

Re-discovery of River Sarasvati

Everyone agrees that Rigveda was perceived on the banks of River Sarasvati. In one rika, the Rigveda notes: sarasvati_ saptathi_ sindhu maataa (sarasvati as the mother of seven rivers; sindhu means 'natural ocean frontier, river'.) As Sarasvati connotes the roots of Hindu civilization, Coedes' (French epigraphist's) work on Hinduised states of southeast Asia, show that hindu migrated eastwards along the Indian Ocean Rim to set up the largest Vishnu Mandiram of the world in Nagara Vatika (Angkor Wat). Hindumahaasagar is the only ocean so named after the Hindu Rashtra. This is an evocation of an extraordinary span of time from Vedic times to the early centuries of the Common Era when Hindu culture reached many shores along the Indian Ocean rim which extends over 63,000 miles.

The story of the discovery of Vedic River Sarasvati and a riverine, maritime civilization of ancestors of the present-day Hindus everywhere has been made possible by a remarkable coalition of scientists of a number of disciplines ranging from archaeology to glaciology.

Rishi Gritsamada among Rigveda rishi-s, calls Sarasvati as mother, river and devi (ambitame, naditame, devitame sarasvati). This shows that Sarasvati had attained the stature of a devi, divinity even in Rigvedic times. Why was she, a river, called a mother? Because, she nurtured a civilization on her banks. A civilization evidenced by over 2,000 archaeological sites out of a total of 2,600 sites of the so-called Indus Valley Civilization, making it appropriate to call it Sarasvati Civilization.

Archaeological excavations and a series of scientific discoveries have established beyond doubt that the evolution of Indian civilization was indigenous and that the Sarasvati was once an over-ground reality, flowing from the Himalayas to the Indian Ocean.

Importance of the river

The river figures in the Mahabharata, and flows north of the Kurukshetra battlefield. The epic writers however, also noted its drying up and the resultant desertification of the land, recording for posterity that the river was “disappearing into the desert” and was later “lost.” It is truly noteworthy that when in modern times British archaeologists mapped the Indus Valley sites, they found most were located round the dried-up Ghaggar-Hakra (Sarasvati), which is why modern Indian archaeologists feel it should be re-named the Sarasvati civilization.

The Indus Valley civilization was so named because the first site discovered by Sir John Marshall in the 1920s, Mohenjo Daro or “mound of the dead,” happened to be situated in the Indus Valley. Thereafter, more discoveries were made and eventually as many as 2600 sites were unearthed between Iran in the west, Turkmenia, Bactria and the Pamirs in the north, beyond Delhi into western UP in the east, up to the Godavari in Maharashtra in the south, encompassing over one million square kilometers. The culture goes back to around 7000 BC in Mehrgarh (Pakistan), which shows evidence of a strong agricultural economy and the presence of granaries for storing surplus grain. In its mature phase, this culture spawned the great cities of Mohenjo Daro, Harappa and Lothal, around 2600 BC.

To this day, Mohenjo Daro startles us with the quality of its urban planning, water supply and

drainage systems. The more recently discovered Dholavira created elaborate stone gateways and water harvesting structures, and is deservedly renowned for creating the world's first sign-board in the Harappan script. Lothal had a port with a dockyard and granaries. Yet by 1900 BC, the Indus-Sarasvati cities were being abandoned and an eastward shift in population took place. This is reflected in the Sanskrit literature, with increasing importance bestowed upon the Ganga and Yamuna. Saraswat Brahmins preserve a tradition of their southward migration, while Gaud Saraswat Brahmins say they came South via Gaud (Bengal) after the Sarasvati disappeared.

There is no evidence of invasion, or even substantial inward migration, but a population shift following the loss of a major water source.

It seems reasonable to conclude that the Rig Veda was composed by people who called themselves 'Arya' (noble) long before 2000 BC, when the Sarasvati was a mighty river, and that Harappa was one of their cities. One clinching evidence is the finding of the Vedic fire altar in several Harappan buildings (homes) and seals showing yogic meditation postures.

The discovery of Vedic River Sarasvati sounds the death-knell of an indological myth called Aryan Invasion/Migration Theory.

How was River Sarasvati re-discovered?

The modern quest for the Sarasvati began in the 1970s when American satellite images showed traces of water channels in northern and western India that had disappeared long ago. Thereafter, Dr. Vakankar together with Moropant Pingle established the invisible river's route through satellite imagery and archaeological sites along its route. The Sarasvati project was vetted and cleared by eminent archaeologists and geologists, and an earnest search for the lost river launched in 1982.

For instance, in 1995, scientists of the Bhabha Atomic Research Centre (BARC) found that water was available in the Rajasthan desert at depths of merely 50 to 60 metres, as a result of which agriculture was possible even in the extreme summer months. The Central Arid Zone Research Institute (CAZRI), Jodhpur, mapped the defunct course of a river through satellite and aerial photographs and field studies. In fact, satellite imagery has given the river scientific teeth. It seems to have originated in Kailash Mansarovar and emerged on the plains from the Siwalik Hills at the foothills of the Himalayas in Himachal Pradesh, flowed through the Ghaggar valley in Haryana and the Rajasthan desert, on to Hakra in the Cholistan desert (Sindh, Pakistan), before reaching the Rann of Kutch through the Nara Valley and falling off into the Arabian Sea.

Since the Ghaggar Valley is eight to twelve kilometers wide at many places, it is obvious the Sarasvati was truly a great river. Earthquakes and floods changed the course of the Ghaggar and its tributaries frequently, and satellite imagery together with ground morphological studies confirm that it too originated in the Siwalik Himalayas before flowing into the Arabian Sea. This was the 'lost' Sarasvati. Scientific studies suggest it dried up around 2000 BC, which makes it a contemporary of the Indus Valley civilization, and gives the Rig Veda a greater antiquity than previously suspected, as the Sarasvati was a powerful river when the seers composed the Vedic mantra-s.

After Dr. Wakankar's demise in 1996, the Vedic Sarasvati Nadi Shodh Pratishthaan, Jodhpur (regd.) continued the project, by roping in the Indian Space Research Organization (ISRO), whose chairman Dr. Kasturi Rangan and Regional Remote Sensing Services Centre (RRSSC) director Dr. J.R. Sharma displayed a gratifying interest in the project. The Jodhpur RRSSC conducted three major scientific seminars on the subject and analyzed satellite images of IRS 1-century, thus mapping the entire course from Kailash Mansarovar to Gujarat.

Meanwhile, after the Pokharan blasts on 11 May 1998, the Isotope Division of the Bhabha Atomic Research Centre (BARC) led by Dr. S.L. Rao took water samples from 800 deep wells within a radius of 250 kms. of Pokharan. Their findings, published in Current Science, showed there was no nuclear contamination of the ground-waters. Normally, when a neutron or hydrogen bomb implodes (3 bombs were imploded), huge amounts of tritium (an isotope of hydrogen H³) are released. Yet the tests showed very small traces of tritium, which are normally found in any body of water together with H₂O, a tribute to the meticulous care with which Indian scientists conducted the tests.

BARC also made some amazing discoveries. First, the waters tested were potable; second, they derived from Himalayan glaciers; third, they were between 8000 to 14000 years old; and finally, the waters were being slowly recharged through aquifers from somewhere in the north despite the fact that records showed only very scanty rainfall in the semi-arid region of Marusthali. BARC thus confirmed ISRO findings about the river, and this was an unintended fallout of Pokharan!

Archaeologists from the Shimla Circle did excellent work in 2003-2004, reporting three sites and a Buddha vihara in Adi Badri alone. Dr. Vijay Mohan Kumar Puri, an expert on Himalayan glaciers, reported finds of metamorphic rocks on the terraces created by Himalayan glacial River Sarasvati and proved that Adi Badri was the site where the river entered the plains from its Himalayan home. Adi Badri is just 20 kms. from Jagadhri (Yamuna Nagar) and 70 kms. from Dehradun (Paonta Saheb) or Kurukshetra. Further, Dr. Puri proved the origins of Sarasvati from Rupin-Supin glaciers north of Paonta Saheb, where a Yamuna tear occurred on account of plate tectonics and caused a lateral shift of the Shiwalik ranges and consequent eastward migration of the Yamuna, a tributary of Sarasvati, taking the Sarasvati waters to join the Ganga at Prayag and create the Triveni Sangam.

These excavations proved that Adi Badri was the spot where a Himalayan glacial river entered the plains. The Sarasvati originated from the Svargarohini glacier mountain. Already the revived river has reached upto Danan in Barmer, Rajasthan, and will reach the Rann of Kutch in a few years. Plans are already afoot to take it upto the Sabarmati with S'arada (Mahakali-Karnali) river glacial runoffs.

Given the magnitude of the findings, scholars like Dr. Karan Singh and Dr. Kasturi Rangan suggested the Ministry for Culture examine the Vedic texts and the work done by ISRO to prove the course of the River Sarasvati. There is a case for expediting the project, through excavations to reveal the evolution of civilization on the banks of the river.

Re-birth of River Sarasvati and National Water Grid

Projects related to the re-discovery of Vedic River Sarasvati have been transformed as projects to revive the great river to fulfil the water supply needs of 20 crore people in Northwest India and to make the Thar desert fertile again. These projects have also led to the demand for a National Water Grid to make every river of India a perennial river and provide water for everyone, for generations to come.

Dr. D.K. Chaddha, Chairman, Central Groundwater Authority, Union Ministry of Water Resources, validated BARC findings of potable water 30 to 60 m. below the ground, through ground morphological studies. A Rs. five crore Sarasvati Project was sanctioned to drill test tubewells along the identified course. ISRO located the test sites on the basis of a palaeo-channel (old course) shown in satellite images; the existence of a tectonic fault line; and the proximity to an archaeological site.

Dr. S. Kalyanaraman, director, Sarasvati Nadi Shodh Prakalp, author of a seven-volume encyclopaedic study of the river, pointed out that there are over 2,000 archaeological sites along the banks of the Sarasvati as compared to only 600 on the banks of Sindhu. The sites identified by ISRO were drilled in 25 places, with special drilling equipment from Japan, in order to precisely position the drills based on latitude and longitude data provided on toposheets. Barring one drilling due to faulty positioning of the drill, all explorations were successful and yielded sustainable tube wells at a depth of merely 30 to 60 meters, with potable water. Dr. K.R. Srinivasan, Director, Central Groundwater Board, explained in a detailed monograph that it was possible to create one million sustainable tube wells in central Rajasthan alone of the Sarasvati River basin, a project taken up by the state Government.

Sustainability of these tube wells necessitates a recharge through the surface waters of the Rajasthan Canal, which is being extended into Gujarat. In turn, Gujarat will share some Narmada waters with Rajasthan. It is an irony that while Punjab and Haryana dispute over the Sutlej-Yamuna link canal (SYL), Punjab has been forced to release waters into the Sarasvati Mahaanadi Roopaa Nahar in order to save the dams which are located on fault-lines criss-crossing the entire Sutlej-Beas river basin, on account of ongoing plate tectonic activity. Thus, waters are flowing in the 40 feet wide, 12 feet deep Sarasvati nahar, causing the sand dunes to disappear as the banks of the reborn Sarasvati are greened by forests! Nearly 10 lakh acres of land has already been brought under cultivation.

At present, State Governments are showing more interest in the Sarasvati than the Centre. In October 2004, a Sarasvati Sarovar in Haryana was dedicated to the nation, and on Karthik Purnima the following month itself, more than two lakh pilgrims took a sacred dip in the waters of the 83 m. long, 83 m. wide and 11 ft. deep Sarovar. The waters were harvested through eleven check dams, an example of water-shed management and also ecological conservation of forests, apart from the development of a Vedic herbal garden.

As of now, it will take about two years for the waters of the Sarasvati to reach Gujarat. The interlinking of rivers as part of the National Water Grid is also presently left mainly to the initiative of State Governments, as witnessed in the moves to start Kali-Parbati Sindh-Chambal and Ken-Betwa link projects. A revived Sarasvati has the power to magically transform the face of north-western India. The river will flow up to Sabarmati (Ahmedabad)

river once the Mahakali-Karnali-Sharada waters are transported across an aqueduct over the Yamuna and linked with the Sarasvati.

President Dr. A.P.J. Abdul Kalam has expressed interest in the potential this heritage river has to revive the regions through which it will flow. After visiting the Sarasvati Darshan Exhibition at Jagadhri, Yamuna Nagar, on 20 April 2003, Dr. Abdul Kalam invited experts associated with the project to make a presentation regarding the archaeological artifacts recovered from various digs as well as the findings through satellite images. A delegation led by Dr. S. Kalyanaraman explained how scientific investigations proved the historical existence of the river.

The Sarasvati springs from Himalayan glaciers in Har-ki-dun in Uttaranchal and emerges at Adi Badri, a sacred spot 30 km. north of Jagadhri, through the foothills of the Shiwalik ranges. About 5000 years ago, the river traversed a distance of over 1600 km., through Himachal Pradesh, Haryana, Punjab, Rajasthan and Gujarat, to reach Sindhu Sagara at Prabhas Patan (Somnath), as asserted in the Mahabharata and other ancient texts. Then, around 3500 years ago, tectonic changes caused river-migration and the desiccation of the river, which has been convincingly established through satellite image analyses, geomorphological studies, BARC findings based on tritium analysis of ground-water resources in the Sarasvati River Basin in the Rajasthan Marusthali desert, which will support construction of over one million tube-wells for potable water after recharging the groundwater aquifers using surface channels of the reborn river. This is a \$120 billion project that is part of the proposed National Water Grid.

Thus, what began as a historical quest for a supposedly mythical river has materialized as a reality with the potential to transform the lives of peoples along its route, once again, as in the past. The Sarasvati can make the water-starved north-west fertile and transform the desert into verdant pastures, as the Rajasthan Canal draws waters of the Sutlej and Beas from the Harike Reservoir and takes them up to Danan in Barmer district. The foundation tower at Mohangarh (55 km. west of Jaisalmer) calls the 40 feet wide channel Sarasvati Mahanadi Roopa Nahar, because the Sutlej was originally its tributary.

The National Water Development Agency plans to extend this canal up to the Rann of Kutch and the Sabarmati by adding Sharada waters through an aqueduct across the Yamuna, thereby creating a National Water Grid. Thus, waters from Mansarovar can reach Sabarmati by constructing a 200 km. channel.

Sarasvati old and new: work to be done

Having inspired and facilitated the rich cultural and material civilization of the Vedic 'Arya' people, the Sarasvati was immortalized by her grateful offspring as Goddess of knowledge and wisdom.

Given the tangible reality of the river, it is worth looking at the archaeological finds made in the Sarasvati Basin and contiguous areas, and see the connection between the ancient settlements and the river's course. During 2002-2003, the Archaeological Survey of India (ASI) decided to excavate major sites from over 2,000 sites identified after establishing the entire 1600 km. course of the river from the Himalayas to Gujarat. Some major sites thus

identified included Adi Badri, Bilaspur, Sadhaoura, Mustafabad, Bhagawanpura, Thanesar, Raja-Karn-ka Qila, Mirzapur, Pehowa, Kalayat, Kaithal, besides ongoing excavations at Banawali, Rakhigarhi and Dholavira. These excavations are now establishing the cultural chronology of India's ancient past.

Investigations by the Geological Society of India show that nearly 4000 years ago plate tectonics caused migration of Sarasvati's tributary rivers, the Sutlej and Yamuna. As a result, the Yamuna captured the waters of Sarasvati at Paonta Saheb in Himachal Pradesh (this is the origin of the story of Balarama changing the course of the Yamuna by pulling the river towards him with his plough!). Then, taking a tear in the Shiwalik ranges, the Yamuna migrated eastwards to join Ganga at Prayag, forming the eternal Sangam of three rivers, one of which is 'invisible.' As for the Sutlej (Sutudri of the Rig Veda), it took a 90-degree turn at Ropar, 50 km. north of Chandigarh, and migrated westwards to join the Sindhu.

In our contemporary era, there is a real chance that the primordial river may be reborn and flow 1600 km. from Kailash Mansarovar to Somnath (Prabhas Patan). In May 2004, the ASI excavated an ancient terrace of the Sarasvati and found high-grade metamorphic rocks belonging to the palaeo-glaciated regions of the Central Himalayas. A terrace is a level shelf of land interrupting a declivity, i.e., steep slopes above and below.

At Nausharo (Pakistan) two terracotta figurines of female figures were unearthed. The neck ornaments were painted golden-yellow, the hair black, while the parting of their hair was pigmented red (to simulate the sindoor of married women), and these powerfully indicate the sheer continuity of Indic culture from its origins 7000 years ago. At a conference of the World Association of Vedic Studies (WAVES), 2003, Prof. B.B. Lal revealed that a journalist was tutored to ask him if the figurines could have been forged by interested parties seeking to prove the convergence of the Vedic and Sarasvati civilizations! Prof. Lal replied that the images were found by French archaeologist Jarrige, in Pakistan, so the question should be directed to them!

S'ivalinga were also found at Harappa and terracotta models in Kalibangan. So was s'ankha wide bangle found at Nausharo dated to 6500 BCE. The s'ankha industry is a continuing industry for the last 8500 years. At Tiruchendur (Gulf of Mannar), the total turnover of West Bengal Handicrafts Dev. Corp'n. is Rs. 50 crores acquiring s'ankha to make s'ankha bangles which are a must in every bengali marriage. No wonder s'ankha adorns the hand of Narayana and is used as Panchajanya by Srikrishna.

Today, Adi Badri in Haryana, where Sarasvati emerges on the plains, has been converted into a pilgrimage-heritage site with a 83 m x 83 m sarovar with bathing ghats, set in a scenic valley, under the benevolent gaze of the Adi Narayan, Kedarnath and Sakti Mantra Devi temples. Yet it is also a heritage site from the point of view of water-harvesting and watershed management. The Sarasvati waters, like those of the Ganga, are clear and pure and without any contaminants. President Dr. A.P.J. Abdul Kalam visited an exhibition near Jagadhri in April 2004, where satellite images, revenue records and other evidence was showcased to establish the reality of the river. Recording his impressions in the Visitors' Book, he wrote: "Delighted to see the hard work in realizing the reality of epic information."

Dr. R.S. Bisht, former director, ASI, who excavated Dholavira and supervised the search for the Sarasvati in 2001, emphasized that the Sarasvati was a reality: "The overwhelming

archeological evidence of ancient settlements along the course of what was once the Sarasvati River proves that our earliest civilizations were not confined to the Indus river alone. Those who wrote the Vedas on the banks of the Sarasvati were the same as the Indus Valley people.”

Work has begun to decipher the so-called Indus Script. Kalyanaraman has noted that the epigraphs are hieroglyphs in mleccha language (the same language used by Yudhishtira and Vidura in Mahabharata discussing about the shellac palace – laakshaa griha – to trap the pandavas). The hieroglyphs refer to the repertoire of metalsmiths and smithy – furnaces, minerals, metals and alloys and continue to be used on Sohgaora copper plate and on punch-marked coins all over Bharatam. This points to the need for study the Bharatiya languages as an indigenous continuum from proto-vedic. <http://protovedic.blogspot.com>
<http://spaces.msn.com/members/sarasvati97> (with albums of Sarasvati hieroglyphs).

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