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Environmental factors contribute to the decline of Indus valley civilization

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Abstract
The mysterious fall of the largest of the world's earliest urban civilizations nearly 4,000 years ago in what is now India, Pakistan, Nepal and Bangladesh now appears to have a key culprit- Ancient Environmental change. The ancient Egypt and Mesopotamia may be the best known of the first great urban cultures, but the largest was the Indus Valley Civilization. The environmental variation has often been cited as a determining factor in cultural changes in the context of the Indus Valley Civilization of Indian sub-continent, 2500–1900 BC. While these claims have been critiqued by archaeologists they continue to be accepted by non-archaeologists, including scientists. The purpose of this paper is to assess the available evidence and published arguments and to provide a constructive working synthesis of evidence for the pre-historic environmental setting of Indian sub- continent for the mid- to late last 10,000 years. The most of evidence suggests that there was no sudden fall, rather a combination of environmental factors was the most likely reason for decline. We conclude that Indus Valley civilization decline the most important factors contribute of environmental degradation.

Keywords: Archeological, biodiversity, civilization, geographical, hemisphere, insolation radiocarbon etc.

1. Introduction
The Indus valley civilization was a Bronze Age Civilization that was located in the north-west region of the Indian subcontinent, consisting of what is now modern day Pakistan and north-west India. Flourishing around the Indus river basin, the civilization extended east into Ganges-Yamuna doab, it extended west to the Makran coast of Baluchistan, in north to north-eastern Afghanistan and south to Daimabad in Maharashtra. The geographical extend of this civilization encompassed a triangular area with 1,000 miles on each side, or approximately 425,000 square miles. This is an area larger than ancient Egypt and Mesopotamia combined. Flourishing from approximately 3000 to 1500 B.C., the Indus valley civilization drives its name from the type site of Harappa, located in Punjab province in Pakistan. It is also called Harappan civilization because the civilization was discovered first in 1921 at the modern site of Harappa. Indus civilization was discovered in 1920–22 when two of its most important sites were excavated. These were Harappa on the banks of the river Ravi and Mohenjo-Daro on the banks of the Indus. The first was excavated by D. R. Sahani and the second by
R.D. Bannerji. On the basis of the archaeological findings the Indus civilization has been dated between 2600 B.C–1900 B.C and is one of the oldest civilizations of the world. It is also sometimes referred to as the „Indus Valley civilization‟ because in the beginning majority of its settlements discovered were in and around the plains of the river Indus and its tributaries The 1400 settlements, discovered so far are distributed over a very wide geographical area. Its known extent in the west is upto Sutkagendor in Baluchistan; Alamgirpur in Merrut District (uttar Pradesh) in the east; Daimabad (Ahmadnagar District, Maharashtra) in south; and Manda (Akhnoor District, Jammu and Kashmir) in the north, covering an area of almost 1600 km. east – west and 1400 km. north-south. The total geographical area over which this civilization flourished is more than 20 times of the area of Egyptian and more than 12 times of the area of Egyptian and Mesopotamian civilizations combined. It covers an area of about 12, 50,000 sq.km. These settlements are mostly located on river banks (Possehl, 2002) [19].

Table 1: Phases of Indus Valley Civilization

Dates	Phase	Era
7000-5500 BCE	Mehargarh	Early food Production Era
	I (aceramic Neolithic)	
5500-3300	Mehargarh II-VI (ceramic Neolithic)	Regionalization Era 5500-2600
3300-2600	Early Harappan	
3300-2800	Harappan 1 (Ravi Phase)	
2800-2600	Harappan 2 (Kot Diji Phase, Nausharo I, Mehargarh VII)	
2600-1900	Mature Harappan (Indus Valley Civilisation)	Integration Era
2600-2450	Harappan 3A (Nausharo II)	
2450-2200	Harappan 3B	
2200-1900	Harappan 3C	
1900-1300	Late Harappan	Localization Era
1900-1700	Harappan 4	
1700-1300	Harappan 5	
1300-300	Northern Black Polished Ware (Iron Age)	Indo-Gangetic Tradition

Data Sources: Journal of World Prehistory.

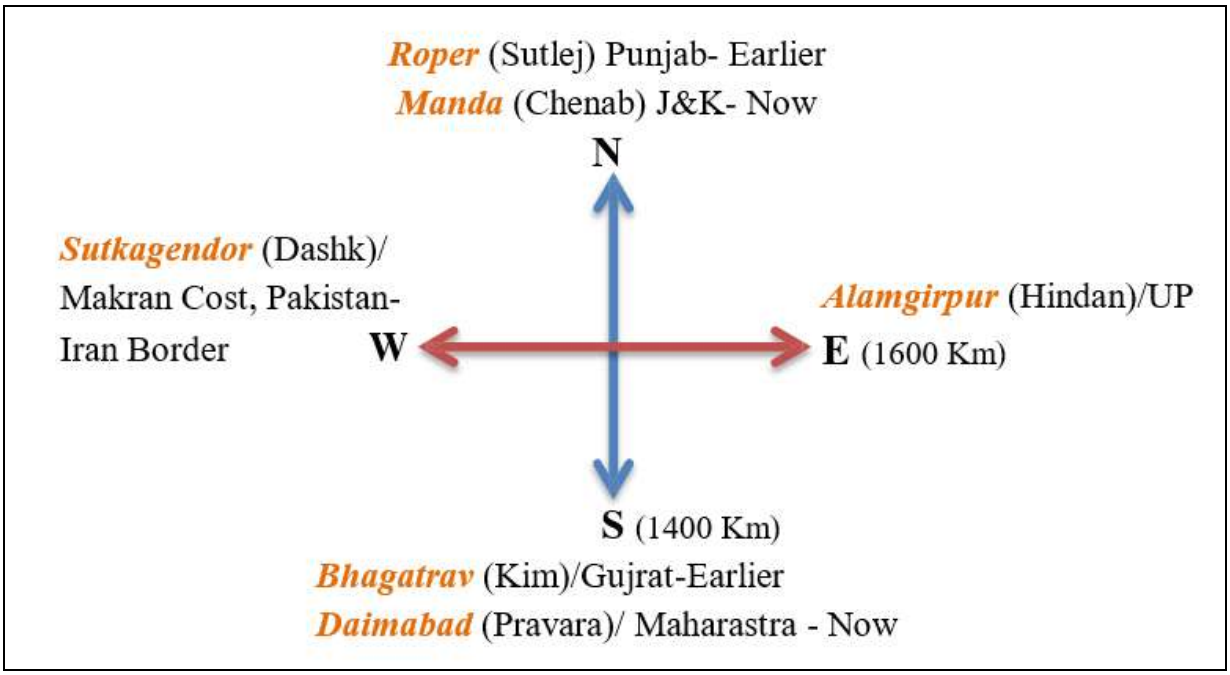
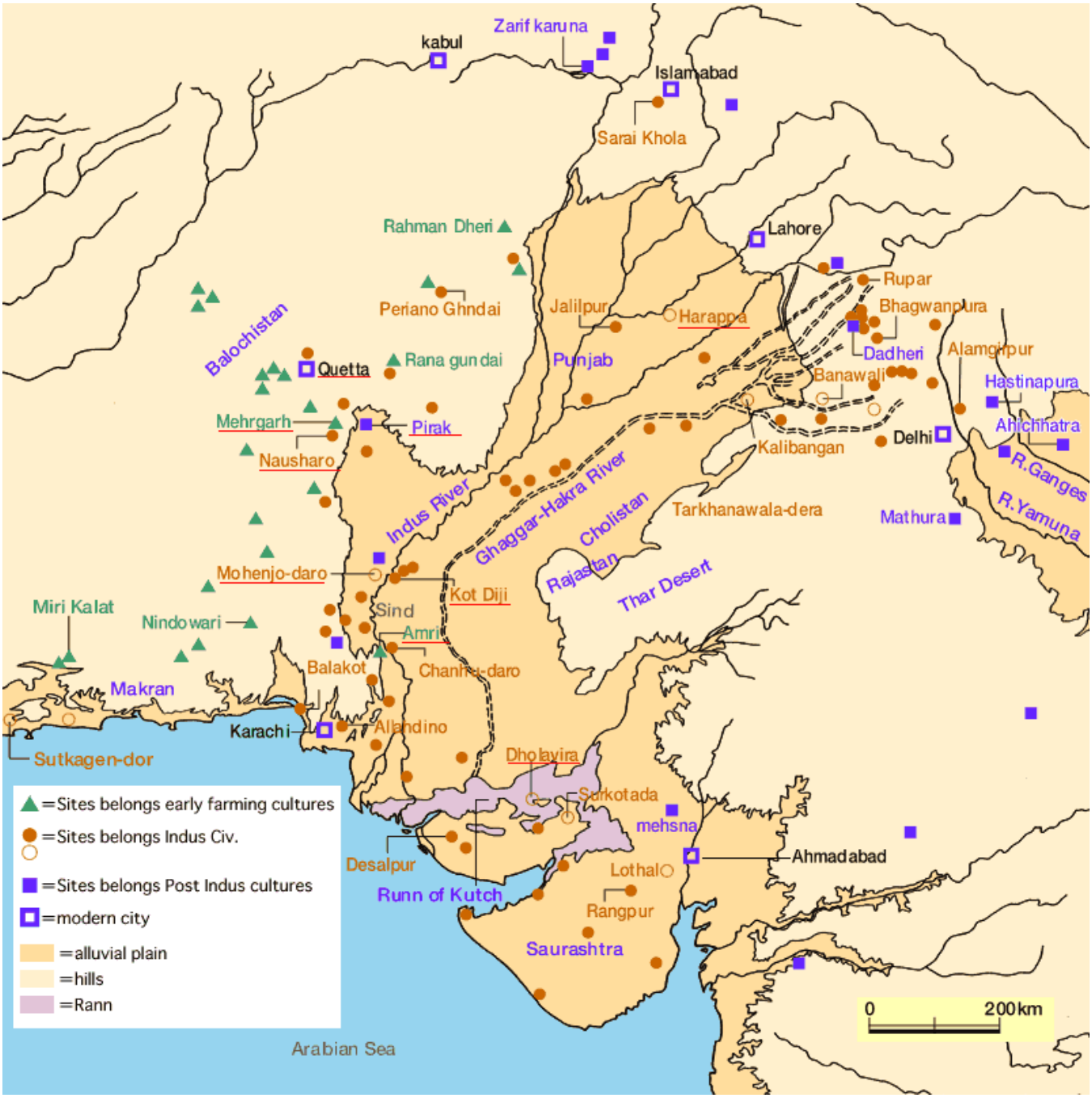


Fig 1: Geographical Area of Indus Valley Civilization

The Indus valley civilization is one of the world‟s earliest urban civilizations. At its peak, the civilization may have had a population of over 5 million. The civilization is noted for its cities built of brick, roadside drainage system and multistoried house. The civilization was famous for its great bath, proper drainage system and well planned houses. Harappa and Mohenjo-Daro (near Karachi) in Sind, are called the "twin Capital cities" of the Indus valley civilization because of their size, strategic locations, and the appearance of the greatest diversity of materials in their archaeological records.

A possible natural reason for the Indus Valley Civilization decline is connected with climate change that is also signaled for the neighboring areas of the Middle East: The Indus valley climate grew significantly cooler and drier from about 1800 B.C. linked to a general weakening of the monsoon at that time. Alternatively, a crucial factor may have been the disappearance of substantial portions of the Ghaggar-Hakra river system. A, tectonic event may have diverted the system‟s sources towards the Ganges plain, through there is complete uncertainty about the date of this event as most settlements inside Ghaggar-Hakra river beds have not yet been dated.



Map 1: Sites of the Indus Valley Civilization (Tokai University Library)

2. Objectives of the Study

The Indus valley civilization declined suddenly between 1800-1700 BC and its end is puzzling as its beginning. How and why did the first great empire of South Asia decay into oblivion? One cannot say with certainty whether massacres by marauders or inbuilt decay that had set in caused the decline of this powerful civilization. Another school of thought relates the demise of Indus valley civilization to have been brought about by a major tectonic shift that caused continuous floods of this area.

This research paper is to analyse more vibrantly about environment factors contributing to decline of Indus valley civilization. Specific objectives of the study are: to

- Describe the historical prospective of Indus valley civilization.
- Investigate the factors having an impact on occupations, trade and commerce of Indus valley civilization.
- Find out the actual cause of the decline of Indus valley civilization.
- Emphasize on environmental factors that might have caused the downfall of Indus valley civilization.
- Know about the theories of decline proposed by different environmentalist and historians.
- Examine about the climatic evidences that led to the decline of Indus valley civilization.

3. Historical Prospective

Around 1800 BC, signs of gradual decline began to emerge, and by around 1700 BC, most of the cities were abandoned. However, the Indus valley civilization did not disappear suddenly, and many elements of the Indus civilization can be found in later cultures. Current archeological data suggests that material culture classified as late Harappan may be persisted until at least C. 1000-900 BC and was partially contemporaneous with the Painted Grey Ware and perhaps early NBP cultures.

A consideration of what actually defines the unique character of the Harappan phenomenon during its mature period (2500 to 1700 BC) would be in order at this point (Chakrabarti, 2004).

- Essentially polar-aligned pre-planned urban settlements, usually divided into a lower town and an increasing labeled "citadel".
- The frequent architectural use of mud brick platforms.
- Fastidious, almost fanatical, attention to water control, including a plethora of hydraulic feathers such as drains, wells, sump pits, baths and bathrooms.
- Consistent binary system of weight and measures and its application in architectural
- feature such as brick size.
- Pottery unique in terms of manufacturing technique, decoration, shape and style.
- Distinctive animal and human figurine assemblage.
- Unique and still deciphered script.
- Essentially a complete lack of any military related materials, both in terms of weapons and probably fortification.
- No palatial architecture or any other types of administrative architecture.

4. Causes of Decline

The proposed mitigating factors for the apparent decline or „collapse" of the Indus Valley Civilization in the mid second millennium can be divided into either historical event causes or cultural causes, in other words uncontrollable versus theoretically controllable factors. Same of the proposed factors are:

- Invading hordes of Aryans/Indo-Europeans (Dales 1904. Fire services 1971, Srivastava 1984).
- Seasonal flooding of Mohenjo-Daro and other side in Sind (Dales 1966, Raikes 1965, Dales and Raikes, 1977).
- Tectonic uplift along the Makran coast which landlocked many here to fore costal settlements (Dales 1966).
- The "Death from natural causes" of Kalibanga and other sites in Yamuna river channel due to shift in the river course (Raikes 1968).
- The desertification of Cholistan/Bahanalpur due to shifts in Hakara river course (Mughal 1982, 1984).
- Climatic changes (Misra 1984).
- Ecological degradation i.e. "wearing art of the landscape" (Gupta 1980).
- The sharp decrease in trade with Mesopotamia at the end of the 3rd dynasty of Ur (Ghosh 1980).
- Cultural process i.e. societal evolution/devolution (Gupta 1980, Fairservis 1971, 1979, Schaffer 1982).

5. Theories of Decline

Various theories accounting for the eventual collapse of the Indus Valley Civilization have been put forward over the years. Everything from invaders from the north- the Aryan invasion theory of Friedrich Max Müller- now out of favour, to over-exploitation of natural resources leading to erosion and poisoning of the land by rising salt levels through over-irrigation. Other environmental catastrophes such as the demise of the Saraswati, the changing course of other rivers and climactic change might also have been a factor (Kenoyer, *et al*, 2000). Most scholars today seem to attribute a combination of environmental factors to the slow decline. Whatever the case, and we will probably never be completely sure, this decline can be seen c.1900 BC. Structures become poorly constructed with heavy re-use of material, which indicates a shortage of natural resources such as clay for bricks and timber for building frames (Kostman, 1996) [13]. The current research being conducted in India and International hopes to answer questions concerning invaders and the drying up of river beds. The first promising written script interpretations have been made. Radiocarbon chronologies are proving very useful. Satellite imaging is exposing old trade routes.

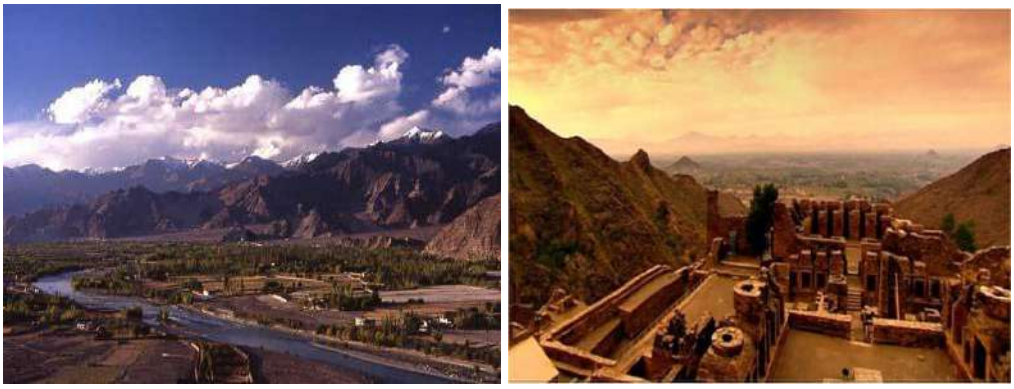


Fig: 2 & 3 Showing Decline of Indus Valley Civilization

The decline of the civilization has been attributed to several factors. Among these, are:

5.1 Aryan Invasion

The argument supporting the invasion was based on the subsequent culture of Vedic corpus using a language–Indo Aryan that had affinity with the Central Asian Indo-European particularly the Old Iranian. That this language gained currency in northern India was thought to be the result of a conquest of the local population by the Indo-

Aryan speaking, the evidence being drawn from the hostility of the,, Arya ‟towards,, Dasa‟ from the Rigveda (Masica, 1993). The reference to „Indra‟ attacking the „Pur‟ enclosed settlement of „Dasas‟ were erroneously read as referring to the Indus Civilization. The later stages of Mohenjo-Daro as painted out by many scholars depicted signs of tension and and uncertain possibilities of warfare/invasion. The nature of the feared group could not be determined whether they were Krithars from hill, or the enemies in the plains, or the local rebel factions. The head of the much known „Prist King‟ seems to have been broken and to have fallen together with a wall into a passage. The archeological contexts of such desecrated sculptures "Speak for internal dynastic feuds or ideological confrontation in the last days of Mohenjo-Daro" (Masica, 1993). Jewelry and vandalized stove sanctuaries left behind, give us an idea of the urgency of the abandonment that drowned and the people of the Harappa.

The early theory about Aryan invasion has been dismissed on the following grounds:

1. The skeletons don‟t all belong to one and the same occupational level, which should also be the latest marking the end of the Indus Settlement.
2. At the site there is no evidence of an alien culture immediately underlying the Indus one.
3. The post Indus cemetery at Harappa has been brought into picture. It has although elsewhere demonstrated by same writer that this cemetery had come years after the Indus Valley Civilization had collapsed.
4. There is evidence for the movements out of the Central Asia the homeland of the Indo- European and their Indo-Iranian branch, after about 2000 BC. We had seen that settlements like Yarim Tepe and Hissar were abandoned, so too the settlement in Southern Turkmenia. In Southern Baluchistan we find new kinds of pottery, seals and burial practices which point to new concern. At Sabri and Pirak we had seen the influx of Central Asian elements. None of this, is however the proof of moment of people speaking a particular language. There is no necessary link between a particular kind of material culture and its geographic relied an elite/taste sponsorship or demand, experience with different soils and rainfall regimes, knowledge of different varieties of crops, observation of animal breeding behavior, and the fuel properties of different trees, these would be a part of popular sciences and would endure. So, the house forms and construction techniques of Mohenjo-Daro did not endure.

5.2 Flood Theory

This applied basically to Mohenjo-Daro. The flood is often referred to as „the catastrophe‟. Disastrous changes in the course of Indus River resulting in desiccation of areas which were essential for the feeding of city‟s population, could have been a more believable cause. Mohenjo-Daro was in same way the epicenter of the entire balance that held the whole of the Harappan Structure together. Therefore such an event would lead to depredation by tribesmen from the nearby hills and might have well brought together the desertion of the city and of the outlying settlements. The latest levels of Mohenjo-Daro show a marked decadence in the civic control (clear sign of de-urbanization). It is only after the complete abandonment of sites that we see new squatter populations moving in the famous cemetery „H‟ occupation at Harappa and Jhukar occupation at Chanhudaro (Kenoyer, 2003). Terming these cultures as being the continuation of the Harappan people seems to a little problematic. The Sind area is prone to earthquakes as well as floods. In 1818 there was a major up thrust of the ground at Sehwan, downstream of Mohenjo-Daro and upstream of Amri and Chanhudaro, which pushed, the Indus River back and gigantic lake was formed for about two years. It is this kind of phenomenon that the scholar suggests might have the cause of the decline of Harappan culture in Mohenjo-Daro and the adjoining areas. Another problem with this theory was that there was not enough archeological evidence for 3rd millennium floods. What some archeologist took to be laid by still water on the southern edge of Mohenjo-Daro is now believed to be the remains of mud platforms.

5.3 Tectonic Uplift of the Coastline

Another natural and uncomfortable factor in the demise of at least some of the Indus cities was tectonic uplift on a ground scale. The evidence for this is simple and indisputable. Harappan seaports along the Makran coast such as Sutkagendor, Sotka-Kou and Balakot are now as far as 50 km inland. These displace ports made it evident that the coastline of Pakistan had risen considerably during the past 4,000 years, with the initial rise apparently having occurred during the Harappan period (Dales 1966-95). The earthquakes associated with such an uplift would have been tremendous and the disruption of sea and land trade networks would have been devastating. The proximity to Arabian Sea trade routes was, after all, the raison deter for sites such as Sutkagen Dor and Sutka Koh. This tectonic uplift, thus would explain the demise of several Harappan coastlines, as well as imply a hardship for many other Harappan sites which were dependent on these coastal sites for trade and marine resources.

5.4 Climatic Change

A new study combining the latest archaeological evidence with state of the art geoscience technologies provides evidence that climate change was a key ingredient in the collapse of the great Indus or Harappan Civilization almost 4000 years ago. The study also resolves a long-standing debate over the source and fate of the Sarasvati, the sacred river of Hindu mythology.

Giosan and his colleagues have reconstructed the landscape of the plain and rivers where this long- forgotten civilization developed. Their findings now shed light on the enigmatic fate of this culture. He said that "Our research provides one of the clearest examples of climate change leading to the collapse of an entire civilization." The researchers first analysed satellite data of the landscape influenced by the Indus and neighboring rivers. From 2003 to 2008, the researchers then collected samples of sediment from the cost of the Arabian Sea into the fertile irrigated valleys of Punjab and the northern „Thar Desert‟ to determine the origins and ages of those sediments and develop a timeline of landscape changes. The Giosan recalled, "It was challenging working in the desert temperatures were over 110 degrees Fahrenheit all day long." This brought new insights into the process of eastward population shift, the change towards many more small farming communities, and the decline of cities during late Harappan times. Some historian had suggested that the

Harappan heartland received its waters from a large glacier fed Himalaya river, thought by some to be the Sarasvati, a sacred river of Hindu mythology (Gupta, 1996). However, the researchers found that only rivers fed by monsoon rains flowed through the region. Archaeological evidence suggested the river, which dissipates into the desert along the dried course of Hakara Valley, was home to intensive settlement during Harappan times.

5.5 Environmental Degradation by the Population

George Dales aptly noted that "wearing out a landscape is basically impossible to prove and no alluvial plain wears out anyway." Also, "If environmental factors had been decisive in the downfall of civilizations and Mesopotamia would have been deserted long ago" (Gupta 1980: 52). In other words, although mother nature weakened have on several significant portions of the Harappan region as discussed above, the Harappan themselves would not have been able to change their environmental setting to such an extend as to have any being on their ability to sustain themselves.

5.6 Monsoon Failure

It has been suggested that reduction in water availability, perhaps as a result of climatic change or because tectonic activity caused rivers to change course, could have played a significant part in decline of this ancient civilization. There is evidence that about 10,000 years back the Indian.

Subcontinent went through a period when monsoon rainfall was greater that it is now, according to R. Ramesh of the Physical Research Laboratory in Ahmedabad who works on reconstructing the past climate (Gupta, *et al*. 2004).

Initially, the monsoon-drenched rivers the researchers identified were prone to devastating floods. Over time, monsoon weakened, enabling agriculture and civilization to flourish along flood-fed riverbanks for nearly 2000 years. Geo-scientist Giosan and his team members find out that "the insolation the solar energy received by the Earth from the Sun- Varies in cycles, which can impact monsoons." In the last 10,000 years, the Northern Hemisphere had the highest insolation from 7,000 to 5,000 years ago, and since then monsoons were affected by lower insolation, decreasing in force. This meant less rain got into continental regions affected by monsoons over time. Eventually, these monsoon based rivers held too little water and dried, making them unfavorable for civilization.

6. Debate

Research had proved that the decline of the glorious Indus Valley civilization was due to a variety of factors, both manmade and natural. In the beginning of several millennium BC, there were great changes in the environmental conditions the climate changed and large parts of the plains were flooded when tectonic changes threw up a dam in the lower Indus Valley. Many experts today believe that the Indus Valley Civilization disintegrated after the Saraswati river started turning dry Satellite imagery of the region along the Indo-Pakistan Border clearly shows existence of vast underground channels where the mighty Saraswati once flowed. Most Currently known sites of the Indus Valley Civilization line perfectly along these channels, suggesting that these massive cities propped up along the banks of Saraswati. It is also believed that hordes of people migrated from the Indus Valley Civilization and went towards the Gangetic plains or to Central Asia. Research has also shown that the new centers of activity arose east of the Saraswati a few hundred years after the Saraswati dried up.

Mortimer Wheeler pointed out that the Harappan culture was destroyed by Aryans. The Aryans were more skilled at warfare and were more powerful than Harappans. Sir Johan Marshal, Lambrick and

J.H. Mackay suggest that the decline was mainly due to the vagaries of Indus River. Some of the evidence of the devastation by floods has been found at Mohan-jo-daro and Lothal but there is no such evidence in respect of other sites like Kalibangan. Historians are of the view that the decline of Indus Valley Civilization was not the result of a single went, it was a slow decline and a result of combination of factors.

In 1937 Sir Aurel Stein and Sir Johan Marshal proposed that climate in these regions during the Indus Valley Civilization period was more wet than at present. Their propositions were based on the evaluation of the multiple archeological evidences. This theory was supported and left unquestioned for more than 3 decades and it was also accepted by Stuart Piggot (1930) and Mortimer Wheeler (1953). Sir Stuart made a soil analysis of Mohenjo-Daro and Harappan Civilization and found them prone to floods and found seven layers of houses on excavation, which proved that the city might have flooded seven times over. This also led to an interference that they was great rainfall and huge amount of siltation.

In 1971, Gurdeep Singh made his evaluation based on palenological evidence and cited an increase in rainfall around 8000 BC, which was responsible for the emergence agriculture in the north-west India, and by the study of pollen grain, he found fluctuation in rainfall becaouse of which agriculture came, flourished and declined. Gurdeep Singh also made a study of the four lakes of Rajasthan of which three were salt Lakes (including Lakaraman) and one fresh water Lake (Purkhan).

V.N.Mishra criticizes this theory of Gurdeep Singh and says that the study of stratigraphic records at other salt Lakes along with a few sand dunes in Rajasthan shows an absence of Harappan and Indus Valley Civilization archeological sites. He also stated that the densest distribution of the Harappan sites was not on the Indus River or its tributaries but on the extinct Hakra-Ghaggar Valley. V.N. Mishra laid an estimate of Gurdeep Singh‟s hypothesis and questioned at the validity of the wet-dry climate theory.

The various scholars gave various reasons for the decline the lower Indus Valley:-

- Sir Johan Marshal stated that the decline was caused by the decrease in rainfall.
- Mortimer Wheeler and Faire services held exhaustion of economic resources.
- Mortimer Wheeler and Raikeys held Aryans Invasion and excessive flooding responsible for the decline respectively.

According to Gurdeep Singh‟s hypothesis, the aridity between 2000 BC and 1000 BC in the Lankarauran was due to the hiatus between the Harappan and the PGW cultures which did not stand valid in the light of agricultural evidences recent excavations by ASI show that PGW culture co- exited with late Harappans at these sites. Infect, in 1971 Ramchandaran and Gupta said that the PGW and late Harappan Culture overlapped around 1300 BC and thus,

there was no hiatus but evidences show that population during PGW period was much sparser in Ghaggar Valley.
V.N. Mishra thus concludes, that during the PGW period, the Ghaggar or Saraswati, no longer drained out the upper course. Its original bed had shrunk to a vast extent mainly due to the diversion of the Yamuna channel from Ghaggar to its present course.

7. My Observation

Human Civilization has existed in India for the past the fifty thousand years-even since the first pre Harapans migrated out of Africa and proceeded towards the Southern Coastline of India millions of migrants have since entered India through the North-Western frontier. Most decided to stay here the country had plentiful rivers, a beautiful landscape, fertile soil and an amazing biodiversity. The cultural evolution over the past two thousand years saw much of this nature get integrated into the lifestyle of the people. Right from having gods bearing Pythons and Elephant heads to finding medicinal uses of leaves and roots, from worshipping the rivers as deities to considering the earth as the mother, India‟s nature got richly integrated into this culture. India not just the country, but also the concept exists because of its nature. As the example of the Indus Valley Civilization shows, you destroy India‟s nature and you‟d have disintegrated its civilization.
This scenario is no longer a historical, or for that matter a juristic one. It is very much a problem this generation and the generations to the come have to deal with climatic change today is a reality. According to several scientific reports, India and its 1.5 billion people and countless species will be among the worst affected by climatic change Himalayan glacier, for example, provide water to one third of the world‟s population. These glaciers are the sources of our rivers like Ganga, the Indus and Brahmaputra. Prediction suggests that changing patterns of the monsoon winds will significantly change water availability and the ground water table in these regions. What will that mean for the people living in these areas? How will it affect the rich flora and fauna?
Question like these are no longer just a theory, but very much a reality. We are no longer dealing with petty issues like signing nominal accords with foreign countries. We are certainly not dealing with petty divisions of language, caste or religion. We are at one of the biggest of the Indian Civilization today. We can either let the India of today degenerate into chaos or we can take bold actions with a sense of urgency. Tomorrow is very much dependent on what action we take today.

8. Concluding Remarks

To sum up, the Harappan people after 1800 BC had failed to see sustained occupation, and people seemed to have emigrated. In settlement from, metallurgy, writing system, house construction, crafts using ivory or carnelian or in the use of seals, as also in major aspects of city life and maritime orientations, there was a little continuation of the bronze way of life. There was instead a reversion to rural, tribal cultures, of what we call the chalcolithic stage, where metal may have been used, but was a remarkably cosmopolitan and outward looking phase of South Asian history. The Harappan world was an open one with foreign trade, external influences and migrations. The urban centers had interaction with the hunters of Rajasthan tribesmen in Makran and settlers in Kashmir. Meluhha entered the literary tradition of Mesopotamia as source exotic waves and fine boats. We could say that cultural dynamism lies in openness, interaction, inert-marriage and bilingualism, not in cultural loser and ethnic purity. The Indus Valley Civilization no doubt fell, all the same it left many inedible imprints on later-day culture of subcontinent.
Environmental variation has often been cited as a determining factor in cultural changes in the context of the Indus Valley Civilization of Indian sub-continent, 2500–1900 BC. While these claims have been critiqued by archaeologists they continue to be accepted by non-archaeologists, including scientists. The purpose of this paper is to assess the available evidence and published arguments and to provide a constructive working synthesis of evidence for the pre-historic environmental setting of Indian sub-continent for the mid- to late last 10,000 years, especially ca 4000–1000 cal BC, and its possible connection to important cultural changes. We conclude that Indus Valley urbanism emerged on the face of a prolonged trend towards declining rainfall.
There is evidence that recent extreme climatic events, which caused severe and prolonged drought, have had an impact on human populations. Especially important was the probable loss of crop production associated with these events, which caused famine and human displacements (Bourke, 2000). Even if with respect to the glacial–interglacial cycles the Holocene is considered stable, smaller scale climatic variability has characterised the entire Holocene. Recently, several studies have explored past cultural adaptations to persistent or rapid climate change. The current research being conducted in India and International hopes to answer questions concerning invaders and the drying up of river beds. The first promising written script interpretations have been made. Radiocarbon chronologies are proving very useful. Satellite imaging is exposing old trade routes.

9. References

1. Basham AL. The Wonder That Was India, London: Sidgwick & Jackson Book Company, 1967.
2. Chakrabarti DK. Indus Civilization Sites in India: New Discoveries, Mumbai: Marg Publications, 2004.
3. Coulborn R. The origin of civilized societies, Princeton, NJ: Princeton University Press, 1959.
4. Dutt RC. The Civilization of India, Asian Educational Services, 1995
5. Ghosh A. Cultures. In An Encyclopedia of Indian Archaeology, Published by BRILL. 1990; 1:95.
6. Gupta SP. The Indus-Saraswati Civilization: Origins, Problems and Issues, 1996.
7. Gupta SP. (ed.) The lost Sarasvati and the Indus Civilisation. Jodhpur: Kusumanjali Prakashan, 1995,
8. Gupta SP. *et al*. "Recent Marine Archaeological Finds in Khambhat, Gujarat". Journal of Indian Ocean Archaeology. 2004; (1):141-149.
9. Kenoyer JM. "The Indus Valley tradition of Pakistan and Western India", Journal of World Prehistory, 1991.
10. Kenoyer JM. Ancient Cities of Indus Valley Civilization, Oxford University Press, 1998.
11. Kenoyer JM. Art of the first cities: the third millennium B.C. from the Mediterranean to the Indus, New Haven: Yale University Press, 2003.
12. Kenoyer, Jonathan Mark, Heuston, Kimberly. The

Ancient South Asian World, Oxford/New York: Oxford University Press, 2005.
13. Kostman CJD. The demise of utopia: Contexts of civilizational collapse in the Bronze Age Indus Valley, Journal of the Association of Graduates in Near Eastern Studies. Levant, Mesopotamia, India and China, London and New York: Routledge, 1996, 6(2).
14. Maisels CK. Early civilizations of the Old World: The formative histories of Egypt, the Mystery.pdf, 1999.
15. Marshall, John. Annual Report of the Archaeological Survey of India, 1931, 47.
16. Masica, Colin P. The Indo-Aryan Languages, Cambridge University Press, 1993,
17. Mohiuddin YN. Pakistan: a global studies handbook, Published by ABC-CLIO, 2007
18. Piggot, Stuart Harappa Culture of the Indus Valley, Prehistoric India, Baltimore, Pelican Books, 1961.
19. Possehl GL. The Indus Valley civilization: A contemporary perspective, Walnut Creek, CA: Altamira Press, 2002.
20. Possehl GL. The Middle Asian Interaction Sphere Expedition, 2007; 49(1):40-42. doi: 24776742
21. Robinson A. The story of writing: Alphabets, hieroglyphs, and pictograms, New York: Wheeler, 1995.
22. REM. Civilizations of the Indus Valley and beyond, New York: McGraw-Hill, 1966.