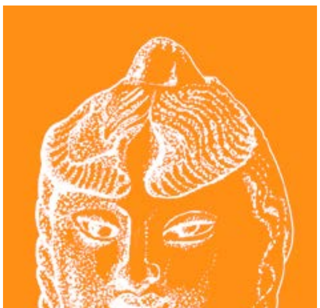
SHERABAD OASIS

Tracing Historical Landscape in Southern Uzbekistan



Editors
LADISLAV STANČO
PETRA TUŠLOVÁ

Karolinum

Sherabad Oasis
Tracing Historical Landscape in Southern Uzbekistan

Editors
Ladislav Stančo, Petra Tušlová

Reviewed by Simone Mantellini and Sören Stark

Published by Charles University
Karolinum Press
Prague 2019
Typesed by DTP Karolinum Press
First edition

Cover illustrations:
1) Sardoba, vaulted structure protecting a water basin with a porch in a middle of Sherabad steppe as photographed in 1896 by L. Barscewski, from the archive of Igor Strojecki.
2) Terracotta head imported from Khotan, found at Baba Tepa, drawing by P. Kazakova.

The work was supported by the European Regional Development Fund-Project
"Creativity and Adaptabilityas Conditions of the Success of Europe in an Interrelated World"
(No. CZ.02.1.01/0.0/0.0/16_019/0000734)

ISBN 978-80-246-3902-4
ISBN 978-80-246-3923-9 (online : pdf)

Charles University
Karolinum Press

www.karolinum.cz
ebooks@karolinum.cz

Contents

Abbreviations

AIT	Archäologie in Iran und Turan
AMIT	Archäologische Mitteilungen aus Iran und Turan
AO	Arkheologicheskie otkrytiya
BAI	Bulletin of Asia Institute
CAKE	Central Asia in Kushan Period, proceedings of the international conference of the history, archaeology and culture of Central Asia in the Kushan Period, Dushanbe 27th September – 6th October 1968, Moskva, 1975.
IMKU	Arkheologicheskiye issledovaniya v Uzbekistane
KSIA	Kratkie soobshcheniya Instituta Arkheologii
MDAFA	Mémoires de la Délégation Archéologique Francaise en Afghanistan
MTE	Materialy tokharistanskoy ekspeditsii. Arkheologicheskie issledovaniya Kampyrtepa
PIFK	Problemy istorii, filologii, kul'tury
ONU	Obshchestvennyye nauky v Uzbekistane
RA	Rossiyskaya arkheologiya
SA	Sovetskaya arkheologiya
SH	Studia Hercynia
SRAA	Silk Road Art and Archaeology
TKhAEE	Trudy khorezmskoy arkheologichesko-ethnpgraphicheskoy ekspeditsii
USA	Uspekhy sredneaziatskoy arkheologii

Acknowledgements

The field part of the project took place in the course of four seasons 2008–2011. During this period, numerous people and organizations supported our efforts in various ways. We would like to thank all those who have helped us, both in the Czech Republic and Uzbekistan, and contributed to the completion of the work and appearance of this publication, and who have also permitted the research project itself to take place – in particular, those institutions that provided finance. The main part of the funds came from the Faculty of Arts of Charles University, Prague, which contributed by awarding several grants both to principal researcher and students. In 2009, it was the project "*The archaeological map of the watershed of the Sherabad Darya: development of settlement pattern in Ancient Bactria,*" in 2010 "*Systematic surface survey in the Sherabad Darya valley, southern Uzbekistan, using non-destructive methods and ArcGIS software*;" and the "*Systematic field survey in Sherabad District, south Uzbekistan.*" Lastly, in 2011, the field work run under the project "*Systematic field survey in south Uzbekistan.*" The Faculty of Arts has also financed the preparatory work for this publication in 2015 (Post-Doc grant of L. Stančo entitled) and throughout the project funded the travel costs of students. The Faculty, more precisely the Institute of Classical Archaeology, also provided institutional support, including most of the needed technical equipment. About 500 sq. km of archive IKONOS images were granted to our project by the GeoEye Foundation.

The work itself could not be completed without a great help of students of the Institute of Classical Archaeology in Prague, namely: Petra Belaňová, Věra Doležálková, Viktoria Čisťakova, Adéla Minaříková (Dorňáková), Martin Odler, and Tereza Včelicová (Machačíková), which all participated on the data collecting in the field as well as on the data post-documentation.

We are also very much indebted to the Termez State University in Termez for their support and aid, above all to the former rector of the University, late prof. M. Haydarov.

We should also like to convey our thanks to the representatives of the Czech Embassy in Tashkent for their availability, frequent help and significant contribution to the success of the expedition. We would also like to thank those who helped us with the final work on the publication, including Judd Burden, who proofread the texts, and Polina Kazakova, who has carefully redrawn old topographic plans of various archaeological sites. We are also very appreciative of the help and kindness of our hosts and friends in the village of Akkurgan.

Finally, the principal authors and editors from their part would like to thank our closest colleagues and friends (and co-authors of this volume) Shapulat Shaydullaev for all the care he lavished on us, and Alisher Shaydullaev, for all his dedication and hard work in the field.

Introduction

Ladislav Stančo

An oasis, a peculiar word with a seemingly clear meaning: "an area in a desert where there is water and plants" or broadly perceived as a general idea: "a pleasant place that is surrounded by something unpleasant".[1] The very first idea that usually comes to our mind hearing that word is a palm-tree island lost in the middle of sand dunes of a great desert of northern Africa or Inner Asia being approached by a slowly moving camel caravan. A well in the centre and men smoking a water pipe are an inevitable component of this rather romantic picture.

For us, however, oasis simply means a more or less well-defined area of land with limited water sources allowing for agricultural activities almost exclusively based on local water management, more precisely on artificial irrigation. It implies firstly that the oasis does not have firm and stable delimitations; its extent is bound to the ability of the human population – and its leadership – to build, and not least to maintain, the irrigation systems, to keep the water canals clean and working. Thus, the extent could vary considerably in individual historical periods as the techniques of water management improves or diminish. Secondly, it means that the water source has not necessarily to be found inside the oasis territory, it could be brought from elsewhere by means of sophisticated water canals. The specific environment in Central Asia with mixed zones of semi-deserts, deserts, steppe, dry piedmonts and high bare mountains, offers here and there fertile soil frequently lacking sufficient precipitation, which would enable agricultural production.

Our research area is such an example of a micro-region with changing boundaries depending on human activities. It is situated in the lowland steppe area of the southern Surkhandarya province of Uzbekistan (see map on p. 12). The landscape here is far from being anhydrous. The main problem seems to be that the waters of the local river – Sherabad Darya are difficult to exploit for the irrigation of the surrounding plains.

The Czech-Uzbek archaeological mission started cooperation in 2002 already, excavating for five years an important site of Jandavlattepa,[2] a tell-type walled multicultural settlement situated near the town of Sherabad in southern Uzbekistan. A new joint project was started in the same region in 2008, with the aim of the research focused on a detailed examination of the settlement pattern based on the mapping of all archaeological sites in the given area. The main reasons for this decision were particularly the need for putting the history of the settlement in the particular research area into the context of the dynamics of the whole region, including sorting and completing already known data and their further processing, but also an increasingly urgent need for a complete mapping of archaeological sites for the sake of heritage preservation and protection. A rapid increase of population in recent decades, expanding irrigation systems,[3] mending areas of cultivated fields and a related growth of villages (they are several times larger than even fifty years ago) in the area, brought a serious threat to a significant number of these monuments. Heritage protection unfortunately did not manage to keep pace with the drastic change of the economic system, and many sites have been irreversibly – and without documentation – destroyed. Since the archaeological research and mapping of the piedmont steppe and mountains of the north-west part of Sherabad District is by no means complete, we limited ourselves in this first volume to the publication of the data concerning the lowlands of the Sherabad District or the so-called Sherabad Oasis.[4]

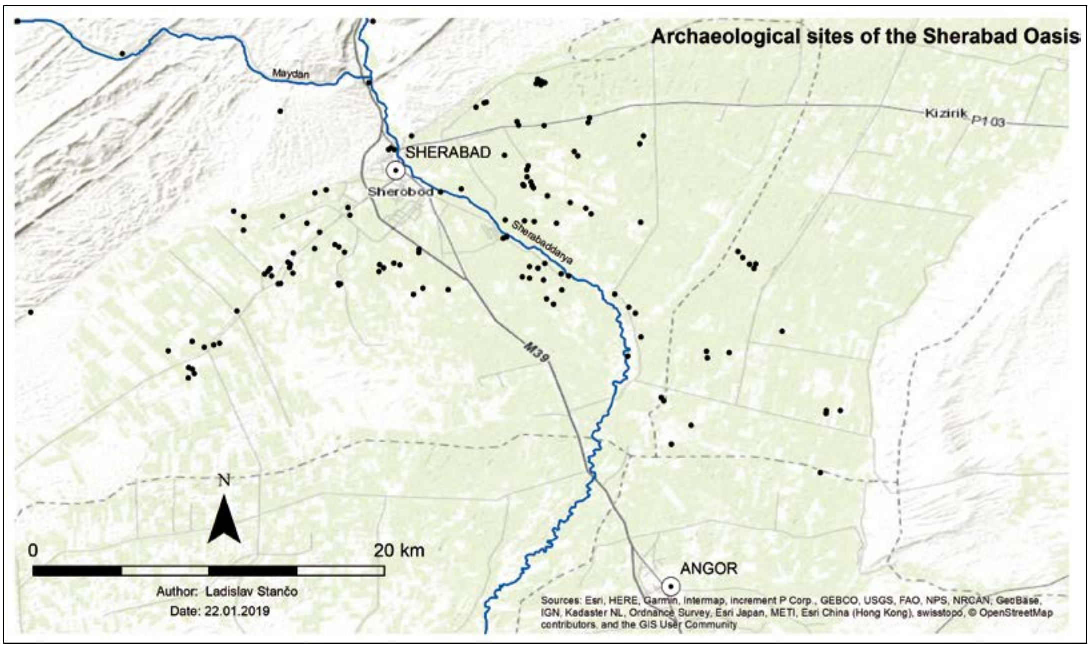
1 These two definitions are given by Merriem-Webster dictionary, see http://www.merriam-webster.com/dictionary/oasis.
2 Most recently see esp. Abdullaev – Stančo eds. 2011; preliminary excavation reports are available online at http://arcis.ff.cuni.cz/.
3 This is for example the expansion of the area of cultivated land into the previously unused steppe.
4 The original definition of research area should reflect very clearly defined territorial boundaries, which was in the past nicknamed by researchers as Sherabad Oasis (see Masson 1974, 5–6; Pidaev 1978, 16–17; Rtveladze 1973), a region around Shearabad with fertile-soil plains that has been in the historical periods irrigated and cultivated and which for a long time (probably since the Achaemenid period to Late Antiquity) has its centre at the site of Jandavlattepa, which was centrally located even in

Our research has been henceforth directed towards the collecting of both spatial and chronological data and also to mapping of the preservation and current state of archaeological sites and historic buildings as such. Although in Uzbekistan there exists legislation on monuments protection, its observance is, in practice, almost never enforced. Recently, however, the government has declared efforts to change this state of affairs, which includes the education of local authorities (*hakimiyat*) and the police (*militsija*) and the creation of a new inventory of sites across the country.

The project was conducted within the framework of collaboration between Charles University and Termez State University.[5] The cooperation with the Archaeological Institute of the Academy of Sciences of Uzbekistan in Samarkand was established to coordinate work within the region.

Preliminary background research of the relevant previous scientific literature had indicated clearly that one of the major difficulties of the survey will be inadequate way of description of the locations of the already known archaeological sites. Frequently, it was based on the mere statement that the settlement is situated – for instance – "on the territory of the kolkhoz named after V. I. Lenin, 15 km southeast of Sherabad." It was clear from the publications that there is substantial amount of insufficient spatial data or errors in the determination in cardinal points, and also confusions in present names, locations, etc. Therefore, it was decided in the early stages of the project to detect newly all topographically and morphologically distinct anomalies of the Sherabad plain, enter them into the GIS-based map, to verify their anthropogenic origin, names, and to obtain other necessary information (see further subheading 2.1 about the applied methods). Only then we have compared the data with previously published information, including comparison of chronological indicators (i.e., published information versus datable material collected during our team's survey). All maps, photographs and drawings are by the authors of the chapters unless otherwise stated.

To sum up, this book aims to contribute to the knowledge of the history of settlement in the southern part of Central Asia through a detailed analysis of the development of a specific, clearly defined area: Sherabad Oasis. How have we succeeded in fulfilment of this intention, let the kind reader assess after reading of this work.



Map of archaeological sites of the Sherabad Oasis.

geographic terms. Circumstances eventually forced us to reconsider that definition and expand the area of interest into the piedmont and mountain belt in the north and north-west part of the Sherabad District so as to correspond with the current administrative boundaries of the Sherabad District. The main reason for this shift was the initiative of the Government of Uzbekistan, encouraging the compilation of the archaeological map of the entire state, which was logically based on the territorial-administrative division. In doing so, we realized that our data for the lowlands are almost complete, while the information for the piedmonts are fragmented even after several years of survey, and thus we have decided to return to the original extent of the research area, at least for the first volume.

5 In this project participated following archaeologists: L. Stančo (2008–2011), A. Danielisová (2009, 2010), Sh. Shaydullaev (2008–2010), T. Annaev (2010, 2011), and students of archaeology: A. Shaydullaev (2008–2011), M. Odler (2009), P. Belaňová (2009), P. Tušlová (2010, 2011), T. Machačíková (Včelicová; 2010, 2011), V. Doležálková (2010, 2011), V. Čisťakova (2010) and A. Dorňáková (Minaříková; 2011). The main part of the ceramic assemblage processing was entrusted to M. Kobierská.

1. Research area

Ladislav Stančo

1.1 Natural conditions

1.1.1 Geography and geomorphology

The Surkhandarya province forms the southernmost region of present-day Uzbekistan and as a whole is clearly defined by natural conditions. It is bordered on the three sides by high mountain ranges: by Babatag in the east, Hissar and Baysun in the north, and Kugitang in the west. The southern border on the other hand is formed by the course of the great Amu Darya. The main river in the western half of the Surkhan Darya province is Sherabad Darya, the real north-south axis of the Sherabad District. Its lower reaches, starting form Sherabad itself, bear, however, the name of Kara Su (Black water) and under this name almost disappears being distributed into uncountable water channels and cotton fields. This heavy exploitation prevents the waters of the Sherabad Darya from reaching the Amu Darya.[6]

The proper research area is situated in the present day Sherabad District of the Surkhandarya province, but some parts exceed the district border into the Kyzyrik District[7] and elsewhere. The Sherabad District is the third largest among 14 districts of Surkhandarya province, reaching officially 2730 sq. km (source: *O'zbekiston milliy ensiklopediyasi*). The north-south axis measures 60 km, the west-east one 64 km. The western border of the district matches with the national Uzbekistan – Turkmenistan border, while the southern part of the district is separated by the Zang Canal from a narrow strip of land on the right bank of the Amu Darya that forms the present-day Muzrabad District (former Gagarin D.). The eastern district border runs along the other huge canal called Bol'shoy Zaur that collects waste waters from the fields of the left-bank Sherabad Darya and becomes its tributary. The flat lowlands to the east of it as far as Haudag hills, which actually belong to the historic Sherabad Oasis form the above mentioned present-day Kizirik District. The northern border with Baysun District lies partly in the steppe, partly follows the road leading from the Sherabad river valley to the village of Khatak at the foot of the main Kugitang range.

Fig. 1.1 Kugitang mountains, view from the east, photo by A. Augustinová.

6 The river reaches the maximum flow rate in May (20.6 m³/s), in August on the other hand it drops to 4 m³/s (Stride 2005, vol. I, 235). Fluctuations in water flow of the river, or water shortages in the summer months, are compensated by the water of the Sukhan Dayra that is brought by a channel built in 1970s and called the Big Sherabad Canal. Even this source seems not to have a steady flow and the water level in the channel varies widely.

7 In 2010, the two small districts bordering Sherabad in the east: Bandykhan and Kyzyrik have been merged into a new administrative unit.

The main centre of both the oasis and the modern district is the town of Sherabad located at the place where the river leaves the mountain valleys and flows into the lowlands. In recent years, the town has grown rapidly, since adjoining villages have gradually been joining it. Despite the substantial area covered by the town, our knowledge of the historic settlement here is rather sketchy. We noticeably lack archaeological supervision of earthworks at the numerous new constructions. Most information is thus provided only by the marginally situated site of Kafirkala, a former stronghold of the local Sherabad Beg, where we can, however, prove much earlier phases of settlements as well.

In terms of natural conditions, we can divide the Sherabad District into two very different areas: lowlands in the south and south-east of the region with an elevation of about 340 to 400 m.a.s.l., which are intensively artificially irrigated, and the north and north-western parts, consisting of arid and semi-arid piedmont steppes (ca. 400–1200 m.a.s.l.) with considerably steep mountain ranges, including the main ridge of Kugitang Tau reaching an altitude of 3000 m.a.s.l., which forms the border with Turkmenistan (**Fig. 1.1**). Between the Sherabad plains and the piedmont steppe, there is another series of steep, although basically not that high, mountain ranges, stretching from the southwest to the north-east. Just a few of these ridges exceeds an altitude of 1000 m.a.s.l.; in the south-western part there are three such ridges: Khojambesh (1134 m.a.s.l.), Pyshtykara (1011 m.a.s.l.) and Karachagyl (1116 m.a.s.l.), and to the north of the plains lies only Takasakyrt (1058 m.a.s.l.) (**Fig. 1.2**). All these form impenetrable natural barriers due to their steepness. The only relatively passable ways are the natural deep valleys of mountain streams. The plains around Sherabad are separated from the river valley of the Surkhan Darya lying to the east by a low, but very dry ridge of Haudag (max. 554 m.a.s.l.), which runs north to south, while south of Sherabad, the plain of the irrigated and agriculturally exploited lands extends down to the Amu Darya.

The choice of a route for long-distance travels in the lowland areas seems to be radically different from that of the trails in the mountains and piedmont steppes. The landscape here – especially in non-irrigated areas – was freely and easily penetrable, and the primary criterion evidently remained in the distance: the way should have been as short as possible, a direct route between points of interest was ideal. Overland communication with the southern part of Bactria / Tokharistan could therefore have several branches, leading from the area of Sherabad to a few ferries crossing the Amu Darya. The main stations of this kind were undoubtedly located at Old Termez and Kampyrtepa. On the contrary, the main communication link with the regions north of Sherabad (mainly Sogdiana) was clearly determined by the Sherabad Darya river valley that runs up to the cultural border between the two areas, which had been called Iron Gate. Its guard- and perhaps also customs function is attested in written sources.

1.1.2 Waters

The waters of the Sherabad Darya / Karasu are salty from the upper course of the stream, which has always represented a limiting factor for long-term irrigation systems and even for settlement sustainability. Among the main tributaries of the Sherabad

Fig. 1.2 Cotton fields with the mountain ridge of Takasakyrt in the background, photo by L. Stančo

Fig. 1.3 Wide riverbed of the Karasu River in the neighbourhood of sites no. 002 and 003, photo by L. Stančo.

Darya belong mostly the seasonal mountain streams the Loylagan Say, the Jidabulaq Say and the Maydan Say. All of them are right bank tributaries. The river bed of Sherabad Darya itself is cut deeply into piedmont steppe areas, and even into the Sherabad alluvial plains after leaving the mountain ranges (**Fig. 1.3**). Here, it would be very difficult to irrigate the surrounding – considerably higher lying – fields. It was therefore necessary to divert some of the water from the river upstream in places, where the difference in the altitude between the canal and the surrounding terrain was more favourable. Among the smaller streams that flow out of the southwest foothills of the Kugitang Tau directly to the Amu Darya, belong the Talkhab and the Muzrabad.

Fig. 1.4 Shearabad Canal to west of the town, photo by A. Danielisová.

The extent of the arable lands differs nowadays from the extent of agriculturally used lands in historic periods, since the modern irrigation systems are more sophisticated and bring water from the valley of the Surkhan Darya by two channels – the Zang Canal and the Sherabad Canal. As is clearly seen from the CORONA satellite imagery, large parts of the Sherabad plains were not irrigated even in the quite recent past. One can speak rather of a Sherabad steppe. The main source of water for agriculture in the lowlands is nowadays, as said above, a huge backbone canal bringing fresh water from the adjacent river valley of the Surkhan Darya, more precisely from Kumkurgan dam on that river. The main channel, built in 1971, runs through the Sherabad District from northeast to southwest just by the edge of the mountains, and crosses the Sherabad Darya in the town of Sherabad itself (**Fig. 1.4**). This modern construction has changed dramatically the possibility of irrigating the entire lowland steppe and affects the spatial distribution of today's villages. The scope of the original irrigated areas in Antiquity and the Middle Ages is therefore one of the main issues on which the project sought an answer. Old maps of the region – as well as Google Earth – show in the southern part of the Sherabad Oasis close to the site no. 22 (Taushkantepa) an important geographic feature that no longer exists: it is Kul' Maygyr lake which was rather salty swamp with some shallow water area.

1.1.3 Climatic conditions

The climatic conditions[8] of this area are very specific: the whole region is well protected from northern winds by mountain range and opened to the flow of warm winds from the southern Afghan deserts, which results in very high average temperatures in the summer and relatively mild winters. The average temperature here reaches 17–18 degrees Celsius, while in the summer the temperature can reach up to 50 degrees Celsius. The southern part of the Sherabad District is also affected by the strong wind that brings heavy dust from deserts in the north of Afghanistan, and is therefore locally called "Afghan". It is most strongly felt in the town of Termez and its surroundings that are not protected by natural barriers. Precipitation occur mainly in winter and early spring. The summer season from May to September is dry, with no rain. Rainfall amounts in the annual aggregate of 154 mm (Stride 2004, vol. I, 234), with precipitation increasing in the direction from southwest to northeast (Pidaev 1978, 15).

A typical soil cover is represented by luvisoil and salinated takir soil.[9] Aside from irrigated fields, on which mostly cotton is grown these days (**Fig. 1.5**), there is a typical spring vegetation cover consisting of low grass and herbs, and thorny bushes. In the summer, the vegetation largely disappears, and the landscape looks very dry. Only in the high mountains, there appears sparse coniferous forest zone. The lowlands of the region belong to the Badkhiz-Karabil semi-desert ecosystem (PA1306), while the piedmont steppes are part of the Alai-Western Tian Shan Steppe (PA0801).[10]

Fig. 1.5 Sherabad oasis nowadays – hand harvesting of cotton still predominates in this area, photo by A. Danielisová.

8 This part of Uzbekistan belongs to group BSk (meaning Arid – Steppe – Cold, where MAT<18) after the Köppen-Geiger climate classification (Peel et al. 2007).

9 After "Pochvennaya karta Uzbekskoy SSR" made in 1960 (1:1,500,000), available online at URL http://gpsvsem.ru. This map distinguishes in the Sherabad plain between three soil types: 10 – irrigated takir soil (salinated clay), 18 – solonchaks on the alluvial or proluvial sediments, 23 – light solonchak luvisoil, and in a small area in the southwest of the region also 4 – grey-brown soil; see also Stride 2005, vol. I, 235–236, who follows the map of Sh. Ergashev.

10 Description of this ecosystem in detail is accessible here: http://www.worldwildlife.org/science/wildfinder/profiles//pa1306.html; In the map part of the application this type seems to cover almost entire Surkhan Darya province. In the text part, however, the eastern border of the given ecosystem seems to be marked by the Kugitang Mountains.

1.2 Previous research

Archaeological mapping and analysing settlement patterns is far from being a new phenomenon in the archaeology of the Soviet and post-Soviet Central Asia. On the contrary, we should say that former Soviet scholarship put an emphasis on this branch of archaeological research and studied it systematically, and the data gained by our predecessors are of great value for the current work. A weak point of all previous mapping projects was the spatial component: in publications, coordinates are missing, maps are inaccurate or absent, descriptions of the locations are often confusing or completely wrong, the use of the local place names varies, etc. If we omit mentions of the individual sites in Surkhandarya province including the Sherabad District by older travellers, Tsarist military officers and local antiquarians, then the first relevant source of a more general description of landscapes and archaeological sites seems to be the work of Parfyonov, primarily devoted to the Stone Age / Lithics, and providing data from the thirties and forties of the 20th century (Parfyonov, s.d.).[11] In the 1950s and 1960s many scholars started to pay attention to the Surkhandarya province, but mostly to other subregions, predominantly to the area around Termez and the upper reaches of the Surkhan Darya, eventually reaching sites around Angor.[12] At the beginning of the 1970s a new wave of interest arose and there were initiated not only new excavation projects, but also survey activities leading to the compilation of the first inventories and maps of all known archaeological sites. A leading figure in this regard has become E. V. Rtveladze of the Institute of Art History in Tashkent, whose publications have introduced a site coding system that is still in use today (Rtveladze – Khakimov 1973; Rtveladze 1974; Rtveladze 1976). Rtveladze walked the landscape of Surkhan Darya Province – including the region of Sherabad – in a systematic way, and identified a number of archaeological sites and monuments, which were dated by him and his colleagues on the basis of surface material, additionally by material from trial trenches. At the same time Sh. Pidaev (1974; 1978) also contributed to the detection and identification of the sites. The main attention was paid then to the monuments dated back to the Antique period, more precisely, mainly to Kushan sites. In the 1980s, there were attempts to map the sites of Early Medieval (Annaev 1988)[13] and generally Medieval sites (Arshavskaya et al. 1982; see also Rtveladze 1990, esp. 26–27, **Fig. 7**). At the same time, there were also excavated and studied in detail some of the major sites of the Bronze Age: Jarkutan and Bustan (Askarov 1977, 1980a, 1980b; Askarov – Abdullaev 1978, 1983), and Early Iron Age: Talashkan I (Rtveladze – Pidaev 1993; Shaydullaev 2000; Shaydullaev 2002). Survey activities in the piedmonts of Kugitang touched also the northern periphery of the Sherabad District (Bobokhadzhayev et al. 1990). After the collapse of the Soviet Union, these activities were temporarily reduced. Newly organized international expeditions started to organize mainly systematic excavation projects of the large or otherwise important sites. They have paid just little attention to a surface survey and mapping, focusing only on the neighbourhood of the given site.[14] The first scholar to concentrate on the archaeological geography of the Surkhan Darya province in a systematic way was quite recently Sebastian Stride, a member of the French mission "MAFOuz B". He has been collecting data during the second half of the nineties and his monumental dissertation covers the whole province including the Sherabad District (Stride 2004). Despite unquestionable benefits of this work, which necessarily became a fundamental reference overview, many questions and problems remained unresolved. The methodologically controversial approach of the author will be discussed below.

In the previous research the attention was paid not only to the detection of the new sites, but also to particular chronological as well as spatial analyses, and first of all to the typology of the settlements. In the 1960s and 1970s there was developed several typologies of the settlements of the Kushan period. Yurkevich divided Kushan settlements into two basic

[11] His book was never published, but it is available as a typescript in the archive of the Termez Archaeological Museum.
[12] For a brief overview of the research see Stančo 2005, 54–55; for more detail see Pidaev 1978, 6–14 or Masson 1985, 251–255.
[13] The work of Annaev is of value primarily for his analysis of pottery shapes.
[14] In the Sherabad District this goes especially for two projects in the vicinity of Pashkhurt, i.e., outside the oasis itself: a German-Uzbek expedition exploring initially under the leadership of D. Huff already mentioned the site of Jarkutan and later under the supervision of his former student K. Kaniuth another site of the Bronze Age called Tilla Bulak (see Kaniuth 2007; Kaniuth 2010; Kaniuth – Herles – Shejko 2009) and the Russian-Uzbek expedition working at the ancient site of Dabilkurgan see Solov'ev 2013. A different situation exists in other parts of ancient Bactria: the eastern margin of Bactria near Ai Khanum was mapped in the first half of the 70s by French archaeologists and their exemplary results were published gradually in three volumes (see Gentelle et al. 1989; Lyonnet 1997; Gardin 1998). The extent of the work of this expedition is hard to compare: during the years 1974–1978 an area of 1,700 sq. km was explored, 800 sites have been found and irrigation canals with a length of ca. 1,000 km were mapped.

groups: 1. towns and town-like settlements, 2. rural settlements. Both groups comprised subtypes based on the size, ground-plan shape, presence/absence of a citadel, character of the fortifications (Yurkevich 1965, 166–167), while Rtveladze divided the settlements into four types: 1. Big walled town-like settlements (with four sub-types), 2. Settlements with some characteristics of a town and others of a village, 3. Rural settlements (with 3 sub-types), and 4. Mountain settlements. The sub-types were specified according to the size, shape and fortification (Rtveladze 1974, 83–85). This typology was further adjusted by B. Staviskiy, whose typology consists of 1. Big towns (more than 100 ha), 2. Towns (15–80 ha), 3. Little towns (5–13 ha), 4. Big villages (1.5–4 ha), 5. Villages (less than 1 ha), and 6. Hamlets (less than 0.6 ha). He added as the 7th and 8th type to the latter group Oasis-type settlement and mountain settlement respectively (Staviskiy 1977, 43–44). In this typology, one is obviously at first glance surprised by the gaps in the reported ranges of sizes, which would ultimately result in the omission of certain settlements from typology. Staviskiy speaks generally of 25 sites of the Kushan period in Sherabad District, among them only two are situated beyond Sherabad plain itself, i.e., up in the piedmonts (Staviskiy 1977, 52–53). Sh. Pidaev had set an essential criterion for his simpler settlements division, which is exclusively their size; categories such as "city" or "village" he found not archaeological enough and thus established four types of settlements with surface up to 1 ha, 6 ha, 15 ha, and more than 15 ha respectively. For the Kushan period he finds in the "Sherabad Valley" 16 settlements of the first type, six of the second, one of the third and none of the fourth type (Pidaev 1978, 15–28, esp. 18–22). The difficulties of this approach, which one must necessarily encounter, are obvious: it is uncertainty of exact determining, but often of just a gross determining of the extent and, thus of the real size of the settlements. Only rarely we get by with simple measuring of the site area of the tell-type settlement. On the contrary, it often exceeds the extent of its core, sometimes even considerably.[15] Besides, it is also very difficult to define precisely the extent of the given settlement in a particular time period of their inhabitation.

Stride, who was first engaged in the settlement pattern of Surkhandarya and its complex dynamics, divided the Sherabad Oasis into two parts: the right-bank and the left-bank area of the Sherabad Darya. According to him, the right-bank area covers 13,668 ha, of which about 10,000 ha were irrigated. To this part, he localizes two sites of the Bronze Age, four proto-historic sites, fourteen dated back to Antiquity, ten of the Early Middle Ages, nine pre-Mongol ones and six post-Mongol sites. On the left bank (16,189 ha / 12,000 ha irrigated), he lists 11 sites inhabited in Antiquity, 11 in the Early Middle Ages, one pre-Mongol and one post-Mongol settlement (Stride 2004, vol. I, 237–239). The following table summarizes the representation of individual sites and periods in the area of interest according to the knowledge prior to the start of our project. The distribution is based on Stride's division of the region.

Another product of the generally geographic approach to the analysis of settlement pattern was the definition of smaller cultural units based on access to natural water sources, eventually with regard to the expected (rarely clearly documented) artificial irrigation systems – called Oases. In accordance with the premise that every large accumulation of settlements linked to the (usually single) presumed source of drinking water is one separate unit, Masson distinguished within the area of Surkhandarya four basic units: 1. region Denau – Shurchi, 2. Jarkurgan area, 3. region of Angor, 4. region of Sherabad (Masson, 1974, 4–5). Staviskiy subsequently determined

Chronology – Period	**Lowlands around Sherabad**		**Total**
	Right bank	Left bank	
Bronze Age	2	0	2
Protohistory	4	0	4
Antiquity	14	11	25
Early Middle Ages	10	11	21
Pre-Mongol period/High Middle Ages	9	1	10
Post-Mongol period	6	1	7
General number of sites	**25**	**16**	**41**

[15] This applies particularly to the Middle Ages, but we have clear evidence that allows us to speak analogically of this phenomenon in Antiquity. Such evidence is given by complexes of monuments around Babatepa, Kulugshakhtepa, Jandavlattepa or Kattatepa, for instance. This issue will be discussed below in this book by P. Tušlová see Chapter 3.

six major irrigation regions: 1. Termez area, 2. Angor – Jarkurgan area, 3. Sherabad area, 4. Shurchi area, 5. Khalchayan area, and 6. Karatag area (Staviskiy 1977, 47–56). Pidaev then defined in the Surkhandarya five main oases: 1. Sherabad valley, 2. the upper reaches of the Surkhan Darya, 3. The lower reaches of the Surkhan Darya, 4. Zang area (belonging to the irrigation system of the Zang Canal), and 5. Right-bank area of the Amu Darya (Pidaev 1978, 16 and 18, tab. 1). The first four areas are *de facto* identical both in the Masson's and the Pidaev's division. For us and for the focus of this book it is essential that all researchers agree on the definition of a separate Sherabad Oasis, although Staviskiy functionally connects it with the valley of Surkhan (Staviskiy 1977, 47). It is noteworthy that in his more recent work on the subject E. V. Rtveladze (1990, 2–3) talks in general about "Surkhandarya Oasis" as of a unit. A summary of the longstanding debate about the proper identification of the Surkhandarya area with one of the larger cultural and political entities of the ancient and early Medieval period – to Bactria and Sogdiana – is clearly given by E. V. Rtveladze (1990, 4–6). The typology of the settlements of the Medieval period is so far missing, even though the available data would allow for at least basic classification.

2. Extensive archaeological survey

L. Stančo

2.1 Methods and pre-processing

The field survey was prepared in advance by using a systematic evaluation of newly available high-quality satellite images (GeoEye IKONOS, LANDSAT, CORONA and since 2008 especially the high-resolution data in Google Earth, see below in detail), where the sites were detected and consequently entered into the database. The resulting set of data was confronted with information given in publications and completed by them.

The field part of the project took place in the dormancy period, when the data gained from satellite imagery were verified on the spot. Chronologically sensitive archaeological material was collected and also in-detail documentation of the sites including precise geodetic measurements was conducted. Occasionally photogrammetric documentation was made as well as topographic plans.

In addition to gathering the largest possible amount of data, the aim of survey was also the methodological issues related both to the detection of anthropogenic features in the landscape, and to subsequent documentation of the sites, which due to various reasons (not least the limited funds) could only take place with basic equipment.

The gained data were processed and spatially analysed using geographical information systems. This part focused on the evaluation of site from the point of view of its relation to the surrounding landscape and particular features (topography, irrigation systems, settlement pattern), and chronology (settlement dynamics). The aim was in particular:

- Mapping the settlement structure
- Evaluation of the use of space in the prehistoric and Early Medieval period
- Reconstruction of resource use and economic strategies in relation to the natural environment and political systems in different periods
- Reconstruction of cultural and social interactions between centres and their agricultural hinterland

2.1.1 Base data layers for detection of the sites and digitizing

The basic prerequisite for the compilation of the archaeological map of the region was the obtaining of the appropriate raster documents necessary for 1) the detection of historical anthropogenic features and 2) the digitization of other important geographic features that shape environment for the archaeological record. To gain a picture as complete as possible, it was necessary to combine data from satellite images and topographic maps.

2.1.1.1 Satellite imagery and its usage

Shortly after the declassification of CORONA espionage satellite imagery in the 1990s archaeologists began to use it as a tool for sophisticated surface archaeological prospecting and the creation of archaeological maps and GIS-based models. Paradoxically, the satellite images were at our disposal before the appropriate topographic maps. Gradually we started to use the images from Google Earth, CORONA and IKONOS. Apart from these, we also worked with images of Landsat distributed free by the USGS.

Google Earth

The basic impulse for the use of remote sensing methods in our work was the launch of Google Earth (2005), which in 2007/2008 gradually made available new land surface images at high resolution. In individual parts, it is possible to achieve a high delineation of detail.[16] Exported raster can easily be

[16] In some parts of the planet the resolutions of up to 0.1 meter is achieved, in these cases, however, orthophotographs are used, while the original basic resolution of older LANDSAT images was 15 m. According to some sources these were gradually replaced by SPOT images with a basic resolution of 2.5 m. The main supplier of images to Google Earth, the company DigitalGlobe, operates satellites of Early Bird 1 (resolution 3 m), Quickbird (0.6 m), WorldView 1 (0.5 m), and WorldView 2 (0.46 m). At the time of the project was not possible to download a particular area at a given resolution in a freely available version of

georeferenced in any GIS software. An important advantage is represented by the integration of a digital elevation model (DEM), created by NASA and using SRTM (Shuttle Radar Topography Mission), in this application, which provided a 3D visualization of the environment. Other features that the Google Earth Pro version – that was not used by our team at the time of the project, but is distributed freely at the moment (since spring 2015) – has, is communication with a GPS receiver. It was possible to easily replace this function by a simple format conversion KML / KMZ to GPX using freely available software.

In archaeology and especially in the archaeological surface survey, Google Earth has been used since the very beginning. The first publications on the possibilities of the using of this environment appeared in 2006 (Madry 2006; Bousman 2006; Ur 2006) and Parcak consequently paid her attention to them in her monograph on remote sensing in archaeology (Parcak 2009). Google Earth is based on the World Geodetic System, 1984 (WGS 84). The resolution varies considerably from area to area, from the basic Landsat images (15 m), which are used globally for the whole planet, to the very detailed (0.5 m). Certain areas are even covered by orthophotography (aerial photographs) with high resolution (0.1 m). It should, however, be added that fast and comfortable work with Google Earth requires a fast computer if possible. A high-speed internet connection is also essential, since the pictures consist of large volumes of data that is continuously downloaded during work.

Actual work with the program is very easy, and its operation is intuitive. In addition to moving around over the selected section of the earth's surface, we can zoom in, and set the picture to horizontal. This means that with the setting on a reasonably pronounced relief, the impression of a 3D model of the landscape can be gained. For detecting anthropogenic features the best view is that from above, although an oblique view can also be used in certain specific cases. The picture may also be rotated at will. It is also possible to try out less detailed detection by "flying" slowly back and forth over the landscape. A very important tool is the ability to save places, with detailed data about them, and export current pictures in the form of JPG pictures. Our first testing of Google Earth took place in 2008 (Stančo 2009). We used Google Earth mainly for the detection of anthropogenic features.

The first step was to "walk over" the area in question using Google Earth, which happened as soon as the higher-definition picture was made available in March 2008. This work lasted a mere 7–8 days. During this short period, we looked at a segment measuring 22 × 25 km, with its centre 2–3 km to the south of the town of Sherabad. We used the then-current Google Earth software version 4.3.7204 from March 2008. In the older versions, lower-resolution pictures had covered the region in question. Starting with version 4.3, the Sherabad District has been covered by high-resolution pictures allowing for our work. Later on (March 2009), we switched to Google Earth version 5.0.11337, but the quality of the imagery was identical to the previously-mentioned one. All the features in the landscape of a potentially historical or anthropogenic character were marked and exported. The first catalogue of archaeological sites in the Sherabad District was then put together. We did not intend, at that time, to cover all archaeological sites that were already known to scholars or even excavated or otherwise explored, but only those that had been detected with the help of Google Earth. Data from scholarly literature was included alongside them, however. The aim of this was merely to permit the identification of sites detected with those that were already known in order to ascertain more precisely the position of the latter and to compare the dating.

For comparison with the final results it would be interesting to discuss briefly the summary of data gained in the first preparatory season (2008). A total number of 47 presumed settlements in the lowlands were included in the catalogue, as well as several dozen features that were – as we believed – highly likely to have originated in connection with human activity. In all, almost a hundred features that may be considered archaeological sites were ascertained in the Sherabad Oasis and the adjoining northern foothills, plus a further 40 unclear features. For each site, two pictures were downloaded from Google Earth: one detailed one (the modelled height from the surface was ca. 500–600 m) and the second also including part of the surrounding area for easier orientation (modelled height from the surface was 1–1.5 km). In addition to the pictures, the catalogue also contained precise data on position, the approximate height above sea level, the dimensions of the site (all these data gained from Google Earth) and, where relevant, references to literature, topographic maps etc. As well as the grid references of the features detected, the routes of presumed optimum access to them were also indicated, with an emphasis on logistical economy. As a test sample of the detected sites, we preferred clusters rather than spatially isolated features. Data from Google Earth in KML format was transferred into GPX format and saved to a hand held GPS receiver. For our purpose, we used a standard walker's instrument, the GARMIN eTrex Vista C.

this application, a single output as raster images remained within the scope of the current screen, which was missing georeferencing. Since 2014, however, Google has made the Pro version, which allows the user to download high reslotion images of selected area, free for all users. Georeferencing of the exported images is still missing.

GeoEye IKONOS

Images of IKONOS, distributed by the GeoEye company,[17] reach the highest resolution among raster datasets used in our work. The reported resolution of the panchromatic images is 0.82 m, while the multispectral images reach only 3.2 m. The cost of acquiring these images is generally very high, but for the purposes of the project, archive images were granted, in limited extent, free of charge.[18] The given sequence was taken on August 18, 2001. The advantage over Google Earth's imagery was the integrity of the images when working off-line, an important drawback on the other hand was the fact that it did not cover the area of interest completely. GeoEye supplies images with accurate spatial data, which do not need be further georeferenced.

CORONA

Images, conventionally referred to as CORONA, were originally produced as a military espionage imagery in the 1960s and 1970s and represent the oldest complex spatial record of this area except for topographic maps. Their "declassifying" after the fall of the Iron Curtain (22/2/1992) placed into the hands of archaeologists a valuable source of spatial data on the areas that are often already irretrievably altered or destroyed, and also offered the possibility of creating a digital terrain model (DEM). This option is currently used in such areas, where archaeologists lack high-quality map data (see e.g., Gheyle et al. 2003; Goossens et al. 2006; Casana – Cothern 2008, here also detailed bibliography). Wide use offers the University of Arkansas project *CORONA Atlas of the Middle East*, in the frame of which georeferenced bands of these images are placed online.[19] Our research area, however, is unfortunately not included yet into this project.[20]

For our project, digital scans of photographic negative strips were acquired, belonging to series KH-4B, captured in the frame of the mission number 1112 that took place on November 21, 1970 with a very high resolution of 1.8 m.[21] The CORONA image ID DS1110-1137DF028 was acquired on 1970/05/29, for instance.[22] Additionally, we also got strips of Mission 1110 (20/5/1970)[23] and lower quality older imagery of Mission 9038 (taken on June 28, 1962, a series of KH-4 with a resolution of 7.5 m)[24] and 1210 (June 12, 1975, a series of KH-9 Hexagon or so-called "Big Bird"), which was not captured in long and narrow horizontal bands, but wide rectangles.[25] CORONA imagery is supplied without geo-referenced data by standard. For setting it correctly into the map project it is necessary to use ground control points. In this case, we utilized precisely localized archaeological sites (their GPS coordinates) and in remote places we used positions of the crossing of canals or roads, whose position could have been verified in IKONOS and Google Earth imagery. Georeference error in this case is relatively insignificant.

Overview of satellite imagery used in the framework of the project:

Satellite	Provider	Resolution	Date
CORONA KH-4	USGS	7.5 m	1962
CORONA KH-4B	USGS	1.8 m	1970
CORONA KH-9	USGS		1975
Early Bird 1 Quickbird WorldView 1 WorldView 2	Google Earth	3 m 0.6 m 0.5 m 0.46 m and less	After 2000
IKONOS	GeoEye	0.82 m	2001

Comparison of the state of the sites as shown in CORONA and more recent satellite imagery attests to rapid changes of the landscape in general and archaeological record in particular (**Fig. 2.1**).

2.1.1.2 Topographic maps as base maps

One of the major difficulties in the implementation of this project has been the restrictive measures of the Uzbekistan government with regard to the distribution and use of detailed topographic maps. In the early 1950s, maps of the area at a scale of 1:10,000 were compiled, which would have provided an entirely sufficient basis for survey work. They record not only all the morphological anomalies on the surface, but we find in them incredible details such as individual yurts.[26] Unfortunately, these, and even less detailed

17 GeoEye operates not only IKONOS satellite, but also GeoEye 1 (0.41 m), and has been preparing GeoEye 2 with the highest resolution among commercial space-imagery providers (0.34 m). The company has merged recently with DigitalGlobe.
18 The GeoEye Foundaiton provided us with 500 sq. km of archived images covering the core area of the Sherabad Oasis.
19 http://corona.cast.uark.edu/index.html.
20 Valid for 13/5/2015.
21 For the basic information about the mission see the web pages of NASA: http://nssdc.gsfc.nasa.gov/nmc/spacecraftOrbit.do?id=1970-098A.
22 http://earthexplorer.usgs.gov/metadata/1051/DS1110-1137DF028/.
23 http://nssdc.gsfc.nasa.gov/nmc/spacecraftOrbit.do?id=1970-040A.
24 http://nssdc.gsfc.nasa.gov/nmc/spacecraftOrbit.do?id=1962-027A.
25 KH-9 Hexagon actually took picture in a very high quality (up to 0.6 m), and the available data was declassified only in late 2011 and 2012. The images that we acquired in 2009 have a very low quality, and there is no doubt about the deliberately reduced resolution. For demonstration of the full resolution of this mission, see: http://www.nro.gov/history/csnr/gambhex/docs/hexagon_kh-9_imagery_web.pdf.
26 See e.g., a sample of the map sheet J-42-64-Bb-3 (city of Denau) published in: Stride 2005, Vol. V, fig. 09.

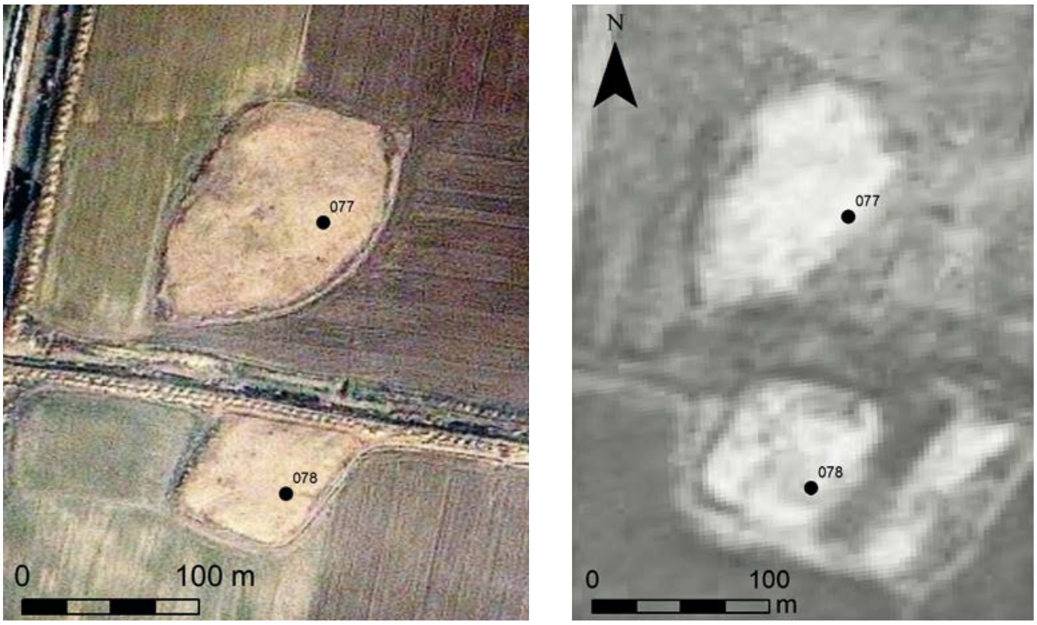


Fig. 2.1 Comparison of Corona (right) and Ikonos (left) images content.

maps at a scale of 1: 25,000 (made around 1970) are classified, and could not be legally obtained. Only in the final phase of the project we did manage to get at least map sheets at scales of 1:100,000, drawn mainly during the 1980s. These are available online for free.[27] In these sets of maps we can also find some sheets at the scale of 1:50,000, but even though they are available for the whole Afghanistan, half of Tajikistan and many other countries, the sheets of southern Uzbekistan are absent in the open sources.

Among the maps, the sheet of 100k--j42-086 has to be highlighted, since the data for its compilation had been collected early in the 1970s, about ten years before the other parts of the district. Thus it offers great comparison with the sheet of 200k--j42-19 of the same area showing many substantial changes in the landscape.

Overview of the used map sheets:[28]

Map sheet	Data collected	Date of issue	Scale
Map 100k--j42-074	1983	1986	1:100,000
Map 100k--j42-075	1983	1986	1:100,000
Map 100k--j42-086	1974	1980	1:100,000
Map 100k--j42-087	1975–1985	1988	1:100,000
Map 200k--j42-19	1983	1986	1:200,000
Map 200k--j42-20	1983	1986	1:200,000
U.S. Army map txu--oclc-6559336-nj42-9	1952[29]	1955	1:250,000

2.1.1.3 Vector data

Unlike raster data, the availability of digital vector data is even worse, particularly as regards the non-commercial sphere. For the southern region of Uzbekistan, there are actually available only very basic data sets,[30] which are moreover relatively inaccurate and outdated. These sets contain vector data on roads, waterways, railroads, location of settlements and administrative units and surface waters. Paradoxically, much more carefully prepared are, as in the case of topographic maps, freely available data for neighbouring Afghanistan. In this situation, almost all vector data for the project maps were gained mainly by digitalization of raster documents and spatial data collection in the field.

2.1.2 Digitization

The above mentioned raster documents were used to build comprehensive maps, out of those we got by way of digitization (vectorization) the following data: CORONA mainly provided us with information on the extent and course of irrigation canals as they existed in the early seventies prior to the beginning of agricultural intensification and expansion of sown areas. IKONOS was a good source of information on modern irrigation canals of the early 21st century (the comparison between the two situations is very

[27] Cf. http://loadmap.net/en for instance.

[28] For easier reading of the Soviet topographic maps the U.S. Army prepared their own manual „Soviet Topographic map symbols", issued in 1958. The manual is available online as well, see http://cluster3.lib.berkeley.edu/EART/pdf/soviet.pdf for instance.

[29] Compilation based on the General Staff of the Red Army maps of 1931–1937 at the scale of 1:200,000 and of 1939 at the scale of 1:500,000.

[30] The data are freely accessible from the following URL: http://www.diva-gis.org/datadown for instance; beyond basic vector data here, threre are not very accurate raster datasets representing altimetry, population and climate.

interesting) as well as on areas / surfaces of particular archaeological sites as known today. In parts of the territory not covered by IKONOS, Google Earth was used in order to determine the surface area of the sites. Basic information about the location of sites (points with coordinates) were also exported from Google Earth. that were already set at the primary detection and later rarely corrected.

From the topographic maps (mostly at a scale of 1:100,000), information of water sources/springs, rivers and other waterways, wells and artificial and natural water reservoirs, distinguished tombs, caves and especially small mounds in the lowlands, mostly representing archaeological sites of the tell type were taken position. For monitoring the dynamics of the development of rural areas, villages have also been mapped, allowing a comparison with the current situation reflected on the recent satellite images (cf. chapter 5.10).

Finally, the U.S. Army map seemingly offering few details on the region, turn to be of high value to us, since it was the only source showing the system of water canals before the beginning of Soviet collectivisation and fundamental change of the landscape in the second half of the 20th c. Thus, again the canals, wells, springs and ruins has been digitized from this map.

2.1.3 Detection of anthropogenic features from the satellite imagery

The detection of features, which could be assumed as being of anthropogenic historical origin was conducted as systematic visual browsing of the selected part of the satellite image. No automatic detection method was tested, which would in any case require feedback control. In the first year of the survey (2008), attention was paid to several groups of features. The first – and most important – group were settlements, represented as the characteristic mounds (tell, *tepa*) situated in irrigated lowlands. These are easily identifiable and there is little chance of errors. Thus only a fraction of these characteristic morphological features proved negative during field verification. The other groups of features were detected in the piedmonts and thus their verification and further study is not included in this volume.[31]

Satellite images were also used to search for modern Islamic cemeteries (sometimes missing on the older maps), which, as it turned out, were a good source of archaeologically relevant information (see below chapter 2.2.4).

The limits of the sites detection from the satellite imagery were revealed during the field survey, especially by the systematic survey of agricultural areas (Tušlová 2011a; 2011b; 2012a; 2012b and below in this volume), but also during surveys of modern cemeteries, where the presence of settlements outside of the *tepas* themselves was documented. Similarly, while traveling to the locations of targets detected on the imagery and maps, we succeeded more than once in accidentally discovering a new archaeological site (or simply a place with a high density of pottery fragments). This happened mainly in the fields where images or topographic maps did not show any morphological anomalies.

2.1.4 Detection of anthropogenic features from the topographic maps

As in the case of satellite imagery, we did not develop any automatic system of detection of the significant morphological features drawn in the topographic maps.[32] The time period of the data acquisition for the Soviet topographic maps (see table above) correlated roughly with the time of capturing the satellite imagery in the framework of the project CORONA. These maps thus offered opportunity to find more sites, which, since the turn of the seventies and eighties, have completely disappeared or were seriously damaged. This was the case mainly for small mounds in the irrigated lowlands, which – except for absolute exceptions – are not visible today on the satellite images or in the field. All other small mounds, detected from the Soviet map at a scale of 1:100,000, whose largest clusters are found in the south-western part of the district (near the site and village of Talashkan), are lost forever.[33] The scale did not offer too much precision, so that verification of these phenomena in the field required walking a large area (partly randomly, partly systematically), until at least a minor accumulation of ceramics was found, allowing us to assume that there was once a settlement. In many cases, however, it was found negative (Tušlová 2012b, 75).

31 For the preliminary discussion see Stančo 2009.
32 A French-Italian team working in Samarqand region states the same (Mantellini et al. 2011, 389).
33 An Uzbek-Italian team working in Samarkand Oasis published statistics of ratio between the preserved and destroyed (known only from old maps) sites. The proportion varies in the individual districts of the Samarkand province, but the average rate is 40% (Mantellini 2014, 43). For the Sherabad District similar figures cannot be obtained, since we did not have analogically accurate maps of the region at our disposal.

2.2 Survey process: field data collection

The procedures applied in the field phase of the research can be subdivided into methods related to the acquisition of spatial data on the observed sites and methods of dating.

2.2.1 Spatial data

For each explored site we measured coordinates in the global coordinate system by a GPS receiver; as the measurement point was defined a central place (or centre points of multiple components). In selected cases, the measured circumference of the *tepa* (if, for example, the centre was not accessible). The circumference was measured also in cases, where the exact extent of the site was not obvious in the satellite imagery. The other features of selected – usually more complex – archaeological sites, such as water canals and similar features, were also spatially measured. As a rule, we documented water sources which are not detectable on satellite images, but this was the case usually of the piedmont steppe areas.

For the collection of spatial data hand held GPS receiver (Garmin e-Trex) and a precise geodetic GPS with external antenna TRIMBLE and TOPCON GM 2 were combined.[34] The GPS instruments were used to navigate to pre-selected targets, to record routes, save waypoints and ground control points.

2.2.2 Topographic documentation of the sites

For the already known sites the topographical characteristics, size and shape of the sites, were in the first phase derived from the published information. Given that many of the data were inaccurate or erroneous, it was necessary to revise these topographical characteristics of sites using satellite images and a field survey. The newly detected sites have been dealt with similarly, although the field survey became primary source of information. In addition to standard photographic documentation, the creation of detailed topographic plans and 3D models using photogrammetry has been tested as well as making topographic plans using GPS receivers. The making of detailed topographic plans of the individual sites was, however, not our primary goal.

The geodetic GPS was used to collect data primarily for new topographical plans, because in addition to fewer errors in the x and y axes, it mainly provides more accurate elevation data. We got a very good picture of more complex or composite sites whose shape was either not obvious in the satellite imagery or was not fully published see (**Ch. 4 cat. nos. 23, 26, 54, pp. 139, 141, 147, 195**). Originally we considred making of topographic plans of all the sites. We, however, gave up this plan, since it was too time-consuming and/or technically too difficult to do.[35]

2.2.3 Dating the sites

One of the major preconditions for the success of the project was to obtain sufficient chronologically sensitive material, mainly ceramics, from the surface of the surveyed sites. The amount of such archaeological material on the surface varies at the individual sites considerably. The main role, besides the original extent and duration of the settlement, is being played by erosion, and also the current utilization of the settlement surface. At the surfaces of all sites, where it was possible, an unspecified amount of pottery shards was collected. The main criteria in the selection of the material laid in their informative value concerning duration and intensity of the given settlement. We concentrated on the characteristic fragments of a diagnostic nature: rims, bases, decorated fragments. Non-diagnostic fragments were, however, not entirely omitted. In individual cases, they were employed also, thus sometimes the field *Ceramics* of the site catalogue (chapter 4.2) admits pottery, even if the following catalogue of pottery (chapter 6) does not. In the preliminary dating of the material experts on the local ceramic production in various periods Sh. Shaydullaev and T. Annaev were involved. The dating of ceramic assemblages from various sites lead to determining of the dominant component in each assemblage that not always correspond to the expected final phase of the site occupation. Unique reference pottery assemblage has been gained by the excavations of the site of Jandavlattepa, especially in the Sector 02a, the so-called stratigraphic trench. This 14 m deep sounding covered periods from 2nd half of the 2nd millennium BC to 5th c. AD, i.e., almost 2000 years long! The

[34] TOPCON GM2 has the advantage that it combines the receiving signals from both the American GPS system and from the Russian GLONAS and thus leads to a significantly more accurate measurement (function nowadays common, but just several years ago not yet). As data analysis programs were used Garmin-MapSource, Topcon Tools v.7.5 and above all ESRI ArcGIS (ArcView license in Version 9.3 to 10.0), which served for setting up maps and creating and maintaining geodatabase.

[35] The other archaeological team experienced the same (cf. Mantellini et al. 2011).

proper publication of the material from this trench is, however, still in preparation. The sites that yielded no pottery or the pottery material is not sufficient for exact dating (usually a few insignificant fragments) are classified here as having no dating. This fact is indicated in the catalogue entries by empty fields of the respective periods.

2.2.4 Archaeology of modern cemeteries

While examining the satellite imagery of the research area it became clear that the surfaces of some of the local – and presumably modern – cemeteries are uneven and in some cases graves within these cemeteries even cover small mounds resembling *tepas*. Since our experience from Jandavlattepa (and from elsewhere in the region, including Talashkan II and Dal'verzintepa), where pre-modern graves were scattered across all the surface of the site, has confirmed this assumption, we decide to verify the presence or absence of the traces of historical settlement. Thus, as a very special part of the survey we conducted an investigation on the surface of the modern cemeteries of the Sherabad lowlands. Since typical grave in the area is simply covered by a pile of earth excavated from beneath, one can come across archaeological material from as much as 2 m deep "soundings". Larger modern cemetery in this way offers set of regularly distributed test-trenches allowing for localization of the extent of an eventual archaeological site. An important advantage represents the fact that local people use to embellish the grave-covering earth pile with objects they had found in the grave pit itself. Typically, it is a larger fragment of pottery (frequently also decorated), or, in some cases, complete vessel (**Fig. 2.2**). Among other objects we should mention Medieval fired bricks, Arabic inscriptions in stone, and a clay water pipe. In this way, several cemeteries in the Sherabad District has been surveyed with positive results: the archaeological material was attested at Akkurgan village (085),[36] Gambir village (026 and 125), Kishlak Bozor village (102, 128), Yakhte Yul'/ Dekhkanabad (033, 159), cemetery close to the Chinobod village (100), Takiya (079) and Hurjok (162). Besides, modern cemeteries cover also the

Fig. 2.2 Medieval pottery decorating a modern grave-covering at the site no. 033. photo by L. Stančo.

[36] Numbers in brackets indicate serial number in the catalogue of the sites below.

surface of the sites mentioned in scholarly literature already, such as Chopan Ata (035), or above mentioned Jandavlattepa (001). Let us summarize that it has been conclusively demonstrated that at almost all modern cemeteries in the Sherabad plain, there are ancient and Medieval artefacts exhibited by local grave diggers on the modern graves attesting existence of an earlier settlement at the same places. The prevalent period of occupation of these sites is Medieval one. In some cases, but not exclusively, finds are concentrated on a small mound / *tepa* within the cemetery, although finds in the flat cemeteries are also common. It is noteworthy that at the cemetery of Chinobod (100), for instance, we were able to define precisely the formerly inhabited area, since the pottery fragments appeared on the surface of the limited south-eastern part of the large cemetery. This research showed clearly that our knowledge of settlement pattern based on the in-depth study of tell-like sites reveals only a fraction of relevant data and that substantial information are still available under the surface. The interpretation of individual situations depends on various circumstances. While some sites in frame of modern cemeteries seem to represent "lower towns" of a larger *tepa* in their neighbourhood (as in the case of Kulugshatepa 004 and the pottery finds in the modern cemetery No. 098 next to it), other cemeteries cover complete settlement areal including its central architectural complex or citadel (as in the case of Yalangoyoqotatepa, nos. 026 and 125).

2.2.5 Intensive field survey

In 2009 we decided to employ also an intensive field survey in order to investigate special areas of the research region in detail. This concerned especially the neighbourhood of the *tepas* themselves. The skilled field archaeologist P. Tušlová was entrusted with this task. She with her team worked in two consecutive seasons (2010 and 2011). The intensive field survey was conducted in large polygons, while selected locations were subject to total pick-ups and additionally also to micro-trenches (in this case areas with the highest density of pottery were targeted). This sub-project, methodologically quite unique in this region, brought many interesting ideas and greatly enriched the whole mapping program of the Sherabad District. Its methodological basis, workflows, and results are described in detail in separate articles (Tušlová 2011a; 2011b; 2012a) and an MA-thesis (Tušlová 2012b). It is also presented as final report here in this volume (see chapter 3).

2.3 Evaluation of previous literature and confrontation with previous research

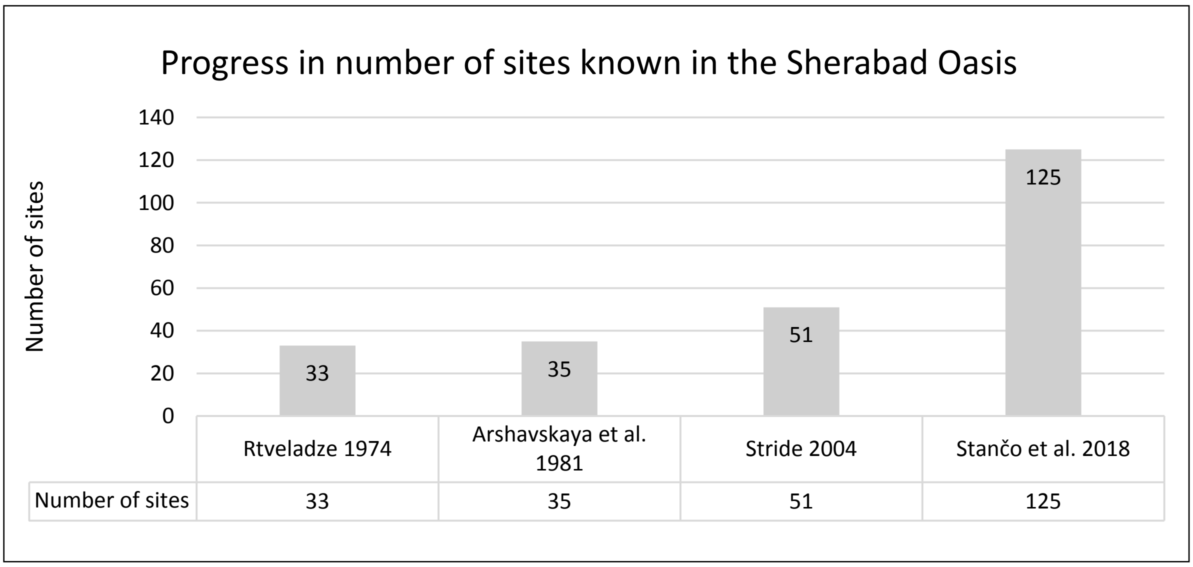
The collected data were continuously compared with the information provided by the work of Soviet researchers mainly from the 70s and 80s of the last century (see chapter 1.4 Previous research). The work of E. V. Rtveladze and his colleagues from the 70s remain the base (Rtveladze – Khakimov 1973; Rtveladze 1974; Rtveladze 1976; Arshavskaya et al. 1982). Besides the aforementioned shortcomings in the majority of these publications many problems arise by a strange convention, according to which some smaller monuments are not dealt with separately, but grouped together or included in the description of some of the nearby major sites. In some cases, clusters of various topographic features are grouped and described under the name of central *tepa*, as in the case of Kattatepa (Rtveladze – Khakimov 1973, 19; Rtveladze 1974, 77). Accordingly, we considered a feature detected in the field or in the satellite imagery to be a new site, but it turned out to be a site already known to our predecessors, its description though was published only within the publication of the larger nearby site. The other "newly" detected sites were known to other scholars, but the information was not properly published, not to mention sites kept secret by fellow scholars. The greatest problems, however, were paradoxically caused by the most recent work and most ambitious publication on the settlement pattern in Surkhan Darya, which in its assumptions and objectives in many respects coincide with the objectives of the current volume (Stride 2004). The author – as it turned out – in the case of our research area worked (with exceptions) only with the aforementioned Soviet literature and has not verified the data in the field. This led to the situation that many sites are mistakenly identified by him as other features in the field, many are completely wrongly localised, since the coordinates are based on inaccurate and poorly understood descriptions in older literature, and especially the dating of the sites that demands revision is adopted without any corrections, although these data are then used for significant historical interpretations. It confirmed the legitimacy of the practical procedure we employed in the following order 1) detection in satellite imagery, 2) verification in the field, 3) verification in the literature.

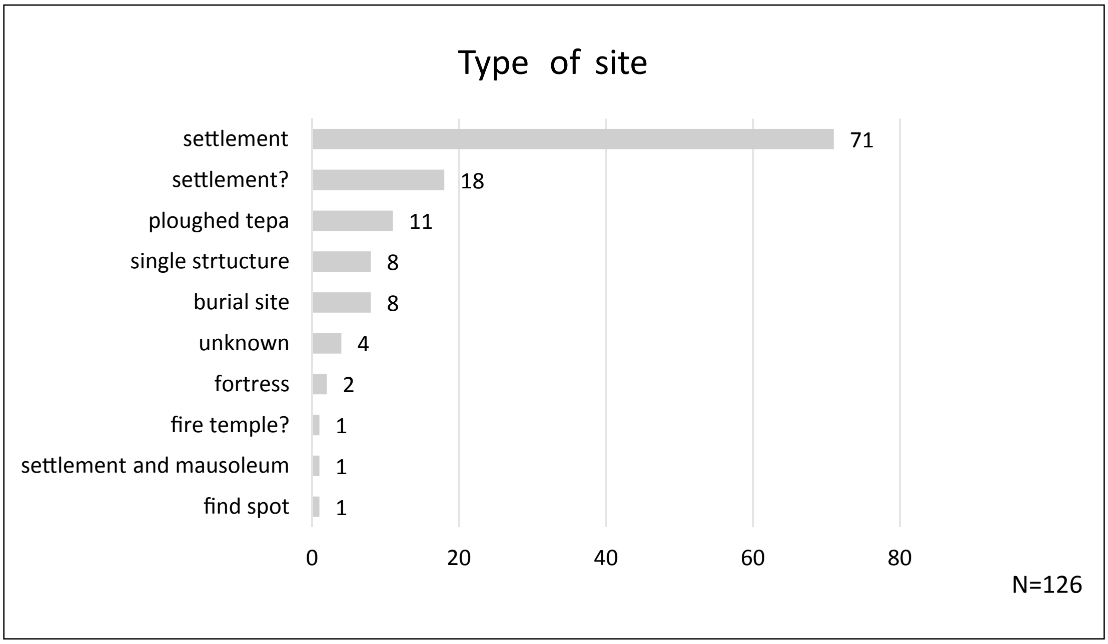
2.4 General results: statistic overview of the gained data

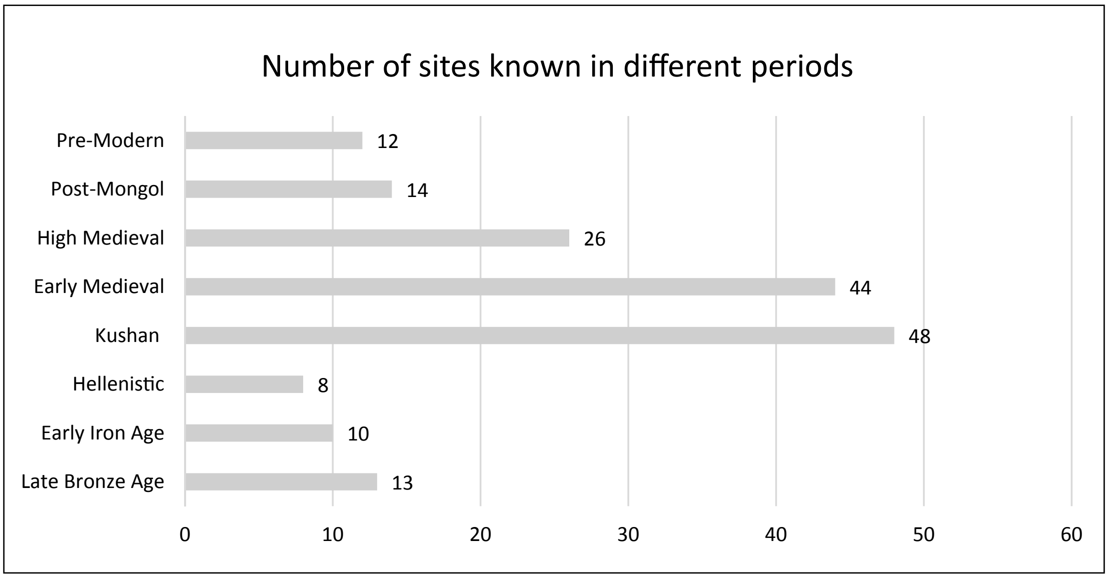
After four seasons of fieldwork, the overall database consists of 126 individual archaeological sites, of which only 12 belong to a group of the sites which we ourselves have not visited, but the information about their existence and characteristics were taken from publications. Some sites were visited more than once, some of them had been reported even before the commencement of systematic mapping (2002–2006). Most of the 112 surveyed sites yielded pottery material and consequently 27 sites have been dated for the first time, while dating of many other sites has been refined or updated.

As for the typology of the sites, we divided the sites into the basic types consisted of settlements, forts, single architectures, burial sites, and their combinations, and also find spots of individual objects without topographical anomalies. A limiting factor for developing an in-depth typological study was state of preservation of individual sites. Besides many completely destroyed or ploughed *tepas* that are scarcely recorded in historical maps or CORONA imagery, many other sites were partially damaged or disturbed, at least in their lower parts especially in the recent decades. Typically – as we assume – a well preserved main *tepa* represents only a central elevated part of an otherwise destroyed site, as in the case of Jandavlattepa, Kattatepa, Khosiyattepa and others. Nevertheless, following the basic typology given above, the prevailing type of sites in the research area, judging from surveyed sites only, is the tell-type multicultural settlement (tepa). We have documented 101 such sites (in 11 cases it was ploughed *tepa* that was with all probability originally settlement, too), two forts, eight single structures typically well-preserved architectures and eight burial sites. In one case the settlement is combined with mausoleum. Specific case is represented by a site interpreted as fire temple.

One site is marked as find spot, since it has yielded only one, but interesting find (clay figurine), without being otherwise morphologically distinct. This category may have been much more numerous, but we have not documented single finds in a systematic way (not to mention single highlight quoted in scholarly literature). Four sites are not typologically determined.




Type of site
settlement 71
settlement? 18
ploughed tepa 11
single strtucture 8
burial site 8
unknown 4
fortress 2
fire temple? 1
settlement and mausoleum 1
find spot 1
0 20 40 60 80
N=126


Number of sites known in different periods
Pre-Modern 12
Post-Mongol 14
High Medieval 26
Early Medieval 44
Kushan 48
Hellenistic 8
Early Iron Age 10
Late Bronze Age 13
0 10 20 30 40 50 60

3. Intensive surface survey

P. Tušlová

3.1 Introduction

The following chapter summarizes the results of a two-year intensive surface survey conducted on the cultivated lowlands of the Sherabad District in 2010 and 2011. The project was initiated in the year 2010 as an extension of the ongoing research of Ladislav Stančo, during this time focusing on the ground control of archaeological sites detected in satellite imageries and topographic maps and their reconnaissance in the terrain (Stančo 2009; Danielisová et al. 2010).

The short term project had two main tasks to fulfil. The first aim was to complement the selected Czech–Uzbek investigation with the intensive surface survey; the second task was to test the potential and suitability of the field survey methodology in the area of Sherabad District for future large-scale research.

The project, conducted all together in a period of seven weeks, was carried out in September 2010 and during October and November 2011. Selected fields were first intensively and systematically surveyed; later specific areas were chosen for total pickups and test pits. All the field work was carried out by students of the Institute of Classical Archaeology at Charles University. Aside from the author, four students participated in the data collecting in the field and their later post-processing.[37]

3.2 The agricultural conditions of the Sherabad Oasis

The favourable climatic conditions of the Sherabad Oasis are reflected in the intense agricultural activity. The main crop of the Sherabad Darya valley is cotton. Its cultivation was enhanced during the Soviet period when a dense network of irrigation channels was built to supply fields with a sufficient amount of water (Stride 2004, 61).

Other agricultural products in the area include spring and autumn vegetation common in Central Asia in general. In early spring, cereals, particularly wheat, barley and millet, are planted to be harvested at the end of May. Autumn plantation includes cotton, corn, sorghum and cucurbitaceous which are sown after the May crop is harvested (Stride 2004, 136). The cotton bushes remain on the field until November when they are cut and collected. In September, our team encountered also rice, sunflowers, pomegranates and melons in the fields, all however covering only small fractions of them.

During the two-year investigation our team familiarized itself with the agricultural system in Uzbekistan which is based on a variation of the principal crops, cotton and cereals, which are annually rotated. This is very important knowledge for field survey planning as almost every extensively cultivated field has low vegetation cover period and is therefore possible to be properly investigated. While surveying in autumn, the fields covered by cereals are uncultivated. In such a case, every year only the harvested fields can be investigated with the possibility to cover a continual area with excellent surface visibility in a two-year period. During the first year season of our project, cotton fields, around the areas of our investigation, were drawn in the form of polygons into the GIS and the

[37] Great thanks belong to participating students: Věra Doležálková, Adéla Minaříková (Dorňáková), Viktoria Čisťakova and Tereza Včelicová (Machačíková) for their help and hard work.

next year compared with the current situation. While considering the cotton and cereal, the rotation worked in approximately 95%; only on one of the investigated fields the cotton persisted into the next year.

Diverse vegetation covering smaller areas such as rice, corn and sunflowers were not included into the previous statistics of rotation as they are not that clearly predictable. In some cases, sunflower fields of the first year turned into cotton fields the next year and therefore the visibility and passability did not distinctly change from year to year. Grasslands field cover either persisted to the next year with no changes or started to be cultivated (most frequently it was turned into a cotton field).

3.3 The field cover, factors of visibility and passability

During the course of the project the main characteristics of the investigated fields were recorded. An emphasis was placed on a detailed description of the field cover, land use, vegetation characteristics and its density. Furthermore, factors of passability and surface visibility, which proved to be very closely connected to each other, were marked.

Fig. 3, 1 Ploughed field, captured in autumn, south of Gorintepa. Photo by Petra Tušlová.

The visibility of the surface of each field was recorded in a percentage in the range of 100–80% (excellent), 80–60% (very good), 60–40% (good), 40–20% (low), 20 % > (very low). The passability (the walking conditions) was expressed as excellent, medium-hard and difficult. According to the two-year observations the surveyed fields were divided into the following classes with more or less consistent characteristics:

- **Ploughed fields** contained deep furrows reaching up to 50 cm underground. Their surface visibility was excellent and the passability ranged from medium-hard to difficult. In September these fields were very dry and hard. From October to November the soil was softer, sporadically moistened due to occasional rain (**Fig. 3, 1**).
- **Harrowed fields** featured excellent visibility in general. During September hard and dry lumps of clay of variable sizes accumulated on the field surface making the passability medium-hard. From October and November surface of those fields was softer, but muddy, keeping the passability on medium-hard (**Fig. 3, 2**).
- **Furrows** in the Uzbek context are freshly piled up parallel lines of earth separated by narrow and reg-

Fig. 3, 2 Harrowed field with Gilyambobtepa in the background, captured in summer. Photo by Petra Tušlová.

Fig. 3, 3 Furrows in summer, captured without water, north of Shishtepa. Photo by Petra Tušlová.

Fig. 3, 4 HDS field in summer. Photo by Petra Tušlová.

Fig. 3, 5 Pasture during autumn (originally HDS field), area of Shishtepa. Photo by Petra Tušlová.

ularly irrigated channels approximately 30 cm deep. In general, the visibility and passability is excellent, although these good conditions might be negatively influenced by water flooding parts of the fields making them difficult for walking or simply inaccessible (**Fig. 3, 3**).

- **HDS** is a term artificially created by our team, which stands for harvested beaten furrows that are no longer irrigated; they are flattened and covered by varying amount of straw as a result of the past agricultural activity. HDS stands for Hard, Dry with Straw, indicating the basic characteristic of the field surface (**Fig. 3, 4**). These specific features however apply to the dry weather only. In October and November, although the straw cover did not change, the soil became softer due to the rain. The visibility on the surface worsened with the passing months (in some cases probably also years) after the harvest as weeds started growing on the uncultivated soil. In fact, in some places it was difficult to separate HDS from pasture. In the result the visibility varied between very good (100%) and very low (up to 20%). Surface visibility below 20%, although in combination with formal shaped HDS, was automatically considered as pasture.
- **Pasture** – uncultivated fields – contain permanent amount of surface vegetation ranging from sparse to mature. This influences the visibility covering almost the entire spectrum, except the excellent one (consequently ranging from 80% > 0). The passability is in general excellent or medium-hard while waterlogged (**Fig. 3, 5**).
- **Harvested cotton fields** were investigated during the 2011 season only when they were partly or entirely harvested. There were either leafless cotton bushes standing in the field or cut shrubs piled up on the field surface. In both cases the visibility was on the average very good, although excellent or low visibility was also possible. The passability differed depending on the growth stage of the bushes (**Fig. 3, 6–7**).

The following table illustrates the extent of each land cover within the total amount of fields walked in September 2010 and October/November 2011:

Fig. 3, 6 Leafless cotton bushes. Area of Jandavlattepa. Photo by Petra Tušlová.

Fig. 3, 7 Harvested cotton bushes piled up on the fields. Area of Jandavlattepa. Photo by Petra Tušlová.

Year	HDS	Ploughed	Pasture	Harrowed	Furrows	Harvested Cotton
2010	47%	23%	20%	7%	3%	0
2011	49%	6%	3%	9%	9%	24%

There were also other aspects of the surface visibility and passability besides the density of the vegetation cover. For instance, the soil aridity or, by contrast, the soil moisture level influenced the clarity of sherd recognition in the terrain. Pottery fragments were easier to find on wet grounds as they were "disappearing" to the neaked eye when coated with dust. For sherd identification late autumn featured slightly better conditions as most fields were wet.

Another outstanding aspect influencing visibility around some of the investigated areas was salinization. The water of Sherabad Darya, which is used for the irrigation of the oasis, is partly salty. When the water evaporates a thin layer of white salt crust remains on the surface obscuring both the soil and any potential artefacts (**Fig. 3, 8**). Regarding the investigated area, this effect was particularly noticeable around Kulugshatepa.

Enclosures for domestic animals and mobile shelters for the shepherds were another significant impediment to the intensive field survey. They are simple wooden or metal fence structures standing in the middle of a field surrounded by straw, with domestic animals (mostly goats and sheep) covering the area with a layer of excrement (**Fig. 3, 9**). The enclosures were often accompanied by guard-dogs which also very effectively eliminated the passability in their surroundings.

The investigated areas are interlaced with an ingenious network of channels bringing water to irrigate the field (called *arik,* **Fig. 3, 10–11**) and diverting water to drain off the field (called *zeber,* **Fig. 3, 12**). The first channels are shallow, mostly of concrete, either recessed in the ground, placed directly on the

Fig. 3, 8 A field covered by a soil crust. Area of Jandavlattepa. Photo by Tereza Včelicová.

Fig. 3, 9 Domestic-animals enclosures with temporary dwelling placed on the fields. Area of Ayritepa. Photo by Tereza Včelicová.

Fig. 3, 10 A concrete *arik* placed on the ground, area of Gilyambobtepa. Photo by Tereza Včelicová.

Fig. 3, 11 An elevated *arik* made of concrete, area of Gorintepa. Photo by Tereza Včelicová.

field or slightly elevated. The latter channels are several meters wider and deeper. An appropriate example of a modern day *zeber* is the one east of Ayritepa which is approximately 12 m wide and seven meters deep (**Fig. 3, 48**). During the field walking the water channels represented the main boundaries between the fields, and in some cases they were very difficult to cross. Some of the *zebers* do not have a crossing for several kilometres, although in some places it is possible to wade through if the water is low. *Ariks* are easy to climb over or crawl underneath, however for the agricultural machines both types of channels represent impassable boundaries. The cultivation of fields is thus undertaken in a delimited area which does not allow the movement of surface materials to great distances. This is an excellent premise for the field survey as artefacts in irrigated lowlands accumulate around the place of their original deposition.

Fig. 3, 12 Wide water channel – *zeber*, area of Gilyambobtepa. Photo by Tereza Včelicová.

3.4 Methodology

The project was based on the intensive field survey of selected areas chosen according to their proximity to *tepas*, their (easy) passability and (excellent to good) visibility. The survey was complemented by total pickups which were performed on all of the detected scatters, and by several test pits which were carried out in the areas with the highest pottery accumulation.

During the project, satellite images (CORONA, IKONOS, Google Earth) were combined with Soviet topographic maps (1:500,000, 1:200,000 and 1:100,000 scale), and processed in an application based on Geographic Information System (GIS). This technology was used to facilitate the data collecting, visualisation and evaluation. The digital data were dabbled by paper forms to collect maximum information and to prevent their loss.

In the landscape the topographic maps proved to be a much better tool for orientation than the satellite images. The majority of the depicted main roads and irrigation channels with the corssings did not change much from the current situation, which helped with navigation on roads as well as in terrain.

3.4.1 Data collecting

During the field walking data were collected on a PDA Trimble Juno SB equipped with a GPS and running ArcPAD, the mobile application of ESRI ArcGIS. IKONOS satellite imagery and the topographic maps served as base maps, while the integrated GPS showed to the field walking team its constant position in the terrain. Surveyed areas were drawn into the PDA in the shape of polygons and were numbered to facilitate the post-processing. For better orientation and additional back up, tracklog and navigation points were kept by a hand held GPS Garmin eTrex. Digital spatial records were accompanied by detailed paper forms containing information about each field (**Fig. 3, 13**). Both sources of data were daily processed and combined in the project geodatabase, back on the archaeological base.

Fig. 3, 13 PDA Trimble Juno SB, GPS Garmin eTrex and the paper documentation. Photo by Tereza Včelicová.

The paper forms recorded the agricultural and walking conditions, the visibility and the passability of fields, waterlogging or dryness of the soil, the slope of the investigated fields and the information about the stone amount accumulated on the field (**Fig. 3, 14**). The main information however comprised the count of artefacts (pottery, fragments of architectural ceramics and single finds).

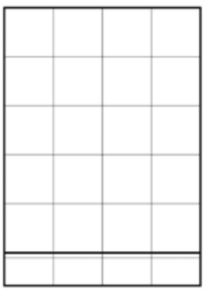
3.4.1.1 Intensive field survey

The intensive field survey was applied in areas in the immediate vicinity of *tepas*, previously investigated by the team of Ladislav Stančo. An average amount of material located on the fields was determined, visualized in the GIS application and evaluated in accordance to its growing and falling tendencies in separated polygons which created a basic unit of the research.

The methodology of the project was based on the multidisciplinary Tundzha Regional Archaeological Project (TRAP) conducting field survey in the Yambol and Kazanlak Districts of Bulgaria between 2009 and 2011 (Ross et al. 2010; Ross – Sobotková 2010; Sobotková et al. 2010; Sobotková 2009).[38] As a permanent member of the research team in Bulgaria I learned the methodology and the documentation processes. Therefore, the project in Sherabad District was inspired by the TRAP procedures but the approaches were modified to suit the different environmental conditions and cultural-historical development of Central Asia.

In contrast to the TRAP, only the intensive field survey strategy was utilized. The visibility 100–50% used by the TRAP for the intensive survey was by our team extended to 100–40%. This approach enabled us to intensively cover a more extensive area. Furthermore, the spacing between field walkers was set at a permanent 15 m instead of the original TRAP range which varied between 10 m and 20 m (Sobotková et al. 2010, 58–61). The different agricultural and climatic conditions of the Central Asia had to be also taken into consideration in the field work preparation, undertaking and evaluation.

The investigated fields in the Sherabad District were walked in transects with participants spaced side by side at 15 m intervals. Artefact densities were also called out by walkers at 15 m intervals as they progressed. This formed "cells" of 15 × 15 m. After five rows were walked the polygon was closed and drawn in the portable electronic device. The dimensions of one polygon approximated a rectangle of 60 × 75 m (covering about 0.45 ha), i.e., four walkers by five rows (**Fig. 3, 15–16**). The polygons were prolonged by up to two more rows or shortened and narrowed when necessary, depending on the fields' dimensions or anomalies revealed during the field walking.



Sherabad 2010 - 2011	Date:
Polygon:	
Shard count type: Row count	**Walk. Interval**: 15 x 15m, 10 x 10m
Visibility: 100-80% x 80-60% x 60-40% x 40% > 0	**Stones**: 5 x 3 x none
Land use: Annual x PerAnnual x Pasture	**Pottery Frag.**: 5 x 4 x 3 x 2 x 1
Vegetation: Dense x Sparse x None	**Worn**: 5 x 3 x 1
AgrC: Plow x Harrow x Furrows x HDS x Cotton	**WalkingC**: Excellent x M.H. x Difficult
SurfaceC: Waterlogged x Optimal x Very Dry	**Sample**: Yes/No
Slope: Steep x Gentle x None	**Same as below** ☐
NOTE:	

Fig. 3, 14 Paper form for each polygon recording basic data about the fields and the material which was found there. The particular amount of finds (pottery/AC/other) was filled into the cells on the left, representing four lines/four people walking five rows. The form is inspired by TRAP, modified for the area of South Uzbekistan.

[38] More about the project and its personnel might be found at: http://www.citiesindust.org/.

36

Fig. 3, 15 Intensive survey of HDS field with 15m spacing between individual members, area south of Ayritepa. Photo by Petra Tušlová.

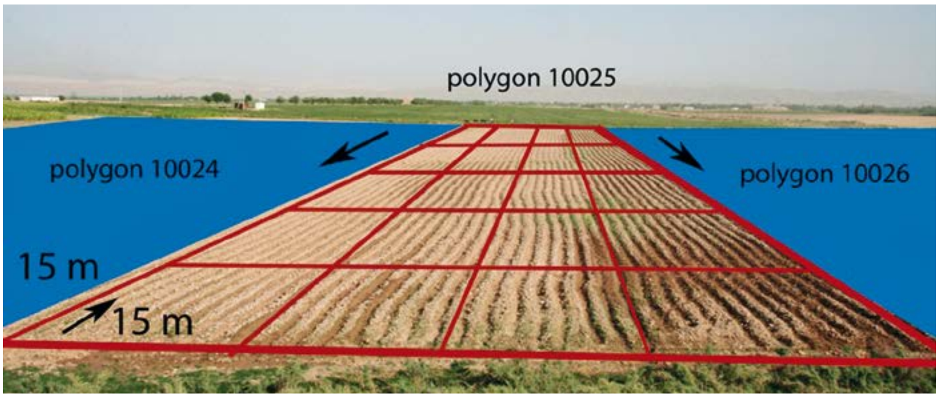


Fig. 3, 16 Visualisation of the intensive field survey polygon by polygon. Created by Petra Tušlová.

The project aimed to obtain a representative field sample without any ambition to cover the entire Sherabad District. As already stated by Alcock et al. (1994, 137), intensive field survey is based on quantified observations and controlled artefact collection in the defined area. As a result, effort was made to proceed in more detailed intensive survey rather than aiming to cover an overwhelmingly extensive area. The spacing between participants defines the size of the smallest detectible scatter/site (Plog et al. 1978, 383–421). In this sense the approaches were chosen in accordance with the desire to examine smaller areas in detail rather than focus on covering an extensive region.

The approximate area observed by each participant was around a two meters wide corridor – one meter to each side of their walking line (e.g., Bevan – Conolly 2012; Sobotková et al. 2010, 58).[39] As a result the final numbers given in the following text represents only a fraction of the total amount of the surface material, counted in 600 sq. m out of 4,500 sq. m of one regular polygon, i.e., about 13% of all of the estimated artefacts prevalence in one polygon, scatter or site.

Information about the amount of pottery fragments, architectural features or other material detected on the field was written into the paper forms regarding each polygon. If possible, modern pottery was distinguished from ancient pottery to study patterns of modern debris deposition. Diagnostic fragments from each polygon, including bases, rims, handles, decorated or otherwise significant pieces were collected for further investigation, while insignificant fragments were only counted for comparative purposes and left in place.

3.4.1.2 Test pits

The test pits were placed on three out of four detected scatters (ShFS01, ShFS02 and ShFS03; **Fig. 3, 17**). The last scatter (ShFS04) was omitted due to its remoteness as well as to lack of a time. The test pits'

[39] Bintliff and Snodgrass (1988) consider a range of 2.5 m on either side of each field-walker, thus creating five-meter-wide corridors. As a result of my previous field survey experiences the number seems to be exaggerated. Therefore, the two-meter definition mentioned in other scientific works was preferred. Consequently, participants were instructed to count one meter to both side of themselves to gain a uniform average number from each of them.

dimensions were established at 100 × 80 cm[40] with an intention to reach 100 cm underground – to fully remove the topsoil and to understand the possible revealed stratigraphy underneath. Individual spits were approximately 20 cm thick. However, in several cases the excavation work was stopped either due to groundwater appearing approximately 80 cm underground or by the presence of a mud-brick wall covered by the topsoil. In such cases the test pits were not fully excavated to the desired depth. By contrast, two test pits at scatter ShFS02 were excavated to a depth of approximately two meters. This was due to the softness of the soil – irrigated by water channels – which enabled easy digging. The advantage of favourable conditions was utilized to dig up to the maximum possible depth in order to reach bedrock or sterile soil. However, neither one of them was reached in any of the test pits.

Pottery fragments gained from the test pits were divided according to the spits and counted for further analysis. Diagnostic fragments were retained and evaluated for comparisons with the collected surface material and also in order to trace remains of stratigraphy. However, the main aim of the test pits was to verify the field survey results – to reveal a continuity of the material under the topsoil whilst also excluding the secondary displacement of the surface material. The final evaluation of the scatter chronology was then based on a combination of data gained from the surface survey and also from the test pits.

3.4.1.3 Total pickups

The TRAP again inspired the project's total pickup methodology by way of re-sampling the investigated scatters (Sobotková et al. 2010, 61). On each surveyed area featuring a large amount of surface material a total pickup was placed in several different places. A square of 10 × 10 m was marked in the selected area and all the material concentrated within was collected (**Fig. 3, 18–19**). The artefacts gathered in the square were then divided into individual groups based on their main characteristics (see 3.5 "The surface material division"). The artefact groups were processed in the field: weighed, counted and photographed. The non-diagnostic fragments were left on the same place as found on the field whilst the diagnostic ones were retained for further study.

The method of total pickups provided the project with a representative and quantified sample of the material present on the fields, including classes of tiny artefacts which might be easily omitted during the field survey. The total pickups enable evaluations of the variability of surface artefacts within one investigated scatter and comparison among the other areas of interest. Different chronological or typological components can also be identified, changing the general idea of a scatter after the evaluation of the intensive field survey.

Fig. 3, 17 Test pit carried out in a corn field – area of Pachmaktepa. All of our field activities enjoyed a great attention among locals who often helped with the work. Photo by Petra Tušlová.

[40] As described further in the text the first test pits placed on SHFS03 had smaller dimensions (50 × 80 cm), which proved to be insufficient.

Fig. 3, 18 Total pick up (polygon 10 × 10 m) carried out next to a Khosyattepa (the first test pick up). Photo by Petra Tušlová.

Fig. 3, 19 Sorting and counting of the material collected during the total pick up. Photo by Petra Tušlová.

3.5 The surface material division

3.5.1 Classification of the material

The collected surface material was divided into several groups based on its characteristics. These groups were material-based classifications, not chronological divisions as the fragments were mostly non-diagnostic, i.e., not suitable for this approach. The main aspects of the characteristic classifications considered the material, the main function and the appearance of the artefacts.

Firstly, different materials were separated within the scatter assemblage. Pottery, various types of architectural ceramics, glass, metal, bones and wasters were grouped together. Rarely detected small finds sometimes represented a unique group as a single piece, for example special objects such as a terracotta bead or part of a stone pestle were found.

Fig. 3, 20 Illustrative example of a pottery group – yellow ware – collected within one pickup. The group is counted and weighted; the diagnostic fragments collected for further documentation (in this case the rim of pithos, see Tab. 3, 3:3). Photo by Petra Tušlová.

The pottery was further divided according to its function and appearance.[41] The subgroups are: kitchen ware (KW), grey ware (GW), fine ware (FW) and common ware (CW).[42] The maximum thickness for FW sherds was decided as 0.5 cm which created an appropriate division between FW and CW classifications as the clay of FW and CW sherds featured very similar characteristics otherwise. The CW was further divided into red ware (RW) and yellow ware (YW), reflecting the standard colour of the clay (for example see **Fig. 3, 20**).

The fabric colour of KW varied between ochre, brown and black. The surface was smoothed to cover the higher amount of inclusions, reaching up to 20%. Variable shapes of pots, generally burned from outside, were found. The pottery was in majority wheel made, with several handmade fragments.

The GW fragments have a solid grey color of the fabric. They are covered from both sides by a thin layer of slip of the same colour. The fabric is very well levigated, with a maximum of 5% of inclusions. This group is represented by five pieces only, connected solely with scatter ShFS03. These sherds were all, except one fragment, dated to the end of the 4th century BC (by Sh. Shaydullaev). The reminding GW sherd belongs to Timurides period and it will be discussed in connection to ShFS03.

The fabric colour of the FW category, and its charactristis in general, varied. In all cases, however, the fabric was very well levigated with a small amount (up to 5%) of tiny inclusions. The shapes included different types of table ware – predominantly bowls, plates and small jugs. This group, most of all, reflected the chronology of fragments regarding colour, slip / glaze and decoration.

The fabric of CW may be both fine and coarse, ranging from 5% to 20% of inclusions. Red and yellow colours for the sherd fabric completely dominate, however no relation between specific morphological types and colouring was detected. Most common in both categeories are bigger size jars, stands and storage vessels.

The Architectural Ceramic (AC) was placed into a single group with the intention to divide the collected material into sub-groups of bricks and daubs if possible. There were no roof-tile fragments on the fields which reflected the practice of rooves constructed from organic materials, a combination of wooden trusses, clay and straw which is still used nowadays.

[41] The material classification was inspired by the Czech-Uzbek team division whilst excavating Jandavlattepa.

[42] Since all coarse wares which had been found relate to kitchen/cooking ware, or to storage wares, the term coarse ware was not used, consequently the abbreviation CW stands for common ware.

Due to the late date of the field survey in 2011 and almost daily rain, not only the investigated fields, but also the collected pottery and architectural ceramics were all soaked and muddy. In order to obtain the real weight of the collected material to compare it with the extremely 'dry' data of the previous year, one kilogram of variable pottery types and of AC fragments was gathered from the wet field, washed, dried, and again weighed. After eight days the weight was established at 816g. Because the conditions of the total pickups were very similar for all of the scatters, the final pottery and AC weight of every detected category collected during the 2011 season was in the end reduced by 0.184 grams per gram to obtain comparable data for both years.

The collected material was processed at the archaeological base – drawn, photographed and analysed for fabric type, colour, manufacture etc. Preliminary classification and identification of the pottery was conducted by collaborators of the Czech team T. Annaev and Sh. Shaydullaev, respected authorities on the issue in Surkhan Darya province, who kindly assessed the fragments and helped with their dating. During preparation of the ceramic material for publication, pottery forms for comparision were seaked for in literature, as well as compered with exhibited material in archeological museums in Sherabad, Termez and Tashkent. No convenient literature for the pottery of the 16th century AD further to the modern days was available (at least up to 2012 when the material was procesed). Consequently, all of the 'younger' material presented here, if not stated otherwise, was recognized by Tokhtash Annaev.

3.5.2 The size of the fragments

To determine the approximate fragmentation of pottery and AC material, a basic definition relating to the sherd dimensions was applied:

- coin size (a regular-size coin such as a quarter dollar or euro 50 cent)
- half palm size
- palm size
- hand size (the palm with fingers)

The different dimensions used in the text derive from those four basic ones or represents their variants. For example, descriptions such as "smaller than a coin size" and "dimension between palm and hand size" were used in the descriptions. The indicated dimensions are based on the covered surface, not on the shape resemblance.

3.6 Introduction to the Field Survey

The intensive field survey was undertaken only in the cultivated areas including both banks of the Sherabad Darya as far as 18 km from the centre of the town of Sherabad. During the seven-week investigation conducted over the two seasons of the duration of the project, 1567 polygons were set up, covering approximately 731 ha (**Fig. 3, 21**). Out of them 245 polygons with the overall surface area of 114 ha are connected to the scatters subsequently described in the text. On average, about 16% of all of the surveyed areas revealed enough surface material to be classified as an artificially created cluster connected with previous human activity. The clusters are predominantly represented by scatters marked as ShFS01, ShFS02, ShFS03 and ShFS04,[43] partly also by the material accumulations ascertained in several areas in the immediate vicinity of Jandavlattepa, particularly with the clusters numbered as 150, 154, 155 and 155.

The chronology of the surface material is based on determined diagnostic fragments which make up about 62% of all of the collected and documented pottery. The remaining amount was insufficiently significant to provide any further data. The pottery drawings in tables shown in the text regard each scatter, representing a selection of the most diagnostic examples, used here to illustrate the most characteristic types for each period. They are a mixture of material gained from the intensive survey, test pits as well as from the total pickups.

If not stated otherwise, the chronology of *tepas* mentioned in connection with the investigated scatters is based on the field walking and pottery studies of the Czech-Uzbek team. For more information regarding the *tepas* itself see chapter 3.8.6, which offers their detailed description.

[43] The abbreviation „ShFS" stands for Sherabad Field Survey. The subsequent number reflects the order in which the scatters were found.

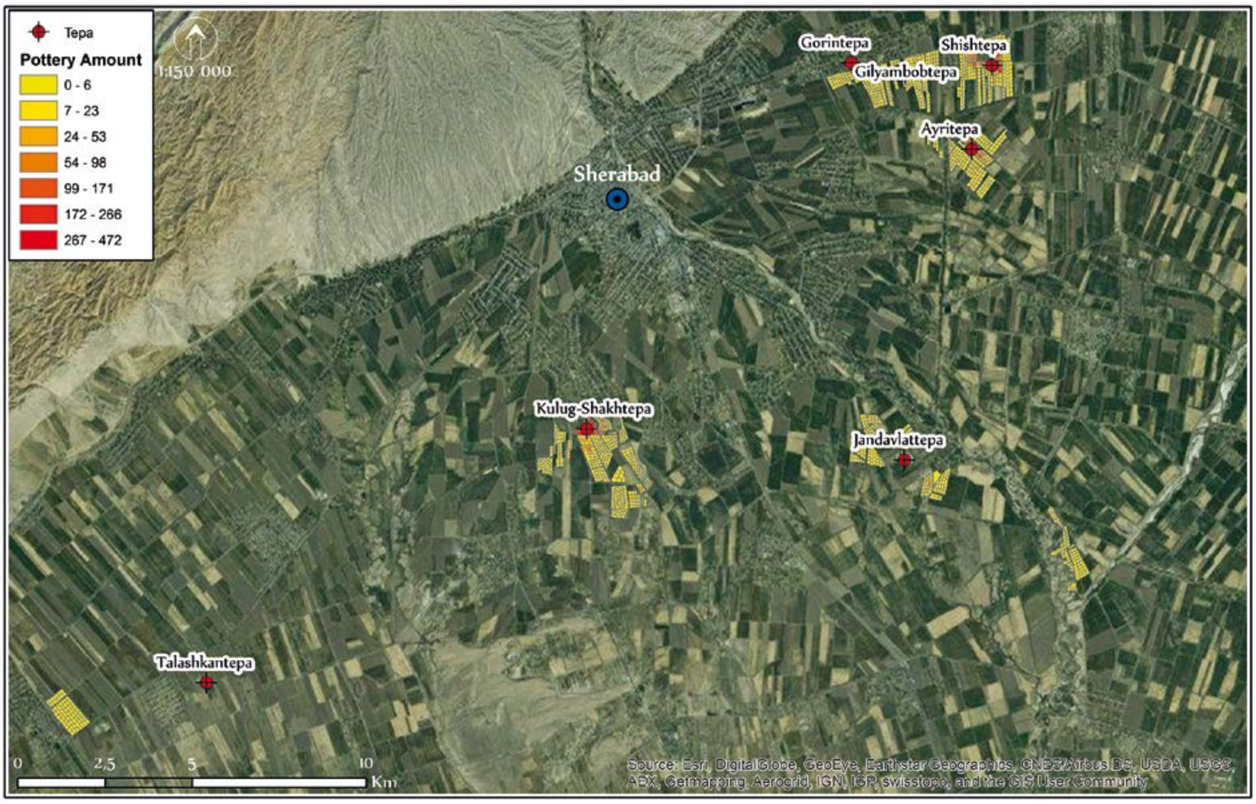


Fig. 3, 21 Map of the Sharabad Oasis showing all of the areas surveyed in 2010 and 2011. High pottery concentrations are marked by the red colour. Map by Petra Tušlová.

3.7 The scatter and the site

3.7.1 The definition of the scatter and of the site

For better understanding of the following text it is now necessary to clarify in what sense the terms "scatter" (or cluster) and "site" are used in this chapter.

The term "scatter" is used for the surface material spread over the fields or accumulated in the vicinity of elevated tepas. The term "site" basically stands for the *tepa* – settlement – itself. It might be applied to the elevated mounds recorded by the field survey as well as to those newly detected in topographic maps or in satellite imagery (as in the area of Jandavlattepa).

3.7.2 The character of the scatter and of the site

The investigated fields in general revealed a small amount of the surface material which has been predominantly connected with the immediate vicinity of tepas. The accumulations may be divided into two groups.

The first one is connected with light pottery scatter concentrated in the immediate vicinity of *tepa* (in our case namely around Taushkantepa, Gilyambobtepa and the southern part of Khosyattepa). The pottery dispersion reaches up to a maximum distance of 350 m from the *tepa* and reveals the same pottery types and thus identical chronology with the closest site. Due to the small amount of pottery fragments and architectural ceramics whose quantity sharply decreases with growing distance from the *tepa* it seems that these scatters only result from the *tepa* fallouts. The distribution of the material over the closest fields was then caused by agricultural activity, but as well various human or natural factors might be involved.

The second group is created by several outstanding surface accumulations of pottery and architectural ceramics. In our investigated sample they are again connected with tepa, but the raised amount of surface material reaches up to 800 m from the centre of the closest *tepa* (measured on ShFS03 – Shishtepa). The amount of the material concentrated around the *tepas* is usually constant for several tens of meters and dwindling gradually after a few polygons. Generally, it is possible to determine the core and the margin of the cluster; also the borders of the scatter are clear, very well differentiable from the surrounding fields. In this case we are either dealing with new sites or, more likely, with continuation of the nearby tepas.

It is impossible to distinguish precisely the original dimension of the site out of the dispersion of the surface material. The dimensions and number of the discovered material discussed in the following text therefore regards the core and the marginal areas of surface scatters, without attempting to define the original extent of the settlement. In several places, the underground continuity of the surface material was attempted to be determined by means of the test pits which without exception confirmed the pottery presence down to the deepest excavated spits.

Different approaches were embraced in the area of Jandavlattepa where the presumable archaeological sites were detected on the basis of the topographical map and verified by the field survey. Since these sites were sought for in specific area, even a small amount of the surface material found in the vicinity of the predicted feature was considered as a site. The lowest number connected with a scatter was 45 fragments collected in an area of approximately 200 sq. m.

3.8 The areas of the field survey

The intensive survey – introduction

Before the beginning of the project, several areas suitable for prospecting had been chosen in advance from the IKONOS and Google Earth satellite images. The main criteria for the selection were the extensiveness of the area, the low habitation rate and presence of at least two known *tepa*. During the first days of the terrain work the chosen areas were visited and evaluated according to their surface vegetation cover and passability which set aside only a few of them as suitable for further research.

The main investigated fields were located next to the village of Hurjak, about 6.5 km south of Sherabad in the surroundings of Kulugshatepa (the area of the scatter ShFS01). The other surveyed areas started about 5.5 km to the east of Sherabad, right to the south of the village of Gorin, and continued for another four kilometres to the east covering the vicinity of the archaeological sites of Gorintepa (ShFS02); Gilyambobtepa and Shishtepa (ShFS03). Later the area was extended to the south into the immediate vicinity of Ayritepa (ShFS04), about two kilometres away from Shishtepa (**Fig. 3, 21**).

The topographic maps of 1:100,000 scale gained in 2010 showed six features (sites) no longer visible in the landscape located in the surroundings of Jandavlattepa. The area of the predicted features was intensively surveyed to determine their precise position and chronology (**Fig. 3, 51**).

Only a single day of prospecting focused on the area about 18 km to the south-west of Sherabad and 2.5 km to the west of Talashkantepa II, the closest well-known archaeological site. About 21 sites in total were marked on the topographical map in this area covering a strip of eight by four kilometres. However, due to the limited time only two of the features were surveyed (**Fig. 3, 57**).

3.8.1 The area of Kulugshatepa (scatter ShFS01)

Location

The first pottery scatter is located 6.5 km to the south of the town of Sherabad in the immediate vicinity of the village of Hurjak. The main site of the area called Kulugshatepa covers about 5.5 ha; three other smaller *tepas* are located up to one kilometre from the centre of the main tepa. At a distance of 550 m to the north-east is situated Tigrmantepa, 760 m to the east is Khosyattepa and 315 m to the south-west is situated another *tepa* whose name remains unknown (catalogue No 73 "No name tepa": Danielisová et al. 2010, 85).

The area directly adjacent to the Kulugshatepa from the north-west is occupied by a modern-time cemetery which covers 7 ha. The rest of the northern and north-eastern part is then covered by the Hurjak village which is slowly expanding southwards, closer to the tepa. Two lines of houses with gardens are not yet visible in the IKONOS imagery captured in 2001, although they are present on the Google Earth

Fig. 3, 22 Area of ShFS01: Kulugh-Shakhtepa showing recently inhabited areas and the modern-day cemetery covering part of the site. IKONOS satellite imagery. Map by Petra Tušlová.

imagery from which they are redrawn to the map in a shape of a polygon under the term "urban area" (**Fig. 3, 22**).

A general description

The extent of the area connected with the site is approximately delimited by 86 polygons covering 37 ha, which produced altogether a statistical amount of 5000 ancient pottery fragments, 110 modern sherds and 575 fragments of architectural ceramics. On average 154 various fragments were discovered per hectare. The highest amount of the pottery finds was concentrated further south and east from the *tepa* as far as 580 m away (**Fig. 3, 23**).

In connection with this site the highest amount of ancient pottery fragments detected in one single polygon was recorded, the number reaches up to 472 pieces. Furthermore, a high amount of modern pottery was detected in marginal areas of the field. The outstanding concentration of the modern pottery is connected to polygons directly situated along the village of Hurjak, where occasionally half or a quarter of a vessel was noted. The surprisingly low modern pottery fragmentation is due to a quite recent dispersion of the material, still accumulated around the place where it was disposed of. The most often recognizable types are dishes with a characteristic cotton-boll pattern and white painted porcelain which are both still in use.

Stones of pebble-size were detected only in six polygons, east of the tepa, in an area of a north-south strip leading along the newly build houses. The ancient architectural ceramics were mainly represented by bricks, belonging according to their measurement (26 × 26 × 8 cm) to the Islamic Middle Ages (**Fig. 3, 32**). The biggest concentration was detected in the immediate vicinity of the tepa, with the biggest portion concentrated to the north, reaching up to 430 m from the centre of the tepa. A smaller amount of AC was spread all over the eastern field, with variable amounts in individual polygons. Another minor isolated group of the AC was identified about 300 m south of the tepa. The total dimensions of the architecture ceramics scatter measured 300 m in the north-south and 200 m in the east-west direction (**Fig. 3, 24**).

Season 2010 and 2011

During the project's first year a pottery scatter was discovered concentrated about 300 m to the north-east and to the east of Kulugshatepa (**Fig. 3, 23** and **25**). The area surrounding the *tepa* was covered by dense cotton fields, which did not allow a surface survey in its immediate vicinity. About 12 ha were as-

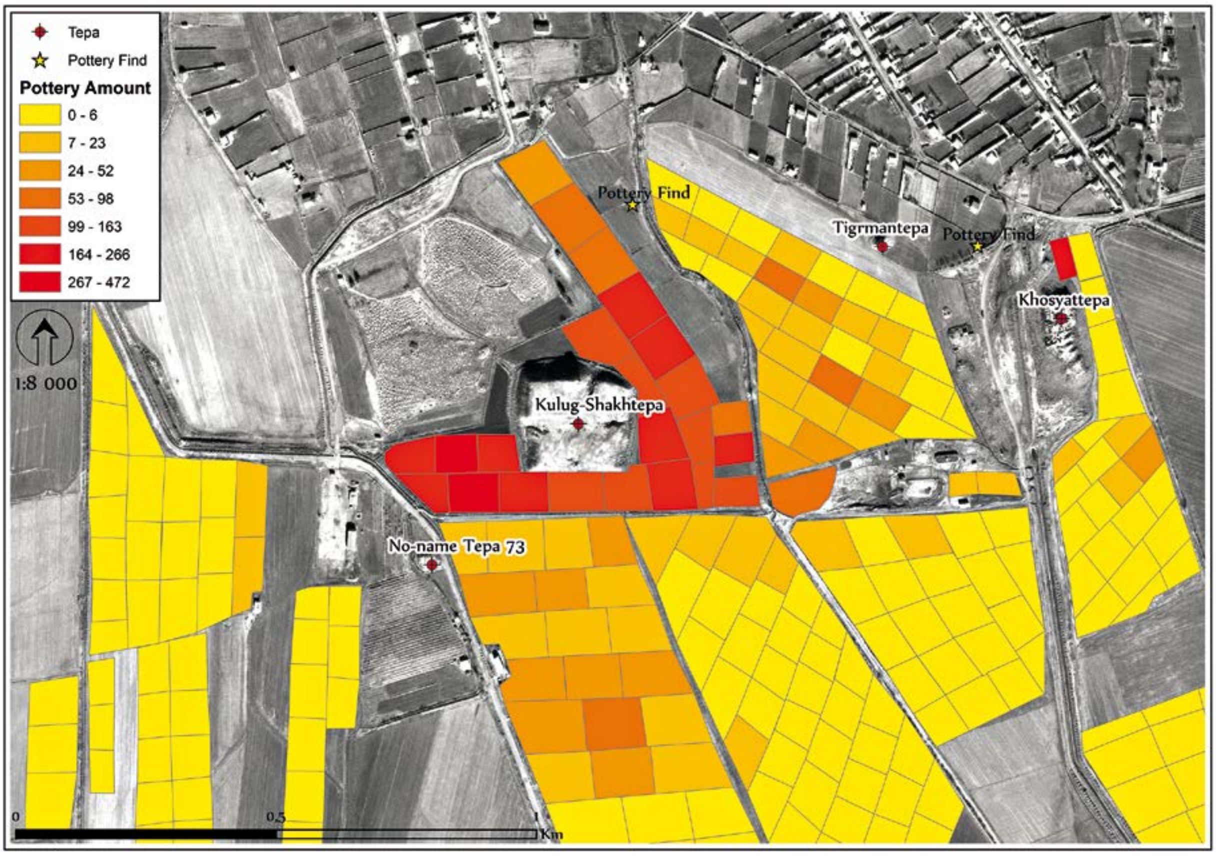


Fig. 3, 23 Area of ShFS01: Kulugh-Shakhtepa showing raised amount of pottery and the approximate location of the two accidental pottery finds made by locals. IKONOS satellite imagery. Map by Petra Tušlová.

Fig. 3, 24 Area of ShFS01: Kulugh-Shakhtepa showing raised amount of Architectural Ceramics (AC) concentrated around the tepa. IKONOS satellite imagery. Map by Petra Tušlová.

Fig. 3, 25 Area of ShFS01: Kulugh-Shakhtepa with marked fields surveyed in 2010 and 2011. IKONOS satellite imagery. Map by Petra Tušlová.

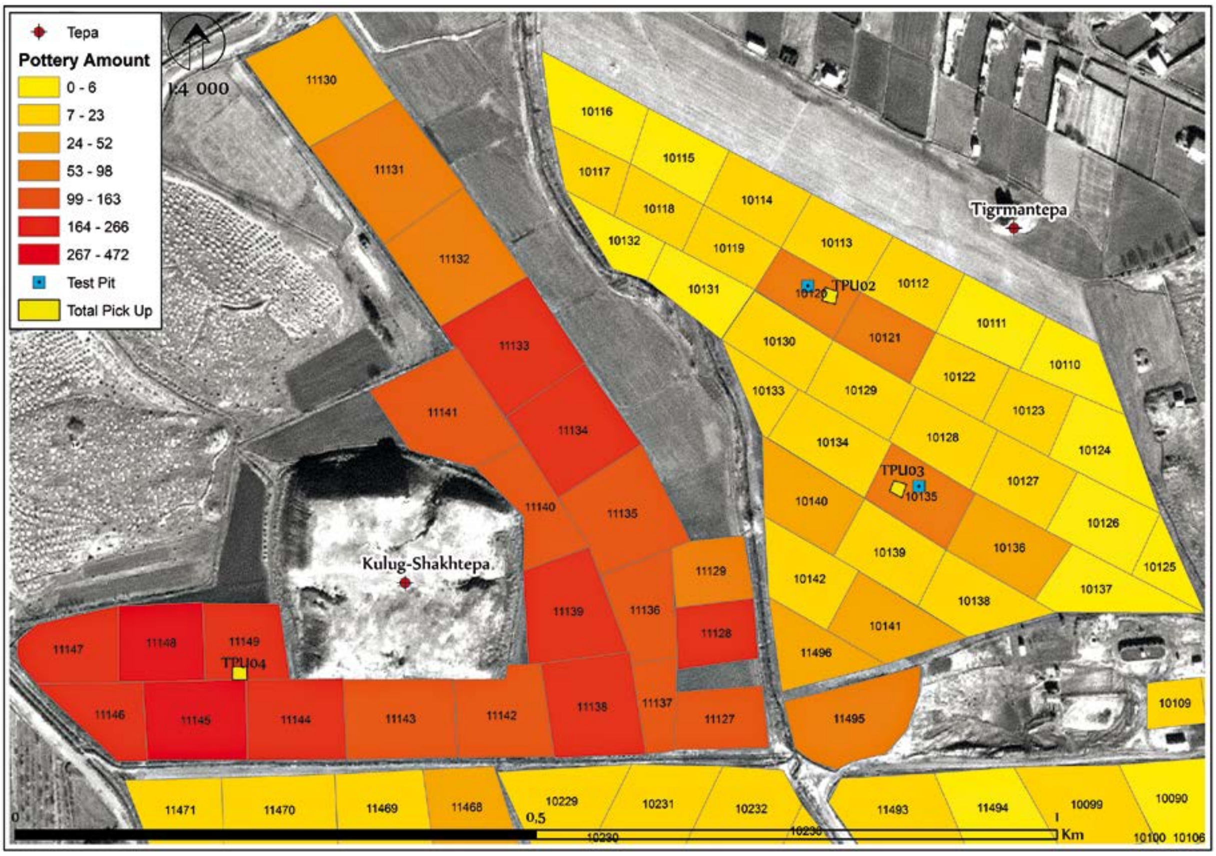


Fig. 3, 26 Area of ShFS01: Kulugh-Shakhtepa with marked Total pickups and Test pits conducted in specific polygons. IKONOS satellite imagery. Map by Petra Tušlová.

signed to the site with apparent continuity under the surrounding houses and gardens.

Local inhabitants testified several random finds in their properties. The first one was located about 150 m to the east of Tigrmantepa, accidentally unearthed during the excavation of an *arik*. It consisted of one vessel of approximate height 50 cm with a neck broken off (**Fig. 3, 27**) and of one terracotta whistle (**Fig. 3, 28**). According to the characteristic decoration of parallel wavy lines of the vessel we may date it to the High Middle Ages. The other notification of a single pottery find came from a spot about 650 m to the west of the first one, but no finds were available for consultation (**Fig. 3, 23**).

The area investigated in 2010 was covered by HDS field treatment which revealed overall 531 ancient pottery fragments, 86 modern ones, and a further 86 pieces of architectural ceramics. Overall it was possible to consider 38 polygons as a part of the concentration covering about 12 ha with the average number of 59 fragments in one polygon. The scatter revealed the smallest amount of all of the other investigated clusters which were detected during the first season; it was nevertheless interpreted as an individual site with continuity under the surrounding houses.

During the second year of the field survey the area adjacent to the *tepa* was harvested and covered by HDS field treatment. The remaining un-surveyed fields located directly to the south of Kulugshatepa could also be examined; their surface was overgrown by seedlings with excellent and very good visibility. An additional 25 ha was investigated, disclosing the highest pottery concentrations. In total 4493 ancient pottery fragments, two modern ones and 486 pieces of architectural ceramics were uncovered in 48 polygons, i.e., 199 various fragments per hectare.

These results distinctively changed the general view of the pottery dispersion. The amount of the finds concentrated around Kulugshatepa revealed the continuity of the surface material away from the previously detected scatter. It turned out that during the 2010 season the margin of the eastern part of the scatter had been discovered. During the following year (2011) the core of the concentration, which accumulated around the tepa, had been surveyed. The area further to the south yielded an increased number of surface materials as well; especially the architectural ceramics fragments were represented in a high number.

Also the second year the local inhabitants were very helpful. A little girl, living in a house in the recently urbanized area half way between Kulugshatepa and the scatter discovered during the first year, brought us a small vessel with the neck broken off with the remains of a red slip resembling the Kushan pottery (**Fig. 3, 29**). She also gave us several fragments of big vessels decorated in a way characteristic of the High Middle Ages (**Fig. 3, 30**; **Tab. 3, 1:8**), all originating in the area of Kulugshatepa.

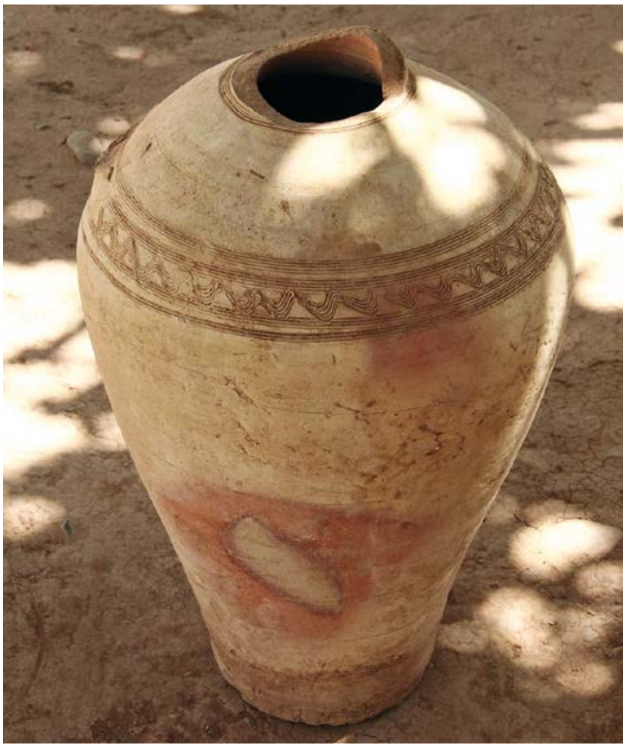


Fig. 3, 27 Area of ShFS01: Kulugh-Shakhtepa. Pottery vessel about 40 cm high, with characteristic decoration of High Middle Age, which was found together with a clay whistle while digging an *arik*. Photo by Tereza Včelicová.

Fig. 3, 28 Area of ShFS01: Kulugh-Shakhtepa. The clay whistle found together with the vessel. Photo by Tereza Včelicová.

Fig. 3, 29 Area of ShFS01: Kulugh-Shakhtepa. Small vessel with remains of a red slip found by locals on their garden, we could only make a fast photograph before returning the vessel to the owners. Photo by Tereza Včelicová.

The test pits

Two test pits were placed in the area located east of Kulugshatepa, in the polygons with the highest concentration of the surface material. The first pit was placed in the polygon 10135; the other one in the polygon 10120 (**Fig. 3, 26**). The test pits (l.100 × w.80 × d.100 cm) were excavated in spits approximately 20 cm deep. Both pits featured the same characteristics. There were no visible stratigraphic layers, only the soil of the upper approximately 40 cm had a grey-brown colour while the deeper part was more dark-brown and soft. However, the transition was hard to determine. The profiles of the pits showed pottery, stones and charcoal in unchanged proportions all the way through, however the freshly uncovered soil more noticeably. In this case I would assume that those differences were due to the dryness of the newly uncovered soil and mean nothing more than different moisture (**Fig. 3, 31**).

Fig. 3, 30 Area of ShFS01: Kulugh-Shakhtepa. A little local girl was supplying us by the pottery dug out on their garden (as she is living in the recently urbanised area north-east from Kulugh-Shakhtepa). On the photo she is holding High Middle Age pottery stand (Tab. 3, 1:8). Photo by Petra Tušlová.

The polygon and the test pit 10135

The surface material of the polygon 10135 contained 72 ancient pottery fragments, four modern ones, and another four architectural ceramics. In the test pit altogether 147 diverse fragments were recognized, from these there were 138 pottery fragments, eight architectural ceramics and three pieces of animal bones.

The amount of material obtained (in pcs.) in each spit is summarised in the following chart. The three upper grey rows represent the top soil (spit 1, 2 and 3), the lower white ones (spit 4 and 5) cover the remaining 60 to 100 centimetres underground.[44]

In the depth of about 50 cm (spit 3) an intact High Middle Ages brick was uncovered (**Fig. 3, 32**) as well as a fragment of a rim with characteristic turquoise glaze classed into the same period. A large fragment of a brick was also detected at the depth of 60–70 cm (spit 3–4) stuck in the western profile (**Fig. 3, 31**). At the depth of 90–100 cm (spit 5), a partly preserved vessel was found dated into the Early Middle Ages. Since the vessel had been broken in antiquity and the pieces remained together in one spot, it seems as if it had been preserved *in situ*. (**Tab. 3, 1:1**).

Polygon	AC	Pottery	Other	Total
10135	4	72	4	**80**

Test Pit			Polygon	10135
Layer	**AC**	**Pottery**	**Other**	**Total**
Surface		2		2
Spit 1	4	59	2	65
Spit 2	2	18		20
Spit 3	1	26	1	28
Spit 4	1	9		10
Spit 5		26		26
Total	8	140	3	**151**

[44] According to the observation of the ploughed fields the top soil reaches in average to 50 cm with maximum of 60 cm underground.

The polygon and the test pit 10120

In the polygon 10120, 73 ancient and 19 modern pottery fragments were discovered as well as ten sherds of AC. Much more material was detected on the other hand in the test pit: overall 435 pottery fragments, 19 AC and 16 bones. In the spit 2 a high amount of terracotta pieces smaller than a coin size appeared. From an overall 171 small fragments more than 130 were not bigger than one centimetre. In the lowest spit five fragments of very soft stone (sand stone?) of approximately a palm size were detected. These finds have no analogy among the other examined material.

The pottery of the High Middle Age is represented in each of the spits down to the lowest excavated layer. The rest of the material is not diagnostic enough, but an increased amount of architectural ceramic, especially daub, should be emphasized. Rather than a decrease in number of finds under the top soil there is, on the contrary, more material cumulated in the two lowermost layers (spit 1 + 2 + 3 = 263/3 = 88 fragments; spit 4 + 5 = 207/2 = 104 fragments).

Polygon	AC	Pottery	Other	Total
10120	10	73	19	**102**

Test Pit			Polygon	10120
Layer	**AC**	**Pottery**	**Other**	**Total**
Surface		2		2
Spit 1	3	22	1	26
Spit 2	4	171	6	181
Spit 3	2	54		56
Spit 4	9	150	6	165
Spit 5	1	38	3	42
Total	19	437	16	**472**

The total pickup sampling

Three total pickups were undertaken in the area of the site ShFS01. Two of them were performed in the same polygons where the test pits had been placed, i.e in the polygons with the highest pottery concentration – 10120 (TPU 02) and 10135 (TPU 03). One additional total pickup was conducted later about 140 m west of the centre of Kulugshatepa, in polygon 11149 (TPU 04).

TPU 02

The first pickup was carried out in the polygon 10120 on a recently harvested cotton field. The surface visibility was excellent with no vegetation cover. The FW was represented in the highest amount, comprising fragments from the coin to the half palm size. Four pieces, mainly body fragments, were glazed with the characteristic High Middle Ages decoration (green and white engobe with incised parallel lines incrusted by black colour, **Tab. 3, 1:3**).

Several tiny FW body fragments also featured red slip, indicating the human occupation of earlier periods (from the Greco-Bactrian period up to Kushano-Sasanian period).

Among the RW and the YW no diagnostic fragments were recognized. The AC combined coin size and half palm size fragments including daub and bricks.

TPU 02	Fine Ware	Yellow Ware	Red Ware	Architectural Ceramic	Total
Count (pcs.)	73	37	51	17	**178**
Weight (g)	229	265	223	591	**1308**
AvgWeight (g)	3.14	7.16	4.37	34.76	**7.35**

TPU 03

The second pickup was performed in the polygon 10135, in the field with the same surface and visibility characteristics as the previous one of TPU 02. The detected finds however covered a wider spectrum of material types including (besides those present in TPU 02) also KW and one base of non-contemporary corroded green glass. The fragmentation of all represented classes decreased, with YW and RW reflecting a very similar average size. Among the YW, one decorated stand from the High Middle Ages was found (**Tab. 3, 1:2**). The FW was represented by the biggest amount containing seven glazed fragments, five with the red slip (**Tab. 3, 1:4**) and two body fragments with a textile pattern (**Tab. 3, 1:5–6**). The latter decoration is characteristic for 15th century AD or even more recent periods (Gardin 1957, 47). The AC was composed of four palm size and six coin size fragments, with the rest varying between those two dimensions. Detection of the KW was very important. Although only body fragments were detected, those were the first examples of cooking pots found during the field survey.

TPU 03	Fine Ware	Yellow Ware	Red Ware	Architectural Ceramic	Kitchen Ware	Glass	Total
Count (pcs.)	89	72	44	13	2	1	**221**
Weight (g)	717	3778	2278	2208	14	<1	**8995**
AvgWeight (g)	8.06	52.47	51.77	169.85	7	<1	**40.7**