Sarasvati : The Lifeline of Harappan Culture

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It is now geologically proved that initially all the land masses were grouped into one supercontinent called 'Pangea' (assemble by ~ 500 Ma). Later on it broke down into two supercontinents, one in the northern hemisphere called 'Laurasia' and the other in the southern hemisphere called 'Gondwanaland' (Fig. 1). This Gondwanaland again started dividing into two, East and West Gondwanaland and then to a number of continents from the Mesozic era (245-65 Ma). India was a part of the East Gondwanaland and India Plate (one of the seven major plates) started moving northward in the Cretaceous Period (135-65 Ma) of Mesozoic era (Fig. 2). Madagascar was attached to India at that time but it broke away and slowed down which resulted into a major volcanism in India (fissure type eruption) in the form of Deccan volcanism. Meanwhile the Indian plate kept on moving northward and the sea north of it called Tethys was compressed into a small sea. Finally the Indian plate collided with the Eurasian plate and moved beneath it causing the crustal thickening (In Tibet the crustal thickness is 70 kms, double of the normal thickness of crust) and disappearance of Tethys. The compression of the ocean sediments between two plates (Eurasian and Indian) caused the sediments to get folded and move up in the form of mountains, the Himalaya (Fig.3). So Himalaya is the youngest fold mountain of the world.

Himalaya plays a major role in the settlement and cultural development of humans in this region. Firstly, it blocks the cold Siberian wind making the subcontinent ideal for cultural development; secondly, it houses hundreds of glaciers (moving rivers of ice) which give rise to many perennial rivers which formed the plains and also made it fertile making it ideal for the settlements and also development of culture. The Harappan culture is the earliest known example of this phenomenon which developed on the rivers from Himalaya. Harappan civilization was a combination of both urban and rural settlements. It had well planned, properly designed cities doing the trade and commerce through rivers and also small rural settlements catering primarily the needs of this civilization by producing cereals, cotton etc.

Harappan culture covered an area of about 2.5 lac square kilometres and was spread in the whole of north-west India and part of Pakistan. It was the most widespread and extensive civilization of its time in the whole world. Its boundaries can tentatively be marked between two mighty rivers of that time. Indus or Sindhu marked the north-

west boundary and Sarasvatī marked south-east boundary, which changed its course many a times before finally disappearing. A look into the river map of the subcontinent catches immediate attention towards a large stretch of land between Yamunā and Indus covering the states of Rajasthan, Haryana, Punjab and Gujarat in India, Sindh and Punjab in Pakistan devoid of any water system. But it was not so during the ancient times (Fig. 4.). LANDSAT imagery and Aerial Photography have confirmed that the Vedic Sarasvatī used to flow with its tributaries in this area, corroborating the literary descriptions given in the early texts.

On the banks of mighty river Sarasvatī flourished the Harppan culture, which is evident from the fact that out of 1100 sites of Harappan Culture known so far, 750 sites are on the bank of Sarasvatī and this confirms that it was the lifeline of Harappan Culture. This river changed its course many times as a natural process or most probably due to some geological disturbances and it is suggested by many geologists and archaeologists after the interpretation of various aerial photographs and LANDSAT imagery that the river initially flowed through a more eastern course through the eastern part of the present desert and river Luni was one of its tributary. Later on it moved westward through modern Jaisalmer district in what is now extremely desert condition. As Sarasvatī changed its course many times, its junction with the Arabian Sea also changed. Finally, before disappearance it met the Arabian Sea through Raini - Wahinda - Nara - Hakra Channel. It might be possible that Lothal, an important Harappan harbour was situated on the confluence of the river with Arabian sea, when in the initial period the river's course was more easterly.

The Gaṅgā, an important river now, was not significant even if it existed at that time (river is scarcely mentioned in the early texts like *Ṛgveda*) and Yamunā was a small river along with Tons, a tributary of Sarasvatī. River Yamunā was a swift river cutting ferociously downwards making its channel deeper and deeper so that its depth was below the Sarasvatī's level. Himalaya was tectonically very active at that time and the Shear Zone behind Yamunā (Trans Yamunā Shear Zone) became active connecting the Yamunā with Sarasvatī. As Yamunā was deeper, the bulk of water was taken by Yamunā, and Sarasvatī was robbed off that water. Besides some other tectonic movements in the Himalaya removed other perennial sources of water which were once tributaries to it. For example Satluj was once a tributary of Sarasvatī, but it changed its tract and became a tributary of Indus. Due to such tectonic movements and other geological processes, Sarasvatī lost its perennial supply from the Himalaya and become

dependant on rain water. Being cut off from the perennial sources, it became sluggish as is also described in the *Mahābhārata*. In Vanaparva[1] and Anuśāsanaparva of the *Mahābhārata* it is mentioned that the swift moving voluminous river was changing into river with lakes due to its sluggishness. The *Mahābhārata* also informs that the river at many places went underground and was slowly drying up. These lakes can also be confirmed today by the presence of many pockets of large amount of ground water in Rajasthan.

With Sarasvatī drying up and many of its tributaries changing their course the whole of the area was devoid of Himalayan waters. As a result, the area dried up slowly, entire region of Rajasthan and some part in Sind changed into desert with time and now we know about Thar desert and do not know about Sarasvatī which once flowed through this part of land and made it fertile and green.

The volume of water once carried by Sarasvatī can only be guessed but even now it can be proved that the river was once a mighty one and carried large amount of water by just one example of Jaisalmer from where Sarasvatī once flowed.

In Jaisalmer the Rajasthan Groundwater board has done some analysis. The analysis reports a negligible Tritium-content in the ground water meaning thereby that this water is not being recharged from somewhere (absence of modern recharge) and is actually what one can say 'fossil water'. The radio carbon dating of this water gives it an approximate age of 5000 B.C.E. i.e., this water is about 7000 years old and the volume of water in that area is so much that since last 50 ears pumps are pumping out that water for the city and still the level has not gone down. This statement itself speaks of the volume of water that Sarasvatī was carrying when it was not dried up or was alive. So seven thousand years earlier Sarasvatī started to dry up slowly and the time mentioned in the *Ṛgveda* about Sarasvatī being a mighty river was earlier than that. It took about 3500 years for Sarasvatī to dry up completely or go underground which will date to 1500 - 2000 B.C.E. and that was the time when the Harappan culture moved from that place to other parts of the Indo-Gangetic plane, as the Harappan culture did not disappeared but new settlements were formed in the newly formed Indo-Gangetic plane. One can see the presence of the elements of Harappan culture in other cultures, which developed later on.

Thus one can say that Yamunā was the main cause of the disappearance of Sarasvatī. Yamunā or Jumnā (literally meaning to combine) took the water of Sarasvatī and became voluminous itself. In the *Mahabharata* it is mentioned that Prayāga is the

confluence of Gaṅgā and Yamunā, Sarasvatī is not mentioned as it had its separate existence at that time[2]. Whereas in Vanaparva of the *Mahabharata* Sarasvatī was still an important river and Gaṅgā was secondary, in the Anuśāsanaparva Gaṅgā gained its present day importance and Sarasvati was sidetracked which means that by that time the river was almost completely lost because of the tectonic disturbances in the Himalaya. People of that time knew that Yamunā robbed off the water from Sarasvatī and hence the name Jamunā was given to it. The earlier concept of Prayāga being a *triveṇī* (confluence of Gaṅgā, Yamunā and Sarasvatī) was actually based on this fact that Yamunā contained the water of Sarasvatī also. The concept of Sarasvatī being underground (लुप्त) in Prayāga was a later addition when people forgot the earlier concept and only the name of Sarasvatī remained in their mind but the river was not physically visible. Gaṅgā also gained its importance during the disappearance of Sarasvatī.

With the disappearance of Sarasvatī the whole of Harappan culture was affected and it changed its place quickly afterwards, as Sarasvatī was the lifeline of Harappan culture whether it be trade and commerce or agriculture. No wonder many archaeologists now call the Harappan culture as Indus-Sarasvatī culture.

References

1. ततो विनशनं गच्छेन्नियतो नियताशनः।
   गच्छत्यन्तर्हिता यत्र मरुपृष्ठे सरस्वती।
   चमसे च शिवोद्भेदे नागोद्भेदे च दृश्यते। *Mahābhārata,* Vanaparva 80.118
2. गंगायमुनयोस्तीर्थे तथा कालंजरे गिरौ।
   षष्टिह्रद उपस्पृश्य दानं नान्यद्विशिष्यते। *Mahābhārata,* Anuśāsanaparva *26.34*

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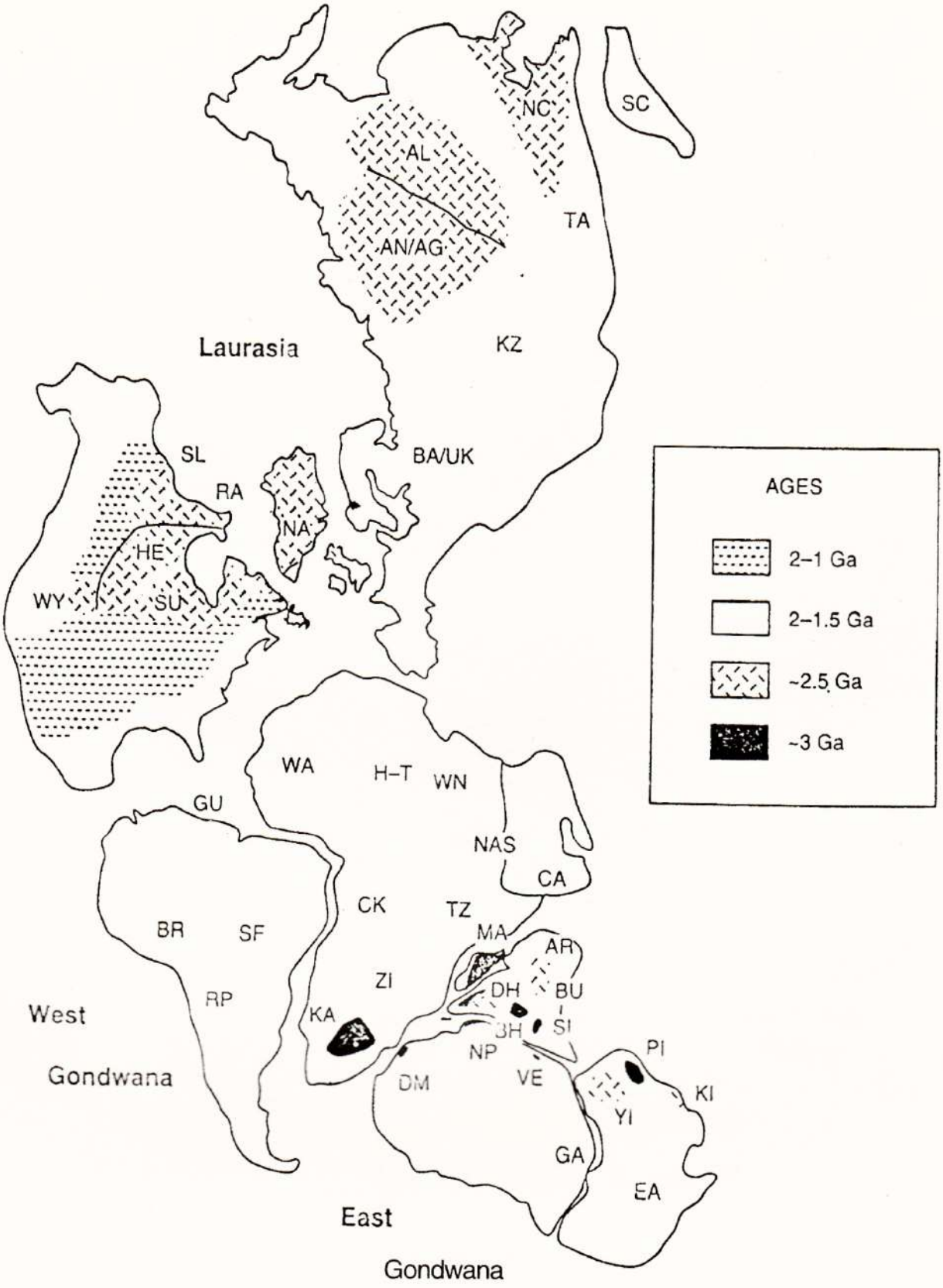

Figure - 1 : Pangea Supercontinent

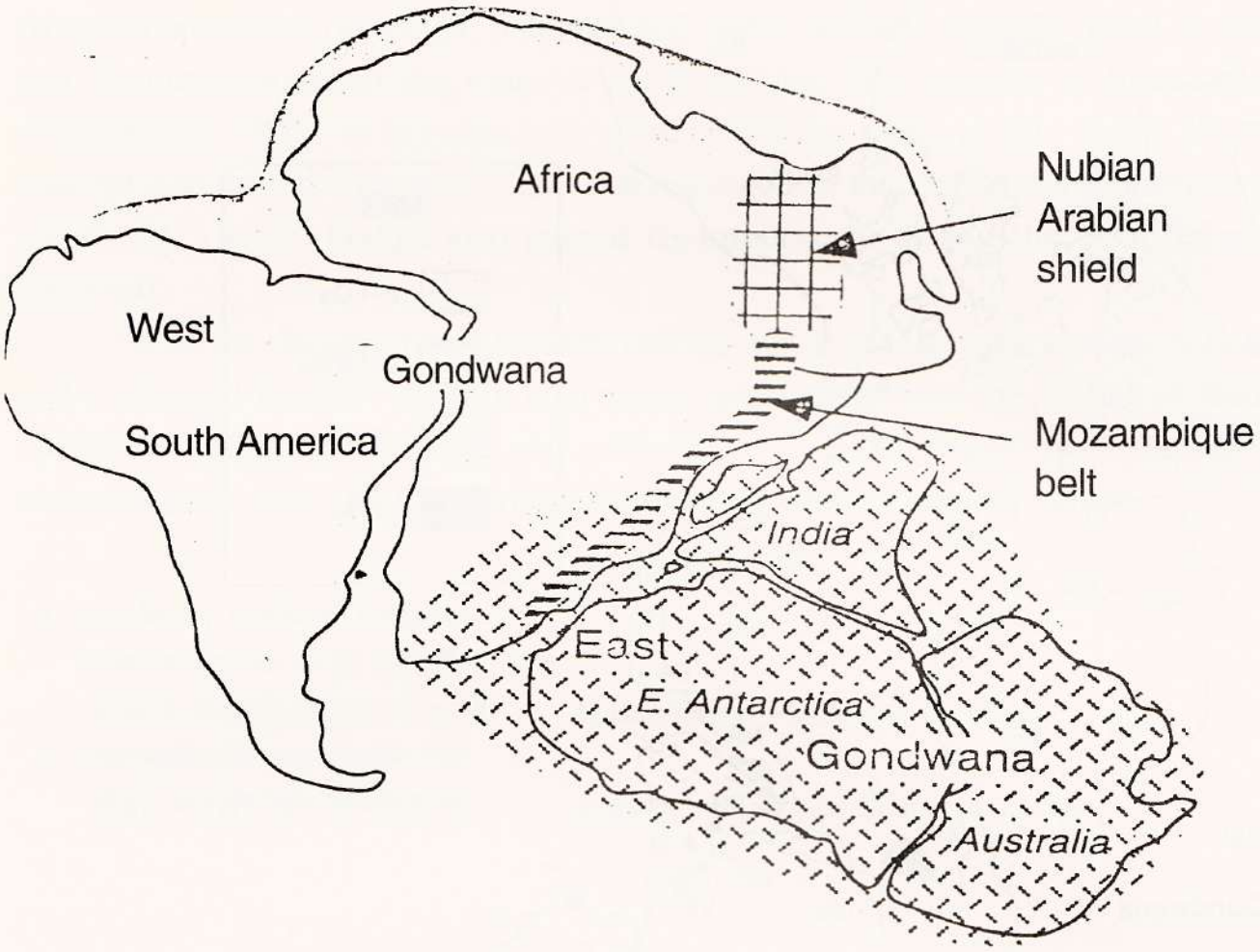

Figure - 2 : Gondwanaland

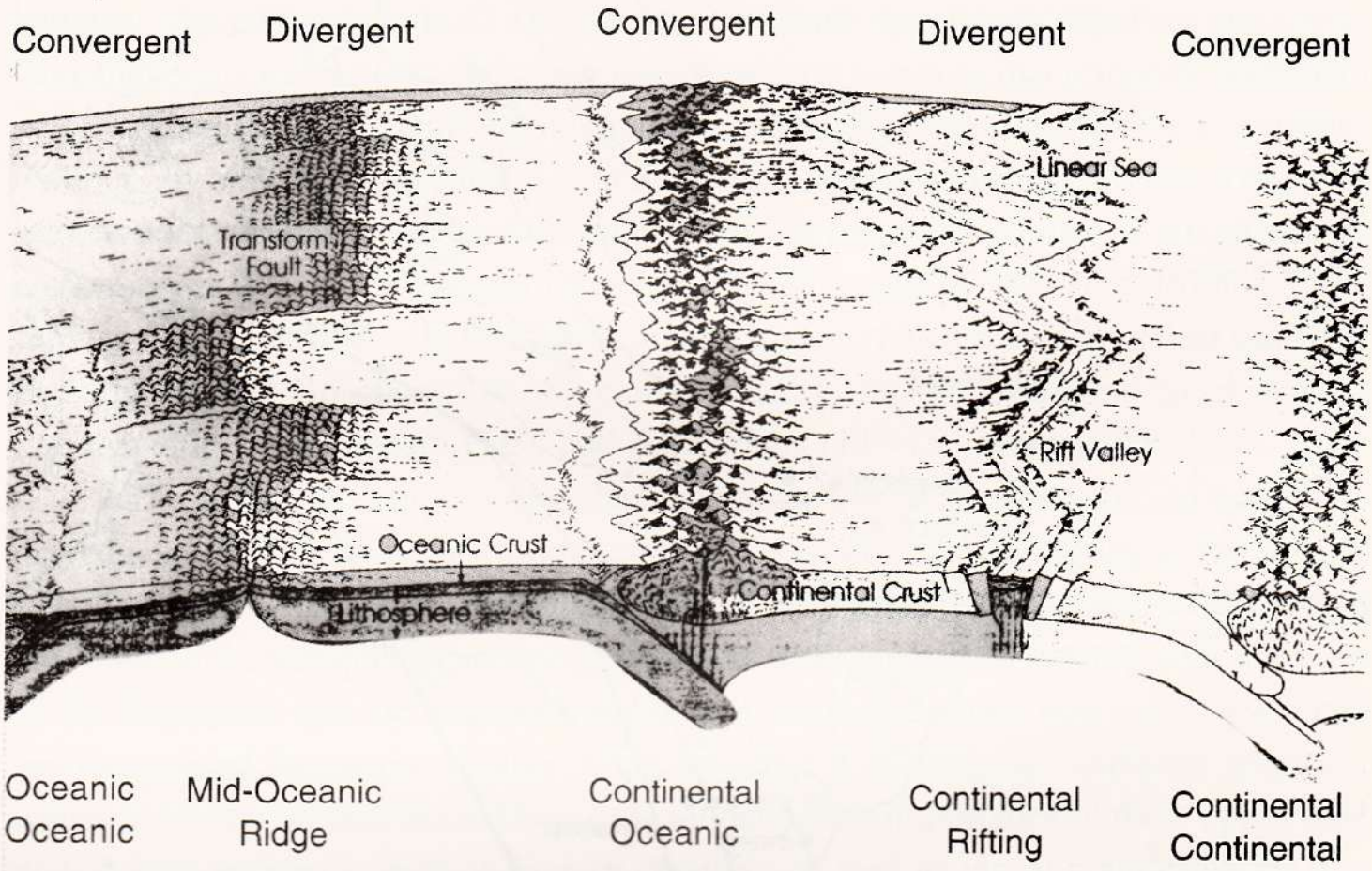

Figure 3 : Continent-Continent Collision along with Other Types of Plate Margin

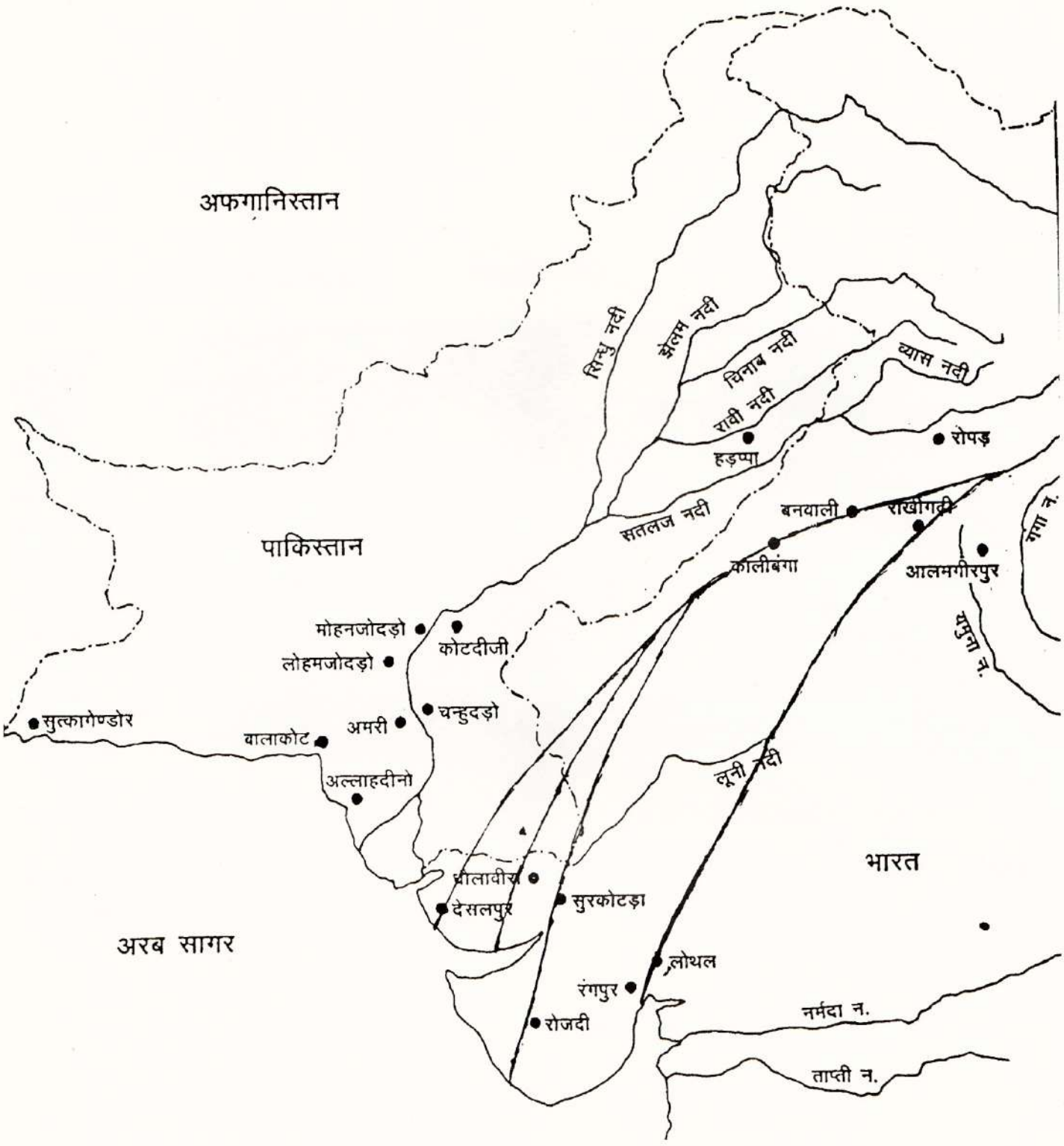

Figure 4 : The Course of Sarasvatī