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A CITY AND ITS LANDSCAPE ACROSS TIME: SAMARKAND IN THE ANCIENT SOGDIANA (UZBEKISTAN)

1. Introduction

Well-known as a historical crossroad along the Silk Road, Samarkand has always been a major political and socio-economic center of ancient Central Asia. Alongside many other Central Asian regions, where oral tradition prevails over written documents, the possibility of reconstructing its major urban development was mostly based on archaeological discoveries. Since the late 19th century, Afrasiab (the site corresponding to ancient Samarkand) was the object of systematic explorations by Russian and Soviet archaeologists and, in the last three decades, by the Mission Archéologique Franco-Ouzbek (MAFOuz) (Grenet 2004). These works shed new light on the history of Samarkand, however, a comprehensive understanding of its past is still incomplete because investigations dealt only with few sectors of Afrasiab when compared to its total extension (220 ha).

As early 2001 when the Uzbek Italian Archaeological Project (UIAP) "Samarkand and Its Territory" began as a joint collaboration between the University of Bologna and the Institute of Archaeology of the Uzbek Academy of Sciences, attention was addressed to the territory behind the city (Shirinov, Tosi 2003; Berdimuradov *et al.* 2007). Assuming that the territory has always sustained economically the city by providing it with basic resources and products, our attempt was to consider the city of Samarkand as integral with its hinterland. We used the data from the territory to reconstruct the major settlement dynamics and landscape transformations. The main goal of this paper is therefore to provide new data on the city of Samarkand by analyzing three major socio-economic topics from its territory such as irrigated agriculture, breeding and local routes.

2. Environmental setting

The Samarkand oasis is a rich floodplain located in the middle of the Zeravshan Valley (Fig. 1). The different ecological zones shaping this oasis have always allowed multiple exploitations of the available resources (Di Cugno, Mantellini, Berdimuradov 2013) and a mutual exchange between settled farmers and semi-mobile pastoralists. The fertile soil in the alluvial plain, improved with artificial canals, allowed the development of agriculture, while the riverine zone along the Zeravshan is a wild habitat suitable for hunting and wild resources. The Karatyube Mountains provide summer pastures, stones and trees for building; flocks of sheep and cowherds graze in the steppe foothills, where rain-fed agriculture is also possible. A semi-arid

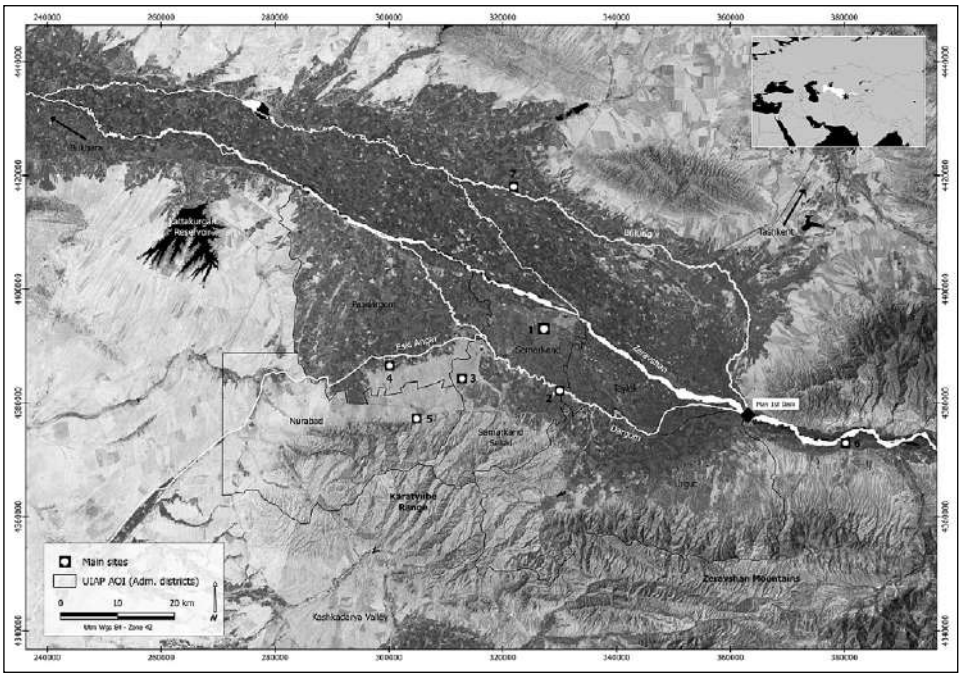

Fig. 1 – Samarkand (star in the box on the upper right) and the major geographical features and archaeological sites relevant to this paper inside the UIAP AOI: 1) Afrasiab (Maracanda); 2) Kafir Kala; 3) Kurgan Kadirbek; 4) Koitepa; 5) Boyssartepa (Sazagan); 6) Penjikent; 7) Koktepe. On the background a 1988-1991 Landsat Orthorectified TM image (RGB band combination 1-2-3 converted to Greyscale).

regime characterizes this region, with an average annual precipitation of ca. 400 mm and a daily mean temperature of 14°C. Hence, extensive cultivations are possible here only by an appropriate water management (Stride, Rondelli, Mantellini 2009; Mantellini, Rondelli, Stride 2011; Mantellini 2015). Since ancient times, artificial irrigation has been based on two major irrigation systems, the Dargom S and the Bulungur N, both diverted from the Zeravshan River at the height of the May 1st Dam. The natural piedmont streams also ensure an additional water supply during the rainy seasons.

3. Historical background

The foundation of Samarkand dates back to the late 6th century BCE, when the city also became the capital of the Achaemenid Satrapy of Sogdiana (Shishkina 1994). During his campaign in Central Asia, Alexander the Great conquered Samarkand in 329 BCE and since then the city has appeared in the sources as Maracanda. As elsewhere in Central Asia, the following

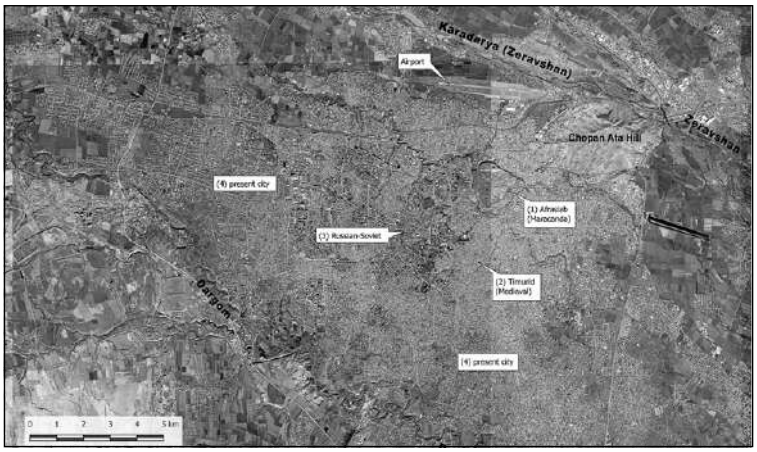

Fig. 2 – The "four Samarkands" from a 2017 Google Earth satellite image.

post-Hellenistic centuries are mostly unknown in texts (Bernard 1994, 99). It was however ascertained that Samarkand was outside the Graeco-Bactrian kingdom and the later nomadic Kushan empires, but the MAFOuz revealed Kangju layers at both Afrasiab and Koktepe (Rapin, Isamiddinov 2013, 129-130). Marshak and Negmatov (1996, 233) summarize well the pre-Islamic centuries, when Sogdiana was fundamentally circumscribed to Samarkand region: «It [Sogdiana] was neither a powerful state itself nor firmly subjected to any of the neighbouring empires». This was the time of the rich trades along the Silk Road and the well-known Sogdian traders (de la Vaissiere 2002). The Arab conquest at the beginning of the 8th century CE introduced Islam and brought significant political and socio-economical changes in this region. The UIAP activities at Kafir Kala demonstrated how, during the Islamic period, this fortified settlement sharply changed from an important administrative center to mere housing residential units (Mantellini *et al.* 2017). The Mongol invasion of Gengis Khan in 1220 led to the complete abandonment of Maracanda. The following medieval city developed S of the former, and it had a relevant renaissance when, in the 14th century, Tamerlane made Samarkand the capital of his vast empire.

Major historical events influenced the city development, causing not only a vertical superimposition of historical layers but also a sort of "urban horizontal shift". Looking at the city from the space it is possible to distinguish "four Samarkands" (Fig. 2): 1) the Maracanda abandoned after the Mongol invasion (today Afrasiab); 2) the medieval capital of Tamerlane; 3) the Russian city (1868-20th century); 4) the present-day city, which expanded significantly between the Zeravshan and the Dargom in the last decades.

4. Research approach and method

The UIAP area of investigation (AOI) corresponded to the six administrative districts S of the Zeravshan River, for a total extension of ca. 2,500 km². The boundaries were the border with Tajikistan (E), the Karatyube-Zeravshan Mountains (S), the Pasdargom District border (W) and the Zeravshan River (N).

The research approach was based on the following steps (Rondelli, Mantellini 2004; Mantellini, Rondelli, Stride 2011, 388-393):

1) collection of historical and recent spatial datasets (topographic maps, satellite imagery, aerial photos, digital elevation models, previous regional investigations);
2) preliminary desktop assessment of anthropogenic features in the AOI by remote sensing techniques;
3) field visits;
4) data processing and analysis.

Desktop identification dealt principally with two main classes of archaeological features: anthropic mounds (locally known as *tepa*) and abandoned canals (Mantellini 2014, 39-41). The first refers to artificial hills, usually built up in mud bricks and with a multi-period occupation from the Achaemenids onwards. They differ in size, height, shape, and topographical complexity, while their function (settlement, fortification, production, etc.) is difficult to establish without any evidence from excavation. Because of their volume and ground raising, *tepa* were accurately mapped by Soviet topographers as early as the 1950s (Mantellini 2014, 40). High-resolution satellite imagery, especially the Corona dated to the 1960s and the most recent free-of-cost Bing, Google Earth and World Imagery, proved very useful in detecting both *tepa* and traces of ancient irrigation systems, including minor canals and field boundaries.

Later ground inspections were essential to validate the presence of anthropogenic features and their preservation state, as well as to collect archaeological finds useful for establishing their chronology. The field approach was differentiated according to the different landscapes inside the AOI. The urban space and the cultivated areas allowed only a survey targeted to the spot where the *tepa* is/was located. On the contrary, the excellently preserved archaeological landscape in the steppe and Karatyube piedmont required an intensive field-walking there to record those features other than *tepa*, which were either barely visible or impossible to detect on satellite data. The first were small burials (known as *kurgan*), usually clustered together, characterized by a slight elevation and underground stone chambers often marked on the ground by one or more stone circles. The second were low mounds, with a very limited vertical extension (ca. 0.5-1 m) and diameter (a few meters) and likely referring to a short-time occupation. Recent investigations at Kurgan

Kadirbek, also proved that these sites might not necessarily be burials as their toponyms suggest (Mantellini 2014, 42). Finally, flat sites concerned the dispersion of ceramic sherds over a few square meters.

If *tepa*, low mounds and canals were always connected to the presence of settled farmers practicing irrigated agriculture, *kurgan* were instead usually connected with nomads and semi-mobile pastoral communities.

5. Results

The UIAP survey resulted in the identification of 2,000+ archaeological sites (*tepa*, low mounds, flat sites, *kurgan*) and multitude traces pertaining to abandoned canals (Fig. 3) (Mantellini, Berdimuradov 2016). The first observations concerned the impressive destruction degree attested in this area. Because of the massive agricultural intensification and urban development of the last decades, around 40% of *tepa* were completely flattened by bulldozers. Likewise, it is also arguable that the same reclamation activities filled up with earth many abandoned canal beds. Historical spatial datasets, where both *tepa* and canals were mapped, suggested that this transformation occurred mainly between the 1960s and 1980s. However, it is worth noting that still today people in the countryside still use *tepa* as quarries for building material.

The finds gathered on the field make possible to trace the major historical settlement development of this region (Fig. 4). The uncertain chronology of many ceramic forms, especially those pertaining to transition period, just permits some considerations in terms of historical-cultural horizons rather than accurate centuries. Although Samarkand was founded in the Achaemenid period (late 6th century BCE), the number of coeval sites is very small in its territory. The settlement growth began with Alexander (4th century BCE), it increased significantly in the post-Hellenistic centuries (3rd-1st centuries BCE) and it reached its height in the pre-Islamic centuries (6th-7th centuries CE). Despite the reduction that followed the Arab conquest of the early 8th century CE, the settlement remained stable during the Samanids and the Karakhanids (9th-12th centuries CE). After the drop connected with the Mongol conquest in 1220, the Timurids (14th-15th centuries CE) attested a new revival.

6. Land use

The discoveries hitherto available within the UIAP make possible the following, preliminary observations on the human-environment interactions in the Samarkand oasis southern sector.

Several traces of abandoned canals, and their proximity to *tepa* and low mounds, testify to the irrigation effort over almost the entire dry territory around Samarkand. A specific geo-archaeological study was conducted with the specific

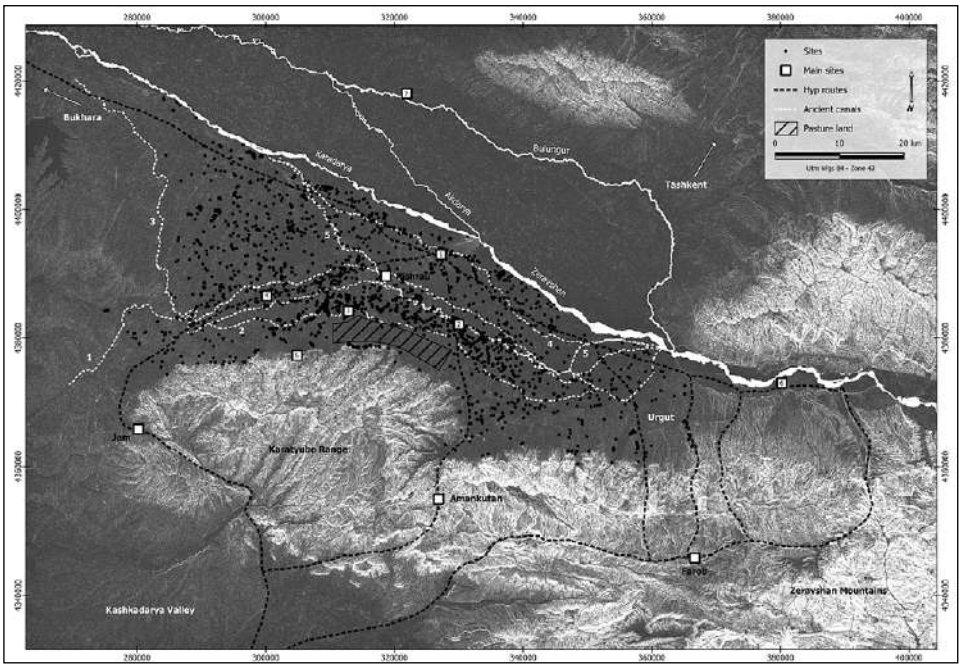

Fig. 3 – Archaeological sites resulting from the UIAP survey with hypothesis of major ancient canals (1 early Dargom; 2 Yangìaryk; 3 Eskì Angar; 4 Siab; 5 late Dargom), pasture lands and local routes (background: 2012 ASTER GDEM with slope). For the major sites numeration see Fig. 1.

aim of providing new evidence on the beginning of irrigated agriculture in this region. The X-ray Diffraction (XRD) analysis of sediments, either from the natural piedmont streams (brown-reddish coarse gravel) or canals fed by the Zeravshan (fine gray sand), proved the existence of several canals in addition to the Dargom (Malatesta *et al.* 2012). Satellite imagery and topographical maps also provided excellent information on their original courses, length and width. If today the Dargom meanders encased in its bed, hardly exceeding 50 m in width, the abandoned canal beds in the steppe proved that once the Dargom was much linear and larger, even 250-300 m between levees, and probably navigable as well. In its origin, the Dargom probably ran SW and reached the Kashkadarya Valley, while the present section from Kishrau to the confluence with the Zeravshan is a later development (Mantellini 2015, 6-7).

The chronology of the Dargom and the ancient canals of Samarkand is a debated question (Isamiddinov 2002, 15-30; Mantellini 2015). Dating irrigation canals is always a difficult and hard task, especially when data from stratigraphic contexts are poor and absolute chronologies few when compared to the available samples. It is therefore difficult to ascertain whether all the

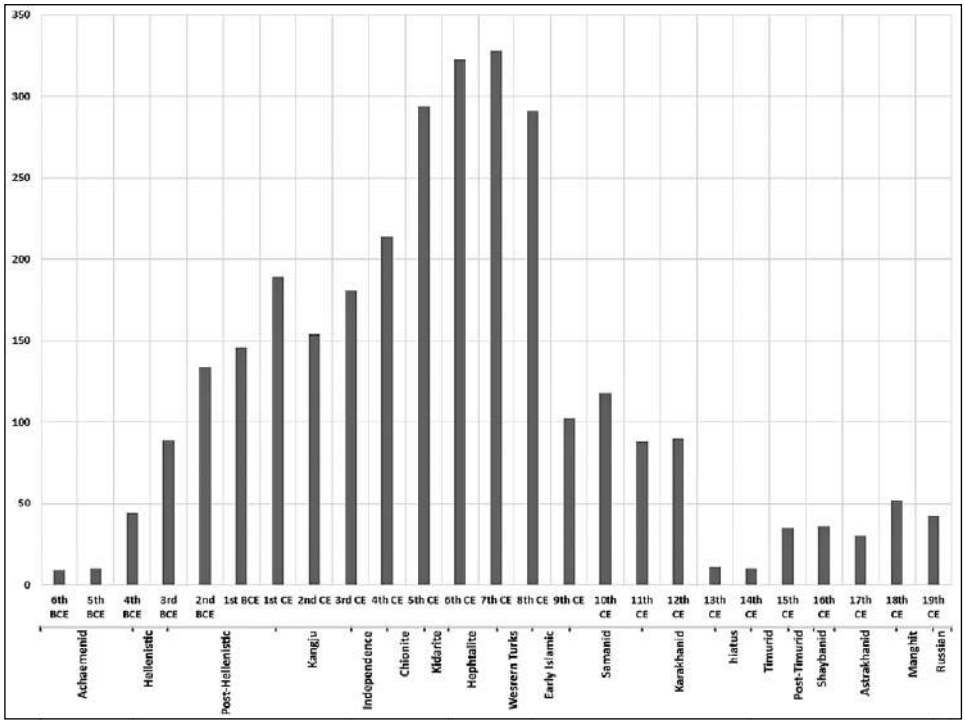

Fig. 4 – Chronological distribution of sites from the UIAP survey.

canals identified by UIAP were functioning simultaneously or if they belonged to different phases. 14C dating of samples collected by UIAP from alluvial layers at Kafir Kala and Sam-174 sites allow only establishing that the Dargom-Yanghìaryk irrigation system was certainly functioning in the 80-240 cal AD (Malatesta *et al.* 2012, 98). This is the same time when Ptolemy mentioned the Dargom as the main water supply of Maracanda in his *Geography*. However, the multitude of sites dated to the post-Hellenistic centuries and located very close to the abandoned canals in the steppe, suggest to place the origin of this system around the 3rd-1st centuries BCE (Mantellini 2015, 6). This chronology is confirmed also by the stratigraphic excavations conducted by UIAP at Boyssartepa, Koitepa (Abdullaev, Genito 2014), and Kurgan Kadirbek.

If this impressive irrigation network watered almost the whole plain, there is a space area (approximately 100 km²) in the desktop assessment, which was empty of archaeological sites. This area stands in the rain-fed strip between 800 and 900 m asl and just above traces of the Yanghìaryk, i.e. the ancient uppermost identified canal. The lack of any human settlement there,

also confirmed by field inspections, suggests that this area was specifically addressed to grazing purposes. The presence in the above foothill of several *kurgan* burials, usually associated with semi-mobile pastoralist communities, seems to confirm this hypothesis.

A few considerations on the local routes connecting Samarkand with its hinterland, and further to nearby regional centers, are also possible based on the main settlement locations and the local geomorphology (Rondelli, Tosi 2006, 481-483; Mantellini 2014, 45). A major EW route probably ran almost parallel to the Zeravshan southern bank, a couple of kilometers from it. It may have corresponded to the actual highways linking Samarkand eastward with Penjikent to the E (Tajikistan) and then continuing westward to Navoi and Bukhara. The SN axis linking Samarkand to Shahrisabz in the Kashkadarya Valley offered different options. The westernmost path ran in its first part inside the Jam corridor and then reached Samarkand along the Karatyube foothill (the same road as today) or slightly northward, passing in the middle of the present steppe. This is certainly the more suitable path, with a very limited slope. The large number of sites, including Koitepa, dated to the post-Hellenistic centuries suggests that this route was used as early as that period, or even earlier. A second way, still utilized today and characterized by a high inclination, developed later via the Amankutan/Takhta Karaga Pass (ca. 1,800 m asl). This path was probably exploited in connection with the settlement growth attested during the Early Middle Ages in the present Samarkand Selski and Urgut districts. The presence of an important administrative center at Kafir Kala, possibly associated with the payments of duties and strategically located close to the Dargom crossing, may support this hypothesis (Masson 1928; Mantellini, Berdimuradov 2005). More paths ran eastward, encased between the mountains. They linked the Kashkadarya Valley with the Urgut Valley or, further E via the pass of Farab, with Penjikent and the Upper Zeravshan Valley.

7. Conclusion

The significant transformations caused by natural (alluvium) and cultural (urbanization and agriculture) factors, as well as the few written sources, restrict our historical understanding of the development of the city of Samarkand and its territory. The data hitherto collected either at regional and local scale from the UIAP demonstrated how the complex history of Samarkand could be understood only in the context of its territory. The various ecological zones were exploited for different purposes, allowing the development of a combined economy based on irrigated agriculture and grazing. This influenced the socio-political dynamics between the settled farmers in the plain and the semi-mobile pastoralists in the steppe. Although Samarkand was an important regional urban center as early as the Achaemenid time (6th century BCE), the UIAP data indicate that the early

systematic occupation of its territory began only in the post-Hellenistic centuries (late 4th-1st centuries BCE). This development must be seen in connection with the progress in artificial irrigation, which allowed to spread agriculture over the almost entire southern floodplain. The development of Samarkand in the later periods seems to matching what happened in its hinterland. Settlement increased in the Early Middle Ages while a drop followed the Arab (early 8th century) and the Mongol (early 13th century) conquests of the city, causing the abandonment of the city and many other settlements in its surroundings until a new blooming under Timurid dynasty (14th-15th centuries).

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ABSTRACT

Located in the heartland of Central Asia, Samarkand has always been an economic, cultural, ethnic, linguistic and religious hub along the ancient Silk Road. A regional approach, based on a GIS remote sensing assessment followed by field validation, was used here to reconstruct the urban evolution of Samarkand in connection with its hinterland. The basic archaeological features in the landscape (anthropic mounds, canals and burials) allowed us to reconstruct the main forms of land use and resource exploitation according to site distribution and chronology. If Samarkand was established as early as the Achaemenid period (late 6th century BCE), the evidence dated to that time from its hinterland is scarce. A first significant increase occurred during the post-Hellenistic centuries (3rd-1st centuries BCE), and reached the peak at the time of the most intense trade along the Silk Road just before the major changes following the Arab conquest of the early 8th century CE. Data also demonstrated how the development of Samarkand must be closely linked with a proper exploitation of its territory. A massive and complex irrigation system in the floodplain ensured the supply of water necessary to develop extensive farming and daily-life activities, while rain-fed foothills were used as pastures.