of the people of Erode District.

3.3 Seasonal Change and the Sangam Understanding

The Sangam tradition divided the year into six major seasons: *kār*, *kūtir*, *muṉpaṉi*, *piṉpaṉi*, *iḷavēṉil* and *mutuvēṉil*. The reckoning that assigns two months to each, beginning from Āvaṇi, became established in later works such as the *Cūṭāmaṇi Nikaṇṭu*. Table 1 compares these seasons with the present-day weather of Erode District.

Table 1. The six major seasons and the weather of Erode District (approximate correspondence)

Major season	Tamil months	Lexicon explanation	Weather in Erode District
Kār	Āvaṇi–Puraṭṭāci (mid-Aug.–mid-Oct.)	Rain from dark clouds	Though the sky is overcast in September, rain is scanty
Kūtir	Aippaci–Kārttikai (mid-Oct.–mid-Dec.)	Shivering cold wind	The north-east monsoon strengthens in October–November
Muṉpaṉi	Mārkaḻi–Tai	Dew before midnight	Rain ceases in December; pleasant weather prevails
Piṉpaṉi	Māci–Paṅkuṉi	Dew after midnight	Pleasant weather until February; heat begins to rise in March
Iḷavēṉil	Cittirai–Vaikāci	Mild sunshine	Heat peaks in May; light drizzle brings no relief

Major season	Tamil months	Lexicon explanation	Weather in Erode District
Mutuvēṉil	Āṉi–Āṭi	Intensified heat	Heat eases somewhat in June–August

The table conveys two subtle points. First, the peak of rainfall in Erode corresponds with *kūtir* (Aippaci–Kārttikai) rather than with *kār*. An interpretive question therefore arises here: should "*kār*" be taken as the literary name for the rainy season, or as particular months? Second, in the months of Āṉi–Āṭi, which bear the name *mutuvēṉil* ("mature heat"), the heat abates, while it peaks in the months of *iḷavēṉil* (Cittirai–Vaikāci); this suggests that the matching of seasons with months is a later convention.

The Sangam tradition also understood that seasonal change could alter the very nature of the land. *Silappatikaram* says that *Mullai* and *Kurinji*, departing from their proper order and losing their nature, take on the form called *Palai*. It is clear that land is not an unchanging category but a state that can change through climatic transformation. This may be regarded as an early understanding of drought and land degradation.

4. Natural Signs and Climate Forecasting

Sensing the season through natural signs – through various natural changes such as the flowering and leafing of trees and the activities of birds and animals – is recorded extensively in Sangam literature as indicators of seasonal change.

காயா, கொன்றை, நெய்தல், முல்லை, போது

அவிழ் தளவமொடு பிடவு அலர்ந்து

கவினிப் பூ அணி கொண்டன்றால் புறவே;

பேர் அமர்க் கண்ணி! ஆடுகம் விரைந்தே

With kāyā, koṉṟai, neytal and mullai, with taḷavam unfolding its buds

and piṭavu in full bloom, the woodland has grown lovely, adorned with flowers.

O lady of large and lovely eyes, let us hurry there to play!

— Ainkurunuru 412

This poem beautifully tells how, as soon as the rainy season begins, many kinds of flowers bloom in the *Mullai* landscape in keeping with the change of season.

Tamil has beautiful names for the directions of the wind: *koṇṭal* (east), *kōṭai* (west), *vāṭai* (north) and *teṉṟal* (south). Of these, the word *vāṭai* is still current in the wind nomenclature of the fishers of Tamil Nadu, who regard one particular kind of *vāṭai* as a reliable indicator of the north-east monsoon storm.

All such natural cyclical methods share a definite sequence:

- **observing natural events;**
- **understanding their pattern;**
- **encoding it in the form of a song or proverb; and**
- **applying it in agriculture and daily life.**

In this way, these natural signs served not merely as predictions but also as decision-making information for acting in the field at the right time. Nevertheless, not all the natural signs handed down through the ages can be blindly accepted as equally reliable; it is scientifically essential to test them against modern rain-gauge data.

4.1 The Five Landscapes and Climate Knowledge

The *Tolkappiyam* phrase beginning "*kārum mālaiyum mullai; kuṟiñci kūtir yāmam*" binds each *tiṇai* to the time units of the major season (*perumpoḻutu*) and the minor period of the day (*ciṟupoḻutu*). The Sangam Tamils, we may say, closely linked their lives with the landscape and with the seasonal change that prevailed there. The *tiṇai* may therefore be taken as a place-based climatic and ecological classification (Table 2).

Table 2. The five landscapes and their climatic elements

Tiṇai	Land	Major season	Time of day	Climatic element
Kurinji	Hills and the land around them	Kūtir, muṉpaṉi	Yāmam (midnight)	Cold, hill showers, mountain moisture
Mullai	Forest and the land around it	Kār	Mālai (evening)	Rain clouds, flowering, greenery
Marutham	Fields and the land around them	All six seasons	Vaikaṟai (pre-dawn)	River irrigation, agriculture
Neithal	Sea and the land beside it	All six seasons	Eṟpāṭu (sunset)	Sea breeze, waves, storms
Palai	Dry land	Iḷavēṉil, mutuvēṉil, piṉpaṉi	Naṉpakal (midday)	Heat, drought, water scarcity

Note. Based on the Akattiṇaiyiyal tradition of Tolkappiyam; this is the order generally accepted.

Applying this view to Erode yields the following: 27.7% of the district's area is forest; there are hill ranges in the north; river-irrigated agriculture is practised on the Bhavani and Cauvery plains; dry, low-rainfall uplands are widespread; but there is no coast. That is, the ecological elements of *Kurinji*, *Mullai*, *Marutham* and *Palai* all lie within a single district; only *Neithal* is absent. This offers an opportunity to use the *tiṇai* concept today as a classification of agro-climatic zones.



Figure 2. Climate knowledge and the five-landscape system in Sangam literature (infographic; labels in Tamil)

Figure 2 explains the climate knowledge of the Sangam age, the water cycle, the divisions of major seasons and times of day, and natural signs. It also clearly visualises the theory of the five great elements, monsoon forecasting and the social reckoning based on the rainy season, together with the five-landscape ecological system as it corresponds with the landscape of Erode District.

5. The Traditional Climate Knowledge of Erode District

5.1 Traditional Rain Knowledge in Erode District

Erode District lies in the north-west of Tamil Nadu, adjoining the Karnataka border. The undulating plain sloping towards the Cauvery is drained by the Noyyal and Bhavani rivers. The district profile describes it as a region of low rainfall and dry climate. Rainfall is relatively higher in the Gobichettipalayam and Bhavani taluks. The westerly wind coming through the Palghat Gap reaches the region only after losing its coolness. The uncertainty of the north-east monsoon and the small share of the south-west monsoon create risks for farmers; the Noyyal River is "unpredictable" in character.

This setting may have shaped traditional rain knowledge in three layers. The first layer is calendar-based proverbial knowledge. Among the agricultural proverbs of Tamil Nadu, the saying "*Aippaci aṭaimaḻai, Kārttikai kaṉamaḻai*" ("steady rain in Aippaci, heavy rain in Kārttikai") recalls the north-east monsoon. The belief that if it rains on the new-moon day of Āṭi there will be no rain until the next new moon, and the view that it is best for the season to begin with rain in Puraṭṭāci and for Aippaci to begin dry, also appear in the same collection (Vivasayam, 2016).

The second layer is prediction based on the almanac (*pañcāṅkam*) and the lunar calendar. A study of farmers in Coimbatore District identified fifteen traditional weather practices, eleven of them related to rain. Most farmers used the almanac for sowing and harvesting and the evening flight of winged termites to know the rain, and regarded the new-moon day as auspicious for beginning agricultural work. Because Erode was part of Coimbatore District until 1979, these customs are likely to have existed in both areas.

The third layer is the cultural memory associated with water bodies. The *Āṭipperukku* festival, held at Bhavani and Kodumudi in the month of Āṭi (July–August), is one of the district's important festivals. It may be regarded as fixing in social memory the time when the Cauvery fills during the south-west monsoon. In the neighbouring district of Dharmapuri there is a tradition of naming each rain and of dividing the year into short named intervals. Whether such a tradition of naming rains exists in Erode can be ascertained through fieldwork.

5.2 The Understanding of Seasons in Erode District

Erode farmers view the seasons through two water sources. One is the water that falls on the Western Ghats and comes down the Bhavani and Cauvery. The other is the rain that falls on their own land, mostly during the north-east monsoon. The district profile confirms this difference. According to it, the rivers are filled by the south-west monsoon in the Western Ghats. The first two months of the year have pleasant weather; heat rises from March and peaks in May; it eases somewhat in June–August; in September the sky is dark but rain remains scanty; the north-east monsoon strengthens in October–November; and in December the rain ceases and the weather clears.

In agricultural usage, names of sowing seasons such as *āṭippaṭṭam* and *kārttikaippaṭṭam* put this seasonal knowledge into practice. Turmeric, banana, groundnut, sugarcane and cotton are the main crops of the district. Because the soil is thin and sandy, farmers depend heavily on well and canal irrigation. Modern systems such as the Lower Bhavani Project on the Bhavani River, and old canals such as the Kalingarayan canal, show the integration of traditional and modern water management.

5.3 The Knowledge of Natural Signs among the People of Erode

Coimbatore lies to the west of Erode, and Salem to the east and north. A study conducted with about 320 farmers in eight villages of Salem (western zone) and Kanchipuram (coastal) recorded the use of eleven animals, twenty-five birds, seventeen insects and eight plants (61 in all) to forecast rain. Table 3 links selected signs with the Sangam tradition.

Table 3. Selected natural signs: records from regional field studies and links with the Sangam tradition

Sign	Forecast recorded in field studies	Link with the Sangam tradition
Peacock	Calling in the morning and evening – rain; frequent calling – rain within a day or two (Usha et al., 2025)	The peacock's call and dance as a sign of the rainy season (Mullai tiṇai)
Frog	Croaking in groups under stones – imminent rain; continuous croaking in wells – heavy rain (Usha et al., 2025)	To be studied separately
Winged termites	Flying in the evening; appearing after dry days – rain (Anandaraja et al., 2008; Usha et al., 2025)	Sign of rain
Black ant	Carrying eggs in a line to a safe place – flood (Usha et al., 2025)	Direct record not confirmed
Neem	Profuse flowering in summer – about 40 days before the monsoon; seeds ripening and dropping – rain in 10–15 days (Usha et al., 2025)	Flowering of koṉṟai, kāyā, tōṉṟi and piṭavam – sign of kār
Livestock	Cattle raising their tails and returning quickly; goats bunching together – rain nearby (Usha et al., 2025)	The life of herders and herds in the Mullai land
Halo around sun / moon	Size of the halo – rain in the coming days (coastal fishers; Salim & Monolisha, 2019)	Observation of sky and planets
Vāṭai wind	Types of vāṭai – indicator of the north-east monsoon storm (Salim & Monolisha, 2019)	Vāṭai – the Sangam name for the north wind

The ecological logic behind these signs can be understood. When humidity reaches saturation, houseflies and dragonflies become active; when heat and cloud increase, goats bunch together – living beings, we may say, sense atmospheric change. These signs were recorded in the Salem, Kanchipuram and Coimbatore regions; in some parts of Erode the same beliefs exist. It is useful to classify the signs by the lead time of the forecast. The behaviour of frogs, livestock and dragonflies points to rain coming within hours to a day or two. People say that sprouting aerial roots of the banyan signal rain 2–4 days ahead; neem seeds ripening and falling and castor buds sprouting, 10–15 days ahead; and full flowering of the neem, about 40 days ahead. Traditional knowledge thus operates at several time scales, from immediate warning to seasonal forecast. When testing, each sign must therefore be compared with rain-gauge data matched to its time scale.

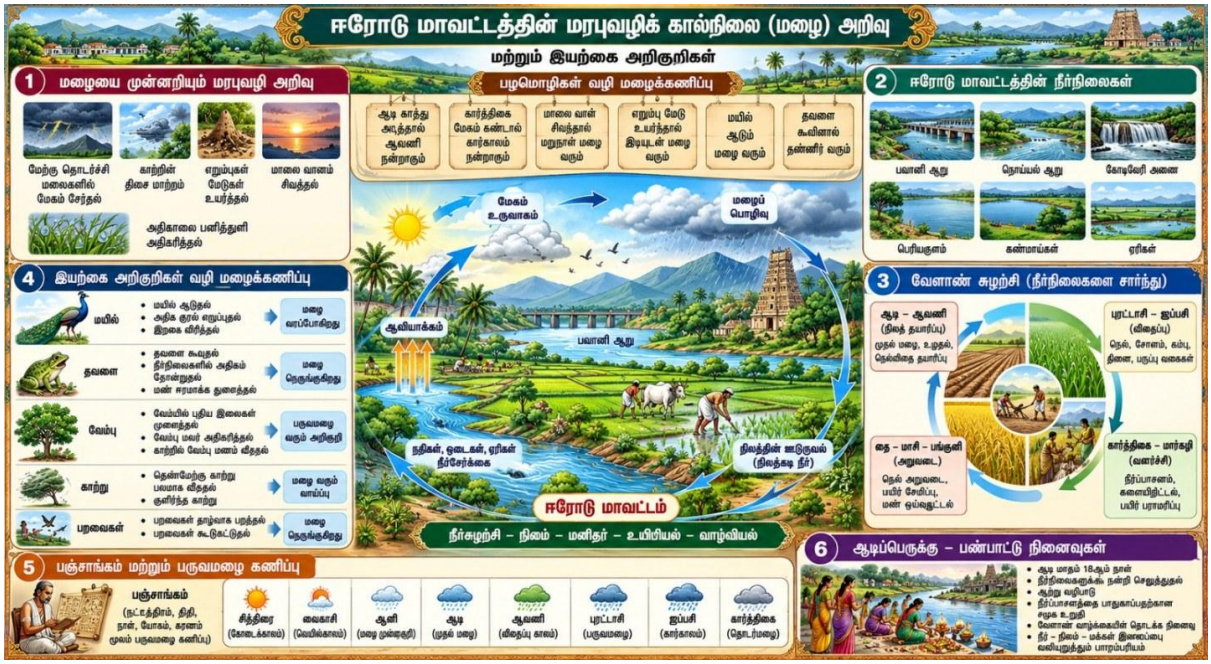

Figure 3. The structure of traditional climate and natural knowledge in Erode District (infographic; labels in Tamil)

Figure 3 explains the traditional rain knowledge of Erode District, the agricultural cycle based on water bodies, and natural signs. It clearly visualises the traditional ecological logic by which farmers forecast rain through proverbs, the almanac, cultural memories connected with *Āṭipperukku*, and the behaviour of living beings such as the peacock, frog and neem.

6. Comparison: Continuity and Change

6.1 Climate Knowledge of the Sangam Age and of Erode District: A Comparison

Table 4 compares the two traditions in seven dimensions.

Table 4. Sangam literature and the living tradition of the Erode region: a comparison

Dimension	**Sangam literature**	**Living tradition of the Erode region (including evidence from neighbouring areas)**
Form of knowledge	Verse; conventions of tiṇai and tu̲rai	Proverbs, oral tradition, almanac, festivals
Time framework	Six major seasons; times of day	Tamil months, paṭṭam, new-moon day
Focus of rain	Kār (Mullai)	North-east monsoon in Aippaci–Kārttikai
Omens	Flowering of kon̲rai and kāyā; peacock's call; lightning and thunder	Peacock, winged termites, ants, neem flowering, livestock behaviour
Sky and planets	Deviation of Venus; planetary positions	Almanac reckoning; belief about the new-moon day
Water management	Storing rainwater; reliance on river water	Wells, canals, Lower Bhavani, Āṭipperukku

Dimension	Sangam literature	Living tradition of the Erode region (including evidence from neighbouring areas)
Notion of risk	Failure of the sky's rain; Palai	Delay or failure of rain; dry climate

Similarities: three similarities are evident between the two traditions. In both, knowledge arises from experience and is encoded as collective memory; living beings, plants and the sky are taken together as integrated indicators; and the water chain of rain, river and well is seen as a whole.

Differences: the differences are equally clear. The Sangam poem is a literary genre, subject to aesthetic and *akam* purposes, whereas the living tradition aims at decision-making. Further, the "*kār*" rainy season of the Sangam tradition does not fully correspond with the actual rainfall peak of Erode (*kūtir*). From this it appears that local knowledge has adapted the general classification of literature to suit its own land.

A correspondence at the level of vocabulary is also noteworthy. In the Sangam tradition the west wind is called *kōṭai*, and the same word also denotes the hot season. In Erode, the west wind coming through the Palghat Gap loses its coolness and intensifies dryness. That the name of the wind direction and the name of the season coincide appears to fit the practical experience of the region.

6.2 Continuity and Change in Traditional Climate Knowledge

What continues includes the persistence in usage of words such as *vāṭai*; observations of peacocks, flowering, and the moon and sun; calendar-based proverbs; and festival memories. Continuity does not mean remaining unchanged; knowledge is continually renewed in a dynamic state.

There are many pressures for change on this knowledge. A study of the knowledge of the coastal fishers of Tamil Nadu (Salim & Monolisha, 2019) points to weakening intergenerational transmission, the lack of documentation of oral codes, the fading of old technical terms, and the growth of a negative attitude towards traditional signs because of the changing climate. A farmer in Dharmapuri has said that, although total rainfall is as usual, the number of rainy days has fallen and more than 120 mm falls in a single day, so that the value of traditional knowledge about rainfall patterns has declined (YourStory Tamil, 2019). This is an individual statement; nevertheless, because the signs have been used mainly to forecast the onset of the season, it raises the research hypothesis that they are inadequate for extreme rainfall events.

Change does not signify loss alone; it can also take the form of reshaping. Whether new sources such as television and mobile weather apps are used together with traditional signs, or displace them, is an important question to be raised in the field in Erode.



Figure 4. Sangam literature and the living tradition of Erode: comparison and change in climate knowledge (infographic; labels in Tamil)

Figure 4 compares the climate knowledge expressed through Sangam verse with the practical living tradition of the people of the Erode region. It also explains how traditional knowledge that continues through natural signs (peacocks, flowers) and water sources adapts and renews itself in response to present-day seasonal change and the arrival of modern technologies (apps).

7. Contemporary Applications

7.1 Traditional Knowledge for Meeting Climate Change

Traditional knowledge can assist climate adaptation in three ways. (1) **Local-scale forecasting:** where large-scale forecasts do not reach a particular village, local signs can fill the gap. (2) **Seasonal calendars:** an effort has been proposed for the coastal region of Tamil Nadu to create a seasonal ecological calendar combining traditional indicators with scientific data; fishers are willing to accept scientific forecasts if they are delivered in their own local idiom. (3) **Cultural acceptance:** communicating scientific forecasts in the local language and in the language of signs will build trust.

At the same time, there are limits. The signs mostly arose under the baseline conditions of the past, and their reliability may decline in a changed climate. Rather than accepting traditional signs as "truth" as they stand, the scientific way is therefore to treat them as testable hypotheses and to verify them statistically against rain-gauge data. In this way reliable signs will be retained and unreliable ones abandoned – a method of correction that respects tradition.

These opportunities are relevant to Erode. The flash floods of the Noyyal and the uncertainty of the north-east monsoon underline the need for short-term warnings. For turmeric, sugarcane and groundnut farmers dependent on well and canal irrigation, advance notice of the onset of the season and of gaps in rainfall could support the planning of water use. Dual-source advisories that combine government weather forecasts with local signs are a method worth studying here.

7.2 Sangam Climate Knowledge and Present-Day Ecological Needs

Sangam literature offers four lessons for today's needs. (1) **Water discipline.** The idea of storing rainwater and using it when needed, and the warning that failure to conserve rainwater causes shortage, provide a cultural foundation for present-day efforts such as rainwater harvesting and the restoration of water bodies. (2) **A catchment perspective.** The *Pattinappalai* line praising the Kaviri

வான் பொய்ப்பினும் தான் பொய்யா

... though the sky should fail, it never fails ...

— Pattinappalai

reminds us that water resources do not depend on local rain alone. Protecting the forests of the Western Ghats is protecting the very rivers of Erode.

(3) **A*tiṇai*perspective for place-based planning:** the *tiṇai* can be used as a zonal perspective for devising different adaptation strategies for hills, forests, fields and dry lands. (4) **A warning about*Palai*.** The *Silappatikaram* idea that *Mullai* and *Kurinji* turn into *Palai* echoes the present-day understanding of land degradation, that deforestation and drought can change the very nature of the land. To put these lessons into practice, an Erode register of traditional climate knowledge could be created and this knowledge integrated into school and college curricula. A critical approach is needed that does not exaggerate the Sangam scenes but treats them as a tradition of observation to be tested.



Figure 5. Traditional and Sangam knowledge for meeting climate change in Erode District: a comparative view of the tiṇai environments (infographic; labels in Tamil)

Figure 5 compares in detail the traditional climate knowledge, ecological logic and adaptation methods of farmers in the *Marutham*, *Mullai*, *Kurinji* and *Palai* environments of Erode District.

The opportunities for turning these lessons into practical programmes are summarised in Table 5.

Table 5. Proposed applications based on Sangam and traditional knowledge

Area of application	Proposed action	Traditional basis	Expected benefit
Rainwater and water bodies	Recharging village ponds, tanks and wells; rainwater harvesting in schools	The idea of conserving rainwater	Reduced water shortage
Catchment protection	Protecting the Western Ghats and riverine forests	The Kaviri that "never fails though the sky should fail" (*Pattinappalai*)	Sustained river flow
Local forecasting	A register of rain signs; citizen science with mobile-phone recording	The tradition of natural signs	Testing the reliability of signs
Seasonal calendar	A seasonal calendar for Erode using Tamil season names	The tradition of major seasons	Choosing the time of sowing
Education	Sangam nature knowledge and local rain signs in school and college curricula	The tiṇai tradition	Intergenerational transmission
Land-use planning	A tiṇai-based perspective of agro-climatic zones	The five landscapes; the transformation into Palai	Area-specific adaptation



Figure 6. Traditional and Sangam knowledge for meeting climate change (infographic; labels in Tamil)

Figure 6 emphasises the need to combine traditional indicators with scientific data in order to meet a changing climate. It also explains how the ecological lessons taught by Sangam literature – rainwater harvesting, afforestation and planning suited to the landscape – serve today's needs.

8. Conclusion

Sangam literature places rain, seasons and omens within the order of *tiṇai* and *poḻutu*, making climate the foundation of its literary structure. Field studies conducted in the regions around Erode show that knowledge of the same character still functions today through the behaviour of birds, animals, insects and plants, observation of the sky, the almanac, proverbs and festivals. Both traditions share a similar structure of observation, encoding and action; yet literary purpose and practical purpose distinguish them. The decline in rainy days, untimely seasons and the generational gap are putting this knowledge under pressure today. An effort is therefore needed to document it, test it and integrate it with scientific forecasting.

Semi-structured interviews and group discussions could be held with farmers and herders over 45 years of age, and the signs recorded could be verified against three years of rain-gauge data (Table 6).

Table 6. Proposal for primary fieldwork in Erode (by taluk)

Taluk	Setting (according to the district profile)	Informants	Signs to be recorded
Gobichettipalayam	Relatively higher rainfall; where the Bhavani River enters the district	Canal-irrigation farmers	Rain signs, names of sowing seasons, names of rains
Bhavani	One of the higher-rainfall taluks; confluence of the Bhavani and Cauvery	Farmers, riverside communities	Flood signs, memories of Āṭipperukku
Sathyamangalam	Forest areas and hill slopes	Herders, forest-fringe communities	Bird and animal signs, flower signs
Perundurai	Red soil; pebbly and sandy land	Rain-fed and well-irrigation farmers	Drought signs, signs relating to well water

Three policy recommendations emerge from this study: (1) joint documentation by the Tamil departments of local colleges, agricultural research institutions and the government departments that operate the rain-gauge network; (2) dissemination of the recorded signs and the seasonal calendar in Tamil, in the words that farmers use; and (3) assurance of credit and a share of benefits to the communities that shared the knowledge. When these are achieved, Sangam literature will serve not only as a past glory but also as a living repository of knowledge for present-day adaptation.

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Conflict of Interest

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Use of Artificial Intelligence Tools

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