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# HISTORICAL AND ARCHAEOLOGICAL PERSPECTIVES OF SOIL DEGRADATION IN CHOLISTAN

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## INTRODUCTION

Cholistan is an extension of the Great Indian Desert, which includes the Thar Desert in Sindh province of Pakistan and the Rajasthan Desert in India, covering an area of 26,330 Km<sup>2</sup>, it lies within Southeast quadrant of Punjab province between 27°42' and 29°45' North latitude and 69°52' and 73°05' East longitude (Arshad *et al.*, 1995; Ahmad, 1999).

The word 'Cholistan' has been derived from a Turkish word, 'Chol', means a desert, while some historians believe that this name has been distorted from Iraqi (Kurdish) word, 'Chilistan' meaning waterless waste land (Ahmad *et al.*, 1992; Auj, 1995 and Ahmad, 1999), popularly Cholistan is known as 'Rohi'. In a dialect still spoken in some parts of Tibet, 'roh' means a hill, from which the name *Rohilla* has been attributed. In fact, *Rohi* has been derived from the Pushto word 'roh', meaning is a sandy desert (Auj, 1987; 1991; Ahmad, 1999b).

## Cholistan: Cradle of Hakra Valley Civilization

Around 4000 BC Cholistan was a cradle of civilization commonly known as Hakra valley civilization, when Hakra River flowed through the region (figure 1). The river supplied water until 1200 BC, about 600 BC it became irregular in flow and consequently vanished. The Hakra civilization, which flourished was one of the longest in the course of world history. *Aryans* were the indigenous people (Auj, 1987b) and the earliest civilization of the Indian subcontinent. In cultural advancement it can be compared with the Mesopotamian, Egyptian and Babylonian civilization. Probably a variety of problems such as hostile invading contributed to the ultimate disappearance of this great civilization (Ahmad, 1999c).

The phenomenon of disappearance of the mighty river Hakra or Ghaggar is supposed to be the prehistoric times, hardly left some clue to the geographical change, resulted in the desolation of two thirds of the area of Bahawalpur region. In spite of its fading past, this legendary river is still remembered by geographers as the 'Lost River', identified by "Sacred River Saraswati" in the *hymns of Rigveda*, also praised as "the chief and purest rivers flowing from the mountains to the ocean" (Auj, 1987b). According to *Mahabharat* it has been called "one of the two divine rivers forming the northern boundary of *Darma Khestra* (Holy Land)". The first *Aryan* settlement was also established on its bank.

Derawer, the earliest settlement of the Indus Valley and the only habitation that has survived up till now, is also in Cholistan. According to Mughal (1997), the highest concentration of older Indus sites exists here. At Ganweriwala (National Geographic, 2000) near Derawer, he discovered ruins of a town (larger than Harappa); which was almost as large as Moenjodaro, all suggestive of stable means of subsistence. In the same region are represented all the known development stages of the Indus Civilization, the Early Harappan, the Mature Harappan, and the Late Harappan. On present evidence, it would seem that sometime around the middle of the second millennium BC hydrographic changes that were operative since at least the third millennium BC had substantially reduced or cut-off the river water-supply to the Hakra. The population settled alongwith Hakra were forced to move out and resettle near the upper course of the Ghaggar and its tributaries, to the North and the Northeast of Cholistan, where water was still available perennially or with seasonal regularity. This site when excavated was sure to reveal the hidden mysteries of civilization that was larger than the Babylonian or the Egyptian empires.

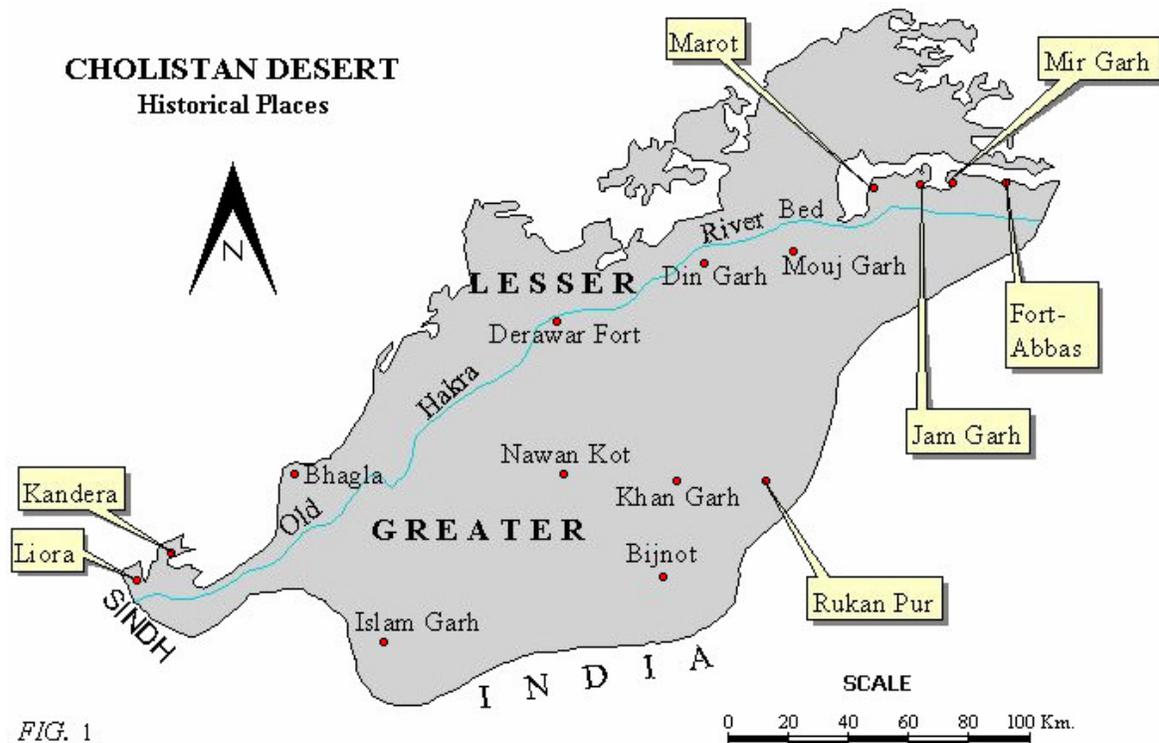


FIG. 1

Changes in the courses of the Indus and the Hakra River system of the Indus Valley have profoundly influenced the settlement patterns and have induced significant cultural changes, which have not been documented archaeologically. The evidence suggest that the origin, climax and decline of the Indus Valley Civilization between the late fourth and second millennium BC, were intimately linked with the environmental changes generated by the shifting of river regimes. The relationship between the rivers and the development of civilization is best exemplified in the East central Indus Valley comprising of Cholistan desert of Pakistan (Mughal, 1992; Auj, 1995).

The Cholistani people have inherited a rich cultural heritage from their ancestors, who dwelt for centuries in the Hakra Valley, which is now acclaimed as the forerunner of the Indus Valley civilization.

#### Archaic views about Hakra depression

The depression of Hakra is still visible in Bikaner, Bahawalpur and Sindh province. Its width is about two miles and length not less than 150 miles. Half of its course passes through Sindh, where the present Nara canal exists, which is in fact the continuation of Hakra River. The map

illustrated by Thomas Pennant, Hakra as rising in the Himalayas, East of the Sutlej and flowing down the town of Umerkot and ending into the Gulf of Kutch (Auj, 1995). There it is called Ghaggar.

In 1942, Sir Aural Stein surveyed the deserted course of the 'Lost River'. He mentioned that, "It would be hazardous to co-relate the archaeologically attested changes of conditions along the Ghaggar-Hakra bed with reference found in the *Vedic* texts to the Saraswati River, but the evidence shows that down to historical times the Ghaggar carried water for irrigation under existing climatic conditions much farther than it does now. This makes it intelligible how the Saraswati has included in *hymns of Rigveda* to be praised as a 'Great River'. The interval between the time, when the notion found expression in *Vedic* poetry and the time when the Ghaggar was joined by the branch of Sutlej, may not have been so great as to efface traditional knowledge of the entire river, having once been large enough to make its way as far as the Panjnad and the Indus. The width of the Ghaggar-Hakra bed is so great that even now it is mentioned in the local folklores. A great change affected the Saraswati River or Ghaggar since reference was made in *Vedic* texts, which is scarcely composed before the second millennium BC at the earliest. This change may be attributed to two distinct physical causes. As regards the upper portion of the ancient bed, archaeological evidence attests a drying up during historical times, which is likely to have been at work in prehistoric periods. It might have been hastened by the diversion of floodwater for irrigation, brought about by more settled conditions and the resulting pressure of population". Down on the Hakra, the main change was due to the Sutlej having in late prehistoric times, abandoned bed, which before had joined the Ghaggar, the result of a law, affected all rivers course lies over alluvial plains. We have clear evidence that the drying up was gradual, at least in the historical period (Stein, 1942).

Wilhelmy (1969) examined and suggested during the 1960s that from the Tertiary times the drainage of North India was very different to that of the present day, which has been influenced by the up-thrust of Himalayas. In more recent geological times (Late Pleistocene and Early Holocene), there were three major river systems; Indus, Saraswati and Ganges. The Saraswati flowed in the Ghaggar-Hakra channel, receiving water of both the Ur-Jumna and the Sutlej. In *Rigvedic* times (around 1000 BC) the Ur-Jumna had already been captured by the Ganges system, and in *Mahabharat* (around the beginning of the Christian era) the water of the Sutlej was largely captured by the Indus. Wilhelmy (1969) suggested that the Ghaggar

or Hakra channels continued to serve as flood channels of the Sutlej and the Indus, which were utilized for irrigation (Allchin *et al.*, 1978).

The 'Lost River' played a vital role in the demise of Hakra Valley civilization after it dried up or changed its course. Geographers are still trying hard to find the real cause of disappearance of Hakra River keeping in view, its traces, depressions, chronology of physical changes and geographical history of the region where the river once flowed.

Once, Cholistan Desert was rich in all kinds of wildlife, including magnificent mammals like Rhinoceros, Lions, Leopards and a number of beautiful game birds. There is evidence that hunting of Lion, Leopard, Deer (*pahra*), and Ravine-deer (*hiran*) Wild Boars were common. Lion and Leopard had disappeared from the desert by the beginning of this century. Black Buck (*kala hiran*), Chinkara, Nilgai and Bustards are now the most threatened species, however, large herds are found across the border. Similarly, Wild Ass has been encountered near Pak. – India border but its number is dwindling fast. Desert Cat and Wild Boar have almost disappeared, whereas Hare and other rodents are still found. Among birds, some species of Partridges, Quails and Sand Grouse are found.

Cholistan was once green and prosperous land, where cultivation was practiced. The source of irrigation water was Hakra River (Akbar *et al.*, 1996). With the drying of the river, area was deserted through desertification processes and left only as grazing lands. A vast majority of the population of Cholistan continues to lead a nomadic existence, and for the small proportion of the population, who has chosen to settle down to agriculture, the dramatic changes have proved traumatic in many ways. The vastness and beauty of Cholistan still haunts the people who have moved from the desert to settle down in *chaks* on its peripheries. But the radical change in their circumstances following their switch from a nomadic to a peasant way of life is seen as a mixed blessing by most of the desert people.

The nomads of the parched, thirsty land of Cholistan, who are denied the fruits of overall development of the country, are living a Stone Age existence. They do not have access to the most basic needs such as clean drinking water, food and basic health care.

Cholistan offers tremendous opportunities for those seeking to gain a deeper understanding of its rich cultural heritage. As one expert puts it, the area has a “unique romanticism, distinguished poetry, literature, folklore and music”.

## **CONCLUSION**

Cholistan was once green and prosperous land, where cultivation was practiced. The source of irrigation water was Hakra River. The river supplied water until 1200 BC, about 600 BC it became irregular in flow and consequently vanished. The Hakra civilization, which flourished was one of the longest in the course of world history. Cholistan is the only place where the remnants of the oldest settlements are still intact because of the desertion of the river Hakra. With the drying of the river, area was deserted through desertification processes and left only as grazing lands.

Archaeological ruins present in Cholistan indicate that water availability in the area was higher a few centuries ago. The reduction of vegetation to about one third or less of its historical cover most probably, results in considerably higher near surface and surface temperature. As a result, evaporation of the scarce rainfall has increased considerably during the last decades so reducing the effective rainfall available for range and groundwater recharge, which is well known as self-reinforcing aspect of desertification. The aridity in Cholistan is rightly seen as a major limitation to wide-scale range improvement and management programmes. However, aridity prevents high incidence of many crops and livestock diseases as well as nutrient leaching from soils.

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Soil degradation and soil erosion are a serious threat to sustainable agriculture. The climate change leading to sea level rise and increased evaporation would result in increasing salinization of the coastal soil and aquifers. One of the strategies proposed by Swaminathan (2011) is to resort to highly salinity-tolerant crops which are nontoxic and which could also be a source of protein, fat, and micronutrients. Issues of soil degradation in SSA and the urgent need to reverse this ominous processes have been addressed at different levels, ranging from global to project programs. Soil protects the buried heritage of archaeological and historic remains from damage and depletion. Much of the evidence of. Soil Degradation | Introduction. Key processes that result in degradation of soil chemical properties include: Decline in the number and availability of soil nutrients (N,P,K, secondary and trace elements) e.g. through leaching, gaseous losses, removal in harvested products etc. Chemical imbalances and toxicities e.g. through application of inappropriate types and quantities of fertiliser, pesticides etc.