

The Date of the Disappearance of Rigvedic Sarasvati River and Post-Vedic Sarasvati River

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Numerous scientific studies have been undertaken for mapping and dating of the palaeochannels of Sarasvati River. Recent studies of Great Ran of Kachch and Nd & Sr isotopic measurements suggest that a distinct source of water (Sarasvati River) may have been present before 10000 years. Later in Holocene, under a drying climate, sediments from the Thar Desert probably choked the signature of an independent Sarasvati like river. The new research undertaken by IIT, Kanpur and Imperial College, London has also concluded that Sarasvati River might have been dried up around 8000-12000 years ago. Based on these scientific findings, IITK's Prof Rajiv Sinha and his team claimed that "Our paper clearly demolishes the age-old river-culture hypothesis that assumed that the disappearance of the river triggered the demise of the Harappan civilization. This has clearly been demonstrated by the large difference in age data between the demise of the river (8000-12000 years ago) and the peak of mature civilization 3000-4000 years ago."

The study of IITK also suggests that between 15000 and 8000 years ago the Sutlej River avulsed (migrated) to its present day course to the northwest. The abandonment of the former course left a topographic low formed by the former channel in the landscape. The Dating of the sediments in the palaeochannels was done by IITK using a technique known as Optically Stimulated Luminescence (OSL). It may be noted that the OSL method is not an accurate method and therefore, the date arrived by the OSL method may be an underestimate of ~10%.

Let us analyze these scientifically calculated dates with reference to the archaeoastronomical dates of Vedic and Post-Vedic texts. I have already presented the following timelines of various eras from Svayambhuva Manu to Mahabharata war.

- Proto-Vedic Period – 16000-14500 BCE
- Vedic Period – 14500-10200 BCE
 - Adiyuga – 14500-14000 BCE
 - Devayuga – 14000-11000 BCE
 - The great flood – 11200 BCE
 - Later Vedic period – 11200-10500 BCE
- Post-Vedic Period – 10200-6777 BCE

- The Date of 28th Kritayuganta – 6778 BCE
- The 28th Treta Yuga – 6777-5577 BCE
- The 28th Dvapara Yuga – 5577-3177 BCE
- The Date of Mahabharata war – 3162 BCE

Vedic Sarasvati and Post-Vedic Sarasvati

First of all, it is pertinent to understand the difference between the course of Vedic Sarasvati River and that of Post-Vedic Sarasvati River. Vedic Sarasvati River was originated at a place called Plaksha Prasravana (near Badrinath) and flowed up to Prithudaka (Pehova), close to Kurukshetra. Vedic Sarasvati took a south-western course from Kurukshetra region and flowed from Hisar, Sambhar Lake, Pushkar and Jodhpur to Great Ran of Kachch and Gulf of Kachch. Post Vedic Sarasvati changed the course at Kurukshetra region and started flowing westwards. The Map of Sarasvati Palaeochannel course given below clearly indicates the Channel II to be the course of Vedic Sarasvati River and the palaeochannels marked in blue colour belonged to Post-Vedic Sarasvati River.

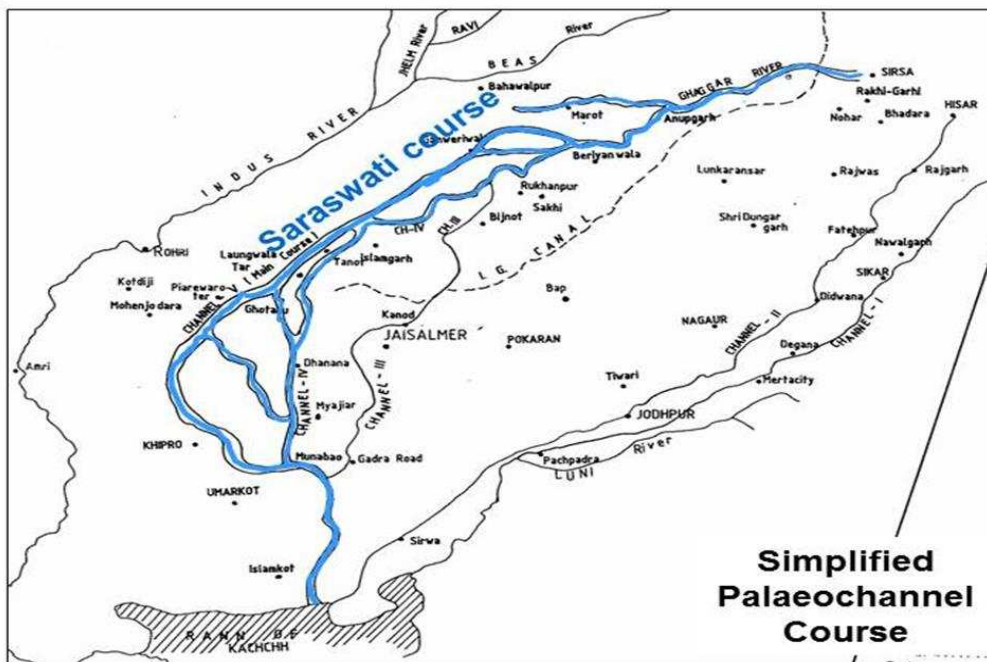


Fig.7: Simplified palaeochannel map course of NW Rajasthan

Panchavimsha Brahmana explicitly mentions the change in the course of Sarasvati. It says that Sarasvati started flowing from east to west and became नुञ्जिम्ती. Sāyana interprets नुञ्जिम्ती as वक्रोपेता (tortuous). The map of palaeochannel given above also confirms that Sarasvati became नुञ्जिम्ती (tortuous) when the River changed the course towards west instead of flowing on south-western course. Panchavimsha Brahmana also indicates that the east and the west banks of Sarasvati were no more existed in the region of Kurukshetra because Sarasvati started flowing from east to west. Therefore, Panchavimsha says that the Diksha for

Sarasvati Satra must be undertaken on south bank of Sarasvati at Vinashana (the area where Sarasvati had disappeared in the Thar Desert or changed the course).

सरस्वत्या वै देवा आदित्यमस्तम्भवन् सा नायकत् साभ्य-
व्रीयत तस्मात् स नुजिमतो वतं वृहत्यास्तम्भवन् सायक-
तस्माद् वृहती कन्दसां वीर्यवत्तमादित्यं च तथास्तम्भ-
वन् ॥ ११ ॥

पूर्वं भूत्यां वर्त्तमानमादित्यं द्युलोके निधाय सरस्वत्या
अस्तम्भवन् स्तम्भितुमैच्छत् सा नायकत् नियन्तुं नाशक्रोत् किन्तु
अभ्यवलीयत शिथिलाभूत् तस्मात्सारस्वती नुजिका वक्रोपेताभूत्
तं वृहत्या स्तम्भवन्नित्यादिषष्टं ॥ ११ ॥

प्रतीपं यन्ति नक्षत्राणि पमष्ट वै पूर्वेषु पक्षसा यन्ति ॥ १२ ॥

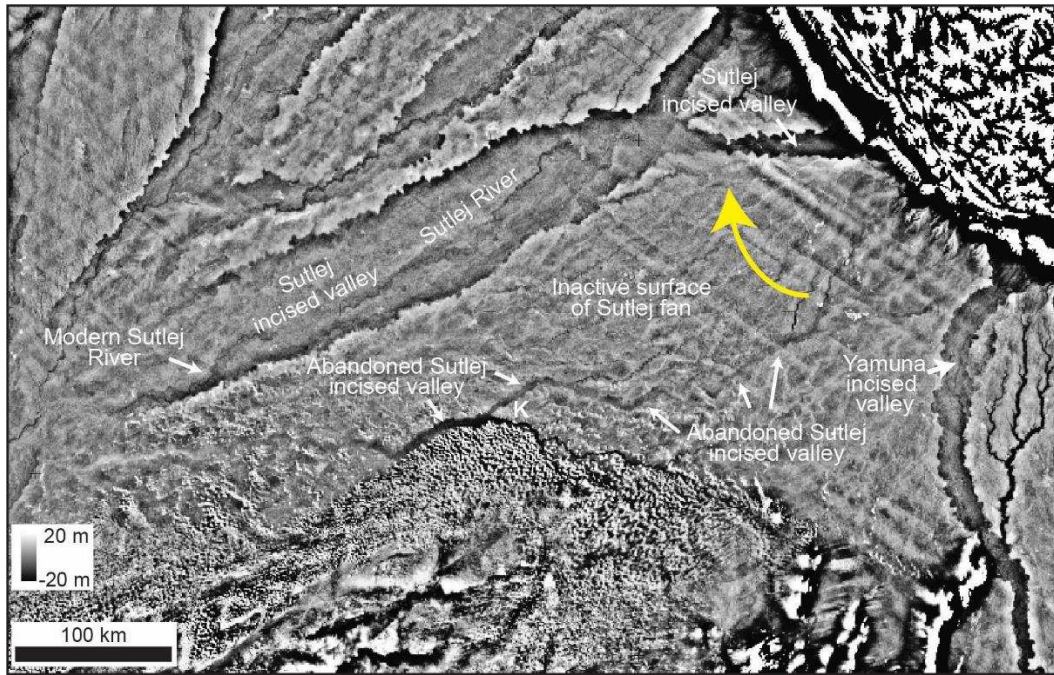
प्रत्यक्षुखी खलु सरस्वती प्रवहति अतस्तद्विचित्रे कूले प्रतीपं
प्रतिलोमं प्राञ्चोयन्ति ॥ १२ ॥

Sarasvati and her tributaries

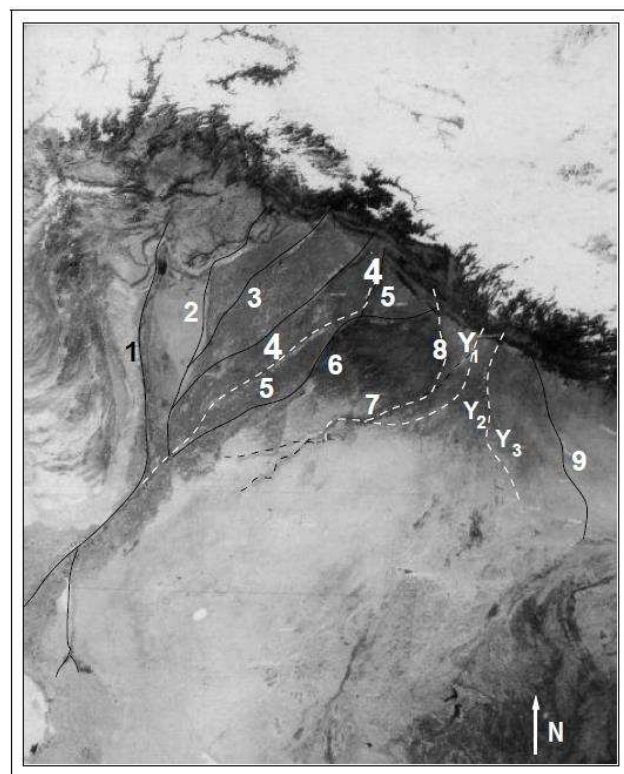
Sarasvati had many tributaries. Rigveda (6.61.10) indicates that Sarasvati had seven main tributaries. This may be the reason why Sarasvati was referred to as Saptasvasā (having seven sisters).

(14)	61	(म. 6, अनु. 5)
ऋषिः भरद्वाजः बार्हस्पत्यः छन्दः जगती 1-3, 13, गायत्री 4-12, त्रिष्टुप् 14		देवता सरस्वती
इयमददाद्रभुसमृणुच्युतं दिवोदासं वध्र्यश्वायं दाशुषे		
या शश्वन्तमाचुखादावुसं पुणिं ता ते दात्राणि तविषा सरस्वति	॥ 1 ॥	
इयं शुष्मेभिर्विसुखाईवारुजुत्सानुं गिरीणां तविषेभिरुर्मिभिः		
पारावतुम्रीमवसे सुवृक्तिभिः सरस्वतीमा विवासेम धीतिभिः	॥ 2 ॥	
सरस्वति देवनिदो नि बर्हय प्रजां विश्वस्य बृसंयस्य मायिनः		
उत क्षितिभ्योऽवनीरविन्दो विषमेभ्यो अस्रवो वाजिनीवति	॥ 3 ॥	
प्र णो देवी सरस्वती वाजोभिर्वाजिनीवती धीनामवित्र्यवतु	॥ 4 ॥	
यस्त्वा देवि सरस्वत्युपव्रूते धने हिते इन्द्रं न वृत्रतूर्ये	॥ 5 ॥	
त्वं देवि सरस्वत्यवा वाजेषु वाजिनि रदा पृषेवं नः सुनिम्	॥ 6 ॥	
उत स्या नः सरस्वती घोरा हिरण्यवर्तनिः वृत्रम्री वष्टि सुष्टुतिम्	॥ 7 ॥	
यस्या अनुन्तो अहुतस्त्वेषश्चरिणुरणुवः अमृश्चरति रोरुवत्	॥ 8 ॥	
सा नो विश्वा अति द्विषः स्वसूरन्या ऋतावरी अतन्नहेव सूर्यः	॥ 9 ॥	
उत नः प्रिया प्रियासु सप्तस्वसा सुजुष्टा सरस्वती स्तोम्या भूत्	॥ 10 ॥	
आपुप्रुषी पार्थिवान्युरु रजो अन्तरिक्षम् सरस्वती निदस्यातु	॥ 11 ॥	
त्रिषधस्था सप्तधातुः पञ्च जाता वर्धयन्ती वाजैवाजे हव्या भूत्	॥ 12 ॥	

Shutudri, Yamuna and Drishadvati were the main tributaries of Sarasvati. Shutudri (Sutlej) changed the course during the early Vedic period around 14500-13000 BCE. IITK has dated the palaeochannel of Sutlej River around 13000 BCE (15000 years ago) by OSL method. Considering the error margin of 10%, Sutlej might have changed the course around 14500 BCE.



Evidently, Sutlej changed the course and started flowing westwards in the early Vedic period. This may be the reason why Shutudri (Sutlej) had no importance in Sarasvati Satra Vedic ritual. Yamuna and Drishadvati continued to be the tributaries of Sarasvati River. In all probability, Yamuna had two channels in Vedic period. One Yamuna channel flowed westwards and merged with Sarasvati in Karapachava region of Himachal Pradesh (close to Paonta Sahib) whereas another channel flowed eastwards and merged with Ganga River at Prayaga.



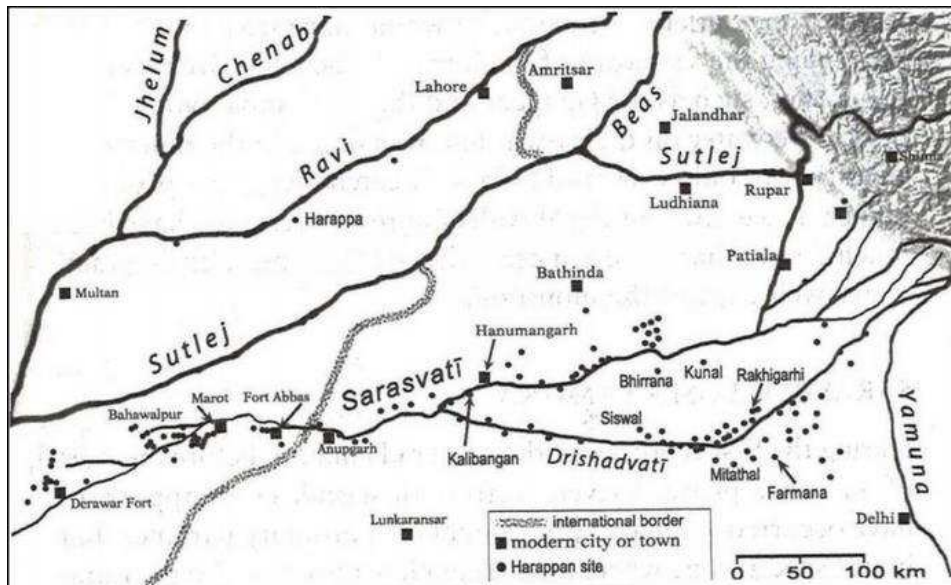
The Yamuna Palaeochannels of Y1 & Y2 as shown in the map above were the tributaries of Sarasvati. It is difficult to say when Y2 palaeochannel changed the course because some scientists have also dated this change of course around 50000 years ago. Interestingly, the Avabhritha ritual was performed in Yamuna River in the Janapada of Kārapachava at the end of the Sārasvatiya Satra as mentioned Panchavimsha Brahmana and Latyayana Shrautasutra. Seemingly, Yamuna, a tributary of Sarasvati (Y1 palaeochannel) had changed the course in later Vedic period. Probably, this change of course occurred at the same time when Sarasvati lost in the sands of desert. It appears that the Avabhritha ritual might have been introduced to commemorate the past confluence of Sarasvati and Yamuna. Most probably, the confluence of Sarasvati and Yamuna was located in Kārapachava Janapada in Rigvedic era and this Janapada was located in between Nahan and Paonta Sahib and before Jagadhari, Yamunanagar in Haryana.

कारपचवं प्रति यमुनामवभृथमभ्यवयन्ति ॥ २३ ॥

कारपचवोजनपदविशेषः तन्मध्ये यमुना गच्छति तां प्राप्य

तत्रावभृथन्न कुर्युः कदाचिदपि सरस्वत्यामवभृथीन कर्त्तव्यः
तथा च सूत्रकारः न सकृच्चन सरस्वत्यामवभृथमभ्यवेयुर्हवय-
जनभूता ह्येषा भवत्वविद्यमाने सरस्वत्या एवोद्धारं पार्श्वतस्त्विति
अविद्यमाने सरस्वतीप्रान्ते नद्याह्नसम्भवे सरस्वत्या एव जल-
मुद्गत्यावभृथार्थं उद्गत्यापि जलं पार्श्वत एवावभृथः कर्त्तव्यः न
तत्रेत्यर्थः ॥ २३ ॥

IITK has dated the demise of Sarasvati River around 12000 years ago (10000 BCE). Considering the error margin of 10%, Sarasvati might have lost at Vinashana around 11200-10500 BCE. Panchavimsha Brahmana and Latyayana Shrauta sutra indicate that Drishdvati was still a tributary of Sarasvati River. Manusmriti mentions that Drishdvati flowed in the south of Kurukshetra.



Though Yamuna changed the course around 11200 BCE but Drishadvati continued to be the tributary of Post-Vedic Sarasvati River. Drishadvati and Post-Vedic Sarasvati Rivers survived for many thousand years after Rigvedic era and finally dried up after Mahabharata war (3162 BCE) around 3000-2600 BCE.

Sarasvati River lost at Vinashana

Panchavimsha Brahmana (25.10) mentions that Sarasvati River lost at a place called Vinashana. Sāyana says that since Sarasvati had lost or gone underground at Vinashana, the rites were performed on the south bank of the River. Evidently, Thus, Sarasvati had only north and south banks in post-Vedic period.

सरस्वत्या विनशने दीक्षन्ते ॥ १ ॥

सरस्वती नाम नदी प्रत्यक्षोक्ता प्रवहति तस्याः प्रागपर-
भागौ सर्वलोकप्रत्यक्षौ मध्यमस्तु भागौ भूम्यामन्तर्निमग्नः प्रव-
हति नासौ केनचिद्दृश्यते तद्विनशनमित्युच्यते तस्योपक्रमे दक्षिणे
तीरे दीक्षन्ते ॥ १ ॥

The Vedic story of Devāpi and Shāntanu (10500 BCE) and the drought of 12 years clearly indicates the weakening of south-west monsoon in Punjab, Haryana, Rajasthan, Gujarat areas around 10500-10200 BCE. Most probably, the palaeochannels I & II had been gradually dried up around 11200-10200 BCE. According to Vedic legends, Kalmashapada killed the sons of Vasishtha. Aggrieved Vasishtha wanted to commit suicide in Sarasvati River but the water in the River was not enough to drown him. There is also a legend that Sarasvati turned into many lakes. Vishvamitra turned the waters of Sarasvati into red colour. Probably, the copper ore of Khetri area (Jhunjhunu district of Rajasthan) turned the waters of dying Sarasvati River into red colour. The legend of King Videha and Gautama Rahugana indicates that King Videha migrated to the banks of Sadārīrā (Gandaki) River. Seemingly, Sarasvati dried up during the lifetime of King Videha. King Nami, son of Sāpya was the first Videha king who performed Sarasvati Satra from Plaksha Prasravana to Vinashana. Rajarshi Vaikuntha Indra (10800 BCE) mentions King Nami Sāpya in his Sukta of Rigveda (10.48.9). King Vaikuntha Indra was a descendant of the lineage of Indras (Shakra, Arjuna and Kutsa). Saptagu Angirasa was the junior contemporary of Vaikuntha Indra.

प्र मे नमी साप्य इषे भुजे भूद्वामेषे सुख्या कृणुत द्विता ।
दिद्युं यदस्य समिथेषु मंहयमादिदेनं शंस्यमुक्थ्यं करम् ॥ १ ॥

PB quotes an anecdote of the Videha king Nami, the son of King Sāpya who performed Sarasvatiya Satra.

**एतेन वै नमी साप्योवैदेहो राजाञ्जसा स्वर्गं लोक-
मैदञ्जसागमेति तदञ्जस्कीयानामञ्जस्कीयत्वं ॥ १७ ॥**

पूर्वमेतेन सत्रे ण सप्यपुत्रोवैदेहो विदेहदेशाधिपतिर्नमीनाम
राजा अञ्जसा शीर्घं स्वर्गं लोकमैत् तस्मादयमपि स्वर्गमञ्जसा
आगमेमेति ब्रूवन् तत् तस्मादञ्जस्कीयानां सारस्वतसत्तावय-
वभूतानामञ्जस्कीयत्वं ॥ १७ ॥

I have already explained the dates of Vasishtha, Kalmashapada, Vishvamitra (11200 BCE), King Videha, Rishi Gautama Rahugana (10900 BCE) and King Nami Sapyas (10800 BCE). Evidently, Sarasvati River lost in desert during the lifetime of king Videha (10900 BCE) and his priest Rishi Gautama Rahugana.

Latyayana Shrautasutra also refers to similar procedure of Sārasvata satra as given in Panchavimasha Brahmana. Sarasvati lost at Parina Sthali (Vinashana = Uchana) close to Kurukshetra and used to flow westwards from Vinashana. Lātyāyana states that the ritual must be performed on the south banks of Sarasvati Rivers. Latyayana also indicates that Drishadvati was reduced to be a seasonal river before the lifetime of Acharya Dhānanjayya (7500 BCE).

अथ पञ्चदशी कण्डिका

दक्षिणे तीरे सरस्वत्या विनशनस्य दीक्षेन् सारस्वताय षष्ठ्या-
मपक्षस्येति गौतमः १ अमावास्यायामतिरात्रः स्यादेवऽस्वस्थानमा-

अथ सप्तदशी कण्डिका

दृषद्वत्या अप्ययेऽपोनघ्नीयामिष्टिं निर्वपेन्वदि सोदका स्यात् १
अप्यनुदकायामिति धानञ्जयः २ शते गोष्वृषभमप्युजन्तीति वत्स-
तरी शते गर्भिणीषु ३ ता यत्र गव्यमभयऽस्यात्तत्र रक्षेयुः ४ पुङ्गवै-
स्तासां भुङ्गीरन् सर्पिषा च ५ तासु सहस्रऽसम्पन्नासु पूर्वपक्षे
गामतिरात्रं कृत्वा दत्त्वैता उत्तिष्ठेयुः ६ यदा सर्वज्यानिङ्गीयन्त इति
तासामेवाधिकारः प्रकरणभूतत्वात्तत्र विश्वजिदतिरात्रः ७ मृते
गृहपतावायुः ८ प्रादुर्भावान्तादेतयोरापदोरुत्तिष्ठेयुरप्यपरपक्षे ९ न
सकृच्चन सरस्वत्यामवभृथमभ्यवेयुर्देवयजनभूता ह्येषां भवति १०
अविद्यमाने सरस्वत्या एवोद्धारं पार्श्वतस्तु ११ यदा प्लक्षं
प्रास्त्रवणमागच्छन्त्यथोत्थानमिति तथा प्रास्येयुर्यथैनं पूर्वपक्ष आ-
गच्छेयुरिति गौतमः १२ यदेनात्किञ्चिदुत्थानमागच्छेदिति धानञ्जयः
प्रायणीयमेवातिरात्रमुपेत्योत्तिष्ठेयुरिति १३ प्लक्षं प्रास्त्रवणमागम्य
पुरस्तादतिरात्रस्याग्रये कामायेष्टिः स्यादिति शाण्डिल्यः १४
उपरिष्ठादिति धानञ्जयः १५ तस्यामश्वाञ्च पुरुषीञ्च धेनुके यज्ञोप-
करणशेषाऽश्वाभिरूपायान्यस्मै दद्युः १६ स्वामिनो हि सर्वे सत्रेषु
तेषां प्रतिग्रहं न विद्यते १७ उक्तोऽवभृथो ब्राह्मणेन १८ अपृष्टशम-
नीयमेतत् १९

अथ ऊनविंशी कण्डिका

संवत्सरादूर्द्ध्वं परीणं नाम स्थली कुरुक्षेत्रे तस्यामग्नीनाधाय
यथाकालमन्वारम्भणीययेष्ट्या प्रसृज्येतेति शाण्डिल्यः १ दर्शपूर्णमा-
साभ्यां यजेतेति धानञ्जयः २ सायंप्रातराहुती एव हुत्वा पुरस्ता-
द्धेदाहिताग्निः ३ सरस्वतीदृषद्वत्योः सम्भेदं प्राप्याग्नेन्येनाष्टाकपालेन
यष्टुमुपक्रमेत् ४ तत्र शम्याप्रासनं यथा सारस्वतेषु ५ न तु प्रक्र-
मात्प्रक्रमेत् ६ काममनेकामिष्टिमेकैकेनाह्ना सऽस्थापयेत् ७ दृष-
द्वत्या दक्षिणेन तीरेणेत्यात् ८ तस्याः प्रभव्यमर्मं प्राप्येतयेष्ट्येष्ट्या त्रिप्ल-
क्षावहरणं प्रति यमुनामवभृथमभ्यवेयात् ९ यत्र क्वच ततो दूरे यमुना
स्यात् तत्रैतयेष्ट्येष्ट्या स्वयऽसाम गायन्नवभृथमभ्यवेयादगायन्वा १०
प्रव्रजिष्यतोऽयनमिदं मन्य इति धानञ्जयस्तदेव मनुष्येभ्यस्ति-
रोभवतीति ११ न ग्रामं पुनरेयादिति १२ स्वर्गं लोकमाक्रमते १३
व्यावर्तते श्रेयान् भवतीति वा १४ उदकान्तर्द्धानाद्वा यथा सरजस
इति १५

The location of Vinashana

According to Bhāgavata Purana, Vinashana, the place of disappearance of Sarasvati was located close to Kurukshetra. PB mentions that Sarasvati originates from Plaksha Prasravana and the distance between Plaksha Prasravana and Vinashana was 44 Ashvinas. Sarasvati originated from the hills of Badrinath. Mahabharata also indicates that Plaksha Prasravana was located in Shivalik hills.

चतुश्चत्वारिंशदाश्वीनानि सरस्वत्या विनशनात् स्रजः
प्रास्रवणस्तावदितः स्वर्गलोकः सरस्वती समिते नाध्वनाः
स्वर्गलोकं यन्ति ॥ १६ ॥

सरस्वतीविनशनप्रदेशादारभ्य गतां चतुश्चत्वारिंशदाश्वीनः
प्रमाणप्लवः प्रास्रवणः एकोप्यश्व एकेनाहीरात्रेण यावन्तमहानं
गच्छति तावानेकाश्वीनः तथाविधश्चत्वारिंशदाश्वीनैर्यावान-
द्वा भवति प्लवप्रास्रवणो भवति आश्वीन इत्यस्यैकाहगताश्वीने-
धाइतः स्वर्गलोक इत्युक्तं नैष दोषः सहस्राश्विनोस्यान्त-
र्भावात् ॥ १६ ॥

Ahnya, Ashvina and Yojana were the oldest measures of distance during Vedic and post Vedic era. Ahnya was longer than Ashvina whereas Yojana was shorter than Ashvina. Panchavimsa Brahmana (9400 BCE) refers to the distance of 44 Ashvina. Evidently, Ashvina means the distance a horse could travel without a break in a day. Seemingly, Ashvina was equal to 10 to 15 miles. During later Rigvedic era (11200-10200 BCE), the south-west monsoon weakened after 11000 BCE. Yamuna also changed the course at the same time. Thus, the south-western channel of Vedic Sarasvati River dried up around 10900 BCE. Sarasvati River also changed the course and started flowing westwards from Kurukshetra, Sirsa to Kalibanga and Anupgarh. Drishadvati River also joined Post-Vedic Sarasvati River.

Vedic sources clearly tell us that Sarasvati originated from Plaksha Prasravana and lost in desert at Vinashana. Vinashana was not a city but the area at which Sarasvati disappeared. The original Vinashana was probably Sambhar Lake. Sambhar Lake was formed from the waters of Sarasvati River. Asura King Vrishaparva's kingdom was located close to Sambhar Lake. His daughter Devayāni married to King Yayāti (11200 BCE). The point of Vinashana might have gradually shifted northwards. Vinashana was at Uchana, Haryana close to Kurukshetra during Pre-Ramayana era (7000-6000 BCE). This is the reason why Bhagavat Purana indicates the location of Vinashana close to Kurukshetra.

Interestingly, the shifting of Vinashana point also affected the length of the measurement unit of Ashvina. Sarasvati's disappearance marked the end of Rigvedic era. Sarasvatiya Satra, a Ritual was introduced after the disappearance of original course of Sarasvati. Videha king Nami, the son of King Sapyā was the first who performed Sarasvatiya Satra. In all probability, King Nami Sapyā travelled 44 Ashvinas from Plaksha Prasravana to Vinashana. Considering

Sambhar Lake as Vinashana, there was a distance of 1000 or 1050 km from Badrinath to Sambhar Lake. Thus, one Ashvina was equal to 23 or 24 kms (15 miles).

During the period of Panchavimsha Brahmana, Vinashana might have shifted close to Sadulpur, Rajasthan. Therefore, the distance of 44 Ashvinas reduced from 1050 kms to 730 or 770 km. Thus, one Ashvina was equal to 16.5 or 17.5 km. Since the travel of 44 Ashvinas was linked the ritual Sarasvatiya Satra, the number of Ashvinas remained 44 only but the distance had been gradually reduced. Finally, the point of Vinashana has been shifted to Uchana, Haryana around 7500 BCE during the time of Latyayana Shrautasutra. The distance between Badrinath to Uchana is around 598 km. Thus, Ashvina became equal to 13.5 kms.

Since Ashvina was a greater measuring unit than 13.5 kms, a Unit of Krosha equal to 13.5 kms came into practice during the period 7000-5500 BCE and the use of Ashvina measure was abandoned. Valmiki Ramayana refers to the Krosha of 13.5 kms and a small unit of Yojana (165 or 175 meters). Later, a standardization of measuring units was undertaken during Pre-Mahabharata era and a Yojana of 13.5 kms came into practice.

Conclusion

As discussed above, we can fix the following important dates related to Sarasvati River.

- Shutudri or Sutlej, an ancient tributary of Vedic Sarasvati River changed the course around 14500-13000 BCE.
- Yamuna (Y1 palaeochannel), a tributary of Vedic Sarasvati River also changed the course around 11200 BCE.
- Vedic Sarasvati River lost in Thar Desert or disappeared in the sands around 10900 BCE.
- Vedic Sarasvati River changed the course and started flowing westwards and became tortuous around 10900-10500 BCE.
- The first Vinashana was probably Sambhar Lake around 10900 BCE but Uchana or Parina Sthali in Kurukshetra was the Vinashana point around 10500-10000 BCE.