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The Scale and Extent of Political Institutions in Early Dynastic Mesopotamia: The Case of Archaic Ur

Camille Lecompte, Giacomo Benati

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The Scale and Extent of Political Institutions in Early Dynastic Mesopotamia: The Case of Archaic Ur

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Abstract

In this paper we investigate the scale and extent of the political institutions of Ur during the beginning of the Early Dynastic period (28th century BC), a historical juncture that saw the rise of city-states in southern Mesopotamia. We provide a fresh analysis of a group of administrative texts related to field management, originating from the temple household of Nanna, in order to identify patterns of institutional land use, the organizational hierarchy of institutional farming, and the resources at the disposal of the temple. We also combine archaeological, textual and survey data to estimate demographics and agricultural production in the agrarian state of Ur. We provide proof that temple households in the early 3rd millennium BC controlled land estates that could virtually sustain entire urban sites and exploited them through increasingly complex arrangements with the farming sector.

1 Introduction¹

The management of the agrarian sector controlled by the political institutions in early 3rd millennium Ur, during the ED I period (approximately during the 28th century, see Lecompte / Benati 2017, table 2), has been investigated by several scholars, either by relying on the written evidence or by combining it with archaeological settlement patterns and environmental conditions in the region of Ur (Benati 2015, §§ 6.3.3 and 6.3.4; Burrows 1935, 12–13; Charvát 2016, 224–273; Pettinato 1999, 100–106; Steinkeller 1988, 19–23; Wright 1969 and 1981).

¹ C. Lecompte wrote §§ 3, 4, 5.2, and the Appendixes; G. Benati wrote §§ 2 and 5.1; §§ 1 and 6 were written together. We thank Emmert Clevensine for having corrected our English, the editors of this volume for useful comments that helped us strengthen the article, and R. Rattenborg for discussing with us relevant methodological aspects of the approach employed in this work.

The management of the agricultural estate of the temple household of Nanna in Ur is well documented by approximately 80 tablets and fragments which form the only institutional archive dating from the inception of the Early Dynastic period so far retrieved in Mesopotamia.² These tablets, combined with survey and archaeological data, offer reliable evidence to estimate the resources controlled by such head institutions in the city. In order to better interpret the scope of the economy of this political institution, new studies have been undertaken by the present writers on the land texts from Ur, offering a comprehensive edition of the documents as well as an evaluation of the land areas managed by the temple administration and a detailed index of the individuals connected to it. In this paper, which aims at giving an overview of the mechanisms of land management and of the agricultural texts, including the results of former studies, particular attention is given to the mechanics of land allocation, to labor organization and to the quantitative dimension of institutional farming. Taken together, these aspects can provide insights into the developing fiscal systems of Early Dynastic Mesopotamia.

2 State capacity at the dawn of the Bronze Age: H. Wright's model of agricultural political economy

According to the analysis carried out by H. Wright (1969, 27–28), Ur at the beginning of the 3rd millennium was a town of ca. 21 ha populated by ca. 4,000 people. The institutional sector was formed by at least one large temple household, the temple of Nanna, headed by saĝĝa-officials, and by a palatial-like sector headed by an ensi-official (cf. Benati 2015, § 4.4.5; Sallaberger 2010; Visicato 2000, 18 fn. 17). These political institutions performed functions that largely correspond to those traditionally attributed to the state, i.e. organizing agricultural activities, levying taxes, providing public goods, etc. In the surroundings of Ur were located two small towns – Tell al-Sakheri, and Sakheri Sughir – and some small agricultural villages (Wright 1969, 117; Benati / Leoni / Mantellini 2016; Hammer 2019). The total rural population is estimated to have been around 6,000 individuals (Wright 1969, 27). The center of Ur had at working distance ca. 9,000 ha of arable land, watered by a branch of the Euphrates river and by a network of small channels bringing water to the fields (Wright 1969, 34 fig. 4; Hammer 2019, 196 fig. 19). By analyzing the cuneiform records stemming from the administration of the temple of Nanna, Wright (1969, 27) concluded that the temple household was formed by a class of

² It has been formerly demonstrated that the agricultural domain mentioned in the ED I texts from Ur belonged to the temple household of the god Nanna, see Burrows 1935, 13; Charvát 1979, 17; Steinkeller 1988, 23; Benati / Lecompte 2016a, 21; see also Sallaberger 2010, for a different interpretation.

titled officials, controlling large land-holdings and agricultural outputs, cooperating with a class of small farmers cultivating the land in return for a share of the harvest and drafting power (see also Steinkeller 1988, 21 and in general Steinkeller 2019). He estimated that ca. 800 people out of 6,000 could have been farmers attached to the institution, while the total of rural workers settled in the Ur enclave could be estimated at around 2,500 individuals (Wright 1969, 121). Land controlled by the institutions is divided according to its use in the texts and allotted to high officials and institutional personnel in return for service and maybe rents, in line with the well-known šuku-system (Wright 1969, 119–120; Pettinato 1999; Benati 2015, § 4.4.8; Cripps 2007, 19). Šuku-lands were sub-allocated and farmed by sharecroppers. Sharecroppers were organized according to the plow-team model – they were farmers provided with oxen, seed and fodder by the institution in exchange for a share of the produce.

In this paper, we present a new assessment of the texts dealing with land management with the aim of further elaborating on Wright’s framework as to the agricultural decision-making in land allocation employed by the temple of Nanna. We also present an estimation of the scale and extent of the cereal economy of the Ur enclave and temple household of Nanna, in order to better frame the capacity of the institutional economies of the time (cf. Rattenborg 2016). In the next sections, we review the institutional management of arable land at Ur (§ 3) and the land management structure of the temple household of Nanna (§ 4), in light of a fresh analysis of the Archaic Texts relating to land use. Furthermore, we provide a first assessment of demographics and population resources for the Ur enclave (§ 5), based on survey data. Finally, we provide a general assessment of the relevance of Ur ED I evidence for understanding the crucial political and economic changes occurring at the onset of the Early Dynastic period in Mesopotamia (§ 6).

3 The land management texts

3.1 The Ur land texts and their classification

The agricultural texts represent one of the main bodies of the archaic texts from Ur, approximately 20% of the whole corpus (with probably 75–80 tablets).³ Interestingly, the majority of the land texts originate from a primary archaeological context, called the “Ancient Room”, which was an office

³ Compare with Viscato 2000, 15, with a total of 23%, but this was prior the publication of the remaining tablets and fragments from Ur in Lecompte 2013 and in Benati / Lecompte 2016b, 8–10.

pertaining to the Nanna temple (Benati / Lecompte 2016a), while the rest was mostly uncovered in trash layers in Pit X (Lecompte / Benati 2017, 6–8).⁴

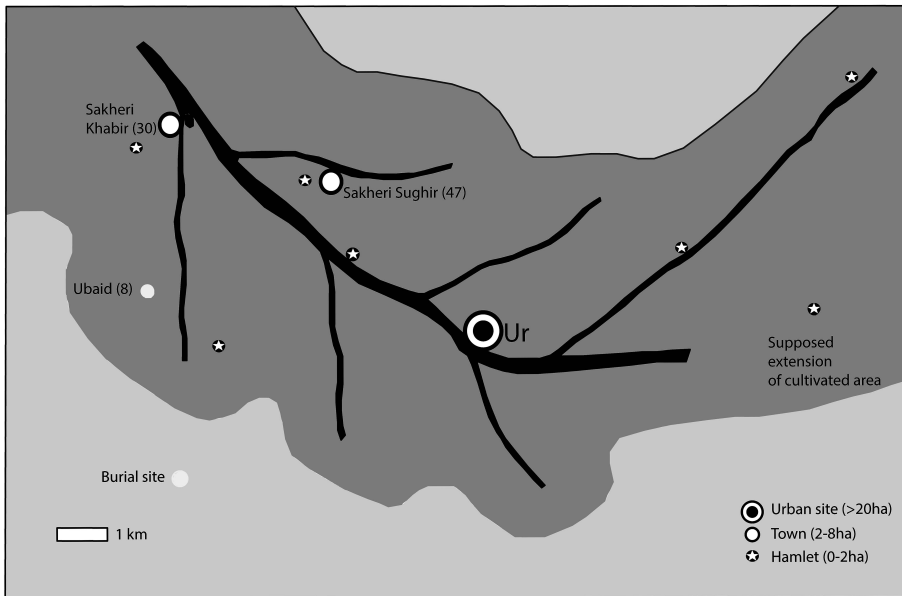


Figure 1. Settlements, waterways and possible extension of arable land in the Ur region at the beginning of the Early Dynastic period according to survey data (based on Wright 1969, 34 fig. 4).

As to their content and layout, land texts can be divided among following categories:

1. Most of the agricultural documents are field allotments; these record plots of land in diverse areas with the name of their recipients, which were probably assigned as *šuku* (see § 4.1), “subsistence land” or, if this type of management is confirmed, rented to the personnel of the Nanna temple. They include tablets of large format with separate columns, considered by Visicato (2000, 15 fn. 6) as possible *Sammeltafeln*, such as, UET 2, 168, which is presented below (Appendix 1). UET 2, 87, in contrast to those texts, is a large tablet giving a long list of recipients, but is devoid of any clear separation marks or lines, being therefore a document written for one occasion and not a summary of distinct procedures. There are also smaller documents, some of them referring only to a few recipients, such as ATFU 58. Note also that UET 2, 82 looks like a small docket referring to only three large areas allocated to different individuals.

2. A few tablets are similar to small dockets. They consist of a land-recording procedure for an important area of land. Examples include: UET 2, 102 (see Table 1 below), 122, 147bis.

⁴ The relevant texts are UET 2, 351, 356–371.

3. Another type of text, identified by Friberg (1997–1998), consists of two or three area-and-seed texts (UET 2, 20, 167, to which he adds UET 2, 201; see also Steinkeller 1988, 20), which give the seed rate used for fields.

4. At least two texts are mixed accounts: UET 2, 127 displays unusual information by associating amounts of uruda (copper) and animals with one land surface; and UET 2, 371, records a troop of individuals keše₂-ra connected with fields' areas.

UET 2, 102	
obv. 1.	2(bur'u) 2(bur ₃) 4(iku) aša ₅ uru ₄ (APIN) ša ₃ BU.MA
“144 ha, within BU.MA, APIN land”	

Table 1. Example of a short land document with an important agricultural area: UET 2, 102.

3.2 Observations on the terminology

Burrows (1935, 12–13) drew specific attention to several administrative terms in use in the ED I texts from Ur which are ambiguous and cannot be fully understood. In the present paper, most of these expressions will be analyzed in order to exemplify the issues raised by the aforementioned documentation, but a more in-depth discussion is still a desideratum.

1. šu-tab and nu-šu seem to represent opposite categories. While šu-tab occurs in several tablets (UET 2, 98, 104, 168, 226, maybe 254 and 362), nu-šu is only attested in UET 2, 226. That document is important because it might show that both terms refer to a step in the land attribution. Šu-tab is in general associated with personal names, except in UET 2, 98, while nu-šu immediately follows the surface of the plot without any holder and is only once followed by the term ̒I-ra (which eludes our understanding as well). Therefore, the former (šu-tab) may indicate a piece of land assigned or attributed to someone, while the latter (nu-šu) may designate a piece of land which remains without any individual to take care of it. The clause nu-šu, set apart from the rest of the first column of the reverse, might have been used to remind the scribes and administrators of the presence of unattributed plots, or to state that the individuals listed on that column received plots that were formerly unattributed. Alternatively, those terms may instead be understood as referring to an agricultural technique or to an interest or a levy (of unclear nature). This is nevertheless highly hypothetical since it has been assumed elsewhere else that nu-šu referred to a personal name (Lecompte 2016, 139). Interestingly, šu-tab occurs also in a few Abu Šalabiḥ texts, which may represent a relic of the ED I uses, although this term is seemingly unknown in the Fara documents (Krebernik / Postgate 2009, 13, with bibliographical references, see Table 3). Therein, šu-tab, which follows regularly še+gan₂ and is in some instances

associated with *munus* (assigned to women?),⁵ refers, as is the case in ED I Ur, to a type of *šuku*-land. The *šu*-tab plots are rather large areas, from 2 *eše*₃ at the lowest to several *bur*₃, with an average area of approximately 2–3 *bur*₃.⁶ The *šu*-tab-plots are mentioned with land recipients or, in some instances, with a geographical name, such as *Lal*₃-*la*-*ad*^{ki}.⁷ This term can also be compared with TAB-BA in the ED IIIb texts from *Ĝirsu* and *Umma* (cf. Bauer 1972, 110–111; Maekawa 1977, 23; Powell 1978, 19).

2. UET 2, 98 rev. ii 3: '4(iku)' *ziz*₂ *šu* *ĝal*₂, maybe “4 iku (of land) (with) available emmer” (see Burrows 1935, 7).

3. *ki aša*₅-*ga* (?) / *aša*₅ KI GA. There seem to be two variants, either *aša*₅ KI GA or merely KI GA. Both terms are designations of fields which occur together with personal names. As a field category, it is written in some instances on the first line of the tablet, referring therefore to the status of all the plots concerned.

— UET 2, 140 rev i 1: 2(*eše*₃) *aša*₅ KI GA Ur-^dNin-DUN₄

— UET 2, 206 obv. i 1: 2(*bur*₃) 2(*eše*₃) *aša*₅ GA KI Me-*saĝ*-an-AK

— UET 2, 208 obv. i 1: [...] '2(*bur*₃)' *aša*₅ GA KI 'šu' x⁸

— UET 2, 211 obv. i 1: *aša*₅ 'GA KI'

— UET 2, 358 rev. ii 1: 2(*eše*₃) GA KI [...]

— UET 2, 366 obv. ii 4: 1(*bur*₃) Zur-zur GA KI

It might be read *ki <aša*₅-*ga* or *ki*^{ga}*gana*₂, although its meaning in this context is not clear and indications of grammatical elements are rare in archaic Ur. According to UET 2, 206, plots of this type can be located within the (district of) BU.MA. It seems to occur in connection with plots belonging to the *šuku* category. Tentatively, it could refer to a stage in cultivation of land, for instance to a cultivated area of a plot recently measured (or the opposite, to a fallow plot),⁹ rather than to an institutional condition. It may be similar with GAN₂ *ki*, occurring in the En-*ĝeĝal* tablet.¹⁰

⁵ This association occurs in: IAS 511, 529, 552, maybe 553 and 554, see Krebernik / Postgate 2009, 20. Since both terms are also features on their own of several plots of land, they might indeed be understood as two distinct categories which can nevertheless be associated (see Krebernik / Postgate 2009, 6 and 12–13 for an interpretation as a land assigned to women).

⁶ For instance, large tracts of lands are represented by IAS 528 obv. iii 2: 6(*bur*₃) [še]+'gan₂' *šu*-tab. Smaller fields are to be found in IAS 511 obv. vii 3: 2(*eše*₃) *še*+gan₂ *šu*-tab.

⁷ IAS 511 (= OIP 99), obv. vi 2.

⁸ Maybe TAB?

⁹ The ED IIIb texts from *Ĝirsu* refer for instance to the terms *aša*₅ *ki*-*duru*₅ and *aša*₅ *ki*-*ĝal*₂, cf. LaPlaca / Powell 1990, 76–77.

¹⁰ Obv. ii 5. See Gelb / Steinkeller / Whiting 1991, 71; Wilcke 1996, 30: “KI-Feld”. See also Powell 1978, 19 on its rare occurrences in ED IIIb *Umma*.

4. aša₅ PEŠ/ĤA du₃ and AL. These terms may be references to cultures and to seeds, but their meaning eludes us.

— ATFU 63 rev.: 2N₃₄ 3N₁₄ 5N₁ aša₅ apin-du₃ šuš_x: “155, plowing (?), the šuš-herdsman”, which might refer to draft animals (?) or to seeds.

— UET 2, 167 obv. 3: 3N₁₄ du₃ PEŠ (maybe seeds or objects are meant, see Friberg 1997–1998, 51).

— UET 2, 196 C, rev. i 1: aša₅ ‘AL’ [...] (fragment).

— UET 2, 201, rev. 1: 2(bur’u) 4(bur₃) 2(eše₃) aša₅ al du₃ ĤA: “159.84 ha of field, plowed (?), hoe (?) ĤA”; tablet dealing with seeds (Friberg 1997–1998, 52).

— UET 2, 177. rev. ii 2: du₃ PEŠ (quantity of seeds; Friberg 1997–1998, 52).

5. Land-recording terms. Apart from gid₂-a (also interpreted as a-gid₂),¹¹ note also the reference to aša₅ bar. However, due to the large area in UET 2, 163 rev. i 8: 1(bur’u) 1(eše₃) aša₅ bar, it is unlikely that it refers here to the marginal and irregular surface implied during the procedure of land measurement.

6. Fields with geographical designations. Most of the fields for which a geographical clue is given are located within a possible district, ša₃ BU.MA. Note also the possible topographical indication: aša₅ E DUR₂ (eg₂ dur₂, compare with the Ĝirsu terminology, cf. Maeda 1984, 41).

4 The institutional structure of early Ur and the management of agrarian resources by the temple of Nanna

4.1 A Three-tiered organization?

Since the seminal works by Burrows (1935, 12–13), Wright (1969, 99–104), Steinkeller (1988), and Pettinato (1999, 100–106), it is acknowledged that the management of fields in archaic Ur follows more or less the well-known patterns from the ED IIIb period. For instance, in Ĝirsu during the ED IIIb period, institutional land was divided into three main categories: (1) fields that were directly supervised by the central administration notably called “lord domain”, niĝ₂-en-na; (2) fields which were allotted on conditions of services to be performed (Sumerian šuku, literally meaning “subsistence field”); and (3) fields which were leased out (Sumerian apin-la₂). Similarly, according to the Late Uruk and Jemdet Nasr period records, fields might have been divided between different legal categories, such as GAN₂ en (lord’s field), subsistence fields, or fields connected to the sign MAŠ, a male kid (notably in documents from unknown provenance), which might represent the payment of a rent.¹² The

¹¹ Cf. Lecompte 2016, 138 with bibliography.

¹² Steinkeller 1988, 13–14; Pettinato 1999, 106; Englund 1998, 208–213; Cripps 2007, 111. For the existence of a payment in goats (maš) in connection to fields, see the

evidence of this terminology from the ED IIIa period seems more limited, since the texts from Fara and Abu Šalabiḥ document mostly the use of šuku and maybe APIN.

In archaic Ur, the following categories are distinguished as management types:

1. aša₅ en “lord’s field”, which is interpreted as land directly supervised by the central institution. According to Burrows, this term occurs in four tablets (UET 2, 147b, 160, 184, and 227) and may be inferred in three further documents (UET 2, 143, 362, 365).¹³ Relying on UET 2, 160, in which individuals are attributed plots of land within the “new field of the lord” (?), Steinkeller (1988, 21) assumes that the recipients of plots of land called aša₅ en are high-ranking administrators who managed almost independent administrative units. A closer look at these documents shows that aša₅ en does not follow a fixed pattern:¹⁴

— UET 2, 147b, a fragment of an originally small tablet: ‘aša₅’ en is the only field preserved and is included within the “domain of Nanna”, aša₅ Nanna_x(ŠEŠ.NA), which has an area of 2 šar₂ 9 bur₃ and 3 iku, that is 837 hectares, or 2 bur’u 9 bur₃ and 3 iku, 189 hectares, which seems more likely.¹⁵

— UET 2, 160 refers more precisely to the “new lord’s field” or to an area “within the new fields of the lord’s domain”: aša₅^{ša₃} en gibil / ša₃ aša₅ en gibil. It is subdivided into four large tracts of land:

Lu₂-ĝeštin:¹⁶ 8 bur₃ = 51.64 ha

E₂-igi+bur (SAR?): 8 bur₃ 3 iku = 52.92 ha

Mes-pa₃-da: 8 bur₃ = 51.64 ha

Ša₃-si: 6 bur₃ 2 eše₃ = 43.2 ha

— UET 2, 184 records 10 plots of land, the areas of which range from 3 bur₃ (19.44 ha) to 1 eše₃ (2.16 ha) either assigned to individuals (E₂-igi+bur, probably the same as in the former tablet and [Lu₂’]-ĝeštin) or designated as aša₅ bar, “outer land”; aša₅ en is displayed as a clause set apart from the rest of the columns on the obverse, while the reverse seems to summarize the fields as

observations in Monaco 2007, 269. The tablets from the Schøyen collection seem to reinforce the association between goats and areas as being the payment of a rent rather than a sale. On MAŠ in the ED IIIb texts related to land renting, see Steinkeller 1981, 131–139.

¹³ The latter is uncertain and the identification of the sign EN should be collated.

¹⁴ Maybe also in UET 2, 113 D ii 3: gu₂-an-še₃ 7(bur₃) 2(eše₃) ‘EN’² [aša₅].

¹⁵ Former calculation according to Friberg 1997–1998, 51: while the author identifies the numerals as being equal to 29 bur₃, he seems nevertheless to have recognized the two first ones as 2 šar₂ (“D”) and not as bur’u (Dd). The photograph provided by CDLI shows 2 bur’u rather than 2 šar₂.

¹⁶ Considered to be a personal name in Abu Šalabiḥ by Krebernik / Postgate 2009, 17. However, note that the same term is considered in the texts from Ebla to be a profession related to wine, which does not seem likely in ED I Ur.

APIN, either *uru*₄, *apin*, or *engar* (see below, § 4.1, 3), therefore perhaps mixing two institutional categories.

— UET 2, 227 is a fragment referring to three plots of land, with an area of at least 3 *bur*₃ (19.44 ha), associated to a personal name, KA-iš and to the “domain of Nanna”; *aša*₅ *en* is their common designation.

— UET 2, 143 records 19 plots of land, the areas of which range from 2 *bur*₃ (12.96 ha) to 1 *eše*₃ (2.16 ha); only one of them, assigned to Amar-*e*₂ *baḥar*₂⁷ RU (or Amar-E₂.EDIN RU),¹⁷ of 2 *bur*₃ (12.96 ha) seems to belong to the category of the *aša*₅ *en*.

— UET 2, 362 and 365 are too fragmentary to offer any relevant evidence, but the latter seems to refer to a large field of 5 *šar*₂ / 5 *bur*^u 9 *bur*₃ 1 *eše*₃ 2 ½ *iku*, that is 2005.38 or 385.38 ha.

Steinkeller’s line of reasoning (see above) is not fully supported by UET 2, 184 in which two tenants, occurring also in UET 2, 160, receive an average size of plots, 12.96 and 19.44 ha, not the large domains mentioned in the former document. Rather one can infer from a comparison with the *Ĝirsu* texts that those large tracts of land referred to in UET 2, 160 are areas on which works, like harvest, plowing or sowing, are planned. Also, one notices that fields devoid of any administrative designation as to their status can have a considerable area, such as in UET 2, in which a *kindagal*-official receives 259.4 ha. The qualification *aša*₅ *Nanna*_x co-occurs with *aša*₅ *en* in two instances: first in UET 2, 147B, *aša*₅ *en* seems to be logically included within *aša*₅ *Nanna*_x, then the relation is the opposite according to UET 2, 227, as already noticed by Pettinato (1999, 106). The term *aša*₅ *Nanna*_x is mentioned in further documents listed by Burrows (1935, 13), one dealing with cereals (UET 2, 73), another being UET 2, 127 (see below for its interpretation), while it may also be found in connection with *šuku* plots, in UET 2, 164 and 358.

2. *aša*₅ *šuku* is held to be a subsistence or sustenance field, which is granted in exchange for a service. The term occurs in connection to fields in four documents:

— UET 2, 163 records several plots of land assigned to individuals or categorized as *aša*₅ *bar*; their area ranges from 1 *eše*₃ (2.16 ha) to 8 *bur*₃ (51.84 ha) or 1 *bur*^u 3 *bur*₃ (84.24 ha), but the total as well as a sub-total on the obverse refer to larger areas. *Aša*₅ *šuku* [...] is written as a subscript in the first line of the obverse, probably as an institutional designation for all the fields. The total, *gu*₂-*an*-*še*₃, may be read as 2 *šar*₂ 7 *bur*₃ (822.96 ha) or 2 *bur*^u 7 *bur*₃ (174.96 ha). The latter seems less likely since only four of the fields would represent half or more of the total area. *Šuku* may also be repeated on the obverse but associated with other signs.¹⁸

¹⁷ Compare with BAḤAR₂.E₂, maybe as a spelling of the divinity ^dNun-ur₄-ra, cf. Marchesi / Marchetti 2011, 167.

¹⁸ Obv. ii 1: 1(*eše*₃) *šuku* NIĜ₂ KALAM ASAL.RU.

— UET 2, 164 is a fragment referring to seven plots of land ranging from 5 bur₃ 1 eše₃ (34.56 ha) to 1 eše₃ (2.16 ha); only the first plot of the obverse is labeled as šuku zi-ga, probably “šuku land taken out”. The plots seem to be labeled as belonging to aša₅ Nanna_x.

— UET 2, 368, see below (§ 4.4), is a fragment referring to šuku keše₂-ra gibil.

— UET 2, 365, refers to a large field within the locality BU.MA, with an area of 5 šar₂ / 5 bur' u 9 bur₃ 1 eše₃ 2 ½ iku, that is 2,005.38 or 385.38 ha.

Furthermore, the tablets referring to plots of land assigned to individuals without any institutional category are probably to be understood as šuku-fields, as suggested here, although this cannot be proven in each case. Prosopographical connections between UET 2, 163 (with aša₅ šuku as a subscript) and other texts seem to reinforce this idea, since the individuals assigned a plot in the same document occur elsewhere (Table 2 below).

Although different individuals can have the same name, it is assumed that Bil_x-igi+bur, a name which is rare in archaic Ur, in UET 2, 163 (where fields are described as šuku) and in UET 2, 181 (no clause indicating the status of the fields) is the same person since the land plots have an identical area. It can be suggested that the tablets dealing with land allocation and devoid of any clause related to their institutional status (such as those listed on Table 2) refer in general to fields belonging to the šuku category.

3. APIN occurs several times in connection with fields, and rarely in the expression aša₅ APIN. It has been debated whether or not it has to be equated with the later apin-la₂, “leased out”. According to Steinkeller (1988, 23), it may be read as uru₄, “to cultivate” or engar, the latter being unlikely in some tablets (Burrows 1935, 35; Pettinato 1999, 106; Cripps 2007, 111 fn. 17). Since APIN refers often to the profession engar, especially when following a personal name, only the occurrences connected with aša₅/GAN₂ and set apart as subscript or clauses are considered here:

— UET 2, 102: docket of type 2 (see § 3.1), “144 ha, within BU.MA, APIN land”.

— UET 2, 104: several plots (12 preserved) assigned to individuals, some of them being engar (obv. i 2 an individual seems to be merely designated as engar); the sign APIN occurs also as a clause set apart on the obverse (obv. i 5, ii 3, and iii 4), but its value is uncertain. It may refer to the category of land rather than to the profession engar.

— UET 2, 127, see the discussion below (§ 4.1, 3).

— UET 2, 161, individual plots of land, APIN is written in the first line, unfortunately badly damaged, reading ‘APIN šum₂-šum₂’.

— UET 2, 184, see above (§ 4.1, 1); combination of aša₅ en and APIN, the former on the obverse, the latter on the reverse and seemingly being the category of all the fields.

Recipients of land	UET 2, 163	Other land documents
Ama-en ₂ -si	1 eše ₃ 3 iku	UET 2, 87: 2 eše ₃ 3 iku UET 2, 109: engar
Bil ₃ (NE.PAP.UET 2-Sign 377)-igi+bur	1 eše ₃ 3 iku	UET 2, 181: 1 eše ₃ 3 iku
Lu-lu	1 bur ₃ 1 eše ₃ 3 iku	UET 2, 164 (šuku zi-ga): 1 bur ₃ 1 eše ₃ UET 2, 171a: 1 eše ₃ UET 2, 181 with GUR ² - ^d Nirah: + 1 eše ₃ [?] UET 2, 226: occurs four times (+1 bur ₃ – 1 eše ₃ – 1 eše ₃ – 2 bur ₃ 1 eše ₃) UET 2, 371 (nu-banda ₃): connected to keše ₂ -ra
Mes-an	2 bur ₃ 4 iku	UET 2, 140: mes-an-ne ₂ ¹ engar
Zur-zur	2 bur ₃ 2 eše ₃ 3 iku	<i>Passim</i> , smaller areas (UET 2, 27 – UET 2, 108 – UET 2, 128 – UET 2, 202 – UET 2, 366 – UET 2, 367

Table 2. Individuals to which šuku fields are assigned in UET 2, 163.

The evidence regarding the meaning of APIN is therefore ambiguous. UET 2, 184 might show, as already pointed out by Steinkeller (1988), that the categories APIN and en are not separated and that the former does not refer to a rent. It may nevertheless be that these fields' status changed since, as evidenced in ED IIIb Ġirsu, plots belonging to the aša₅ en could be transferred to the apin-la₂ category.¹⁹ By comparison, only one of the Fara land texts, in which the category apin-la₂ does not occur, refers to the term aša₅ uru₄ "ploughed field". Pomponio (in Pomponio / Visicato 1994, 221–222) considers this to be an abbreviation for anše uru₄-du₃, "the asses have carried out the ploughing", and perhaps should be understood as absin₃-du₃ or apin-du₃ (cf. VWDOG 143, 13). In Abu Šalabiḥ, the sign APIN is mostly encountered in šuku engar ("prebend of farmers").²⁰ This evidence from the Fara period (see Table 3) seems to reinforce the interpretation offered by Steinkeller that APIN should be read uru₄.

A critical document for the understanding of APIN is UET 2, 127, which has been the subject of much debate.²¹ The tablet consists of two parts: first, several

¹⁹ See for instance HSS 3, 40 (edition: Selz 1989, 205–206), obv. iii 18–20–iv 1, 1 ½ iku of rented land (apin-la₂) are said to have been "given out of the lord's demesne", niġ₂-en-na-ta ba-a-am₆, see also VS 14, 72 rev. ii 4.

²⁰ Krebernik / Postgate 2009, 10.

²¹ Burrows 1935, 13; Wright 1969, 109–111; Steinkeller 1988, 23; and recently Bartash 2019, 40–42. Note that the item dug-uruda occurs in the lexical list Archaic ḤAR-ra A, no. 128 (see Civil 2008, 84), in which it probably relates to a pot, despite the author's opposite opinion. On the other hand, uruda NI, measured in ma-na in obv. i 4, recalls either the vessel, lid₂, well-known in the archaic and 3rd millennium texts or, should it be a mistake for gag as suggested by Bartash, the term ^{gu}gag^{uruda}, also written gu^{uruda}

individuals are associated with amounts of copper measured in mina, a copper object dug-uruda, a copper object (?) NI measured in mina, and animals (oxen and once donkeys or horses). The last column of the reverse contains an area as a total, referred to as APIN, as well as amounts of copper objects dug-uruda, and oxen (without any personal name associated). A clause set apart indicates that this is connected with the domain of Nanna (aša₅ Nanna_x). While Wright (1969, 109–111) had considered this text as a payment of the rent of fields, Steinkeller (1988, 27) challenged this interpretation, and suggested that the oxen and amounts of copper represented an allocation of draught animals and implements for agricultural tools. Bartash (2019, 40–42), emphasizing the uncertainties of its administrative context, thought that the items of copper and animals “may have been payments to the temple for the use of the fields”. Yet some problems arise from the tablet:

— The copper object dug, notwithstanding Bartash’s dissent, is probably a pot, scarcely attested but at least occurring in a lexical list from the 3rd millennium (see fn. 22 in the present article); Wright (1969, 109) suggested that its weight, which is unknown, should be equal to 3.5 minas.

— obv. i 4 refers to 60 minas of uruda NI, which seems to be otherwise unknown (Bartash 2019, 41 compared it with KAK uruda, “copper nails”).

— Due to the lack of established equivalency between livestock and copper, it is hard to estimate the value of such animals; Wright (1969, 109) suggested equating the value of 1 ox with 5 minas of copper (compare with the price known in Ur III texts at a rate of 1 ox for 8.5 to 10.5 gi₄ of sliver, cf. Gelb / Steinkeller / Whiting 1991, 278).

— A comparison of the document with later sale contracts from the Fara period is necessarily tentative; while land, according to the Fara documents, is sold for 2 or 3 copper minas per iku (and approximately between 5 and 15 copper minas by adding the “additional payment”, niĝ₂-diri, and the “gift”, niĝ₂-ba, cf. Andersson 2014, 3–4), the price of the field in UET 2, 127, with an area of 304 iku, should it be sold at the same rate, would be 608 or 912 minas (but 1,540 to 4,620 with the additional payment).

— The total of the items preserved on the obverse and the first column of the reverse of UET 2, 127, is as follows: probably more than 83 minas of copper; 60 minas of uruda NI; 23 copper pots (dug-uruda); 1 horse/donkey (anše DUN.GI); 9 oxen. The last column on the reverse of the tablet, which does not seem to be the final total, refers to 5 oxen and 17 copper pots (dug-uruda).

occurring in the aforementioned lexical list, no. 153, see Civil 2008, 36 and 88. The name in obv. ii 4 surely contains the sign GAN to be read ħe₂ (with ĤI as a phonetic indication) whose value is discussed in Lecompte 2013, 139, and can be understood either as aya₂-ħe₂ for aya₂-ħe₂-AK, cf. with PNs 111 and 624 in UET 2, or as ħe₂-a.

Compared with the sale contracts of Fara, all those items, supposedly exchanged for the use of land, may be equal to the “main price” of the Fara contracts.²²

— This total could also be compared with the rent of the fields expressed in the later ED IIIb texts from Ġirsu, when the rent could be given as a sum of silver, an amount of barley and an amount of goats (Steinkeller 1981, 129–141), or from the Ur III period (cf. Maekawa 1977, 22–23): the rent seems to have been respectively $1/6$ giġ₄ of silver and $5/6$ gur saġ-ġal₂ in barley per iku (Maekawa 1977, 23) and 10 giġ₄ of silver per bur₃ (as said above, the area of UET 2, 127 is 304 iku, approximately 16.89 bur₃). Although it does not seem straightforward to convert a sum of silver from the end of the 3rd millennium to a sum of copper from the beginning of the 3rd millennium, the items paid by the individuals in UET 2, 127 might be superior to the expected price of the rent of the field.²³

²² Bartash 2019, 42, finds nevertheless the amounts in UET 2, 127, “comparable” to those “in the Šuruppak legal texts”. A calculation, based upon a rate of: $2/3$ giġ₄ of silver = 1 ma-na of copper; 1 ox = 10.5 giġ₄ of silver = 15.75 ma-na of copper; 1 anše dun-gi = 11 giġ₄ of silver = 16.5 ma-na of copper; 1 dug-uruda = 7.5 giġ₄ of silver = 11.25 ma-na of copper (following the rate of 1 container uri for 10 giġ₄ of silver and of axes for 5 giġ₄ of silver, cf. Gelb / Steinkeller / Whiting 1991, 290), gives the following amount of copper (without the puzzling term uruda NI): 83 minas of copper (uruda ma-na) + 220.5 minas for the oxen + 16.5 minas of copper for the donkey/horse + 450 minas of copper for the containers dug-uruda = 770 minas of copper. To this can be added 60 minas of uruda NI, the rate of which is unknown. Be that as it may, if 1 mina of uruda NI is equal to 2 minas of regular copper, the price of the field would therefore be in the average range of the Fara documents (890). This does, nevertheless, not take into account the additional payment, which could be represented by the amounts of copper containers (dug) and oxen on the last column of the reverse, devoid of any personal name (if the document was a sale contract). The total amount of copper items and animals is therefore similar to the main price of the Fara fields but still much inferior to their total price. Such calculations are of course tentative and cannot take into account the variations of prices during the third millennium.

²³ By comparison, Englund 2012, 444 and Powell 1990, 83–84 refer to the following equivalency between copper and silver during the Ur III period: 1 shekel of silver = $1 \frac{1}{2}$ mina of copper; according to Gelb / Steinkeller / Whiting 1991, 289, 1 mina of copper has a price of $2/3$ shekels of silver in the Sargonic Lambert Tablet, but this rate would result in a high amount of copper but probably still inferior to the total amount of copper items and animals: the Ur III rate of rent could imply that in UET 2, 127, 168.9 shekels of silver are expected, which, converted according to the Lambert Tablet, gives 253.35 minas of copper; if the rate of the ED IIIb Ġirsu texts is applied ($1/6$ giġ₄ of silver and $5/6$ gur saġ-ġal₂ per iku, which would mean 1 giġ₄ of silver per iku), the expected rent is 462 minas of copper. The amount of copper items and animals in this tablet is therefore superior to the expected rent of fields. Although the calculation is tentative, this situation could also be explained by the variation of prices or a higher rate of rent during the ED I–II period.

Despite the uncertainty of any interpretation, the tablet UET 2, 127, might be one of the rare pieces of evidence of a rental system of fields (the plots belonging to the Nanna temple) or maybe more probably of a field's purchase (the plots being purchased or sold by the Nanna temple),²⁴ which can be linked to other documents and data.²⁵

ED I–II	-- / (aša ₅) APIN	(aša ₅) APIN	aša ₅ šuku	aša ₅ en	šu-tab nu-šu
Fara	--	aša ₅ uru ₄ = uru ₄ -du ₃ ?	šuku	--	--
Abu Šalabiḫ	--	--	šuku (and šuku engar)	--	šu-tab
ED IIIb Ġirsu	aša ₅ apin-la ₂	--	aša ₅ šuku	aša ₅ niġ ₂ -en- na	--

Table 3. Comparison of the terminology related to fields during the Early Dynastic period.

Compared to the ancient kudurrus and the sale contracts from the Fara period, UET 2, 127 does, however, not seem to follow any well-known pattern and does not display a structure which could be related with a sale (compare with Wilcke 2007², 80, 63–64 for the Ušumgal Stele and ELTS 13, a document dating maybe to the ED I–II period and referring to oxen) – the mention of aša₅ Nanna_x is more reminiscent of management documents and there is no explicit term for the sale. The sale could therefore be of another nature than those known so far.²⁶ The reading of APIN is also uncertain, but might be uru₄ rather than a term similar to the later apin-la₂. Interestingly, one rare occurrence of both signs APIN and LA₂ might be found in the slightly later monument called *Figure aux Plumes*, where the interpretation of these two signs is also puzzling.²⁷

²⁴ The interpretation offered by Steinkeller 1988, 23, according to which the oxen and metal objects are draught animals and agricultural implements, is less convincing since it does not explain the presence of minas of copper. Since several individuals are associated with amounts of copper or livestock, they might be either the sellers (similarly to Pre-Sargonic contracts featuring one buyer and several sellers) or the buyers (the land being sold by the Nanna temple).

²⁵ As said above, UET 2, 168 also refers to a copper object but its role eludes us; see also UET 2, 140, rev. i, which, according to the traces preserved, also contains references to the sign uruda.

²⁶ Compare with IAS 508 obv. i 1' and rev. iii 1, which seems to refer to the sale of šuku plots. Tentatively, the items of copper and the animals could also correspond to the *dusu* tax which was paid in lieu of the performance of the *corvée-obligation*, for which see Steinkeller 1993, 143, Cripps 2007, 37–46 and Bramanti 2020.

²⁷ It is also worth noticing that the sign APIN occurs in four ancient kudurrus, although its meaning is not clear (ELTS 2, obv. i 2; ELTS 6 obv. ii 2; CUSAS 17, 103 obv. ii 5 and rev. v 2), as well as in a kudurru dating probably from the ED I–II period (CUSAS 17, 104 viii' 5').

4.2 Professions mentioned as recipients of land

Although the šuku- and APIN-plots are generally attributed to individuals mentioned only by name, professions are also referred to in the documents, but less often. We provide a list of these professions below.

1. Priests:

- pa₄-šeš, a plot of 6.48 ha;
- išib-AN, a plot of 6.48 ha.²⁸

2. Craftsmen and low-level officials:

- An anonymous simug, “smith”: a plot of 4.32 ha (UET 2, 98 rev. ii 2); Ušum-gal, another simug: a plot of 8.64 ha (UET 2, 358 obv. i 3’).
- Lu-lu, a nagar, “carpenter”: a plot of 10.6 ha (UET 2, 366 obv. ii 3).
- dilmun, probably a profession connected with silver: a plot superior to 0.72 ha (UET 2, 79 obv. 2).²⁹
- A nimgir-gal aša₅ (?) occurs twice in UET 2, 226 (rev. i 7’ and rev. iii 9), once with a plot whose area is not preserved, then with a plot of maybe 4.77 ha.³⁰

3. Higher-rank officials:

- kindagal, which is here not a chief barber: 259.2 ha (UET 2, 82 obv. 1).
- A kiĝgal, traditionally interpreted as “head of the assembly” but more probably a leader of a gang or a military official, in UET 2, 108 (cf. Marchesi / Marchetti 2011, 103 fn. 53 and Benati / Lecompte 2016a, 21–22).
- A land-recorder saĝ-sug₅ may occur in UET 2, 168 (see Appendix 1), although Burrows’ drawing shows for that line ’lu₂ du₅’.

In the latter two cases, professional titles are referred to as the responsible for fields or several plots of lands.

4.3 The role of the engar farmers

As said above (§ 4.1, 3), in many instances, the sign APIN refers to the farmers, engar, who had a preeminent role and are mentioned in the following contexts (see also Wright 1969, 103, 107, 109, 111, 115; Steinkeller 1988, 21, 23):

- the engar farmers occur occasionally as recipients of land:

UET 2, 104 rev. i 1: 1(bur₃) Ama-e₂-si engar (6.48 ha); rev. i 4: 4(iku) Ama-e₂¹-si engar (1.44 ha);

²⁸ Respectively in: UET 2, 27 rev. ii 9’ (probably to be understood together with the rest of the inscription, SAL.ĤU AN.U₄); UET 2, 81 obv. ii 2.

²⁹ This term, in consideration of the designation DILMUN ZAG_a in the Archaic Lu₂ list, entry 85, is less likely to be a personal name.

³⁰ In the latter, the last numeral is either ¼ or ½ (less probably) of an iku (cf. Burrows 1935, pl. 37 C [Numerals III. Land Measure]).

UET 2, 226 rev. i 8: 1(bur₃) [...] Munus-ad₂-gal engar (6.48 ha), who may be identical with Munus-ad₂-gal, but without a professional title in the same tablet rev. iii 10 and is assigned an area of 1 bur₃ 2 eše₃ (10.8 ha); rev. iii 1: 2(eše₃) Amar-u₄-sakar (4.32 ha);

UET 2, 356 obv. ii 1: 1(bur'u) Šul-šul engar (64.8 ha);

UET 2, 359 obv. ii 1': 1(bur₃)' Ib-mud (6.48 ha).

— in most of the documents related to the engar farmers (called also by their personal names), those are mentioned in lines devoid of numerals and following some plots of lands, the cultivation of which they probably managed or controlled:

UET 2, 104 rev. ii 1: Ama-e₂-si engar (the same individual receives a plot of 1 bur₃, see above), linked with 11 or 12 plots of land;

UET 2, 108 obv. iii 5: Pa-bil_x-ga engar (at least 15 fields under the supervision of a kiĝgal^{a-ša₃aša₅});

UET 2, 109 obv. iv 6: Ama-en_x(ŠU₂)-e₂-si engar, 22 plots being preserved;

UET 2, 135bis i 4: Ama-[IGI²]+BUR-sa₆-si (fragment);

UET 2, 140 rev. i 2: Mes-an-ne₂¹ engar (5 plots preserved);

UET 2, 168 obv. i 5': Šul-IG engar; obv. ii 5': Dumu-ša₃-dar²' engar; obv. ii 9': Ur-d⁴Lamma engar (see Appendix 1);

UET 2, 356 obv. i 6: AK-lu; obv. ii 5': A-²KA²-ra, both are responsible for fields of large area, the former being linked with two or four fields, two of them having areas of 45.36 ha and 62.64 ha, the latter with three fields, the largest reaching 103.68 ha.

In UET 2, 108 and 168, each engar is, alongside the ensi_x(PA.SI) of BU.MA in the latter document, responsible for some plots of land, while the official in charge of the whole procedure is respectively a kiĝgal^{a-ša₃aša₅} and maybe a saĝ-du₅. This probably shows that the engar was responsible either for the cultivation of the relevant fields or for collecting any tax, rent, or part of the production. In UET 2, 104, Ama-e₂-si is responsible for maybe 11 or 12 plots, some of them being labeled APIN, which is not associated with a personal name and may not have to be considered as engar but rather as uru₄, “cultivated” or apin-(la₂), “on rent”.

In comparison with these data, later ED IIIb texts from Ĝirsu show that the role of engar during the ED IIIb period was partly similar:

— They can be recipients of šuku- and apin-la₂-plots of land.³¹

³¹ The engar farmers receiving plots of land are well documented, see for instance Nik 1, 44 (edition: Selz 1989, 212–213) obv. iv 9–10, in which Ur-dam the engar is assigned a (šuku ki-duru₅) plot of 1 bur₃ (6.48 ha); DP 582 obv. ii 8–iii 1–2, in which Ur-du₆ is assigned a šuku plot of 1 bur₃ (again 6.48 ha). See also VS 25, 79, in which several engar are linked to plots of niĝ₂-en-na condition, probably in connection to some agricultural work to perform.

— Some of them are apparently responsible for the management of fields and their cultivation, especially in a group of texts featuring the expression *engar-be₂*, “their farmer (responsible for those fields)”.³²

— *Ur-dam*, according to documents RTC 75 and VS 14, 170, which feature the same expression *engar-be₂*, seems also to be linked to collecting the payment of the rent, including the *dusu/dubsig(IL₂)-tax* or *corvée* (Wilcke 2007², 34; Steinkeller 1981, 130–137).

— The *engar* could also take other responsibilities, like managing quantities of cereals,³³ digging irrigation canals;³⁴ note also a group of (anonymous) *engar ki-gub* in the ration lists (Selz 1998, 56; Prentice 2010, 70).³⁵

In the documents from Fara, Pomponio (in Pomponio / Visicato 1994, 222) also observed that some individuals bearing the title *engar* were responsible for the barley used for sowing. The administrative tablets from Abu Šalabiḥ are consistent with this picture, since the *engar* farmers regularly receive *šuku* land and are also responsible for other individuals’ plots: according to Krebernik / Postgate (2009, 6), the *engar*-officials were “like farm managers” who could have people under their control.

The *engar*-farmers are therefore an important administrative level in the management of the domain of the god Nanna in Ur: not only did they receive, like other types of personnel of this temple, plots of land, but they probably were in charge of coordinating the cultivation of plots assigned to other individuals and of collecting taxes or some type of levy. By comparison with the texts from Ġirsu, one could also infer that UET 2, 104, which refers to several plots labeled as *APIN* and put under the supervision of *Ama-e₂-si*, an *engar*, was a record of rented fields (see also § 4.1, 3).

4.4 On *keše₂-ra* and the role of the army

The term *keše₂-ra* applies to fields in several tablets dealing with fields’ allotment (Wright 1969, 115; Steinkeller 1988, 22):

³² Nik 1, 32 rev. iii 12 (edition: Selz 1989, 192–195); cf. Bauer 1972, 112. Texts featuring this term are notably RTC 75; VS 14, 170; Nik 1, 32; DP 585, 586, 587, 589, 592, 591 (in chronological order). Not only are rented fields (*apin-la₂*) or fields bound to a levy (*su₃-la*) concerned, but also sustenance land.

³³ See Nik 1, 39 (edition: Selz 1989, 205–206), an accounting document on crops and on the distribution of cereals, two *engar*, *Puzur₄-Mama* and *Gala-tur*, being recipients of cereals.

³⁴ For instance, *Ur-dam*, the same farmer as the one responsible for land on rent in VS 14, 170 and RTC 75, is assigned a length of 100 *nindan* (600 meters) of canal to dig in VS 25, 77. See also VS 25, 7, in which are listed furrows of different plants, one of *šum₂ sikil* (onion) belonging to the farmer *Lugal-pa-e₃*.

³⁵ For instance, in HSS 3, 6 (edition: Selz 1993, 77–93) obv. vi 10. See also Prentice 2010, 191, for their implication in the *maš-da-ri-a*.

1. šuku keše₂-ra gibil (UET 2, 368 obv. i 2'), where it follows the mention of the field aša₅ e₂-tur;

2. keše₂-ra AK:

— UET 2, 135bis obv. i 3', in which it seems to indicate the category of a land tract of at least 2 bur₃ (12.96 ha) probably linked with a name, Ama-[IGI?]+BUR-sa₆-si, a farmer;

— UET 2, 357 obv. ii 7', in which it refers to a field of at least 3 bur₃ (= 19.44 ha) without any individual associated;

3. UET 2, 371 (see Appendix 2) is a key text for this term, mainly recording gangs of men under the supervision of overseers (ugula), who are in turn below the nu-banda₃-officials; some parts of the tablet deal also with fields and agricultural areas. Keše₂-ra occurs therein three times, twice as a designation of the troops, notably in the term uĝ₃ keše₂-ra, once probably for the fields.

Steinkeller (1988, 22) hypothesized that keše₂-ra (read sir₃-ra) referred to plots assigned to soldiers (uĝ₃ keše₂-ra). It could therefore be compared with the later term zu₂(KA) keše₂ = Akkadian *kišru*, for levying troops as well as for workmen performing a task (Lafont 2009, 5–6; Schrakamp 2010: 62, 65, 84, 132; note sur_x(ERIN₂) zu₂ keše₂-ra₂, “die dienstverpflichteten Truppen”).³⁶ In view of the later ED IIIb documentation, for instance from Ĝirsu, it can also be speculated that the uĝ₃ keše₂-ra were workers performing assigned tasks (such as hypothesized by Wright 1969, 115) and liable for military service.³⁷ They might have received their share of land after having performed a duty similar to the later *ilkum*.

5 Quantitative aspects: a first assessment

5.1 Population ecology and resource exploitation in early 3rd millennium Ur enclave

For the purpose of this paper we focused on calculating demographics, consumption requirements and agricultural catchments for the Ur enclave and the institutional capacity for the Nanna temple using survey data provided by Wright (1969, 1981; see also Hammer 2019, 197–202 table 1). According to Wright's dataset, the aggregate settled area of Ur enclave amounted to ca 36.7

³⁶ Note that later texts from the ED IIIb period from Umma and Ĝirsu, also attest the expression aša₅ keše₂-(ra)₂, see respectively CUSAS 33, 154 (Umma), 180, and 184 and DP 578 rev. ii 4 (Ĝirsu).

³⁷ See notably the recent studies of Schrakamp (2014) on the categories RU-lugal and aga₃-us₂, notably Schrakamp 2014, 723–724: “Als Gegenleistung für ihr hohes Einkommen und ihren hohen Status leistete sie, in Gruppen unter Aufsehern organisiert, Wehrdienst und bildete den Kern des lagašitischen Heeres. Zugleich trug sie die Hauptlast der öffentlichen Arbeiten”.

ha, which includes the city of Ur itself, the two towns of Sakheri Khabir (site no. 30) and Sakheri Sughir (site no. 47), and some hamlets ranging between 0.4 and 1.5 ha. In total these sites suggest a settled population of ca 5,400 people, if we consider an average of 150 people per hectare as a reasonable, although conservative, estimate (Barjamovic 2014, 61).³⁸

Site	Site no. (Wright 1981)	Settlement (ha)	Population (150p/ha)
Ur	10	21	3,150
T. Sakheri	30	8	1,200
Sakheri Sughir	47	2.7	405
Hamlets	8, 82, 142	5	750
Totals		36.7	5,505

Site	Cons_L (grain kg/y)	Cons_M (grain kg/y)	Cons_H (grain kg/y)
Ur	557,550	781,200	1,061,550
T. Sakheri	207,600	297,600	404,400
Sakheri Sughir	70,065	100,440	136,485
Hamlets	129,750	186,000	252,750
Totals	964,965	1,365.240	1,855,185

Site	Catch_L (ha)	Catch_M (ha)	Catch_H (ha)	Catch_0,9ha/p/y
Ur	1,714	2,402	3,266	2,835
T. Sakheri	638	814	1,244	1,080
Sakheri Sughir	214	308	418	364
Hamlets	398	572	776	675
Totals	2,964	4,096	5,704	4,954

Table 4. Demographic and resource estimates for the Ur enclave during the ED I period (survey data from Wright 1969, 1981). Catchment scenarios (L = Low, M = Medium, H = High) are given considering biennial fallow practices.³⁹

³⁸ See Colantoni 2015 and Stone 2017 for fresh assessments of demographic estimates based on Mesopotamian urbanization remains.

³⁹ The subsistence level (cons_L) is based on the average per capita consumption of cereals for developing countries estimated by FAO to be around 173 kg per year (<http://www.fao.org/3/y4252e/y4252e04b.htm>). Cons_M is based on the average of 248 kg per year calculated by Sallaberger and Pruß (2015, 113) from the Tell Beydar ration lists evidence (cf. also Ur / Wilkinson 2008, 313). Cons_H is set at 300 kg/person/year based on Rattenborg's (2016, 51), estimates of Middle Bronze Age grain allotments for adult individuals, ranging between 300 and 375 kg per year, and Adams's (1981, 86, 146) estimates based on the Ur III evidence (i.e. 300 kg/person/year).

Then we estimated consumption requirements based on these demographic figures. Table 4 provides three scenarios: (1) a subsistence level (cons_L), calculated using Food and Agriculture Organization (FAO) data for developing countries, (2) a medium level based on Early Bronze Age evidence from institutional food allocation practices at Beydar (cons_M), and 3) a high level (cons_H) based on Ur III and Middle Bronze age food allotment practices (see fn. 39 for the sources). On the basis of these three consumption scenarios, we projected the total agricultural catchment area required to achieve each required cereal output – calculated by dividing the total output by the average yield for large estates given by Wright (1969, 104) as 650 kg of barley/ha – which was then doubled since it is well-known that biennial fallow was practiced during the 3rd millennium and therefore each year half of the arable land was left uncultivated (Widell 2013, 57, 63).

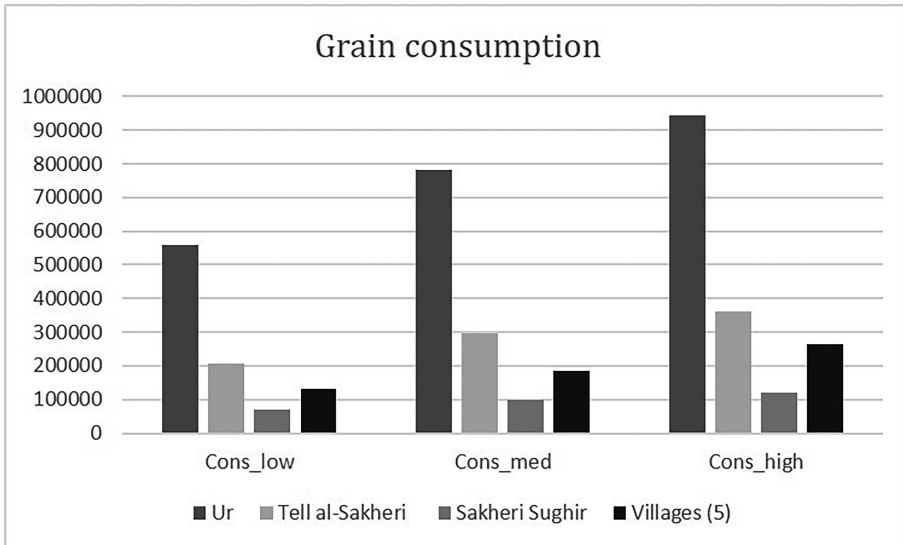


Figure 2. Barley consumption estimates for the Ur enclave based on survey data (see Table 4 and fn. 39 for specific information about consumption scenarios).

Furthermore, to add robustness to the analysis, we estimated the total catchment areas by considering that, to support one individual consuming on average 248 kg/year – and with the farming returns set at 559 kg of barley/ha for small estates (Wright 1969, 104) – an amount of 0.45 ha/person/year would have been required, which translates into 0.90 ha/person/year considering biennial fallow practices. Notably, this additional estimate attains figures which are somehow in between catch_M and catch_H scenarios, providing a more realistic optimum scenario. Thus, the Ur urban population of ca. 3,150 individuals would have consumed between 557,000 and 1,061,550 kg of grain per year – dependent on consumption levels (see figure 2) – resulting from the cultivation of between

1,714 and 3,266 ha of arable land, with a possible optimum catchment between 2,800 (Catch_M) and 2,900 ha (i.e. Catch_0,9ha/p/y). Consequently, the total settled population of the Ur enclave would have required between 964,000 and 1,689,000 kg of grain/year to sustain itself, resulting from the eventual cultivation of between 2,964 and 5,704 ha of arable land, with a possible optimum between 4,000 (Catch_M) and 4,900 ha (i.e. Catch_0,9ha/p/y).

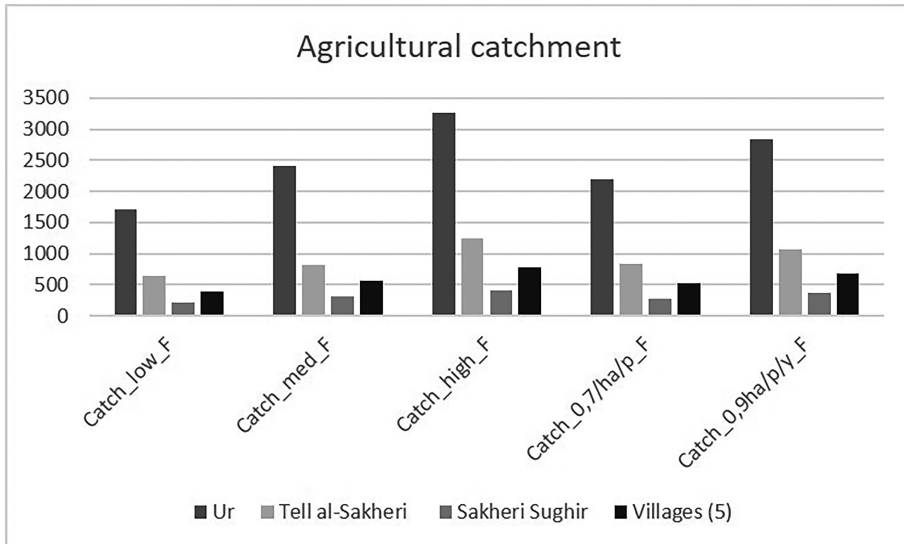


Figure 3. Agricultural catchment estimates based on survey data (see Table 4).

We calculate now the production potential of the Ur agricultural enclave, estimated to be around 9,000 ha by Wright (1969, 33).⁴⁰ According to Wright (1969, 104), harvest yields can be reconstructed from Ur texts at around 650 kg/ha of barley for large estates – a yield in line with the Ur III period crop production levels (Widell 2013, 64; Maekawa 1974, 9, 26; Maekawa 1984, 84; Jacobsen 1982, appendix 17) – and 559 kg/ha for small estates (Wright 1969, 104). Therefore, the total projected production potential of the Ur enclave arable land would have been between 5,850,000 and 4,950,000 kg of barley/year, which, considering fallow, would result in a total of between 2,925,000 and 2,475,000 kg/year.

⁴⁰ According to Wright (1969, 33) the Ur enclave is the agricultural productive area occupying the northern sector of the 1969 survey area. Wright fixed the southern and northern margins of the agricultural enclave respectively as the walking distance from the Ur and the upstream end of the Euphrates branch. The southern portion of the surveyed area was occupied by the Eridu region which, according to Wright, produced negligible evidence of ED I settlement, and farther south by the desert.

Ur enclave (ha)		Total output (650kg/ha)			Total output (550kg/ha)		
Total	9,000	5,850,000			4,950,000		
After fallow	4,500	2,925,000			2,475,000		
Percentage of total output consumed by settlements (in aggregate)		C_L 32%	C_M 46%	C_H 63%	C_L 38%	C_M 55%	C_H 74%

Table 5. Total estimated production for the Ur enclave and relationships between consumption and production levels (see Table 4).

By comparing these figures to the total consumption requirements estimated before, reaching up to 1,690,000 kg/year, we can conclude that the Ur enclave population consumed up to 57–68% of the total agricultural production only if we consider the high consumption scenario, and therefore the enclave was above subsistence level during the early stages of the 3rd millennium (see Table 4). If we consider as mean value the medium consumption scenario (Cons_M), then we can conclude that the Ur settled enclave was consuming around half of the total potential production of the Ur agrarian enclave, leaving substantial margin for the growth of human communities, as attested by the growth experienced by the enclave during the late 3rd millennium (Wright 1981, 327–328; Hammer 2019).

Turning to the production potential of the Nanna temple estate, a total figure of more than 1,165 ha is seemingly given by UET 2, 122. If we take this figure as a possible total amount of land controlled by the temple – but with the *caveat* that the real total could have been even larger – it means that at least 13% of the total arable land of the enclave was administered by the Nanna temple.

Nanna temple household				
Total land controlled (ha)	Production potential (650 kg/ha)	Workforce potential		
±1,165	378,625 kg/y	C_L	C_M	C_H
13% of total enclave arable land	13% of total enclave production (after fallow)	2,188	1,526	1,260
		66% of total farmers	46% of total farmers	34% of total farmers

Table 6. Institutional capacity regarding farming and workforce for the Nanna temple household (see Table 4 for the consumption scenarios).

Considering the average yield mentioned above for large estates, then the total production potential, after fallow, would have been around 378,000 kg/year. By taking into account the three scenarios for per capita consumption of cereals for institutional workers, the estate of the Nanna temple could have sustained between 2,188 and 1,260 individuals/year, which means, potentially, between 40 and 69% of the estimated urban Ur population and ca. 22–39% of the total Ur enclave settled population. If we take as reference the figures provided by

Wright (1969, 121) as to the number of attached farmers (ca. 800) and the total of rural workers (ca. 2,500) settled in the Ur enclave, then the temple household of Nanna could – potentially – have been able to employ between 34 and 66% of them year-round. However, the temple used agricultural produce also for seed, fodder, and other purposes (cf. Wright 1969, 112–113), and therefore the precise amount allocated for paying wages was certainly a smaller fraction of the total, hard to calculate at present. This notwithstanding, we can positively reinforce the idea that the temple household of Nanna was, indeed, the main institution in the Ur enclave.

Another strand of evidence important for assessing the extent of this early institutional economy is represented by a group of texts that record quantities of agricultural produce connected to chief administrators of the Ur enclave (Wright 1969, 113, table 3).

Text	Official	Produce recorded (kg)	Projected land surface	Land surface after fallow	No. of estimated wages (248–300 kg/p/y)
UET 2, 222	ensi of Ur	11,340 kg barley 15,090 kg wheat	17.4 ha; 23 ha	40,4 ha	88–106
UET 2, 188	ensi of Dugin	+1,080 kg	+1.4 or 2.5 ha (?)	+2.8–5 ha	+3–4
	ensi of BU.MA	8,220 kg	11–12 ha	22–24 ha	27–33
UET 2, 162	šid še (accounting?) or saĝĝa še?	7,950 kg barley, 7,035 kg wheat	6.3–8.5 ha; 6.1–9.7 ha	24.8–36.4 ha	50–60

Table 7. Texts collated by C. Lecompte. The conversion from archaic units and kg is based on the assumption – in contrast to the figures provided by Wright (1969, 113, Table 3) based on the equivalency of the archaic Ur cereal quantity system with the ED IIIb gur at Ĝirsu (1 gur = 150 l) – that the archaic Ur counting system applied to cereal units is equivalent to the archaic Uruk system (see for instance Englund 1998, 119, 215).

Indeed, although Wright's (1969, 113) figures had to be corrected, from these three texts we may conclude that high officials had at their disposal large quantities of cereals – either resulting from the collection of rents/taxes through the engar-farmers or as produce harvested from their estates – that they could then allocate for various purposes, e.g. paying wages to workers, providing seed and fodder, etc. If we consider these amounts of cereals as potential payments for wages, then we may estimate that the ensis of Dugin and BU.MA had at their disposal sums that could be employed to sustain small gangs of workers (ugula-rank gangs according to Wright 1969, 115) or perhaps their households, whereas

the ensi of Ur, and possibly the saĝĝa of the Nanna temple, could sustain large households or mid-to-large groups of workers – not dissimilar from the numbers given by Wright (1969, 115) in regard to the workforces controlled by nubanda-level officials.

These estimates, albeit hypothetical, allow us to conclude that, already in the early phases of the 3rd millennium, political institutions in southern Mesopotamia reached a considerable extension and capacity via concentration of landed assets, even in rather small urban sites.⁴¹ In particular, the offices of chief temple administrators and that of the ensi – a high political office apparently attested also in small towns – were directly in charge of managing revenues from farming through a multi-tiered organization structure that integrated the rural sector into the institutional machinery. We further elaborate on these mechanisms in the closing section.

5.2 Statistical and prosopographical perspectives

Our current research, which is still a work-in-progress, focuses on two aspects, which we think may enhance our understanding of the archaic texts from Ur:

1. First, in order to estimate the scope of the resources of the Nanna temple as well as the subsistence land assigned to its personnel, we will convert all the plots and fields mentioned to modern area systems and provide statistics. For instance, we can observe the following facts:

— the tablets of type 2 (see § 3) give a reliable idea of the range of possible sizes of the domain of Nanna (see § 5.1).

— the average area of plots assigned to the personnel of Nanna varies at some extent according to the documents: in UET 2, 168 (see § 3), by only taking into account the plots and personal names preserved, we obtain an average area for 28 plots of 6.84 ha; we can observe that the same tablet refers in general to plots having an area of 1 bur₃, 2 eše₃ or 1 eše₃ 3 iku.

2. Another aspect of our research consists of studying the prosopography of the individuals, notably the recipients of land, which, as shown in § 4, proved its value by reinforcing the idea that most of the agricultural texts refer to šuku-plots. A few individuals suffice to exemplify the approach to be developed in further studies:

— Ama-iri-si: UET 2, 168 rev. i 3': 3.24 ha (see Appendix 1) – UET 2, 108 (join with UET 2, 153?) obv. i 2': 4.32 ha (?). This individual occurs mostly in the agricultural texts, in which they receive plots of similar size and can also be the same as an individual occurring in a sheep account (UET 2, 252).

⁴¹ According to the six-tier site hierarchy based on size proposed by Adams (1981, fig. 25) in ED I, Ur should be considered a four-tier urban site, where Tell al-Sakheri a five-tier one.

— ^dInanna-AK: UET 2, 98 obv. ii 1: 9.72 ha – UET 2, 168 obv. iii 7: 9.72 ha and maybe rev. i 5: 8.64 ha (see Appendix 1). UET 2, 357 obv. ii 6: 19.44 ha – UET 2, 366 obv. ii 7: 16.2 ha – UET 2, 211 2: +4.32 ha. This individual receives rather large tracts of land and twice an identical one. It is nevertheless uncertain whether or not the same individual is referred to (UET 2, 98 and 168 positively do). He can also be connected to the same personal name occurring in cereal accounts, whereby he would be involved in the delivery or the expenses of cereals maybe produced from his own plots.⁴²

Yet, two features of the archaic texts from Ur impede further prosopographical studies. Due to their poor state of preservation, significant pieces of information did not survive and we are left with many fragments containing very limited data. Furthermore, unlike the later Šuruppak, Ĝirsu, or Umma texts, the recipients of land are not arranged in a standardized way, which would help us when reconstructing the missing lines.

6 Conclusions

The onset of the 3rd millennium in Mesopotamia witnessed the rise of secondary urbanism, and important changes at the political and social levels that are still being clarified (Benati 2015; Nissen 2015; Steinkeller 2018, 2019; Matthews / Richardson 2018). Although a redistributive institutional structure is already established by the Late Uruk period in southern Mesopotamia (Steinkeller 1988, 13–14; Englund 1998, 212–213), the “classic” institutional organization system, as we know it from the later Early Dynastic sources (Garfinkle 2013; Prentice 2010), begins to emerge in the post-Uruk phase. A key feature of this state-building process consisted of the rise of a judicial system for managing the main productive asset of the time, arable land (cf. North / Wallis / Weingast 2009). The creation of legal capacity started with the introduction, at the very end of the 4th millennium, of private legal documents (Gelb / Steinkeller / Whiting 1991; Renger 1995, 273–278; Wilcke 2007², 25–26) regulating property rights on land – which, by then, was already concentrated in the hands of elites, notably close to the temple (Renger 1995, 272–273) – and of land-for-tenure arrangements, the so-called šuku-system (Cripps 2007, 19–20; Englund 1998, 209–212). Through this system, political institutions secured manpower and agricultural returns – i.e. more fiscal capacity – by enfranchising a growing number of citizens that received usufruct over land in exchange for labor, taxes, and services. This is attested by the sheer size of the political economies of the institutions in Jemdet Nasr (Renger 1995, 273) and Ur (see above § 5.1) at the onset of the 3rd millennium. The second step was represented by the rise of

⁴² See for instance UET 2, 31 obv. i 2'; UET 2, 65 obv. i 8, in which he might be the responsible of barley delivery or distribution; see the references in Burrows 1935, 31.

palatial organizations as second institutionalized decision-makers, alongside the temples, in the emerging Sumerian city-states (Steinkeller 2018, 2019; cf. Benati / Guerriero / Zaina 2019), and by the introduction of corvée arrangements and army conscription mechanisms (Steinkeller 2015, 9–14; Cripps 2007, 22–29; Schrakamp / Paoletti 2011, 161–162), which, as attested by this article, seem to be emerging already in archaic Ur (see above § 4.4). These political and legal innovations allowed institutions to successfully expand the ranks of citizens participating to institutional activities, which is also attested by the growing infrastructural power of early Mesopotamian states that during the second and third quarters of the 3rd millennium started to be able to raise conscripted armies and build expensive public buildings, such as fortifications (Richardson 2011, 18–20, 35–36; Rey 2016, 36, 39–40, fig. 1).

As said above, Ur provides some of the best data to contextualize the early phases of these important processes. Due to the nature of the sources, we are in a better position to reconstruct the decision-making structure and economic organization of the temple sector since the palace and the early rulers, the ensis, are mentioned infrequently (Benati 2015, § 4.4.2). Indeed, the temple household of Nanna controlled a substantial amount of agricultural land, possibly as much as the catchment of small urban site such as Ur, and extracted revenues in part by cultivating the fields through sharecroppers and in part by allotting and renting fields to its personnel and to farmers. The land of the temple household of Nanna seems to have been organized as follows:

— Land was used according to two or, less likely, three documented modes: (1) *aša₅ en*, land supervised by the central institutions; (2) *šuku*-land as subsistence field allotted to workers and institutional personnel; (3) APIN-fields, maybe rented out to farmers and individuals, although the connection of this term with the later *apin-la₂* category of land is still hypothetical.

— Institutional farming was managed according to a multi-layered hierarchy:⁴³ (1) high-ranking individuals were in charge of large tracts of land, either as *aša₅ en* or as a part of the domain to divide into allotments plots assigned to the personnel of the temple; (2) *nubanda*-rank officials probably supervised work units and/or field allotments assigned to those liable to service in the work units; those groups were subdivided in smaller units ranging from 21 to 43 men – according to UET 2, 371 – under the responsibility of the *ugula*. This organization is reminiscent of the role of the *RU-lugal* and *aga₃-us₂* in ED

⁴³ A preliminary survey carried out on a dozen of land management texts indicates four clusters for the average measures of field allotted by the temple of Nanna, with the majority clustering between 0.36 and 52.92 ha (1), then a cluster between 52 and 137 (2), 259 and 434 (3), and finally, a couple of texts that record surface between 1,165 and 1,211 ha (4). Further work is, however, required to check more carefully the three/four-level decision-making structure for farming hypothesized by Wright (1969, 115).

IIIb Ĝirsu, who formed a high social level, receiving plots of land and being responsible of groups of men serving as soldiers or workers; (3) The engar-farmers, who are the most frequently mentioned officials within our texts, may have been responsible for the cultivation of the plots allocated and for the collection of fees, taxes on the production or for the payment of the rent of the APIN-fields, were it the case that they were similar to the later apin-la₂ category.

— Institutional farming was thus carried out through sharecropping and/or corvée arrangements. The engar-farmers played probably a salient role within this institutional structure, especially as regards the management of the resources and the agricultural production. The management of the institutional land was also based on considerable personnel, reaching up to 700 individuals according to Wright (1969, 115), who received allotments of arable land. Some of them were encumbered with a military service (keše₂-ra), while others, as proven by the occurrence of a few craftsmen such as smiths and carpenters (see § 4.2), were probably integrated in a system of redistribution.

Another important feature of the Ur texts is the information on the collection and management of agricultural revenues, chiefly grain, which can provide further insights into taxation mechanisms. The main officials in the Ur enclave, chief temple administrators and the ensis, are attested in connection to the handling of large quantities of grain that could be employed to sustain the institutional personnel. This is an important strand of evidence because the power to gather revenues is a core component of state capacity models developed by social scientists (Besley / Persson 2009; Mayshar et al. 2019; Winterhalder / Puleston 2018), but the origin of fiscal capacity in the ancient world is still an underdeveloped subject (Jursa / Moreno García 2015; Benati / Bonechi 2020; Bramanti 2020). Besides maintaining the institutional machinery, the revenues from farming were invested by the institutions in the provision of some public goods, such as the maintenance of the irrigation infrastructure (Benati 2015, § 6.3.1, fn. 29), the organization of religious festivals (Benati 2015, § 4.4.7) and seemingly a conscripted army (see § 4.4). The organization of cultic activities also featured a pan-Mesopotamian inter-city network of gift exchanges connected to specific rituals – the so-called “City Seals network” – of which Ur was a key node, further indicating the remarkable institutional capacity achieved by Ur early in the 3rd millennium (Benati 2015, § 6.6, fig. 6; Matthews / Richardson 2018). In conclusion, institutional capacity in early Ur was built by creating synergies between social classes through a common economic activity – irrigated farming – that allowed political institutions to exploit large tracts of agricultural land, extract substantial returns from them and redistribute the outputs via the provision of public goods. Cooperation between an elite managing institutional land and the farming sector was achieved by integrating farmers, craftsmen and people liable to a service into the institutional machinery via land-allocation practices that de facto secured access to land and

benefits to state personnel within a redistributive system in exchange for labor and services and a share of public goods.⁴⁴

Appendix 1. UET 2, 168: a text exemplifying institutional land allocation mechanisms

1. Edition of UET 2, 168⁴⁵

- obv. i (Probably 5 or 6 lines missing)
- 1' ʾ1(bur₃)ʾ [...] ʾxʾ
- 2' 1(bur₃) Iḡ-si₄
- 3' 1(bur₃) AK
- 4' 2(eše₃) Iḡi+bur-ki
- 5' **Šul-IG engar**
- 6' ʾ+2(bur₃)ʾ Amar-MUŠ₃.KUR
- 7' 1(bur₃) Da-dar
- 8' 1(bur₃) Amar-e₂-gibil
- 9' 1(bur₃) En-abzu-si
- obv. ii (A few lines missing)
- 1' [...] -di₄-la
- 2' 2(eše₃) UD.NI-umbin_x²(UET 2-Sign 21-GADA)-na
- 3' 1(eše₃) gag-uruda
- 4' 1(eše₃) 3(iku) AŠ
- 5' **Dumu-ša₃-dar² engar**
- 6' 1(eše₃) Aya₂-šeš¹(uri₃)
- 7' 1(bur₃) 1(eše₃) Ur-saḡ
- 8' 1(bur₃) AN-la-a
- 9' **Ur-⁴Lamma engar**
- 10' 6(bur₃) Bil_x-lal₃
- obv. iii (A few lines missing)
- 1' [...] ʾ1(bur₃)ʾ² [...]
- 2' 2(eše₃) ʾx⁴⁶

⁴⁴ Prentice (2010, 90–95), interprets the “ration” which the personnel of the Ba-U₂ temple received as a type of wage for the performance of a work. It has to be noticed that several professional categories receiving a food allocation in the documentation from Ġirsu were also recipient of šuku plots of land: for instance, the cook Ḥamati, who belongs to the category of the lu₂ šuku dab₅-ba in the “ration” lists (cf. Prentice 2010, 72 for the implication of the cooks), is also assigned plots of land of 4 iku in several tablets, notably HSS 3, 40, VS 25, 70, VS 25, 87, and HSS 3, 38.

⁴⁵ Underlined: lines which do not seem to refer to a personal name but to a possible transaction. **Bold**: officials with a responsibility.

⁴⁶ AL or NI.

- 3' 1(eše₃) EREN₂
 4' 2(eše₃) Mes-utu
 5' 2(eše₃) 4(iku) AN-ma-la
 6' 1(bur₃) A-tu
 7' 1(bur₃) 1(eše₃) 3(iku) ^dInanna-AK
 8' 1(eše₃) 3(iku) Šul
 9' 1(eše₃) 3(iku) AK BU.MA
 10' 1(eše₃) 3(iku) AN-za₇
 11' 2(bur₃) A-me-ki
 12' 2(eše₃) 3(iku) Lu-ma
 13' 1(eše₃) Na-^rni^r
 obv. iv (Some lines missing)
 1' 2(bur₃) [...]
 2' 1(bur₃) 1(eše₃) ^ršu^r-[...]
 3' 1(eše₃) 3(iku) TAR-[...]
 4' 1(bur₃) ^rAŠ[?] [...]
 5' 1(eše₃) 3(iku) Ur-ib
 6' **ensi_x BU.MA**
 7' 2(bur₃) ^rLugal^r-da
 8' 1(eše₃) [...]
 9' 1(eše₃) [...]
 rev. i (Some lines missing)
 1' 1(eše₃) [...]
 2' 2(eše₃) ^rx^r-ad₂-gal
 3' 1(eše₃) 3(iku) Ama-iri-si
 4' 2(eše₃) U₄-sakar
 5' 1(bur₃) 1(eše₃) 3(iku) ^rd[?][Inanna[?]]-AK
 6' 1(eše₃) ^rx^r [...]
 7' BU-[MA x]
 8' ^rGAN₂[?]
 rev. ii
 1 ^rsaĝ[?]-dun₃
 2 [...]-nu-gu₂
 3 šu-tab
 4 BU.MA ša₃

2. Area of the land allotments in UET 2, 168

Allotments	Officials
[...]: 6.48 ha Igi-si4: 6.48 ha Ak: 6.48 ha Igi+bur-ki: 4.32 ha	Šul-IG engar
Amar-MUŠ ₃ .KUR: +12.96 ha Da-dar: 6.48 ha Amar-e ₂ -gibil: 6.48 ha En-abzu-si: 6.48 ha [...] -di4-la: [...] Three plots do not refer to personal names: – UD.NI-umbin _x ² -na (a stone?): 4.32 ha – gag-uruda (a metal object): 2.16 ha – AŠ (dili?): 3.24 ha = in total: 9.72 ha	Dumu-ša₃-dar² engar
Aya ₂ -šeš: 2.16 ha Ur-sağ: 8.64 ha AN-la-a: 6.48 ha	Ur-^dLamma engar
Bil _x -lal ₃ : 38.88 ha [...]: 6.48 ha [... NI/AL]: 4.32 ha EREN ₂ = a group of workers (?): 2.16 ha Mes-utu: 4.32 ha AN-ma-la: 5.76 ha a-tu (a priest?): 6.48 ha ^q Inanna-AK: 9.72 ha Šul: 3.24 ha AK BU.MA: 3.24 ha AN-za ₇ : 3.24 ha A(ya ₂ ²)-me-ki: 12.96 ha Lu-ma: 5.4 ha Na-ni: 2.16 ha [...]: 12.96 ha šu-[...]: 8.64 ha TAR(sila ²)-[...]: 3.24 ha AŠ ² : 6.48 ha Ur-ib: 3.24 ha	ensi_x BU.MA
Lugal-da: 12.96 ha [...]: 2.16 ha [...]: 2.16 ha [...]: 2.16 ha x-ad ₂ -gal: 4.32 ha Ama-iri-si: 3.24 ha U ₄ -sakar: 4.32 ha ^d [Inanna ²]-AK: 8.64 ha [...]: 2.16 ha	BU-[MA x] / ^rGAN₂²
^r sağ ² -du ₅ / [...] -nu-gu ₂ / šu-tab / BU.MA ša ₃ “land-recorder (?) [...], šu-tab-land, within BU.MA”	

Appendix 2. UET 2, 371: a key text for understanding institutional labor management

1. Edition of UET 2, 371

obv. i

- 1 4(u) 3(aš) ʿkeše₂ʿ-[ra] Amar-ku₃-ga [ugula]
 2 ʿ4(u)ʿ 3(aš) Me-ʿraʿ ugula
 3 [...] 3(aš) ʿAma²-ušum²ʿ-^{gal} ugula
 4 [...] Igi-ʿgu₄²ʿ
 5 [...] ʿAmarʿ-[...]
 6 **Amar-[u₄]-sakar [nu-banda₃]**
 7 2(u) 1(aš) ʿAmar-šul-ki ugulaʿ
 8 2(u) 1(aš) Gu₄-tur ugula
 9 2(u) 1(aš) AK ugula
 10 **lu-lu nu-banda₃**
 11 3(u) 2(aš) Ku-li ugula

obv. ii (Beginning of the column damaged)

- 1ʿ ʿ2(u)ʿ [...]
 2ʿ ʿ2(u)ʿ [...]
 3ʿ ʿ3(u) MA²ʿ [ugula]
 4ʿ ʿ3(u)ʿ 2(aš) ʿxʿ-si ugula
 5ʿ **[...]-si nu-banda₃**
 6ʿ si:ga:ʿnam²ʿ
 7ʿ 4(u) 8(aš) Mes-lu ugula

rev. i

- 1 gu₂-an-še₃ 3(ĝeš₂) 4(u) 6(aš) uĝ₃ keše₂-ra Amar-u₄-sakar nu-banda₃
 2 1(ĝeš₂) 3(aš) Lu-lu nu-banda₃
 3 1(ĝeš₂) 4(aš) Ama-e₂-du₁₀ nu-banda₃
 4 1(ĝeš₂) Lu₂-za₇-ʿza₇ʿ
 5 [...] dugin₂
 6 [...]
 7 [...]
 8 [... nam²ʿ]-si-ga
 9 [...] 2(u) 4(aš) Ba-ʿra²ʿ
 10a 1(bur₃²) 2(eše₃) ʿ2(iku)²ʿ [...]
 10b 1(bur₃²) 2(eše₃) 3(iku) ʿlu₂ xʿ
 10c 1(burʿu²) 1(bur₃²) ʿ2(iku)²ʿ [...]
 10d 1(burʿu²) 4(bur₃²) [...]
 10e 1(burʿu²) 3(bur₃²) [...]

rev. ii

- 1 4(burʿu) 4(bur₃) ʿ+1(iku)ʿ keše₂-ʿraʿ [...]
 2 [gu₂]-an-še₃ [...] ʿ1(eše₃)ʿ [...]

2. Observations

obv. ii 6' and rev. i. 8: Burrows held those lines for a possible personal name, GA SI MUD. Its interpretation is thorny since the broken sign may also be NAM and its meaning seems to be that of a designation rather than a name.

The interpretation of the numerals in rev. i 10c–e is not certain. They read as follows by using the conventions for the archaic texts:

10c 1N₄₅ 1N₁₄ '2N₁'[?] [...]

10d 1N₄₅ 4N₁₄ [...]

10e 1N₄₅ 3N₁₄ [...]

They could also refer to cereals, though this does not seem likely here.

3. Analysis

Obverse (lines preserved)		
Number of men	ugula	nu-banda₃
43	Amar-ku ₃ -ga	Amar-u ₄ -sakar
43 [?]	Me-ra-[x]	
43 [?]	Ama-ušumgal	
x	Igi-gu ₄ [?]	
x	Amar-[...]	
21	Amar-sul-ki	Lu-lu
21	Gu ₄ -tur	
21	AK	
32	Ku-li	Ama-e ₂ -du ₁₀
32	x	
Reverse		
226	Amar-u ₄ -sakar nu-banda ₃	4 bur'u (?) 4 bur ₃ +1 iku = +285.48 ha
63	Lu-lu nu-banda ₃	gu ₂ -an-še ₃ : [...] + 1(eše ₃)
63	Ama-e ₂ -du ₁₀ nu-banda ₃	
x	[PA [?]]-dugin _x (UET 2-Sign 303)	
Number of men	ugula	nu-banda₃
x	x	
+4	x	
	[nam [?]]-si-ga	
+24	Ba- ^r ra [?]	

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