Wadi Nadiya 1 and 2: Neolithic Barrage Systems in the Jafr Basin, Southern Jordan

Prof. and Dr. Sumio Fujii
Kanazawa University, Japan
fujiikun@staff.kanazawa-u.ac.jp
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1. Research Background and Objective

The Jafr Basin Prehistoric Project, headed by the author, started in 1997 with a view to tracing the process of pastoral nomadization in southern Jordan on the basis of archaeological evidence. For this objective, we have continuously excavated more than a dozen archaeological sites varying in date and nature from Neolithic agro-pastoral outposts to Early Bronze Age cairn fields. Our recent efforts have been focused on the comprehensive investigation of water catchment facilities that sustained the initial pastoral transhumance in the Jafr Basin (Fujii 2007a, 2007b, 2010a, 2010b; Fujii et al. 2011). This field season dealt with two barrage sites, Wadi Nadiya 1 and 2 (Fig. 1). The first week was devoted to a land survey of Wadi Nadiya 2 that is to be excavated in the next season. The second and third weeks addressed a complementary investigation of Wadi Nadiya 1 that was partly excavated in the last field season.

2. Investigation at Wadi Nadiya 1

Wadi Nadiya 1 is an extramural barrage site ca. 50 km NNE of al-Jafr and occupies the lower edge of a semi-open playa system that flows into the upper reach of Wadi Nadiya, one of upper tributaries of Wadi al-Hasa. The site contains two stone-built barrages, both of which were partly excavated in the 2011 summer field season (Fujii et al. n.d.). This season addressed a complementary investigation of the upper barrage (i.e. Barrage 1) that holds a key to understanding the Jafr PPNB barrage system.

The investigation has shown that: 1) a large number of pits for procuring construction material were dug in front of the barrage wall; 2) the eastern half of the barrage wall was protected with a subterranean masonry retaining wall built at the lower

edge of the pits; 3) the western half, on the other hand, was devoid of such a robust retaining wall and, instead, based on an embankment constructed again at the lower edge of the pits (Figs. 1-3). The pits, up to ca. 1.2 m deep from the contemporary ground surface, were probably not backfilled soon and formed a large composite pond for supplying drinking water to initial pastoral transhumants and their livestock until they were fully buried with fluvial deposits. In view of the scale and density of the pits, it is conceivable that the barrage was gradually constructed over a long time. The existence of such a large-scale barrage equipped with a carefully designed subterranean structure demonstrates that the Jafr Pastoral PPNB had a high level of water use and civil engineering technology. This makes sense, however, when we consider the essential role of water for the penetration into the arid margin.

Understandably, no *in situ* finds were recovered at the extramural barrage site. However, a grooved stone weight and a few heavy-duty flint tools probably used for digging the large pits were found in the upper and lower fill layers in front of the retaining wall (Fig. 5). The former artifact is a standard equipment of the Jafr PPNB, and every barrage (and its neighboring outpost) known to date in the Jafr Basin has produced it. It is possible that as with the other examples, the unique artifact was originally incorporated to the central protruding reinforcement wall as a good luck talisman or a ritual object intended to secure the safety and longevity of the barrage. In addition, an early Islamic gravestone (Fig. 6) and a dozen gray ware sherds occurred again as stray finds in the fill layers. They were probably washed down the original playa or wadi by seasonal floods.

Barrage 2 was also briefly re-examined. The limited reinvestigation confirmed that as with the western half of the upper barrage, it was constructed on a large embankment.

3. Investigation at Wadi Nadiya 2

The other barrage system of Wadi Nadiya 2 is located ca. 1.5 km lower of Wadi Nadiya 1 with the Azraq-Maân Highway in between. Due to time constraints, our field operation was limited to the land survey of the site. The site consists of three stone-built barrages dotted along a small wadi at intervals of ca. 150 m. Overall, they are smaller in scale and more closed in form than the two barrages of Wadi Nadiya 1, being accompanied with a well-developed embankment. Among others, Barrage 3 is a typical example, being semi-circle in general plan and equipped with a soil and rubble bank ca.

0.3 m high from the present playa surface (Fig. 7). It is intriguing to hypothesize that the three barrages represent subsequent forms of the Wadi Nadiya 1 barrage system, but a final conclusion must await a full-fledged investigation.

4. Summary

The complementary investigation at Barrage 1 of Wadi Nadiya 1 has provided valuable insights into the Jafr PPNB barrage system. Unexpected was the fact that the barrage was accompanied with a large number of material procurement pits and a robust subterranean structure. The investigation result has enabled us to realize anew that Neolithic Jordan had sophisticated civil engineering technology of the world heritage class. The next field season, scheduled in the summer of this year, is to address a comprehensive investigation of the neighboring barrage site of Wadi Nadiya 2.

5. References

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Fig. 1 Wadi Nadiya 1 and 2: site map.

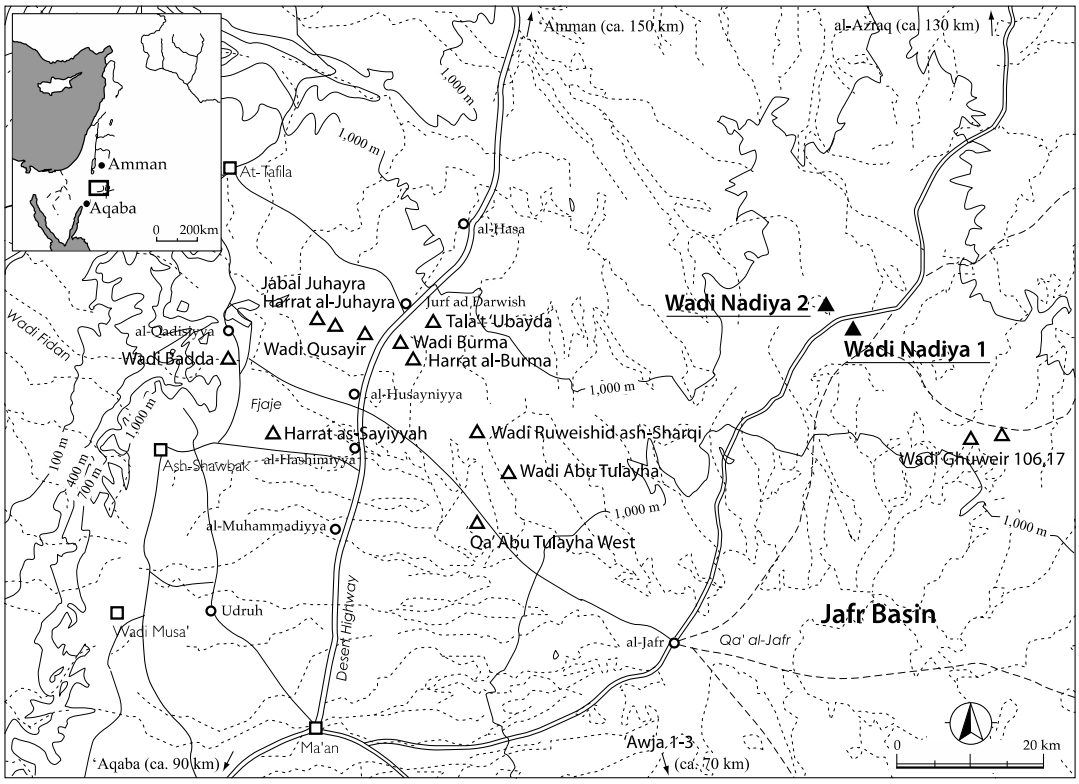

Fig. 2 Wadi Nadiya 1: general view of Barrage 1 (looking NE).

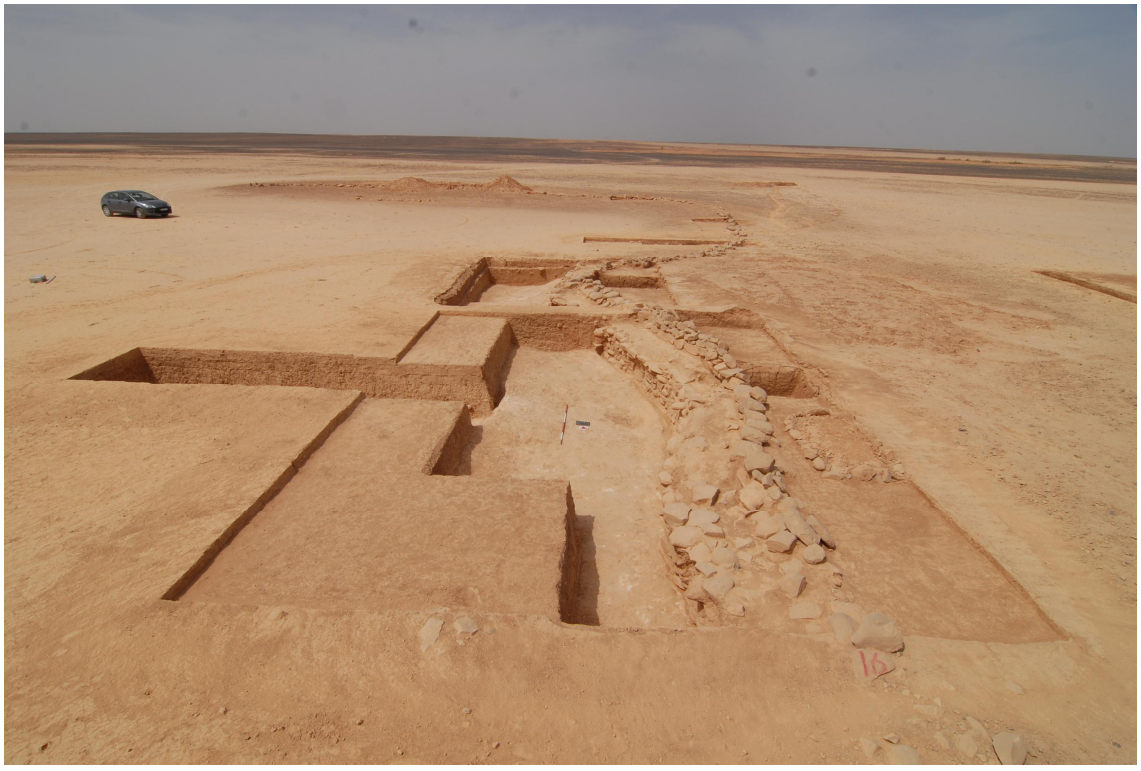

Fig. 3 Wadi Nadiya 1: general view of Barrage 1 (looking NW).

Fig. 4 Wadi Nadiya 1: material procurement pits in front of Barrage 1 (looking N).

Fig. 5 Wadi Nadiya 1: grooved stone weight from Barrage 1.

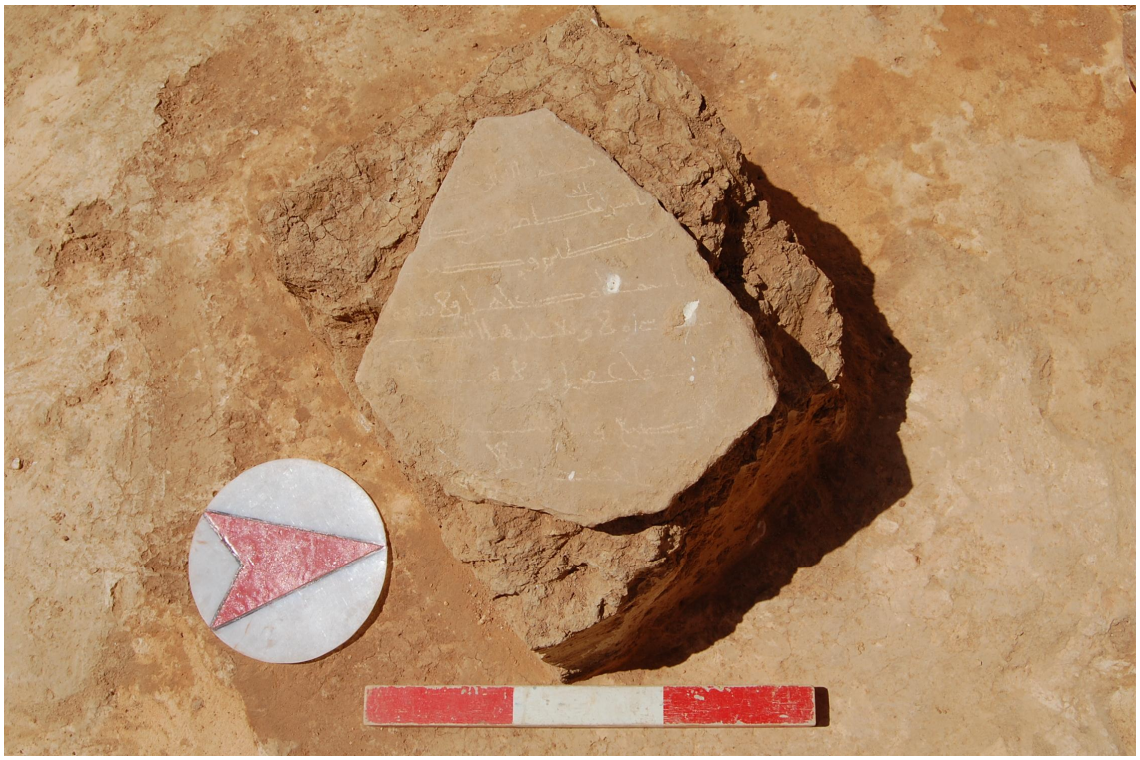

Fig. 6 Wadi Nadiya 1: early Islamic gravestone from a fill layer of Barrage 1.

Fig. 7 Wadi Nadiya 2: general view of Barrage 3 (looking N).