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Vines Among the dunes: sand/dune agriculture in Rimāl Isdūd/ Ashdod-Yam during the Late Ottoman and British Mandate periods

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ABSTRACT

This article offers an interdisciplinary analysis of Palestinian economic exploitation of marginal dunefields along the coast of the Southern Levant. It focuses on the agricultural rehabilitation and agrarian development of Rimāl Isdūd (around modern Ashdod) between 1870 and 1948. After outlining the area's long history, and presenting a novel typology of Palestinian sand/dune agriculture, the article sketches the transformation of an area long left in ruins and buried by sand into intensively-cultivated agricultural land during the Late Ottoman and British Mandate periods. It shows how Palestinian inhabitants challenged the ecological limitations of these supposedly marginal, sandy wastes, through their hard-work and determination within changing (and challenging) colonial, demographic and economic contexts.

KEYWORDS

Sand/dune agriculture; Mawasi; Ottoman Palestine; British Mandate Palestine; traditional agriculture; land improvement; environmental degradation; rural history; rural development

Introduction

Ashdod-Yam (Ashdod-by-the-Sea) is an impressive coastal archaeological site on Israel's southern coastal plain, located within the modern city of Ashdod (Figure 1). A renewed excavation project was launched here in 2013 with the aim of exploring Philistine coastal settlement remains dated to the Iron Age IIB – IIC (eighth to seventh centuries BCE). During these excavations, significant Hellenistic and Byzantine period remains were also investigated.[1] Due to the extensive sand cover overlaying the site, the excavators deployed special geophysical techniques. Yet even when surveying by foot alone, one could not help but notice agricultural remains from a more recent past – grapevines popping out between typical coastal-dune vegetation, or occasional sycamore-fig (Ficus sycomorus) and fig trees (Ficus carica).

This article sets out to recover the story of these vines amongst the sands, and to thus retrace the forgotten economic context embedded in the Palestinian cultural landscape to which they belonged. Building upon exploratory work on modern Palestinian agriculture in adjacent areas (Sasson 2018, Fischer and Taxel 2021, Roskin and Taxel 2021, Taxel *et al.* 2021, Levin 2024), the article focuses on the hitherto-underdiscussed coastal area of Isdūd, called Rimāl Isdūd in Arabic.

The article addresses the economic development of sand dune agriculture in this challenging ecological niche and the reasons for its hitherto not-fully-explained emergence as an agricultural

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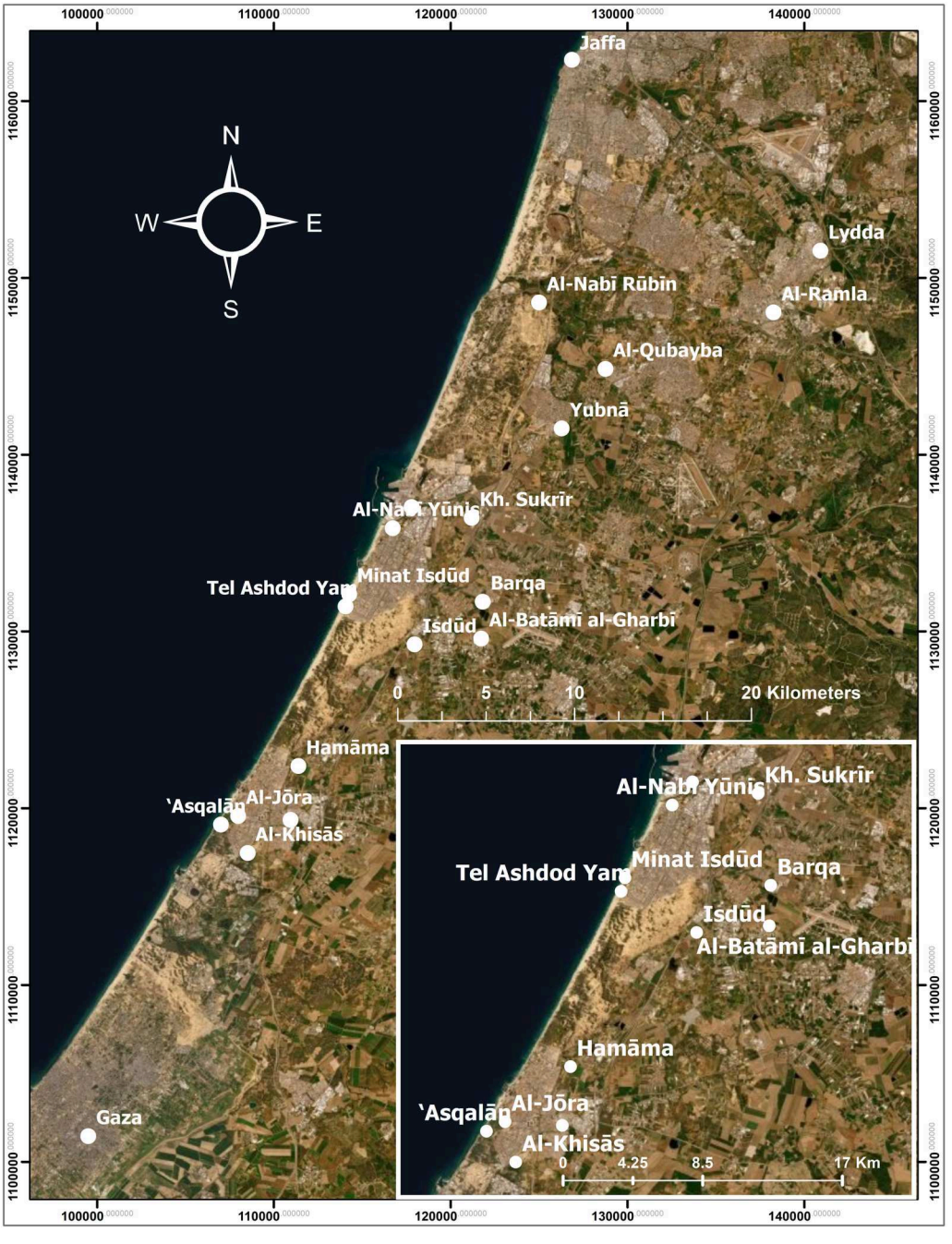


Figure 1. A general location map of the Ottoman and British Mandate-period sites (by Roy Marom).

hinterland during the Late Ottoman and British Mandate Period (c. 1870–1948) (Figure 2). For these purposes, we utilised scattered physical remains as well as the literary sources and oral testimonies of the former Palestinian inhabitants of the area, accompanied by historical cartographic and photographic evidence. The findings of this study challenge prevailing attitudes within both scholarship and the policies of British and Israeli state actors, which typically characterise sand dunes as inherently barren and unsuitable for cultivation. Furthermore, these perspectives tend to minimise or

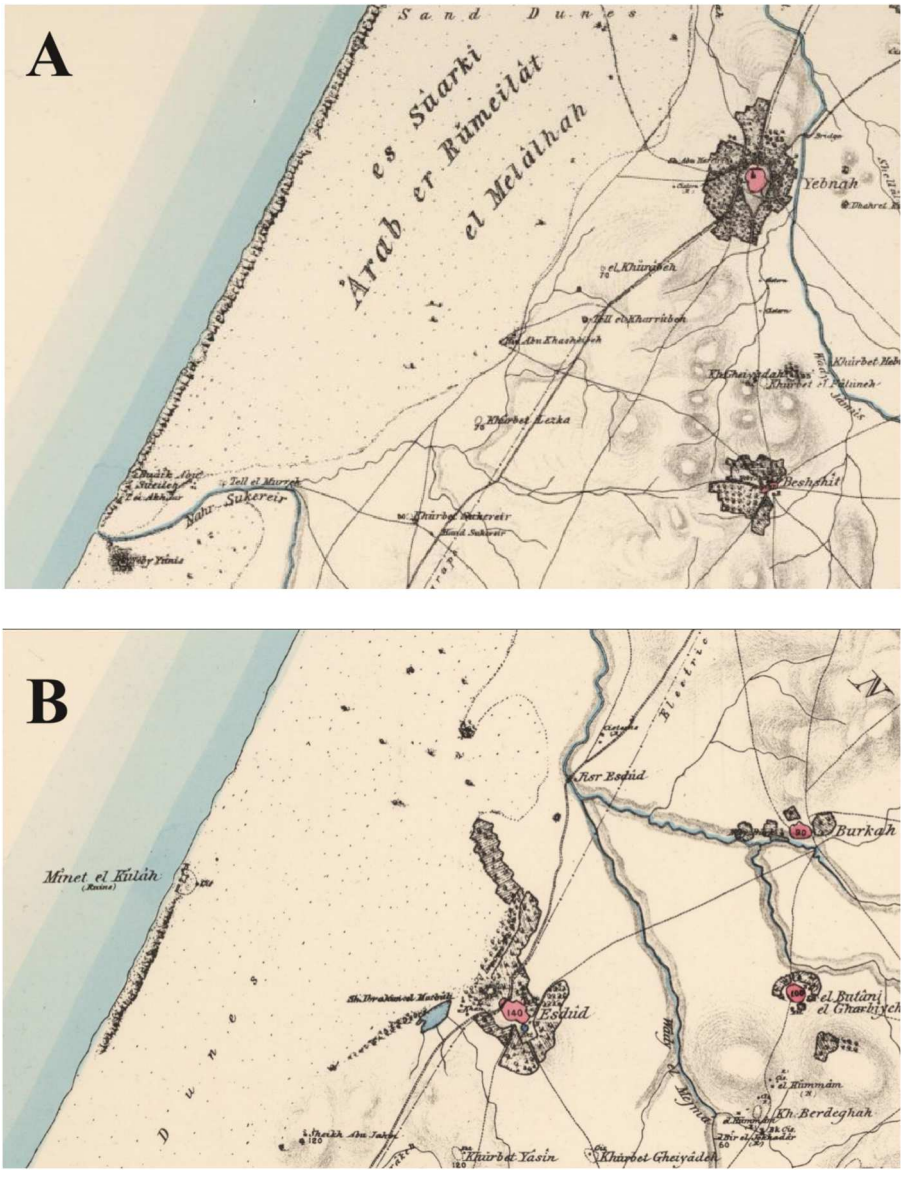


Figure 2. Sections of the SWP map: above (a): 'Arab Sukrīr and Rimāl Yibna, and below (b): Rimāl Isdūd.

altogether overlook the significance and scope of Palestinian agricultural practices. This study further establishes a more refined chronological framework regarding the emergence of sand dune agriculture at Rimāl Isdūd. It does so by examining land uses and economic and agricultural practices that predate 1948, which were pivotal to Palestinian livelihoods and economic stability in this part of Late Ottoman/Mandate Palestine during a time of immense social, economic, political, technological and demographic change.

Geography of Rimāl Isdūd

This area of study encompasses the ancient site of Ashdod-Yam and its hinterland, and comprises a key link in the chain of littoral dunefields along the southern Levantine coast. Bounded by the

Mediterranean Sea to the west and the alluvial plains to the east, it is delimitated by the northern and southern Mandatory administrative village boundaries of Isdūd (Figure 2). The dunefields and lowlands of 'Arab Sukrīr occupy the region north of the study area (with a tribal centre at Tel Mor, near a Lachish River estuary), while beyond its southern extent lies the littoral dunefield's southerly continuation into the neighbouring territory of Ḥamāma village, called Rimāl Ḥamāma in Arabic. Topographically, semi-consolidated aeolian sand dunes of various heights and vegetation cover dominated this area, as well as solitary outcrops of local fossilised sandstone (*kurkār*) (Tsoar and Cohen-Zada 2020).

Rimāl Isdūd belongs to a belt of Holocene-age coastal aeolian dunefields stretched along the Eastern Mediterranean coast, composed primarily of quartzite grains carried from the Nile north into the Mediterranean Sea, and biogenic calcareous accretions (marine and terrestrial mollusc shells) (Goldsmith 2001, Bitan 2020). The development of dunes along Israel's coastlines has received considerable attention in recent years, summarised in Levin's work (2024). The sand accumulation around Ashdod/Isdūd is of a relatively recent date, as evident by the burial of datable Byzantine remains (c. 6th century CE) across the site and by an early Islamic and Crusader fort (c. seventh to twelfth centuries CE; see below). A more recent episode of aeolian sand deposal occurred during the Late Ottoman period, overlapping much of the period of agricultural expansion discussed in this article (cf. Levin 2024).

The Levantine coast enjoys a hot-summer Mediterranean climate (Köppen classification Csa), with cool, rainy winters (December to February) and extremely hot, dry summers (June to September). Annual rainfall in the *rimāl* fluctuates yearly between 300 and 450 mm, and rainwater that accumulates in interdune depressions creates seasonal lakes (Gvirtzman and Wieder 2001, Kafle and Bruins 2009, Levin *et al.* 2009). Fresh water is easily accessible at shallow depths (Nir 1997, Vunsh 2018, Roskin and Taxel 2021, Levin 2024). Dune features and the sand cover vary according to the underlying topography, beachface and various states of dune consolidation. Thus, even extensive dunefields often contain interdune depressions of superior soil quality, which are far better suited for cultivation. The dunes are variously vegetated by Mediterranean bush, shrub and bipinnate love grass/halfa grass (*Desmostachya bipinnata*) habitats, which are susceptible to overgrazing, soil erosion and aeolian sand movement (Dexter 1986, Kutiel 2001, Bar 2013, Bar *et al.* 2016).

Sources and methodology

The article offers a historical-geographical overview, belonging to the genre of local history, which describes a limited space within its broader historical contexts. This study is grounded in comprehensive research into the geography and history of the area, combining historical documents, field investigations and insights from the 'local knowledge' of past residents and their descendants. It draws on visual-cartographic documentation (such as historical maps and photographs), physical remains and oral testimonies in order to better understand local patterns of land use and settlement. In analysing these diverse sources, the authors follow Boschmann and Cubbon (2014)'s methodology of spatially contextualising qualitative narratives (Marom 2020, 2021, 2022; Marom and Taxel 2023; 2024; Marom *et al.* 2024).

One of the problems in the study of Palestine's southern coastal plain during the Ottoman period is the paucity of surviving primary sources, as well as the lack of narrative descriptions by past travellers and explorers. For decades, Shari'a court records have been regarded as one of the most important sources for knowing the country's social and settlement history (Doumani 1985, Yazbak 2001). However, the Gaza series that dealt with both Isdūd and its Rimāl were destroyed by the British bombardment in World War I, with the exception of one volume discovered in Damascus (Rāfiq 1980).

With regard to the more recent past, one can compensate to a limited extent for this shortcoming by turning to oral history and tradition. The article thus makes use of oral testimonies collected during Marom's Palestinian Rural History Project (hereafter PRHP).[2] Oral sources, once properly recorded and cautiously interpreted, provide important information about the geography, residents and land uses otherwise unrecorded in surviving records (Shryock 1997, pp. 1–37, Marom 2022, pp.

However, as subjective, contemporary sources, oral accounts reflect the biases of memory, as .(75–69 moulded by the particular circumstances of narration. Narrations can also be affected by political bias and agendas, or the interviewee's awareness of possible repercussions of being quoted publicly (Hoffman and Howard 1974, Lummis 1981). These drawbacks have been variously addressed by cross-referencing sources, preferring the testimony of early, unrelated sources (cf. Thompson and Bornat 2017, pp. 1–70), and by relying on the common denominator of the various reports (a historical Occam's Razor approach advocated by historian Robert Hoyland [1997] in the early Islamic context).

A more acute and thorny issue concerns the classification and cataloguing of cartographical representations of different agricultural units in the study area, in forming the basis for comparative diachronic spatial analysis.[3] These representations are undoubtedly schematic, and their assignment to a specific cartographical category is arbitrary. Although classified as homogenous, mono-crop plantations, traditional Arab-owned plantations (Arabic: *Kurūm*, *basātīn*, sing. *Karm*, *bustān*) tended to be planted with a variety of fruit trees (Map of Hamāme & El Majdal [Det.], Gaza Sub-Dist., 1:10,000, July 1932, Hasan 2016.). The 1:20,000 topo-cadastral does not reflect the inherent variation in the constitution of the plantations, their density and percentage of cultivation. For example, dune cultivation is inconsistently marked as tree groves or olive orchards on the maps, which most importantly lack a separate symbol for *mawāṣī* (low-laying agricultural plots between dunes), so common in the study area (Tsoar and Zohar 1985). The incongruencies along the borders between the sheets of 'Arab Sukreir and Ḥamāma makes this problem all the more poignant.

Plots are better symbolised on village rural tax maps, which show the composition and percentage of agricultural plots for fiscal uses. These maps, and contemporary (pre-1944) aerial photography, are both missing in Rimāl Isdūd's case. Therefore, as a measure of expediency, the authors accept the symbology at face value, working under the assumption that it represents the most dominant crop in each plot.

In contrast to the colonial tendency to perceive Middle Eastern ecologies as uniformly barren and desolate (Dolbee 2023), patterns of cultivation were not static; rather, they evolved in response to economic demand and supply, prevailing climatic conditions and socio-political circumstances. For example, many citrus groves, expensive to maintain, were uprooted during the Arab Revolt of 1936–1939 and the Second World War (1939–1945) for lack of export opportunities (Karlinsky 2005, p. 75). On the other hand, the increasing number of Allied troops stationed in Palestine, including around Ḥamāma and Isdūd, led to an upsurge in demand for fresh agricultural produce. Some irrigated plots, formerly used for citrus fruit, were utilised instead for vegetable cultivation, an aspect left unmarked on topo-cadastral maps (cf. Kamen 1991).

Over the last decades Palestinian writers published hundreds of village books concerning depopulated and surviving Palestinian settlements (for Isdūd, see Husein 2005, Al-Madanī 2009, al-Manā'ima and al-Madanī 2010, Al-Sahhār 2011, Jūde 2015). As a literary genre, the village books are of eclectic disposition, ranging from childhood recollections, through ethnographic documentation, to serious scientific enquiries. This literature is usually written in Arabic, and it therefore rarely used for studying the historical geography of Palestine's countryside (Slyomovics 1994, Davis 2011). In this study, we make comprehensive use of the village records from Isdūd to reconstruct the practices of sand and dune agriculture within the region's dunefield.

Typology of sand/dune agriculture

Uncultivable rimāl, e.g. dunefields, were known collectively in Ottoman legal terminology as *mawwāt* lands. Mawwāt lands were – by definition – not utilised for agriculture, but were suitable (and open) for seasonal grazing by Bedouins or pastoralists from adjacent villages (Al-Madanī 2009, p. 39, Al-Sahhār 2011, p. 75, 159). Palestinian agrarian vocabulary does not distinguish between plantations in sandy and non-sandy soils. Recent scholars have developed specific

analytical categories of interdune agriculture (e.g., Roskin and Taxel 2021). In the following section, we propose three types of dune cultivation.

A. *Mawāṣī*: plot-and-berm agriculture, invented during the Early Islamic period (eighth to eleventh centuries CE) and known as mawāṣī during the Ottoman era. This form of agriculture is unique to the sandy coastal regions of the southern Levant and is a variation of cultivators utilising shallow wells to irrigate the plots of land after clearing them of sand, and surrounding them with a crusted soil embankment called a berm. The cultivators then fertilised the land with household waste and animal dung, and by taking organic-rich soil from ancient mounds. By 1800 CE, local agriculturalists revived this method of agriculture in a simplified form in northeastern Sinai and in the Gaza coastal lowlands (Levin 2024, p. 195). Cultivators now focused on sunken plots in sand near the beach and irrigated from shallow artesian wells, using the high groundwater table along the shore (Tsoar and Zohar 1985). Mawāṣī plots mainly supplied the population with vegetables for domestic consumption.

A tribeswoman (b. 1940) from ʻArab Sukrīr, just north of Rimāl Isdūd, reminisced to the authors that, 'The *mawāṣi* are located along the shoreline […] and they are in low-lying, fertile ground, characterised by the existence of numerous water springs called *nazzāzāt* [slowly oozing, weak sources of groundwater collected in shallow clay deposits]'.[4] Regarding the process of preparing newly acquired mawāṣī land for farming, the tribeswomen clarified that, 'The land is cleared of grasses, and it is ploughed with camels for the first time.' The resultant uprooting of the vegetation from its roots 'is known as "the stripping of the land (*jaldihā*),"' the elder went on to explain, utilising a linguistic form associated with removing the hide from slaughtered animals. 'The land is then sown without the use of fertilisers,' she continued, 'but the next year the land is ploughed and fertilised with native manure, the dung of cows and sheep called *zibl*. During the winter the *mawāṣī* becomes flooded by rainwater and forms a pool' (PRHP interview, 29 June 2022).

B. *Kurūm, basātīn*: plantations and orchards (*kurūm*, *basātīn*, sing. *karm*, *bustān*) of perennial fruit trees. Traditionally, Arabs stocked their plantations with olive trees (*zaytūn*), fig (*tīn*) and grapevines (*ʻanab*). According to Islamic law, trees were private property (*mulk*), separately from the land on which they grew (most often state land, called *mīrī*). During the Ottoman period, local custom and law officially restricted plantations to a belt encircling the village nucleus, which might have included sandy areas (ʻArrāf 1986, pp. 9–12).

C. *Ḥuqūl*: field cultivation in exposed arable land plots among the sands. Such patches of soil, where available, provided villages and nomads alike with places to plant field crops like wheat, barley and vetch. Fields often formed communal property (Arabic: *mashāʻ*) allocated in rotation to community members on an annual or bi-annual basis. There were no restrictions on the location or the distance of fields with respect to the village nucleus (Atran 1986, Kark and Grossman 2003).

Rimāl Isdūd and its vicinity in the Late Ottoman period (1870–1917)

During the late Ottoman period, Rimāl Isdūd fell within the territory of the District of Gaza. In the 1288 AH (1871 CE) Ottoman census, the District of Gaza comprised 55 villages and towns, divided between the *nawāhi* of al-Majdal, Ghazza and Khān Yūnis (Grossman 2004, pp. 238–240). The population of the countryside was homogenously religious, comprised of Sunni Muslims of the Shāfiʻī *madhhab* (Büssow 2011, pp. 258–265).

For centuries, the dunefields of Rimāl Isdūd belonged to the village of Isdūd, from which their name derived. While Isdūd was in most probability continually inhabited from the thirteenth century CE onward (al-Dabbāgh 1991: I, 193–196, Petersen 2001, p. 155), little is known about the village's economic and agricultural history prior to the Ottoman period (compare to Ḥamāma's case in Marom and Taxel 2023). Ottoman fiscal surveys of Isdūd from the sixteenth century CE attest to a diversified subsistence economy based on the cultivation of field crops like wheat, barley and sesame; planting fruit trees; rearing sheep/goats; and cultivating beehives. During this

time, the Rimāl probably served only as pasture. Cultivation was limited to the village's arable, alluvial lands, for lack of population pressures (Figure 2b).

During the nineteenth century CE, Isdūd was the third largest village in population and economic activity in the Gaza Qadā'/Subdistrict after its southerly neighbours, Majdal 'Asqalān and Ḥamāma. Isdūd's residents made a living from agricultural cultivation of the village's extensive territory, and from commerce along the Cairo-Damascus Road, connecting Egypt and Greater Syria (Bilād al-Shām) (al-Dabbāgh 1991: I, 193–195). In the second part of the nineteenth century CE, Isdūd was divided into four quarters (Arabic: *ḥārāt, arbā'*), each represented by a headperson (Arabic: *mukhtār*) from one of the village's extended clans (*hamāyil*): the Da'ālisa, Zaqqūt/Zaqāqita, Manā'ima, and Jūda, sub-divided into smaller families (Al-Madanī 2009, pp. 39–43, Al-Sahhār 2011, pp. 158–159, Jūde 2015, pp. 34–38, Sasson and Marom 2022). Partition into quarters was a hallmark of large villages and towns, also practiced in neighbouring Ḥamāma and al-Majdal (Marom and Taxel 2024).

During this time, southern Palestine absorbed a large influx of migrants from Egypt, forming a lowly socio-economic stratum called the Masrīyyīn (Kressel and Aharoni 2004, Grossman 2010, pp. 43–62, Sasson and Marom 2022), divided administratively among the aforementioned four *hamāyil* of the 'Fellahin' (lit. peasantry) (al-Manā'ima and al-Madanī 2010, pp. 120–121, Jūde 2015, pp. 32–33).

In addition to the settled population, large Bedouin tribes continued to camp in the southern coastal plain. The most important tribal confederations were the Jbārāt (Wādī al-Hasī/Nahal ha-Besor), the Wuhīdāt (al-Mukhayzin, al-Shuhaybar and Khān Yūnis), the Malāliḥa (Sukrīr) and the Sawārika (al-Nabī Rūbīn). In particular, nomadic groups resided among the sand dunes and made a living from livestock rearing, transportation and limited agriculture (Petersen 2005, p. 81). These transitory populations of humble material culture, economic production and consumption activities have left behind only limited traces in the archaeological record (Fischer and Taxel 2021). Pertinent to our discussion are the 'Arab al-Malāliha Banī 'Āmir, which dwelled in Khirbat Sukrīr (current Tel Mor) (al-Dabbāgh 1991: II, 189–191). According to tribal historians Abū Farda and al-'Āmirī, the Malāliha's tribal territory (*dīra*) originally encompassed the area between Jaffa, Ramla and Isdūd (Abū Farda 2005: II, 228-229, Al-'Āmirī 2013).

The Palestine Exploration Fund's (PEF) Map of Western Palestine (SWP) places the Malāliha, Rumaylāt and Sawārika Arabs north of Wādī Sukrīr (modern Lachish stream), although they are known to have inhabited Sukrīr itself long before this time (SWP Sheet XVI [Ashdod], 1:63,360, London, 1878, Palmer 1881, p. 265) (see Figure 2a). Oral histories collected during the PRHP mention that nomads used to camp among the dunes of Rimāl Isdūd, and that they specialised in animal husbandry, using the dunes for grazing. 'There were those who used to dwell temporarily in the lands of Isdūd bordering Sukrīr for grazing their livestock. Abū 'Amīra, al-'Ammāwī, and others from the Banī 'Āmir, owned no property in the lands of Sukrīr, and they were amongst the destitute members of the tribe who resided in portable woollen tents' (PRHP interview, June 19, 2021).

Nineteenth century CE sources provide no evidence of agricultural cultivation in Rimāl Isdūd. French explorer Victor Guérin, who passed through Isdūd's sand dunes enroute to Minat Isdūd (Minat al-Qal'a), did not mention any cultivation (Guérin 1869, pp. 71–72). Likewise, SWP Map 3, Sheet 3 (Figure 2b), shows that plantations were limited to the western margins along the sand dunes, west and south-west of Isdūd. Isdūd's inhabitants planted these areas with figs, vines and sycamore-figs (Figure 3; cf. Mandatory reports in File m-39/5250, Israel State Archives; Jūde 2015, p. 91), while they left the dunes themselves – including Rimāl Isdūd – uncultivated. These two sources support the notion that the shift in economic activities in the Rimāl from livestock rearing to dune cultivation took place in the following decades, due to demographic pressures and population growth, as detailed below.

First World War British cadastral maps provide a snapshot of dune cultivation at the end of the Ottoman period. The maps show that Rimāl Isdūd was only cultivated in a small strip of orchards

Figure 3. Remains of Isdūd's *kurūm* (orchards), N.W. of village, by Roy Marom, February 2022.

(*kurūm*) along the eastern margins of the dunefield. One of these Late Ottoman orchards was planted in Birkat al-Khān al-Ramliyya, 1 km west of Isdūd, by a *fellah* (peasant) called 'Abd al-Rahmān of the Isdūd al-Da'ālsa clan (Figure 4). British-era land settlement files mention that the Ottoman land registry (tapu) of the orchard accounted for an area of 20 Ottoman dunams (18,260 m^2). On its east and north sides, the *karm* bordered on arable land in the possession of other Isdūd residents, while the southern and western 'frontiers of cultivation' were delimited by the 'sandy wastes' ('*uṭl*). Decades later, a British Land Settlement Officer would find '4 old jummeiz [sycamore-fig] trees and a good number of vines – some parts well planted, some sparsely planted, and others (small areas) not planted' (Figure 5) (Israel State Archives, gl-3/16641).

Rimāl Isdūd and its vicinity during the period of the British Mandate

On November 2nd, 1917, four centuries of near-continuous Ottoman rule ended with the British occupation of southern Palestine, following their decisive victory in the Third Battle of Gaza. By October 1918, the British and their allies completed the conquest of the Levant, with locals living under British military rule. In 1920, the British occupation morphed into the British Mandate of Palestine with the aim of establishing a Jewish national home in Palestine. During the ensuing era, called in modern historiography the 'British Mandate period' (1920–1948), Rimāl Isdūd remained part of the lands of Isdūd. The archaeological site of Ashdod-Yam, located in the area of Rimāl Isdūd, stayed uninhabited, but the wider demographic growth and the resultant intensification of cultivation and grazing still affected it.

As in the Ottoman period, Isdūd remained the third largest settlement in population and economic output beyond Gaza and its urban suburbs, ranking after Majdal 'Asqalān, Ḥamāma, and

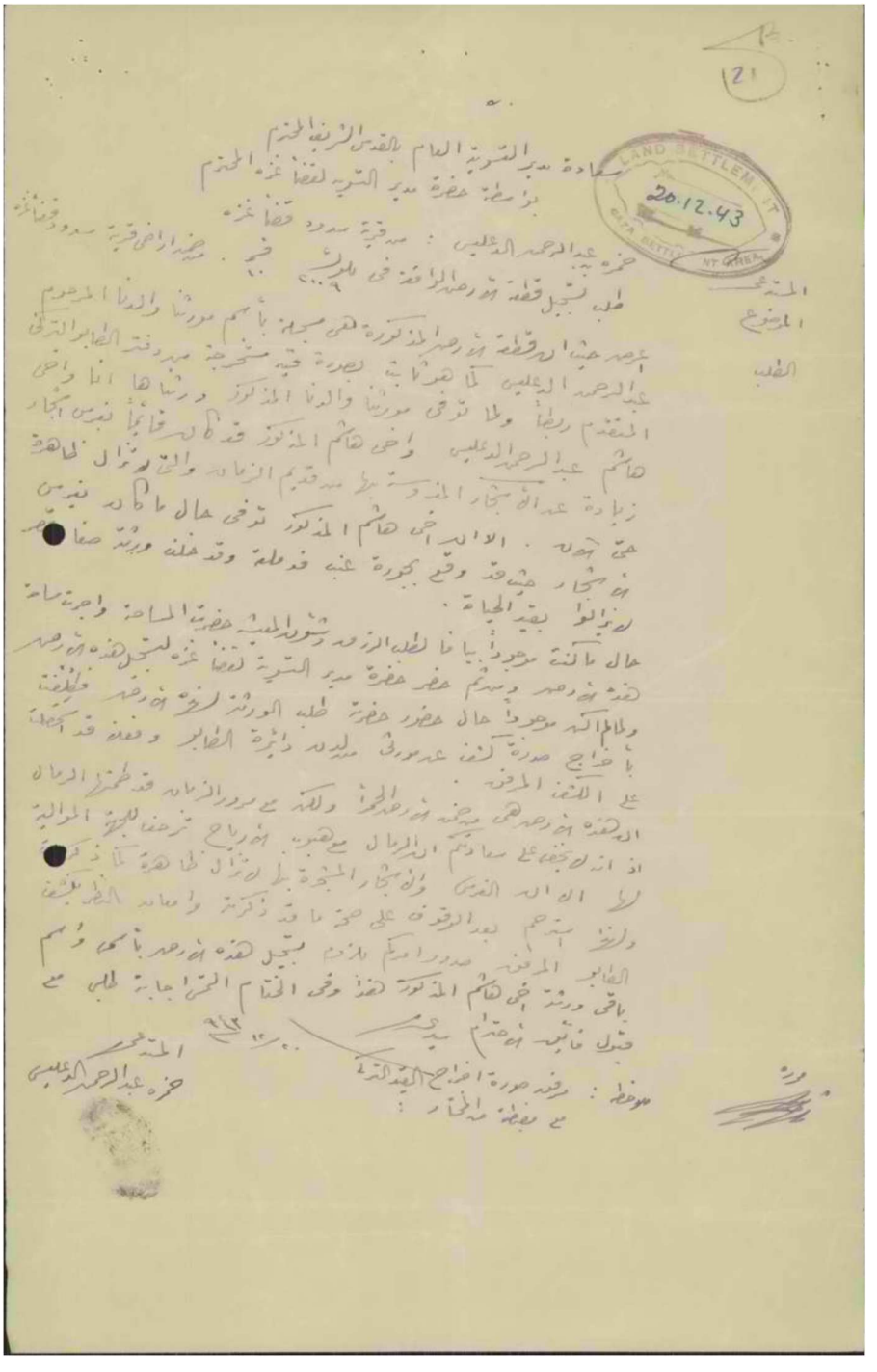
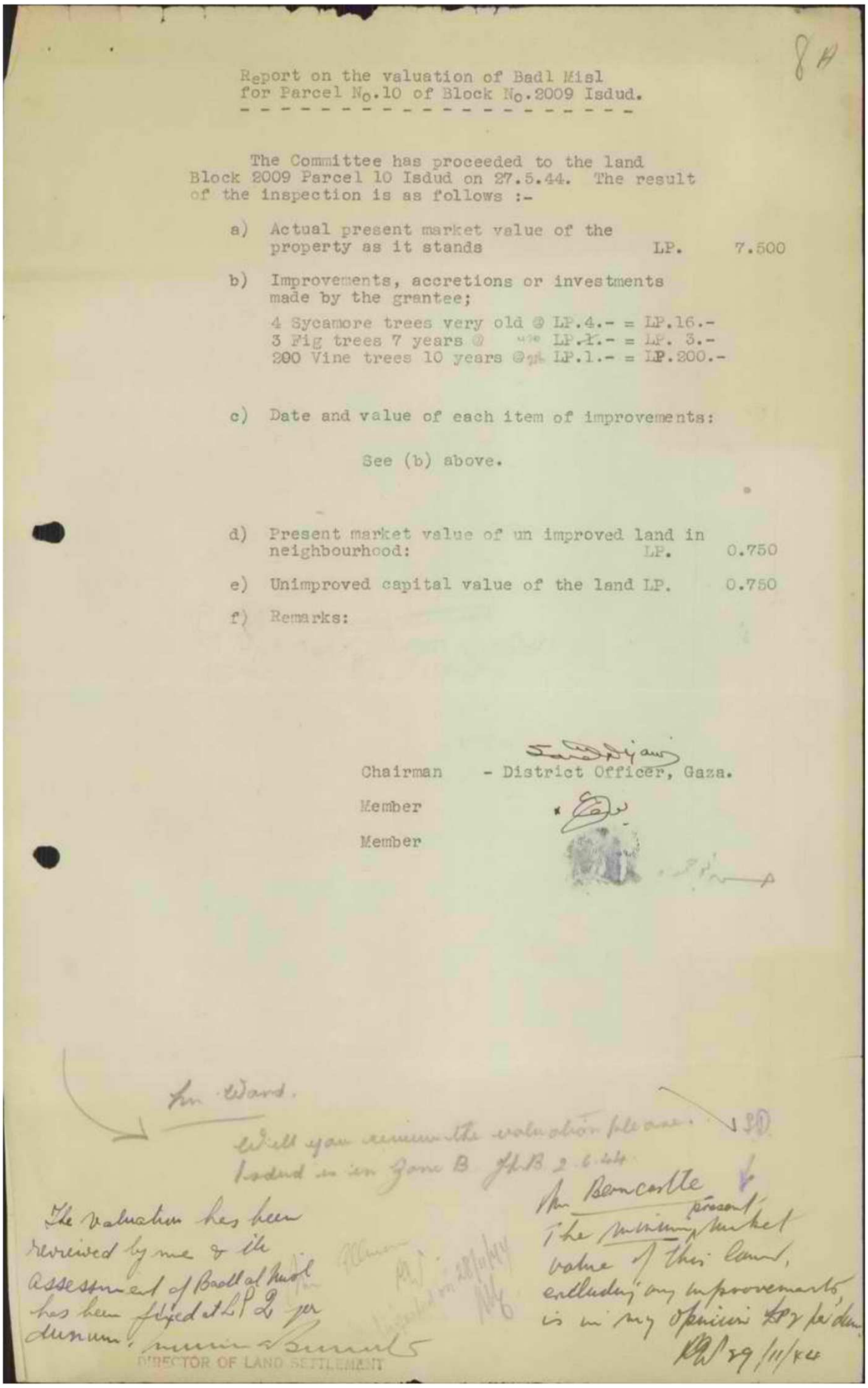


Figure 4. Hamza 'Abd al-Rahmān al-Di'līs' petition (courtesy of the Israel State Archives).

ahead of Bayt Darās. Isdūd hosted a weekly market, in which the agricultural produce from the Rimāl, including grapes and figs, was traded with residents of adjacent communities (al-Dabbāgh 1991: I, 194) (Figure 6). During the three decades of British rule, Isdūd's population nearly doubled in size. This trend is also evident in the neighbouring regions, and reflects the result of a high level of



Report on the valuation of Badl Misl
for Parcel No.10 of Block No.2009 Isdud.

The Committee has proceeded to the land Block 2009 Parcel 10 Isdud on 27.5.44. The result of the inspection is as follows :-

a) Actual present market value of the property as it stands LP. 7.500

b) Improvements, accretions or investments made by the grantee;

4 Sycamore trees very old @ LP.4.- = LP.16.-
3 Fig trees 7 years @ LP.1.- = LP. 3.-
200 Vine trees 10 years @ LP.1.- = LP.200.-

c) Date and value of each item of improvements:

See (b) above.

d) Present market value of un improved land in neighbourhood: LP. 0.750

e) Unimproved capital value of the land LP. 0.750

f) Remarks:

Chairman - District Officer, Gaza.
Member
Member

The valuation has been reviewed by me & the assessment of Badl al Misl has been fixed at LP 2 per dunum.

DIRECTOR OF LAND SETTLEMENT

Figure 5. British valuation report of the Di'līs *karm* (courtesy of the Israel State Archives).

population growth and continued migrations to southern Palestine from Egypt (Jūde 2015, pp. 32–33, Sasson and Marom 2022). The rise in Arab and Jewish immigration populations, as well as local demographic growth, with the resultant increase in demands for foodstuffs, strained the available

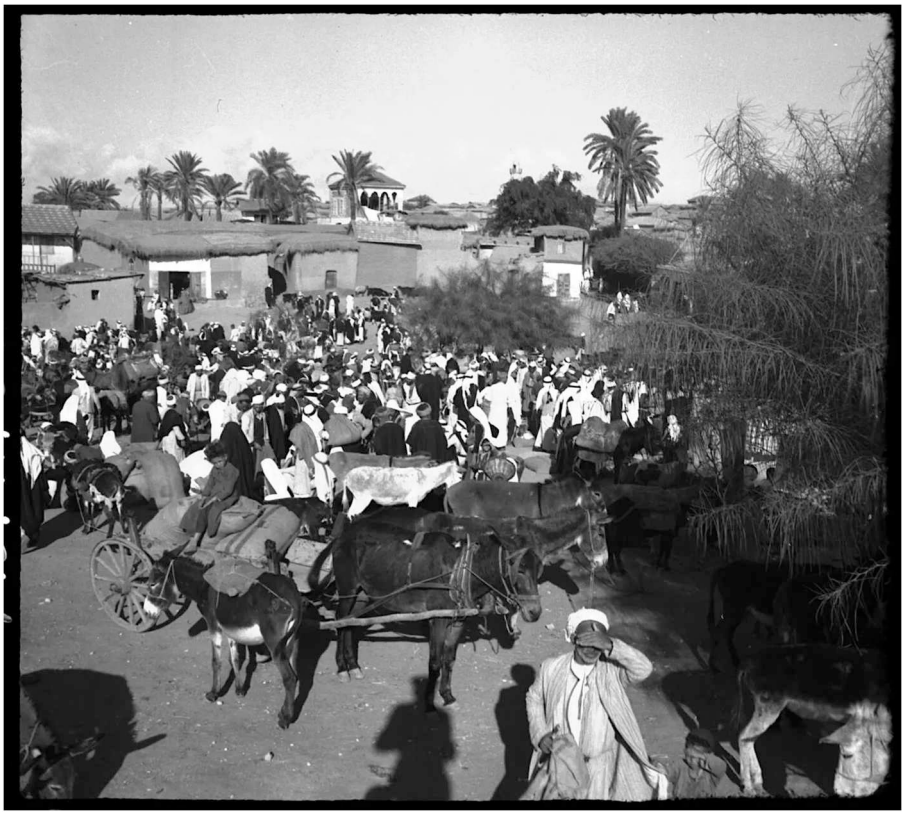


Figure 6. Isdud's market, 1918 (courtesy of the National Library of Australia).

agrarian resources. Combined, these trends necessitated the intensification of agriculture, and the improvement of marginal lands among the dunes.

The profitability of the sale and export of agricultural produce from the Rimāl's marginal lands was increased by lower transportation costs following the construction of modern transport infrastructure, including the Jaffa-Gaza Road and the al-Qantara – Lydda Railway, with a station near Isdūd. However, railway operation was often disrupted in the Gaza Sub-District by sands from the coastal dunes, in particular where it actually bordered on the dunes, like in Isdūd. The British authorities addressed this issue with a policy of dune fixation, which included sand removal and forestation. In El-Eini (1999)'s description, reflecting the British perspective (cf. Halevy 2023), the dunes were unfit for cultivation or grazing. When the dunes crossed east of the railway track, moving onto Isdūd village lands, a large gang of men kept the line open, removing about 1,000,000 tons of sand between 1917 and 1925. According to el-Eini:

> Plantings of pine trees and marrow [*sic*] grasses were begun in 1922, attracting illegal grazing. During the 1930s, dune fixation was continued, and the foresters reduced the threat to Isdud of encroaching dunes, making the area east of the rail-line cultivable as figs and vines were planted (El-Eini 1999, p. 129).

In his book about Isdūd, Ahmad Jūde provides a lively account of the *mawāṣī* agriculture and the seasonal presence in Rimāl Isdūd:

> The sandy lands are found to the W. of the village, and they stretch from Sukrīr in the north (the shrine of al-Nabī Yūnis) to the lands of Ḥamāma in the south. They are about seven kms long and three to four kms wide. Most of this area is made of useless sand dunes. The low-lying areas among the dunes, however, were utilised for the planting of vines and fig trees. Their owners used to reside during the summer in huts (*akhsās*) made of

> *halfā*-grass, reeds (*būs*), and grapevine branches. In the summer, the breeze of the sea and the rays of the sun gave the bunches of grapes special colour and flavour, which made them famous in the markets of Jaffa […] Most of these vineyards belonged to members of the Manā'ima and Zaqqūt clans, and especially those from the Egyptian neighbourhood (Jūde 2015, pp. 92–93).

Originally, the lands of Isdūd were held as common land, divided according to the quarters. During the 1930s, the Mandatory authorities undertook land settlement operations, which led to the privatisation and commodification of Isdūd's lands, which were partitioned among individual owners (al-Manā'ima and al-Madanī 2010, pp. 81–84). Once partitioned, locals could trade land and, moreover, plant fruit trees and undertake other land-improvement measures (Jūde 2015, p. 93). The arable lands to the north, east and south of Isdūd attracted the most attention (Isdūd: Block Plan Index, 1:20,000, 1935, Central Zionist Archives, KL20M/21, Husein 2005, pp. 25–34). In 'Arab Sukrīr, the 'Abū Suwayrih clan became the largest land-owners. In Isdūd, however, the local elites, made up of village notables, took over the majority of village lands. The orange groves in the village's more fertile eastern loamy soils were sometime leased by families from Gaza, al-Majdal, Jaffa and al-Ramla (al-Manā'ima and al-Madanī 2010, p. 74).

Alongside the old plantations on Rimāl Isdūd's eastern margins, patch cultivations in the heart of Rimāl Isdūḍ began by the late 1920s (Figure 7). However, the lack of surviving rural property valuation maps for Isdūd does not allow us to chart this cultivation in detail prior to the 1930s. A rural property valuation map of the village of Ḥamāma, south of Isdūḍ, with similar topography and demographics, might shed light on the land use also in Rimāl Isdūd. Ḥamāma residents achieved upwards of 80% cultivation of 'vineyards and scattered fig trees' in some patches within Rimāl Ḥamāma (Map of Hamāme & El Majdal [Det.], Gaza Sub-Dist., 1:10,000, July 1932). Locals used a strip of *mawāṣī* land along Ḥamāma's coastline, and also the shallow margins of the dunes, for extensive planting of olives, sycamores, figs, dates, apricots and other fruit trees (Director of Land Settlement and Water Commissioner to the Chief Secretary, January 30, 1947, ISA, m-33/4356). Similarly, by 1946, the whole area of Ashdod Yam became planted with vines: 'Most of the planting took place before or on the eve of the Land Settlement and free areas have since been gradually trespassed upon. Some of [*sic*] landless people of Isdud find their livelihood from these vines' (Jacob Ory, Inspector of Antiquities in the Southern District to Robert Hamilton, Director of Antiquities, December 20, 1946, Minat Isdud [Minat El Qal`a], ATQ_616).

As a Mandatory Antiquities Inspector, Ory provided specific examples of agricultural improvements: Ḥasan Maṭar had 'recently' planted fig trees on the site of an ancient enclosure (Parcel 2017/5; ibid). In his book about Isdūd, Ahmad Jūde similarly reports that the sandy soils of Isdūd were planted 'mostly with fig trees, grapevines and a few sycamore trees' (Jūde 2015, p. 80, and compare 84 and 91).

During the 1930s and 1940s, locals partitioned the lands around Ashdod Yam for cultivation. This process took place without acknowledgement from the government, which still regarded the dunes as state domains (letter from the Director of Antiquities to the District Commissioner, Gaza, December 10, 1946, Minat Isdud [Minat El Qal'a], ATQ_616). Other correspondence in the cited file shows, in our opinion, that the British authorities sought to bolster the claims of state ownership of the dunes against ownership-by-land-improvement through negotiating leases with the claimant cultivators from Isdūd and 'Arab Sukrīr. For example, north of the fortress of Minat El Qal'a, 'Abd Rabbuh Abū Khūsa from the Manāyi'a clan possessed Parcel 2017/2, while Muhammad al-Mutlaq from the same clan possessed Parcel 2017/5. According to Jūde, the Abū Khuūsa of the Manāyi'a belonged originally to the Sawārika Bedouins inhabiting al-Nabī Rūbīn ('Arab Rūbīn). They used to dwell in an area called al-Shādūf, north-west of Isdūd, on the edge of the sand dunes. They established strong bonds with the Jūde clan and planted their lands with grapes and figs (2015, p. 25, also Al-Sahhār 2011, p. 73).

The largest cultivator in the region was Husayn 'Awadallāh al-Nūrī, who possessed Parcels 2017/1, 12, 13, and 14 (Preliminary Block 2018, Isdūd Village [Sand Dunes], 1:2,500, undated, Minat Isdud [Minat El Qal`a], SRF_140, IAA Archives). The Nūri 'Awadallah family of the Manā'ima quarter were

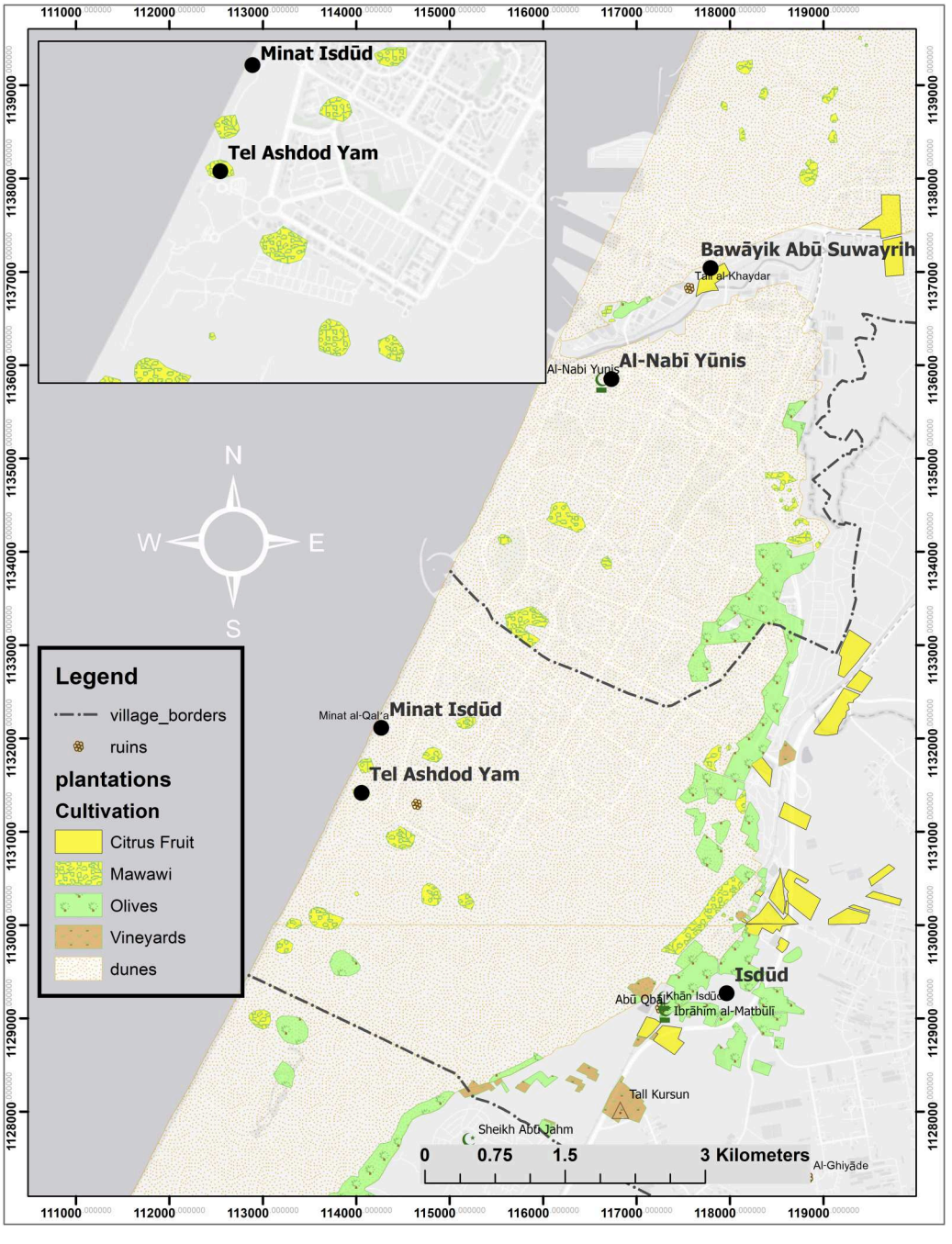


Figure 7. Land use in Rimāl Isdūd during the 1930s, according to British cadastral maps (by Roy Marom).

residents of Isdūd, and Husayn's son, 'Abd al-Rahmān, is mentioned among Isdūd's educated youth (Al-Madanī 2009, p. 41, al-Manā'ima and al-Madanī 2010, p. 79, 119; PRHP interview, August 14, 2012).

The reports of Palestine's Mandatory Department of Antiquities provide us with site-specific information, describing these changes in land use at Ashdod-Yam. In the 1920s development activities were limited to 'stone-digging and searching for antiquities' for construction in Isdūd nearby villages

(G/56, Minat Isdud [Minat El Qal`a], SRF_140, IAA Archives). By 1933, however, the main activity had become agricultural development, with the planting of vineyards among the ruins (Minat Isdud [Minat El Qal`a], ATQ_616).

Mandatory Government of Palestine files show that despite being under Arab cultivation for over a decade, the Government still regarded Isdūd's sand dunes as governmental property. The Department of Antiquities informed the district authorities that it had 'no objection […] to these properties being leased for cultivation of vines or vegetables to the existing occupants,' on the condition that 'no buildings should be erected' on site (letter from the Director of Antiquities to the District Commissioner, Gaza, December 10, 1946, Minat Isdud [Minat El Qal`a], ATQ_616).

The evidence at hand does not show us how these proposals were received by the locals in possession, or that they ever took effect. Rather, surviving records show the government planned to create a large 'forest reserve' in the dunes of 'Sukrīr, Isdūd and Ḥamāma, and to evict the cultivators in the planting season. This was part of a wider initiative aimed at fixing the dunefield, preventing sand encroachment on arable lands and preserving the Government's claim to ownership over the wastelands for future military and settlement needs (letter from the Director of Land Settlement and Water Commissioner to the Chief Secretary, January 30, 1947, ISA, m-33/4356). British policies of dune fixation included sand removal and forestation (El-Eini 1999).

It is important to note that land improvement during the British Mandate period was not a one-way process, but a constant fight against sand encroachment (El-Eini 1999). An interesting account of this struggle is given by Hamza 'Abd al-Rahmān al-Di'līs (= Da'ālisa) of the late-Ottoman *karm* mentioned above, in what British colonial land settlement officers designated Block 2009/Parcel 10, replacing its Arabic native name of Birket el Khan el Ramliya for all official purposes. After his father's death, Hamza narrated to the Land Settlement Officer in December 1943 (Figure 4):

> The land was inherited by me and by my brother Hashim. My brother took the work of increasing the number of the trees planted at that time, the traces of which are still visible on ground. My brother died on the ground. He dropped in one 'Jura' [hole] made by him to plant a vine and was buried deep in the ground. His heirs are minor ones, and all alive.
>
> Surveyors came to demarcate the land and demarcated the parcel when I was in Jaffa looking for my own living. Some time after[,] the Settlement Officer came for registration of the land. […] the land in question is one from the Hamra [red loam], but with the lapse of years the land was covered by the sand. With the blowing of the wind the sand advanced and covered the neighbouring land. New trees and traces of old ones are visible now on the ground … (Israel State Archives, gl-3/16641).

The Settlement Officer confirmed Ḥamza's account, and reported that he was misled to believe that the land was planted unlawfully by one of Hamza's enemies, who served on the Village Settlement committee. Finding the old trees mentioned above, the Land Settlement Officer decided to transfer the plot of land's ownership to Hamza and his brother's heirs – his two widows from the village and two daughters, in return for payment of the difference between the historically registered and newly measured land. This account reflects sedentary Palestinian perceptions of sifting sand as dangerous and inhospitable on the one hand, and the general colonial attitude towards sandy areas as inherently barren and uncultivatable, while minimising the success of native Palestinian agricultural practices.

By the 1930s, following the parcellation of the mushā', cultivation of the sands between Tel Ashdod-Yam and the Minat al-Qal'a fortress expanded beyond recognition. A report by Inspector Ory, dated March 28, 1933, alludes to the planting of vineyards, which the Department of Antiquities sought to regulate (unsuccessfully, given his aforenoted reports). An undated note in the files of the Mandatory Department of Antiquities reports that 'a good deal of unlicensed planting has taken place recently in the ruins'. An undated sketch-map accompanying the note charts numerous, contiguous parcels of '*miri* [government land under private possession] planted with trees' amid 'sand dunes and foreshore' and roads opened to access them from Isdūd (Minat Isdud [Minat El Qal`a], SRF_140, IAA Archives; see Figure 8). A 1944 aerial photograph of the site of Ashdod-Yam (Figure 9) shows many small parcels planted with young trees in a modern grid-plan. In the aerial

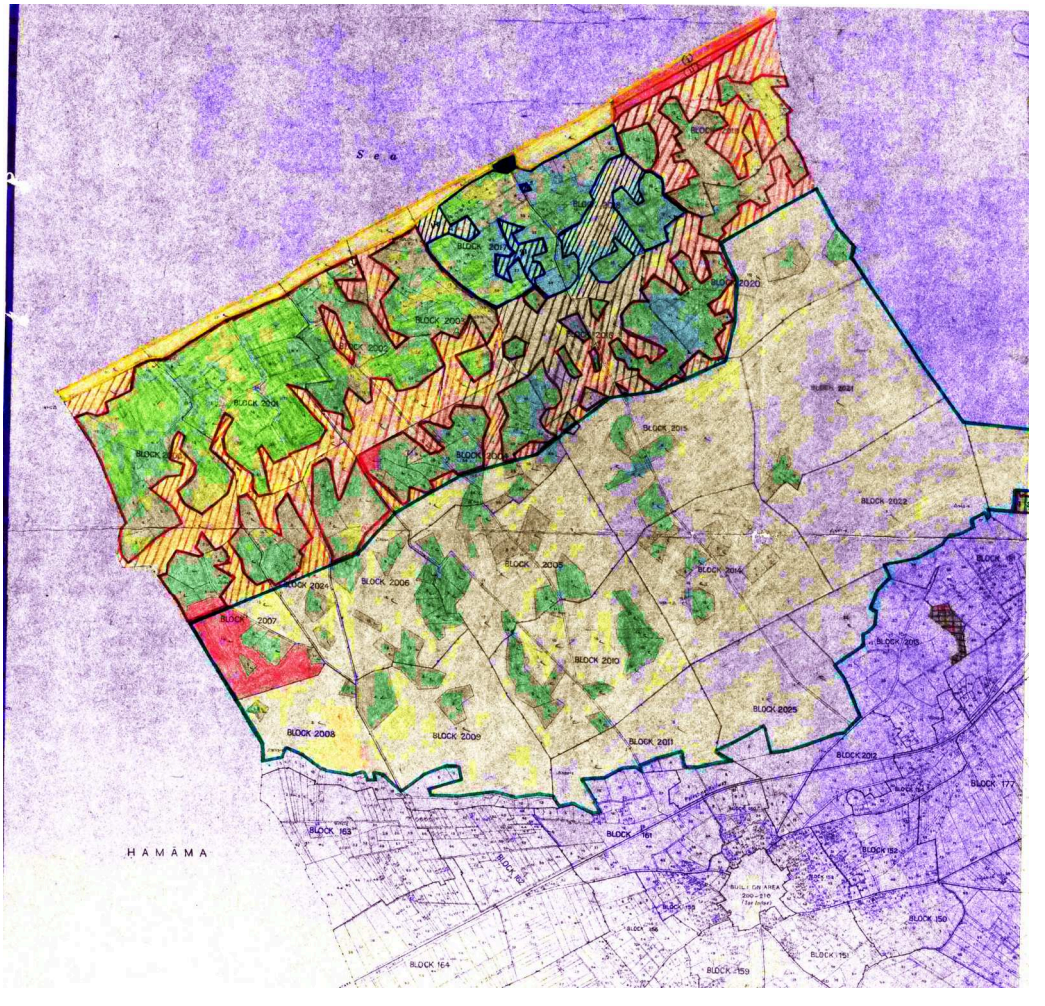


Figure 8. Maximum extent of Arab cultivation in Rimāl Isdūd, c. 1947 (courtesy of the Israel State Archives).

photograph, most of the planting appear to the east and south of the acropolis, with some planting on the mound itself. In December 9, 1946, the area around the Early Islamic fortress (Minat al-Qal'a) was declared as state domain for preservation purposes (SRF_140 file, IAA Archives).

This lively and dynamic picture of life and cultivation among the dunes contrasts strongly with biased British colonial-era statistics (presented and discussed in the Appendix). Statistical data shows a 'bigger picture' of agriculture and other land uses beyond the *rimāl*. This information has to be taken into consideration in order to properly contextualise the relative (un)importance of the *rimāl* to the sedentary population which possessed them. Scholars often resorted to British-era colonial statistics for the supposed lack of better, qualitative sources for village life (al-Dabbāgh 1991, Khalidi 1992), but these statistics suffer significant limitations. Being the by-products of office statisticians and functionaries, these tabulations are often arbitrary, contradictory and incomplete. These statistics aimed at classifying, categorising and controlling local population(s); mapping, measuring and managing resources through taxation, and formulating colonial policy (Marom *et al.* 2024). However, like the critical reading of contemporary maps, these statistical sources can similarly be used to retrieve valuable raw data about land uses, and colonial suppositions and policy biases reflected in their quantitative representation affecting their presentation to various audiences (Village Statistics 1938).

Figure 9. 1944 Aerial photograph showing archaeological structures and traces of sand/dune cultivation (courtesy of the Survey of Israel; modified by Slava Pirsky).

Archaeological and botanical traces of cultivation

Despite the inherent disregard of evidence of 'recent' cultivation, archaeological reports are replete with information documenting it. During the IAA excavations of the thirteenth century BCE industrial-administrative complex with several winepresses at Ashdod-Yam (Nahshoni 2013), for example, many carbonised remains of seeds and fruit were collected from refuse dumps associated with the winepresses. According to Melamed:

> The source of the numerous remains of grape vine (*sic.*) could have been the local fertile soil that today lies under the nearby sand dunes. Remains of the ancient groves are located along the depressions between dunes covered today by thick layer of sands. These grove remains include, beside grapevine (*sic.*), other living fruit trees such as carob (*Ceratonia siliqua*), date palm (*Phoenix dactylifera*), fig (*Ficus carica*), olive (*Olea europaea*), pomegranate (*Punica granatum*) and sycamore fig (*F. sycomorus*) that are rooted in the underlying fertile soil (Melamed 2013, p. 131).

The presently observable remains of the purportedly ancient groves, which Melamed has identified as belonging to the surviving vestiges of thirteenth-century BCE agriculture in the Ashdod-Yam area, are rather related to the sand-dune agriculture during the British Mandate Period, as reported here. As noted in the introduction, the remains of grapevines (Figure 10) and occasional sycamore and fig trees, related to the cultivation of Rimāl Isdūd sand-dunes during this period, are still visible on the ground today (2024).[5] Scattered remains, related to the recent sand-dune agriculture, were discovered during the excavations of the acropolis in the southern part of the site. The most interesting item is a rectangular mattock blade of the type known respectively in Arabic as a *turiyeh* and in Hebrew as a *turiyah* (Figure 11: 1). The mattock was found near a large palm tree, which stands out from its surroundings and is clearly visible from all parts of the acropolis. The tree appears in aerial photographs from British Mandate days, in 1944 (Figure 9, above).

Ayalon identified the mattock as belonging to the 'Crocodile' type, produced by the Chillington Iron Works and Tool Company in the town of Wolverhampton in the industrial Midlands, near Birmingham, England. This specific type, with a rectangular socket, was made by the factory especially for Middle Eastern markets such as Palestine. According to Ayalon (forthcoming), the mattock from Ashdod-Yam could be securely dated to the 1930s or 1940s. Remnants of a wooden handle were found inside its rectangular socket hole. The wood was identified as tanner's sumac (*Rhus coriara*) (Cavenaugh and Langgut forthcoming). This plant is known mainly as a shrub and therefore its

Figure 10. Botanical Remains (by Alexander Fantalkin).

Figure 11. Material Culture Finds from Rimāl Isdūd: 1: British made 'Crocodile' type mattock; 2: Gaza Ware water jug; 3–5: Mandatory Coins (photos by Sasha Flit; montage by Yulia Gottlieb).

use in carpentry is not common, but it also appears as a low tree, growing to a height of 3–5 m. Thus, it seems that the mattock's handle was improvised from the branch of such a tree, probably after the original handle broke (Ayalon forthcoming).

Additional finds on the acropolis consisted of Grey/Black Gaza Ware sherds. This pottery belongs to a long-lived ceramic family, known from numerous southern Levant archaeological contexts and broadly dated from the Ottoman period up to the 1960s (Avissar 2009, Taxel 2024). Grey/Black Gaza Ware was produced in Gaza, Khan Yunis and al-Faluja, all located on the southern coastal plain (Israel and Saidel 2021). Most of this pottery (some twenty fragments, including a restorable vessel; Figure 11: 2) was found in the upper sandy layers on the acropolis and as such most probably belongs to agricultural activities. Likewise, three coins dated to the British Mandate period were detected in these sandy layers as well: two coins from 1927 and another one from 1941 (Schauer forthcoming) (Figure 11: 3–5).[6]

To sum up, the interdisciplinary approach embraced in this study – integrating archaeological, botanical and historical data – underscores the significance of incorporating recent historical periods in archaeological investigations. This methodology provides a more nuanced and accurate understanding of the agricultural history of Ashdod-Yam.

Summary

This article presented and discussed the agricultural rehabilitation and agrarian development of Isdūd and Rimāl Isdūd between 1870 and 1948. This period was the last chapter in a long, though admittingly intermittent, period of settlement through the millennia. Long connected to Ashdod/Isdūd, this period saw the transformation of Rimāl Isdūd and its hinterland, which were in ruins for centuries, into intensively-cultivated agricultural land, challenging the perceived ecological limitations of these supposedly marginal, sandy wastes. The study related to local agricultural-economic activities within the broad outlines of its Late Ottoman and British Mandate administrative, economic and demographic context.

Using an interdisciplinary approach, the article presented a typology of sand/dune agriculture, relating modern analytical categories with traditional Palestinian agricultural nomenclature. Later, it traced the history of sand/dune agriculture and quantified land use in Rimāl Isdūd according to a novel combination of British colonial statistics, land settlement files, historical maps, newspaper accounts and oral testimonies of the area's former inhabitants; giving a voice to the cultivators and highlighting their perspectives in explaining the 'vines among the dunes'. This description challenges colonial and older scholarly descriptions of Middle-Eastern ecologies as eternally barren and as wastelands, by stressing the importance of local agricultural knowledge and its dynamic uses for supposedly marginal environments.

In the nineteenth century, after centuries of population abatement, southern Palestine's population began to increase due to large waves of migration from Egypt. The Malāliha, Rumaylāt and Sawārika Arabs, some of them originally from northern Sinai, camped in the dunes north of Rimāl Isdūd. 'Arab Sukrīr appear in the Ottoman census of 1870/1 CE as 'Abu Suwayrih.' While Isdūd became the third largest village in population in Gaza Subdistrict, its coastal dunes remained uncultivated, and were of little economic value.

During the British Mandate period, Rimāl Isdūd remained largely uninhabited, but its archaeological remains suffered from the intensification of economic activities associated with cultivation and grazing due to Isdūd's population growth. The removal of vegetation cover increased soil erosion, while planting activities and masonry reuse disturbed the stratified remains. In the 1920s, illegal excavations for masonry and antiquities disturbed the ancient remains of Ashdod-Yam, setting the stage for the area's agricultural development. We used a comparative examination of little-used British colonial statistics and cadastral maps, in addition to narrative accounts, in order to quantify these changes in land use and ownership patterns.

In contrast to more northernly (e.g., Sukrīr, Yibnā) and southernly locations (the present-day Gaza Strip), the development of most sand-dune agriculture and associated economic activities around

Ashdod-Yam is relatively late, and dates to between the 1920s and 1940s. These developments took place in an unprecedented period of demographic and economic growth during the British Mandate period. Land ownership in Rimāl Isdūd, although not officially recognised, was divided between residents of Isdūd and nomads from Sukrīr. As a result of this, grid-arranged plantations of vines and fig trees dominated the formerly treeless landscape. The few surviving vines among the dunes remain today as a testament to a short episode of renewed exploitation of the challenging ecological niche of Rimāl Isdūd for the first time in centuries; the product of the perseverance, toil, and determination of local Palestinian inhabitants, on the eve of the establishment of the State of Israel.

Notes

1. The excavation project at Ashdod-Yam is directed by Alexander Fantalkin, on behalf of the Institute of Archaeology of Tel Aviv University. For select preliminary publications (see Fantalkin 2014, Di Segni *et al.* 2023, Fantalkin 2024a, 2024b). The archaeological site of Ashdod-Yam is relatively extensive, displaying a notably uncommon spatial configuration across various periods. It spans approximately 2 km from north to south and around 1.5 km from east to west. The earliest remains, dating to the Late Bronze Age, are situated at the southernmost part of the site. Approximately 1 km north of these remnants lies an artificial mound, where significant remains from the Iron Age IIB-C and Hellenistic period have been uncovered. This location is referred to as the acropolis or Tel Ashdod-Yam in the accompanying figures. The substantial remains from the Roman-Byzantine period are located further to the north, while the Islamic fortress is also situated in the northern section of the site.
2. The Palestinian Rural History Project (PRHP), founded in 2014, set out to document, preserve, study and publish culturally and scientifically important information concerning Palestine's rural history and heritage. The PRHP's corpus contains over 1,500 oral history interviews documenting the local body of knowledge of some 800 Palestinian communities.
3. Cartographical note: The maps accompanying this paper were drawn using the ArcGIS Desktop 10.6 software. As their source maps, the authors utilised the Hamāma and 'Arab Sukreir sheets of the 'Palestine: 1:20,000 Topo-cadastral' map series, on a scale if 1:20,000, dated 1941–1942. This map series offer evidence for land coverage, plot and village boundaries, toponyms and cultivation. Digitised copies of the Israeli State Archives collection maps were rectified according to established practice (Cousins 2001, James 2012). For map digitalisation we used the historical Palestine 1923 Israel CS projection, and rectified them by means of the 1st Order Polynomial (Affine) transformation. The 'Arab Sukreir sheet was rectified according to four cardinal grid-based control points with a Total RMS Error (Forward) of 17.2439m, while the Hamāma sheet was rectified according to eight grid-based control points with a Total RMS Error (Forward) of 8.6988m. As is to be expected, the maps included in this article present modest spatial discrepancies due to projection differences.
4. PHRP interview, 9 June 2022. On the use of *nazzāzāt* watering holes for irrigation and drinking, see: Marom 2022, pp. 251–252.
5. For DNA research on a variety of ancient and modern feral and cultivated grapevines of Palestine, including the remains from the southern coastal plain, see Klein 2008, Cohen *et al.* 2023.
6. During the excavations of the inland Tel Ashdod, Dothan (1964, p. 80) noted that the villagers of Isdud had dug into the rich organic soil of the mound to fertilise their fields and to make adobe bricks for their dwellings. It stands for reason that the organic soils of the ancient Ashdod-Yam, which were located below cultivated sand dunes of Rimāl Isdūd, provided similar nutrients for growing plants.

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Appendix: Quantifying Land Use in Rimāl Isdūd

This Appendix quantifies land use in Rimāl Isdūḍ and adjacent areas by comparing British-era colonial statistics for Isdūd village and neighbouring territories (Tables 1–2).

Table 1. Land ownership in dunams according to the Village Statistics, 1945.

Village	Arab	Jewish	Public	Total
Isdūd	27598	2487	12479	47871
Ḥamāma	26855	1693	12818	41366
Beit Darās	15896	0	461	16357
'Arab Sukrīr	12270	-	27754	40224
Batāni al-Gharbī	4475	-	-	4574
Barqa (Gaza S.D)	4841	226	-	5206
Total	91,935	4406	53512	155,598

Table 2. Land usage according to the Village Statistics, 1945.

Village	Built-up	Uncultivable	Cultivable	Cereal	Irrigated and Plantations	Citrus Fruits
Isdūd	131	12374	32879	22636	8322	1921
Isdūd (Jew. Sett.)	0	0	2487	1126	5	1356
Ḥamāme	167	6494	33012	27726	4325	961
Ḥamāme (Jew. Sett.)	0	0	1693	1164	134	395
Beit Darās	88	527	15742	14438	472	832
'Arab Sukrīr	0	23620	16,604	15,532	489	583
Batāni al-Gharbī	34	123	4,451	4152	95	170
Barqa (Gaza S.D)	34	427	4,779	4031	47	667
Total	454	43565	87671	75820	13889	6885

Table 1 shows land ownership figures. First of all, in 1945, public lands constituted 26.06% of the lands of Isdūd, 30.98% of the lands of Ḥamāma, and a particularly significant 68.99% of the lands of 'Arab Sukrīr. Public lands comprised 34.39% from the total area of the villages. Most public lands consisted of uncultivable rimāl, e.g. the dunefields, conceived as mawwāt lands.

According to Table 2, Ḥamāma and Isdūd were the largest villages by built-up area. Isdūd, followed by Ḥamāma, had the largest area of citrus fruit cultivation, identified with the cultural landscape of the orchard-well-house complex known as *bayyāra* (cf. Al-Manā'ima and al-Madanī 2010, pp. 84–85, Al-Sahhār 2011, p. 159). Citrus fruits were Palestine's primary cash crops during the British Mandate period (Karlinsky 2005). Of the cultivated lands, including type C (ḥuqūl), the majority was devoted to cereal cultivation (68.84% in Isdūd, 93.54% in 'Arab Sukrīr, and 83.98% in Ḥamāma), meant primarily for autarchic subsistence; e.g., for domestic consumption. The remaining percentage was classified as 'plantations and irrigated land' (25.31% in Isdūd, 13.10% in Ḥamāma and only 2.89% in 'Arab Sukrīr); 'plantations' refer here to the heterogenous groves called *karm*, or *bustān,* in Arabic, as described above (cf. al-Manā'ima and al-Madanī 2010, p. 77).