GS Paper I – History

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Goddess Saraswati without veena: glimpses of an early iconography

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At the Arthamandapam of the Gangaikondacholapuram Temple, just outside the sanctum sanctorum, stands an unusual image of Goddess Saraswati – one that is notably without the veena, the musical instrument now regarded as her defining attribute.

Seated in *padmasana* with four arms, the deity is identified as Saraswati by the *suvadi* (manuscript) she holds in one hand and the *akka mala* (rudraksha rosary) in another. The remaining two hands hold an *ankusha* (goad) and a *pasha* (noose), iconographic features rarely associated with conventional representations of the Goddess.

"She is one of the war trophies brought to Tamil Nadu following the Cholas' northern campaign. The image originally belonged to the Pala dynasty," according to R. Komagan, chairman of the Gangaikondacholapuram Development Council Trust.

Historian Kudavasal Balasubramanian, in his book *Rajendra Cholan - Victories, Capital and Temples*, also identifies the sculpture as belonging to the artistic tradition of North India. "She wears a crown, *kundalams* in her ears, and ornaments on her neck, chest, shoulders, arms, and legs. She is entirely different from the Saraswati images sculpted in Tamil Nadu and represents the north Indian style. It could be one of the war trophies brought by the Chola kings," he writes.

A Chola masterpiece

The Pala Saraswati is not the only veena-less depiction of the Goddess at Gangaikondacholapuram. The temple is also home to the celebrated Gnanasaraswati, one of the masterpieces of Chola sculpture, located on the walls near the steps leading to the Arthamandapam. Like the Pala image, this sculpture too portrays the Goddess without a veena, suggesting that the instrument became a standard attribute of Saraswati only in a later phase of iconographic evolution.

According to Lalitharam of Visamayam, an organisation that creates replicas of outstanding Pallava and Chola sculptures, the Chola-era Gnanasaraswati is seated on a lotus with her hair arranged in an elaborate *jata makuta*. She is richly adorned with necklaces, shoulder ornaments, bangles, and *makara kundalams*. Instead of a veena, she holds a *suvadi* in one hand and an *akka mala* in another, underscoring her identity as the embodiment of learning and spiritual wisdom.

Different forms: Idols of Saraswati in the inner *prakarams* of the Brahadeeshwarar Temple at Gangaikondacholapuram and the Airavatesvara Temple at Darasuram. R. VENGADESH

Of the remaining two hands, one carries a *kundigai* (*kamandalu*), while the other is shown in *tarjani mudra* – a rare and striking gesture in Saraswati iconography.

While Mr. Komagan believes the Pala Saraswati may have inspired the Chola sculptors who created the Gnanasaraswati, there is no epigraphic or archaeological evidence to conclusively establish such a connection. The absence of the veena, however, is not unique to Gangaikondacholapuram.

Dr. R. Kalaikovan, founder of the Dr. Rajamanickanar Centre for Historical Research, points out that Pallava-period and Chola-period Saraswati sculptures also lack the instrument. "The Saraswati statues in the Kailasanathar Temple are without a veena. One deity has a *suvadi* and *akka mala* in two hands while the other two hands are damaged. Another sculpture carries a *kundigai* or *kamandalu*," he said.

He explained that the *akka mala* and *kundigai* were traditionally associated with Brahma, the creator God, and Saraswati, revered as his consort, was therefore portrayed with these attributes.

"Even the Saraswati sculptures at the Brihadisvara Temple and Sadaimudinathar Temple at Tiruvalanchuzhi are without a veena. The Gnanasaraswati at Gangaikondacholapuram is especially significant because of the *tarjani mudra*, a threatening gesture that is highly uncommon in depictions of Saraswati," he said.

The Saraswati image at the Brihadisvara Temple has suffered extensive damage to its right hand, making it impossible to determine what attribute it originally held.

Another important example is found at the Airavatesvara Temple, where Saraswati closely resembles the Gangaikondacholapuram sculpture. The Darasuram and Gangaikondacholapuram images depict the Goddess with an uncovered torso, whereas the Thanjavur sculpture shows her with a partially-covered chest.

Hoysala temples

Although it is difficult to determine exactly when the veena became Saraswati's defining attribute, sculptures from Hoysala-period temples frequently portray the Goddess holding the instrument, often in graceful dancing postures. Sanskrit literature contains references to Saraswati with a veena. Saraswati and veena are inseparable in Ravi Varma's paintings.

Interestingly, the presiding deity at the Koothanur Saraswathi Temple – one of the few temples in India dedicated exclusively to Saraswati – is also without the instrument. According to temple inscriptions, the shrine was renovated during the reign of Kulothunga Chola II and is traditionally associated with the Tamil poet Ottakoothar, after whom the village derives its name.

"The presiding deity is seated on a lotus and carries a *mudra*, a *suvadi*, an *akka mala*, and a *kundigai*. The Saraswati depicted on many temple walls with a veena represents the *Sangeetha Swaroopa* form, which belongs to a later iconographic tradition," said the temple priest Sundar Gurukkal.

Taken together, the sculptures at Kancheepuram, Thanjavur, Gangaikondacholapuram, Darasuram, Tiruvalanchuzhi, and Koothanur point to an important evolution in the iconography of Saraswati. Earlier representations in south India consistently emphasised her role as the Goddess of knowledge, learning, and spiritual wisdom through attributes such as the manuscript, rosary, and *kamandala*. The veena, today regarded as inseparable from Saraswati's identity, appears to have emerged as her dominant symbol only in the later depictions of the Goddess.

GS Paper II – Polity

Govt. to move Bill in RS to make insult to the National Song a criminal offence

The Hindu Bureau
NEW DELHI

The Centre will begin the Monsoon Session of Parliament on Monday with a move to grant statutory protection to the National Song *Vande Mataram*, listing the Prevention of Insults to National Honour (Amendment) Bill, 2026.

This legislation seeks to amend the Prevention of Insults to National Honour Act, 1971.

The statement of objects and reasons of the Bill by Union Home Minister Amit Shah said that the 1971 Act provides that any act of intentionally preventing the singing of the National Anthem or causing disturbance to any assembly engaged in such singing constitutes a punishable offence. The proposed amendment seeks to extend similar protection to *Vande Mataram*.


Amit Shah

According to the Bill, any act causing obstruction in the singing of the National Song or insulting it in any form would become punishable.

"Presently, there is no specific legal provision to prevent insults to the singing of *Vande Mataram*... in order to prohibit any person from intentionally preventing the singing of the National Song or causing disturbance to any assembly engaged in such singing, it is proposed to amend Section 3 of the said Act to include the National Song also within its ambit, so as to make such acts punishable," the Bill circulated among Rajya Sabha members said.

The government's move comes amid year-long celebrations marking the 150th anniversary of *Vande Mataram*.

Earlier, the Union Home Ministry had written to the States directing that the song be played or sung at official functions where the National Anthem, *Jana Gana Mana*, is rendered.

GS Paper II – Polity

Shah unveils India's first immersive language museum

The Hindu Bureau
KOLKATA


Home Minister Amit Shah at an event in Kolkata on Sunday. PTI

Highlighting that a country's language carries its heritage and offers a window into its culture, Union Home Minister Amit Shah on Sunday inaugurated the Museum of Word at the National Library campus here and called it a step to preserve the *virasat* of India.

Developed by the National Library under the aegis of the Union Culture Ministry, the first immersive language museum in the country, also known as *Shabdalok*, celebrates India's rich linguistic heritage and showcases the evolution of its oral and written traditions through interactive and technology-driven exhibits.

"Our Prime Minister [Narendra Modi] has prioritised both *Vikas* (development) and *virasat* (heritage). This museum is a step to preserve India's rich linguistic and cultural heritage. Our language carries our heritage, and through languages you can understand a country's culture," Mr. Shah said addressing the inauguration event.

The museum features nine galleries exploring different facets of the history of languages and their influence on India's civilisation and culture. It seeks to present language as a living entity that has continuously shaped society while also being shaped by it.

Linguistic diversity

The first phase of the museum chronicles the diversity of Indian languages, scripts, and literature.

Rather than a conventional repository, it has been designed as an immersive cultural experience using digital displays, holograms, and motion-sensor technology to engage visitors.

Shabdalok celebrates India's 22 official languages and traces their journey from oral traditions and ancient manuscripts to printed works and modern electronic texts, highlighting the country's enduring linguistic diversity.

GS Paper III – Economy

T.N. plans to cut VAT rate on aviation fuel

T. Ramakrishnan
CHENNAI

The Tamilaga Vettri Kazhagam (TVK)-led government is planning to lower the State-level Value Added Tax on the Aviation Turbine Fuel (ATF). The tax rate is 29% now. "We want to put it on a par with that of neighbouring States," says an official. The actual rate will likely be made public shortly.

According to information disclosed by the Union Ministry of Petroleum and Natural Gas in the Lok Sabha four months ago, Andhra Pradesh charges 1%, Puducherry 14.5%, Telangana 16%, and Karnataka 18%. In Kerala, the sales tax rate is 5%, along with a cess of 1% on tax. Furthermore, the four airports in the State – Thiruvananthapuram, Nedumbassery, Kannur, and Kozhikode – charge 1% tax and 1% cess.

The Tamil Nadu government's plan is in response to the persistent request from the Union government for bringing down the rate, which is one of the factors that determine the operating cost of airlines.

About two months ago, Maharashtra and Delhi lowered the VAT rate on the ATF from 18% and 25% respectively to 7%. In Delhi, the reduction would be in force initially for six months. Maharashtra has set no such timeline.

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GS Paper III – Science & Technology

The materials and methods that made the Vikram-1 launch unique

If its engine is printed, the airframe is woven; carbon-fibre composite – filaments of near-pure carbon set in resin – offers strength per unit weight many times that of aerospace aluminium or maraging steel; Skyroot has thus claimed a five-fold saving over the best rocket steel

Jacob Koshy

The Vikram-I rocket, built by the Hyderabad firm Skyroot, shot through the sky a little past noon on July 18. The seven-storey-tall vehicle lifted off ISRO's First Launch Pad at Sriharikota and, a little over 15 minutes later, placed its payloads in an orbit roughly 450 km above the earth. The mission, named 'Aagaman', Sanskrit for 'arrival', made India only the third country, after the U.S. and China, whose private industry can reach orbit on its own launch vehicle.

Rocket engines have traditionally been forged, machined, welded from dozens of parts. 3D printing inverts this. A laser fuses metal powder layer upon layer, building the part up from nothing. There are some real advantages to this approach. An engine printed as one piece sheds the bolts, seals, and joints where conventional engines leak and fail. When Skyroot test-fired its 'Raman' engine in 2020, it said the fully printed injector halved the mass and cut components and lead time by 80% against conventional manufacturing.

Complex internal plumbing – the fine cooling channels that let Vikram-I's regeneratively cooled engine chill itself with its own propellant – can be printed in shapes no drill can reach. Prototypes emerge in days, not months, so a startup can test, fail, and redesign at a pace that would have been anathema to ISRO's supply chains. The downsides are more subtle: peer-reviewed surveys of the field flag porosity, rough internal surfaces, and batch-to-batch variability, and NASA has documented a printed copper combustion chamber failing on the test stand from degraded material quality.

A printed engine, in short, is faster and lighter but demands obsessive quality control. The flaws hide inside the layers.

Carbon-composite body

If the engine is printed, the airframe is woven. Carbon-fibre composite – filaments of near-pure carbon set in resin – offers strength per unit weight many times that of aerospace aluminium or maraging steel. Skyroot claims a five-fold saving over the best rocket steel. Every kilogram of structure trimmed is a kilogram of satellite gained.

The American company Rocket Lab's Electron rocket pioneered the approach. The material also resists fatigue and corrosion and can be laid up by automated machines into seamless tubes. Vikram-I's own stage-1 is India's longest single-piece composite rocket stage. However, the material and its curing infrastructure are expensive; its strength runs along the fibres, so a poorly designed laminate is strong one way and brittle another; and damage can lurk beneath a perfect surface, demanding ultrasonic inspection where a dent in aluminium announces itself.

This photograph taken on July 7, 2026 shows a Vikram-S rocket model at Skyroot Aerospace facility on the outskirts of Hyderabad. AFP

Both Vikram-I and PSLV are four-stage expendable rockets that end in a restartable liquid stage for precise orbital insertion: Vikram-I's Orbital Adjustment Module is a miniature cousin of the PSLV's PS4. Both lean on India's long mastery of solid propulsion. However, the PSLV is a 44-metre, 320-tonne workhorse alternating solid and liquid stages to lift 1,750 kg to polar orbit. Vikram-I is a 22-metre featherweight stacking three solid stages under its liquid module to carry 350 kg.

The nearer analogue is the SSLV. Both Vikram-I and the SSLV have three solid-fuel stages capped by a small restartable liquid module, both conceived for small satellites on short notice.

On raw capacity, ISRO wins: SSLV lifts 500 kg to low-earth orbit against Vikram-I's 350 kg. However Vikram's all-carbon airframe is leaner than SSLV's conventional casings. Most of all, SSLV was designed by the state and its production licensed to Hindustan Aeronautics Limited for ₹511 crore; Vikram-I is owned outright by its maker, financed by venture capital, and priced by the market.

First flight

According to reports, the Vikram-I developmental flight met almost every one of its checkpoints, including the process called 'long coast', a tricky phase for a debutant, where the rocket must hold its attitude with nothing pushing it while the printed engine burns one last time. For a maiden flight whose stated ambition was merely to clear the tower and gather data, reaching orbit is an important achievement: Electron, Firefly's Alpha, and ISRO's own SSLV all stumbled the first time.

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The rocket carried five working payloads and two talismans: EMBRACE, a robotic-arm demonstration by Cosmoserve Space aimed at grabbing space debris; the SOLARAS satellite from Grahaa Space; Skyroot's own SCOPE experimental satellite; and two deployable-technology demonstrators, uD3PP and mD3RN, from the German firm Dcubed.

Alongside flew a lab-grown diamond lotus and an 18-karat gold micro-rocket bearing rice-grain sculptures of 'Sarabhai', 'Raman', and 'Kalam' – the three names Skyroot gives its rockets and engines. The company has said that all the payloads have been deployed.

Building rockets

Skyroot holds both of Indian private spaceflight's firsts – the suborbital Vikram-S launch in November 2022 and now an orbital launch with customer payloads.

But Chennai's AgniKul Cosmos, incubated at IIT-Madras, is running a parallel course. Its Agnibaan SOrTeD vehicle flew a suborbital flight in May 2024 from India's first private launchpad, on the world's first single-piece 3D-printed engine – a semi-cryogenic design burning liquid oxygen and kerosene, a propellant technology ISRO itself is still maturing.

Having test-fired four Agnilet engines in cluster this May, and with former ISRO chairman S. Somanath joining its board, AgniKul is working on its Mission 02: a two-stage Agnibaan attempting India's first sea recovery of an orbital-class booster while the rocket's upper stage reaches orbit as a working platform. Mission 02, in other words, aims at reusability – the technology that rewrote launch economics and the next barrier Indian rockets must clear.

Since the 2020 reforms and IN-SPACe's creation in 2022, India's space startups have multiplied from a handful to more than 400, but until Saturday (July 18) they all needed ISRO's rockets to fly. A private launcher now could turn ISRO from gatekeeper into landlord – and turn access to orbit from a national programme into a market. The small-satellite launch business is supply-starved worldwide; Skyroot pitches itself as a "cab service" to space.

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THE GIST

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