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Uniformitarianism: A Comparative Study of the Global Transitional Climatic Area Influences on the Bampur Valley

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Abstract

The aim of this paper is to examine the interactions between people and the natural environment against a background of climatic change. The focus of attention is on the Bampur Valley, which is located in the global transitional climatic area. During the fourth and third millennium BCE, an important urban society, which was in close economic contacts with the urban societies of the Sistan Basin, Jiroft, Soghan Valley, the Indus Valley and Mesopotamia, emerged in this Bampur Valley along the river bed of the Bampur River. This Valley, which is located along the main natural overland trade routes, not only developed as intermediary for long-distance trade between east and west but also functioned as an important industrial and economical pole in southeast Iran.

It is argued that the global transitional climate area, which is generally located between tropical and subtropical areas, has constantly been faced with periodical changes including dry and humid during worm period. Based on the archaeological and environmental evidence, with reference to uniformitarianism theory and with using GIS, it will be attempted to evaluate movement, collapse and interaction between settlements and natural environment in the Bampur Valley. The disciplines of archaeology and geography have much in common, being concern respectively with the spatial and temporal dimensions of the human condition. Archaeology deals with those aspects of the human past which are mainly elucidated using material remains rather than written sources. The prime concern of geography is to understand the processes that operate within the natural environment (physical geography) and to evaluate the ways in which people interact both with their environment and with each other (human geography). Evidence discovered from the archaeological and geographical surveys carried out in the area between 2002 and 2005 by authors testify to environmental changes, which caused instability and collapse of the human communities in prehistoric and the present times in the Bampur Valley.

Introduction

It is argued that the first stage to evaluate previous environmental circumstances is to look at these conditions globally. Truly, local environmental changes make little sense

unless seen against this broader climatic background (Renfrew and Bahn 2001: 225). First endeavors to reconstruct models of environmental change could be seen in a theoretical approach identified as catastrophism. Therefore environmental changes may be happened because of drought, earthquakes, floods, volcanic eruptions and other cataclysmic events (Chorley et al. 1964). These environmental limitations, which may deeply influence modern environment, must have been equally effective in the past. Paradoxically, while uniformitarianism initially replaced catastrophism as a methodological basis for earth history, cataclysmic events can now be accepted within an uniformitarian framework. Therefore, it is notable to state that the growth of the unifromitarian approach, which firstly stated by the geologist James Hutton, was a fundamental departure from the catastrophist school of thought. In this framework, it is believed that previous changes of the earth's surface may be explained in terms of those processes observed to activate at the present day; or the present is the key to the past (Bell and Walker 1996: 15). All through this paper, we are trying to utilize methodological uniformitarianism to reconstruct the previous environmental changes in the Bampur Valley. In fact, this approach is necessary to achieve any measure of understanding of the processes and patterns of environmental changes in this valley. Therefore the aim of this paper is two folded, firstly to evaluate the environmental changes of the Bampur Valley and to examine the interactions between people and the natural environment of the Valley during the third millennium BC.

The Environmental Setting

The geographical area we are illustrating in the context of this paper is the Bampur Valley, which is located in the Iranian Baluchistan linking the Iranian Plateau settlements with those in the Indus Valley (Fig 1) (Shaffer 1986: 63). The Bampur Valley, which links Central Iran to Pakistan, is a natural highway (Tosi 1974: 30; De Cardi 1970: 239). This highway was connected to the west along the Bampur Valley, which drains into the marshy Jaz Murian Basin. Prehistoric settlements along the Bampur River were connected to the west through Chah-Hussaini and the Jaz Murian Basin (Tosi 1974: 30). The valley is located at the east end of the Jaz Murian Basin and the survey zone is some 120 km from the basin. The valley, which is surrounded by the Karvandar (Birk) mountains in the north, and the Hamont and Ahouran mountains to the south, is very narrow in the vicinity of Damin (about 1-3 km wide) (Abdollah-Garoosi 1995: 9). It gradually widens to about 20-30 km to the west until it joins the Jaz Murian Basin. The Bampur River, which originates in the Karvandar Mountains, flows southwards to Damin and Iranshahr, and finally westwards to Bampur and after 120 km feeds into the basin itself (Seyed Sajjadi 1995: 132). Cultivated regions are situated in the middle and upper reaches of the Bampur River, particularly around Iranshahr. Here, the river is absorbed into porous detrital deposits, and re-appears irregularly as springs and seepages lower down the valley in the direction of Bampur (Fisher 1968: 109). When Stein visited the area, the Bampur River flowed from Iranshahr to Chah Hussaini in the west before being absorbed (Stein 1937: 105). It is very notable that during the fresh surveys in July 2002 and June 2005, the river was entirely dry (Fig 2) due to drought from Iranshahr westwards. As qanats are frequently used to tap this water source, particularly as surface flow presents some curious and intractable features (Fisher 1968: 109); it is more likely

to assume that today the cultivated area around Iranshahr and Bampur mostly depend on the qanats rather than the river. When Stein visited the Bampur Valley, he noted that the cultivated area extended without break from three km north of Iranshahr right up to Bampur and beyond. The width of the cultivated area along the right bank of the river gradually increases to a maximum of about 2.5 km at the fort of Bampur. Beyond the fort, this area expands for another 22.5 km until near Iranshahr (Stein 1937: 105).

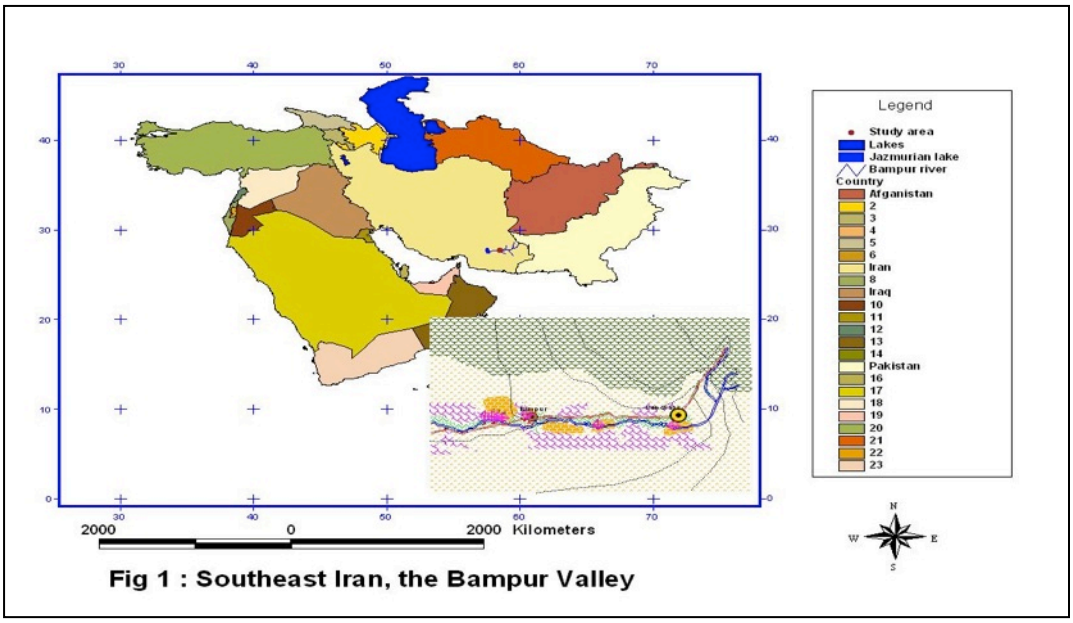

Fig 1 : Southeast Iran, the Bampur Valley

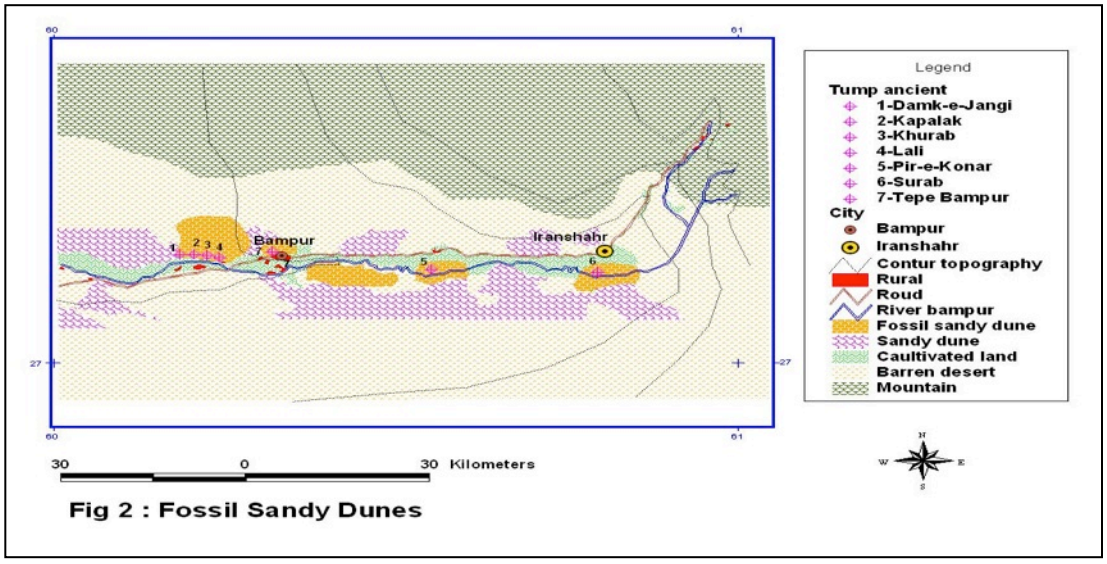

Fig 2 : Fossil Sandy Dunes

Evidence of the Pluvial and Drought periods:

There is much evidence about different forms of water erosion during the quaternary period in the Iranian Plateau (Mahmoodi 1988: 7) in which the Bampur Valley is one of

the most important evidence of water erosion in southeast Iran. The width of the river and its alluvial bed with harsh gravel testify to the water erosion character, which repeated during time and finally replaced by the present drought period in the valley. Evidence of streams helps us to understand the possible reputations of the water erosions. It is notable to state that all the third millennium BC settlements discovered by Stein in 1934 (Stein 1934) and Mortazavi in July 2002 (Mortazavi 2004: 147-186) are probably evidence of the pluvial period in the Bampur Valley. Therefore, it may be assumed that the emergence of the third millennium BC settlements in the Valley is a result of the availability and abundance of water resources and increase of the alluvial plains.

The Iranian Plateau is located in the dry climatic area in which windy erosion and watery- windy erosions are dominant conditions (Alijani 1995:149). It has been argued that these conditions were also evidenced in the Plateau in antiquity (Masoodian 2003:171) Stabilized sandy dunes, rill erosions (Koche) and Kaloutak (Yardang), which are the most important evidence of the above area (Mahmoodi 1988: 25) could lead us to this idea that the present is the key to the past (Uniformitarianisum). Our research team was able to discover the first two evidence in the Bampur Valley during the fresh survey of June 2005 (Fig 3, 4 and 5). The above mentioned evidence was mostly observed around the third millennium BC settlements and the Bampur River. As the Bampur River could have been a gift for the Bampur People, drought of the river and the above mentioned evidence, which was a result of the proposed climate changes, may be considered as causes for the collapse of the civilization in the Valley.

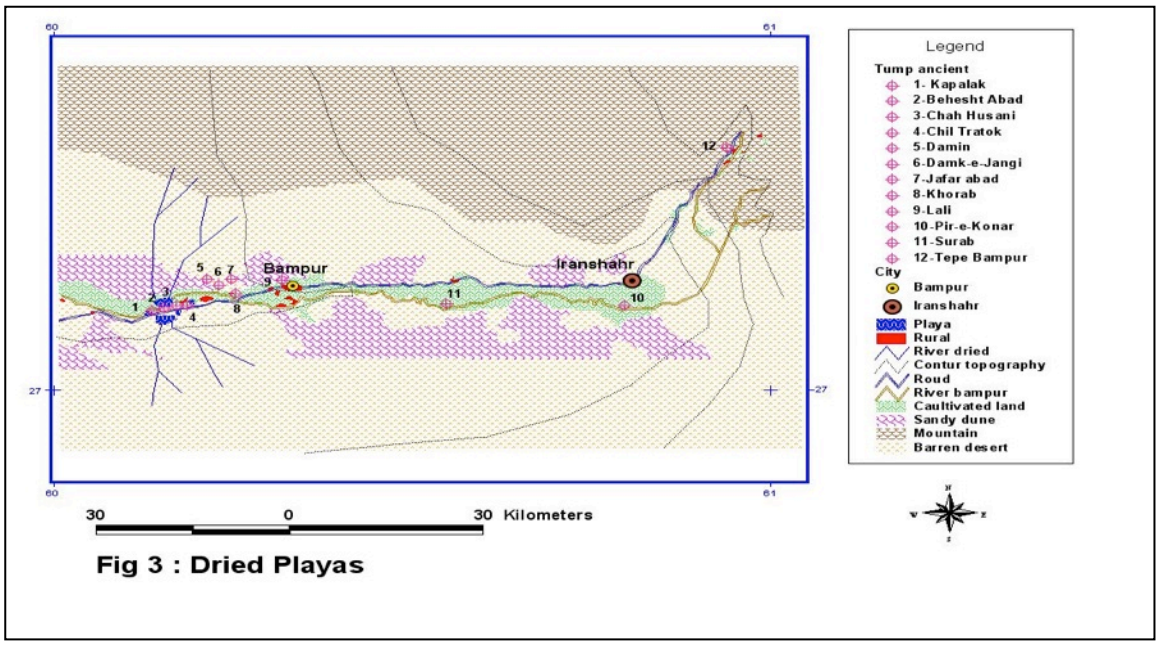

Fig 3 : Dried Playas

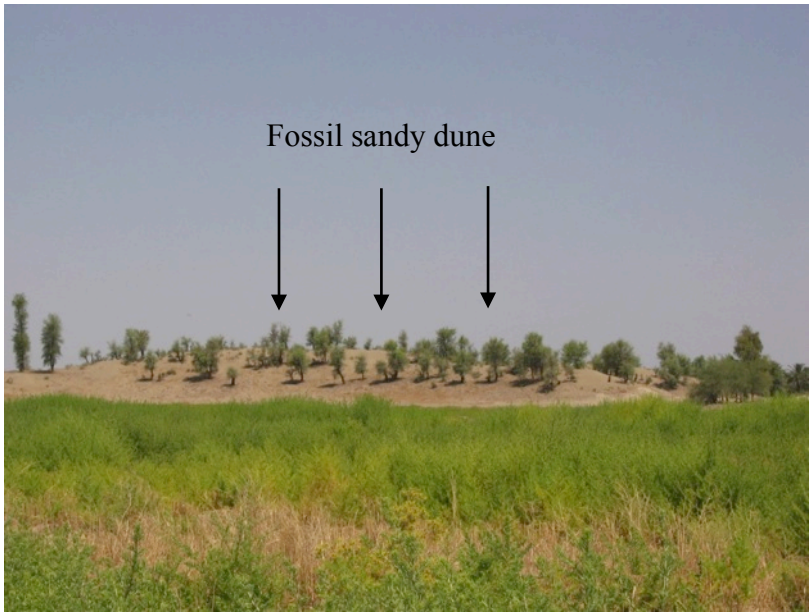

Fig 4: Fossil sandy dune A (Klinak Rural - Bampur)

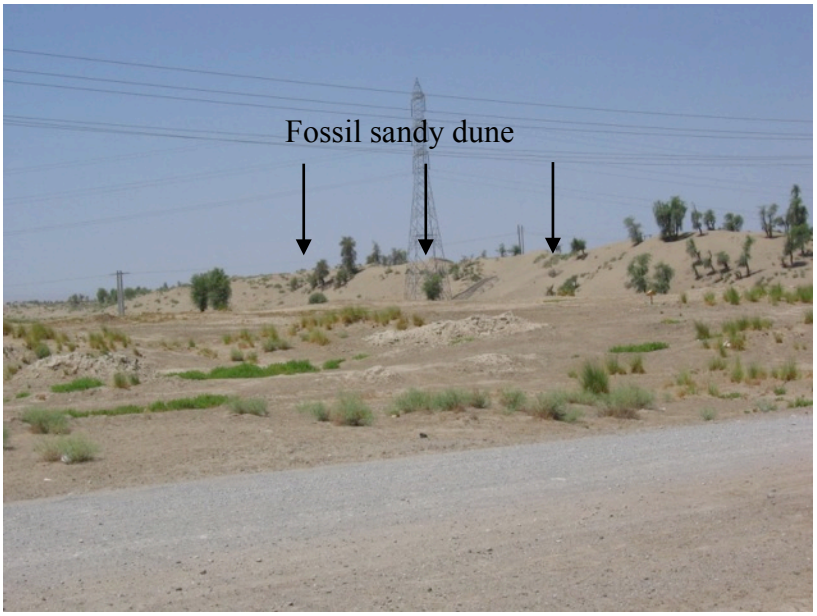

Fig 5: Fossil sandy dune B (Klinak Rural - Bampur)

Discussion:

All the above evidence shows us that in transitional climate area (Fig. 1), the environmental conditions are instable; thus development and collapse of ancient settlements are simply influenced by these conditions. Lack of precipitation and dry climate are the most important characters of this area in which plants cover are poor and

wind move aeolian sand. Due to reduction of wind speed Aeolian sand are deposited; consequently sand dune form (Tricart 1980: 196). These dunes were the most significant problem in the surveys of 2002 and 2005 as they covered many parts of the ancient mounds (Fig 5, 6, 7, 8 and 9), therefore we were not able to sample all the area covered by a number of sites, especially Tepe Bampur, Klinak and Surab rural, a problem also faced by De Cardi in 1966 (De Cardi 1970). These dunes are usually destroyed during rainy climate by running water; dune sandy fossils are the most prevalent evidence of the above process in which drought periods are repeated (Fig 5, 6, 7, 8 and 9). We discovered several of these fossils during our surveys along the Bampur River and around the third millennium BC settlements in the Valley (Fig 3). This evidence could testify that during the prehistoric time the people of the Bampur Valley experienced climate changes that influenced their life. Oscillating model of the Bampur Valley's settlements confirm the environmental changes in the Bampur Valley during the above-mentioned period, because fluctuation in population levels may be adjustment to fluctuations in resource levels (Mortazavi 2004: 205).

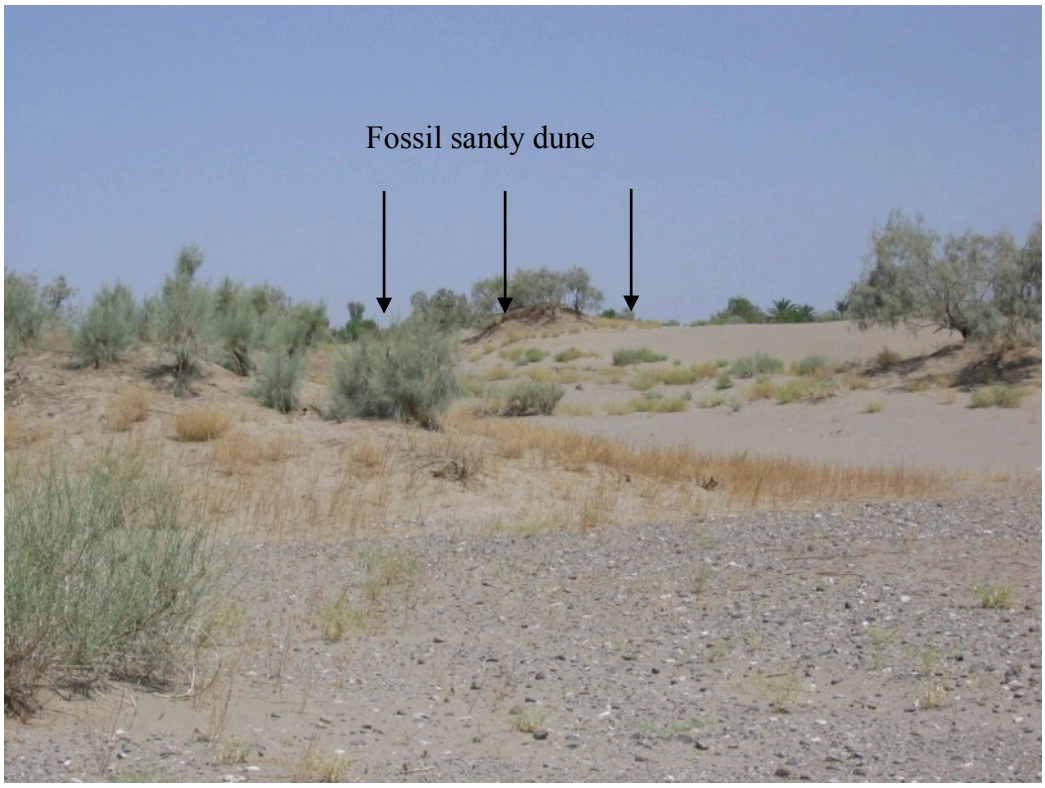

Fig 6: Fossil sandy dune C (Surab Rural - Iranshahr)

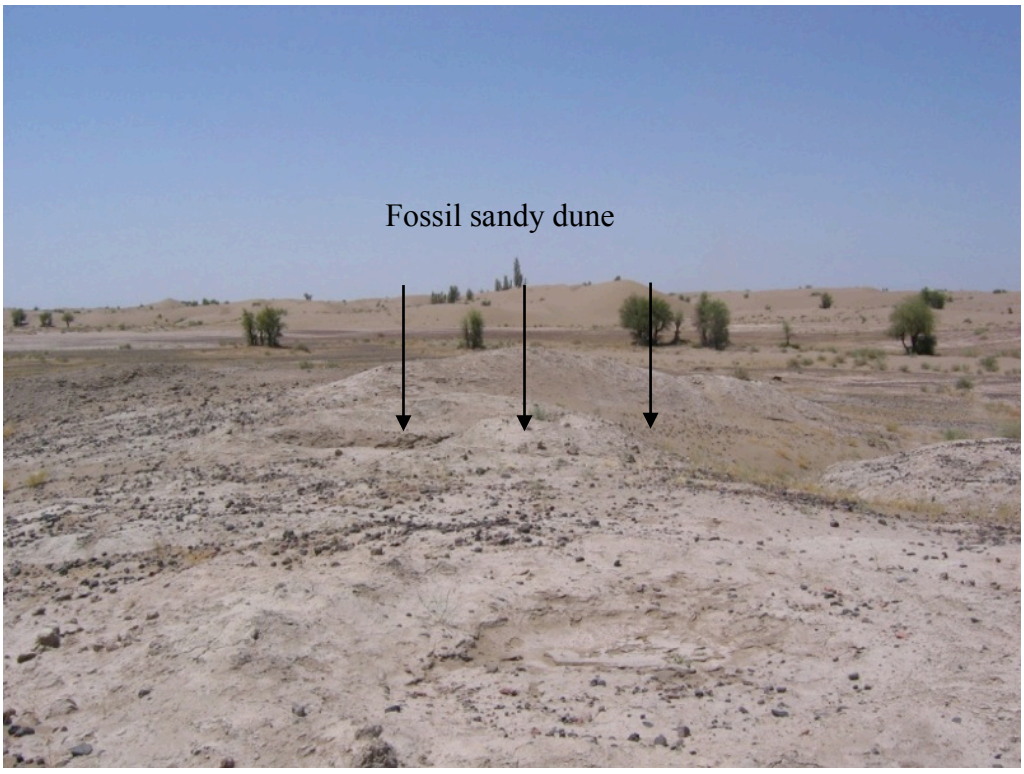

Fig 7: Dried Playa (Chil-Tratok)

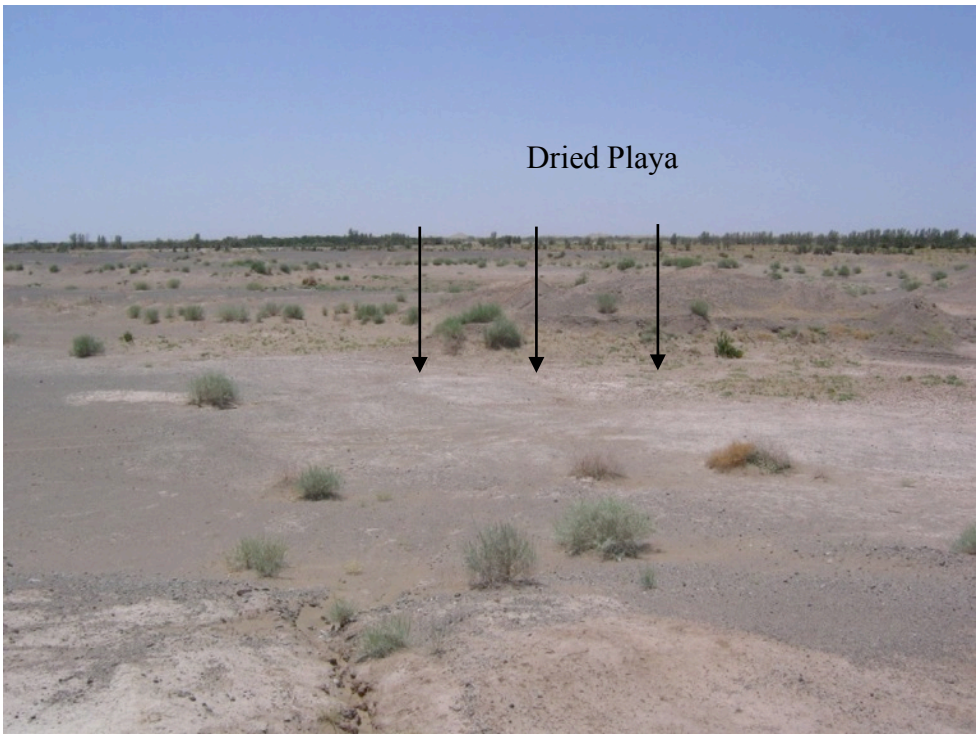

Fig 8: Dried Playa (Chiltratuk - Bampur)

Fig 9: Dried River-bed (Khurab - Bampur)

Streams flowing, which are minor branches of rivers, are stopped in small depressions and rarely join to sea in arid regions. These depressions, functioned as supply water in arid regions, are called Playa (Chotte in Sahara Desert and Sebkha in Arab deserts) (Shahrabi1994:194). The playas, temporary lakes, which are regularly adjusted in these regions, provide availability of water sources for settlements around themselves. It is notable to state that underground water sources also flow toward playas and increase the amount of water in these temporary lakes (Fig 3). As these lakes are temporary, patoralism is completely depended on them (Tricart 1980:198). During our Surveys in 2002 and 2005, we found one of these lakes that locally called Chil Tratok**.** The name Chil Tratok consists of two parts, Chil, which means pond and Tratok, a kind of plant. The site, which has 2 m height and an elevation of 539 m, is located 8 km to the west of Bampur, 1 km to the north of the Bampur River and on the side of the road from Bampur to Spakeh. It covers an area of about 50 × 50-m and is situated at 27^{o} 09’ 30.1” north latitude and 60^{o} 16’ 08.9” east longitude. Ceramic records indicate that Chil Tratok was occupied during periods IV-VI of the Bampur sequence (Mortazavi 2004: 159). As the third millennium BC settlements in the Bampur Valley were gradually disappeared from period IV onward, it is more reliable to believe that Chil-Tratok was a settlement for Nomad peoples. The small size of this settlement, an area of about 50 × 50-m, which is

the smallest settlement, also demonstrates that this settlement probably functioned as a place for nomad people. After environmental crisis, which was a common event in Southeast Iran and probably in broader regions between Mediterranean and the Indus Ocean, these settlements are also collapsed during the first centuries of the second millennium BC (Mortazavi 2004: 244).

Conclusion:

All through this paper methodological uniformitarianism provides the cornerstone for reconstructing the past and is necessary for achieving any measure of understanding of the processes and patterns of environmental changes in the Bampur Valley. This approach, which firstly applied in the Iranian archaeology in this paper, tried to reconstruct the environmental changes in the Bampur Valley. As stated, a number of archaeological and geographical evidence, which were discovered during our surveys in 2002 and 2005, testified to the environmental changes in this Valley. The fragility of the Bampur Valley environment, which is located in the global transitional climatic area, has been the main factor for the environmental changes.

Environmental evidence such as dune sandy fossils and playas discovered through the 2005 survey; and archaeological evidence discovered through the 2002 survey showed us that the third millennium BC settlements were closely depended to their fragile environment. In fact, the population levels of this valley oscillated around the carrying capacity and fluctuations in population levels adjusted to the possible fluctuations in resources levels (Mortazavi 2004: 205). Kirch believes that variations in the carrying capacity may result from a range of temporal processes, including environmental crisis, including periodic drought and cyclonic destruction of crops (Kirch 1996: 103). It seems that constant environmental changes in the Bampur Valley did not allow to the third millennium BC settlements to have a stable pattern of population changes. Instability of environment finally weakened these settlements and with decline of long-distance trade, these settlements also collapsed during the first centuries of the second millennium BC (Mortazavi 2004:244). The above-mentioned evidence, which indicates the climatic and environmental changes in the Valley, demonstrates the uniformitarian theory in the area.

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