

The City and Its Territory – A Digital Archaeological-Cartographical Approach: The Case of Caesarea Maritima

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Numerous studies were already published concerning the territorial interrelations between a center and its countryside, and the potential agricultural yield of a countryside of limited extension. Such are the studies of Yuval Portugali concerning the countryside of Tel Kiri and Tel Yoqne‘am in Izrael Valley in the Biblical period; the study of Rosen on Izbet Sarta and the study of Ben David 1998 on the production of olive oil in the southern Golan; that of Dahari on the gardens of the monks in the high mountains of Sinai, and more recently, together with Sion, on Rehovoth-in-the-Negev. This list is far from being exhaustive. The French studies led by Tate and by Dentzer on the limestone massive and other regions in Syria, and the work of Marlia Mango and her Oxford team on the countryside of al-Andrein, Syria should also be mentioned.¹

The boundaries of the countryside

The city and its countryside were a single administrative and economical entity with respect to provision of food supply, taxation and administration. A recent study by Holum,² as well as earlier studies, had clearly elucidated this point. Any attempt to quantify these aspects must start with tracing the territorial boundaries of a city.

The rural boundaries (*territorium*) of a city are to be determined by the geophysical features, taking into consideration also the available literary sources pertaining to its geographical history. Archaeological finds, such as milestones and dated inscriptions with the city era, are of course also relevant. There is no consensus among scholars concerning the rural boundaries of Caesarea. There are decisive differences in the maps drawn by Avi-Yonah, Notley and Safrai, Faust and Safrai and Holum, overlaid on TIR map (fig. 1).³ According to Notley and Safrai, referring to the borders as traced in Eusebius' *Onomasticon*, Naḥal Alexander marked the southern border, separating the region of Caesarea from that of Apollonia. According to Avi-Yonah, followed by Holum, it was Naḥal Poleg (*Bdellopotamos*), located farther south. In the north, Avi-Yonah set the border line between Caesarea and Dor/Dora in Haḥal Daliya (*Chorseos Flumen*), while Notley and Safrai included Dor in the region of Caesarea, extending it as far as the region of Acre/Ptolemais. Not so in Faust and Safrai. Unlike Avi-Yonah, Holum proposed that Ḥorvat Sumaqa and the entire Lower Carmel were included in the boundaries of Caesarea, forming its northern border. He included within also Elyaqim in the NE, Umm Reiḥan in the E and Tur Karem/Birat Sorqa in the SE. The extension eastward in both Avi-Yonah's and Holum's maps is much vaster than that in Safrai's maps.

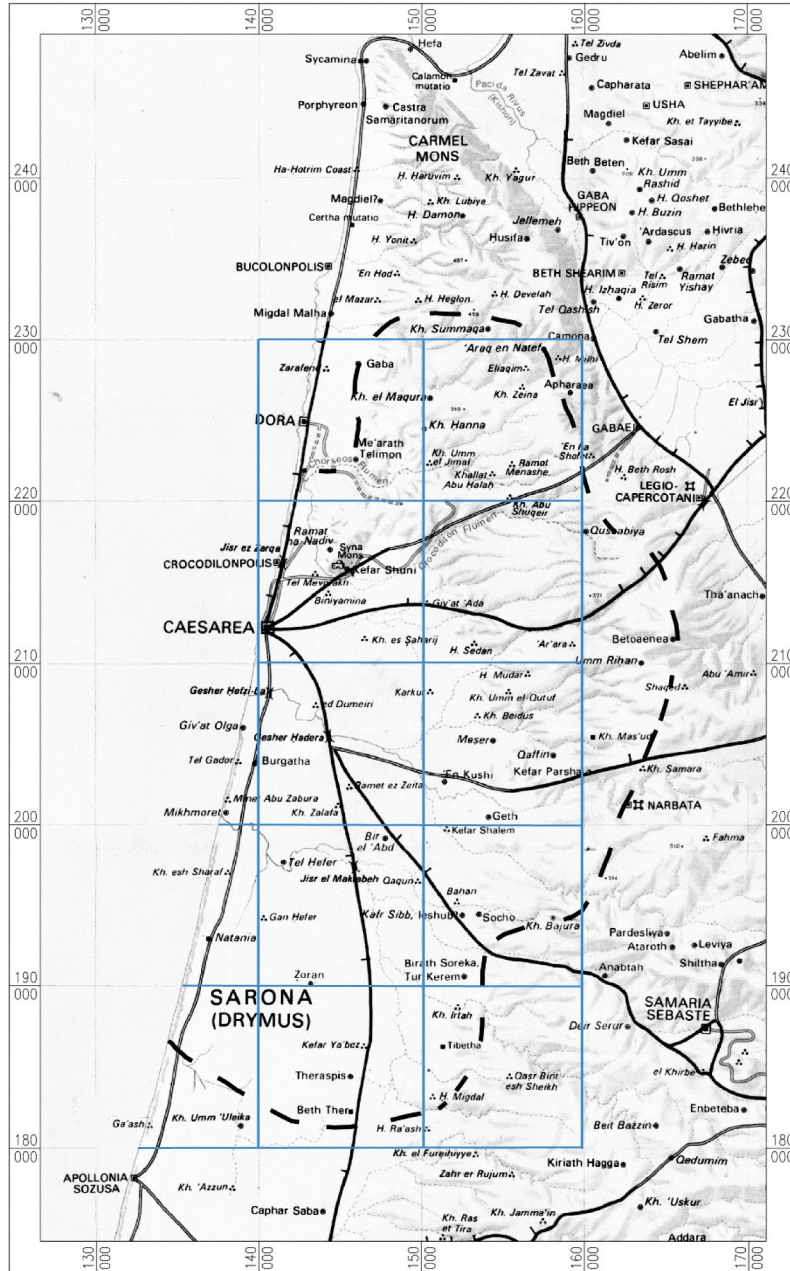


Fig. 1: Map of the territory of Caesarea according to Holm (2016), overlaid on TIR map. The squares mark the Survey Maps.

The area marked by Holm encompasses ca. 900 km². He opined that the area included 100–120 villages. In the TIR map, only 54 villages, 4 forts and 9 farmsteads are marked within these confines. Wine and oil presses and other installations uncovered in the Survey Maps (see below), were not marked on the TIR map. Seemingly, some of

	Atlit (26)	Yagur (27)	Dor (30)	Daliya (31)	Binyamina (48)	Regavim (49)	Mikhmoret (52)	Ḥadera (53)	Ma'anit (54)	Netanya (56)	Kfar Yonah (57)	Tul Karem (58)	Even Yehuda (59)	Total
Hel.	–	–	5	7	7	36	3	5	5	4	6	8	2	88
Rom.	–	50	36	26	90	111	12	38	2	17	10	6	10	406
Byz.	1	10	49	57	88	87	18	69	65	13	26	21	42	546
E. Ar.	1	–	2	4	19	26	3	10	11	2	10	5	4	97

Table 1: Number of sites in the 13 Survey Maps.

them indicate farmsteads. From the Rabbinic sources we know that six of these villages, of Jews or Samaritans, were producers of wine.

The geophysical features of the countryside of Caesarea Maritima

The *territorium* adopted here is that of Holum. Extending between Naḥal Dalya in the north and Naḥal Poleg in the south, it is delineated by the Mediterranean on the west and the western Samaria Hills on the east. It included the Lower Carmel – the southern part of this ridge, part of the Manasseh Heights – as far east as its watershed, the northern foothills of Samaria and the northern Sharon Plain. Administratively, the territory of Caesarea (including that of Narbatha) reached the boundaries of Samaria-Sebaste on the east and those of Antipatris and Apollonia on the southeast and south, respectively. A network of five Roman roads connected Caesarea with its hinterland and with inland cities.

The archaeological data: The Survey Maps

The rural hinterland of Caesarea holds thirteen 10 × 10 km² Survey Maps, some of them only partially. Seven of the maps were already published as hardcopy books and are available also online, electronically. Other four are available at the moment only electronically on the website of the Survey of Israel; one is not available yet.

Like the city itself, the countryside much flourished following its foundation by Herod, in the Roman period and even more so in the Byzantine period (with 406 and 546 sites respectively), relative to the only 88 sites of the Hellenistic period (Table 1). In the early Arab period, when Caesarea ceased to function as a provincial capital and had much shrunken in size, the countryside also underwent a decisive decline, with only 97 sites. This decline is also resonated in the early Muslim sources, according to which following the conquest the lands around the city were known to be swampy, not recommended for settlement.⁴ Seemingly, the lengthy years of the siege (634–640/41 CE), resulted in negligence of proper drainage of the streams and the fields.

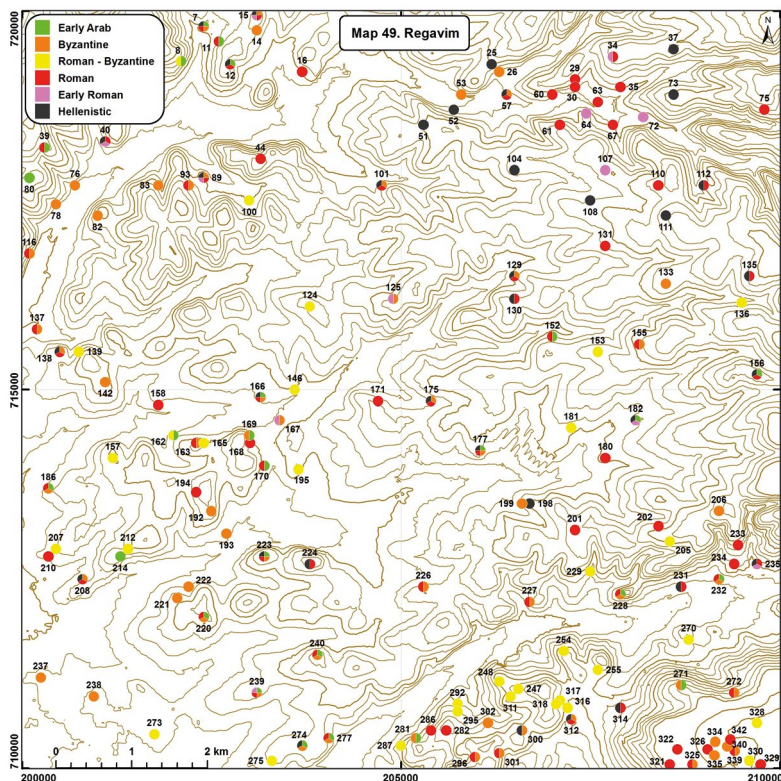


Fig. 2: Regavim Survey Map, marking Hellenistic to Early Arab period sites.

Most of the Survey Maps in the hinterland of Caesarea provide only meager information about each individual site. The surveys of Olami (Maps 30 and 31), and of Neeman (Maps 52–54) were carried out decades ago, when the survey methodology and the publication of the results were by far pre-mature.

The most recent survey was conducted in Regavim (Map 49), published by Gadot and Tepper, located to the east of Binyamina (Map 48), in which Caesarea is included. According to the introduction chapter, pertaining to the Roman and Byzantine periods, more than a third of the 111 Roman sites were settlements, but their names are not listed as a group, and they are not sorted according to size categories: big, medium-size or small villages, farmsteads etc. Hence, only periods can be presented on the map (fig. 2), not size category or site typology. There are neither aerial photographs nor detailed maps or plans of any settlement. The actual pattern of the rural settlement is thus quite vague. It is not clear which were the major villages; neither is it possible to associate a farmstead or isolated agricultural installations with this or that village. The settlement pattern pertaining to the Byzantine period is even more vague. It was not clearly indicated how many of the 87 documented sites are settlement remains (40?), and how many should be considered as installations. As for the farmsteads, the introductory discussion is more detailed, but the description of each farm is laconic. Such is also the case with the other

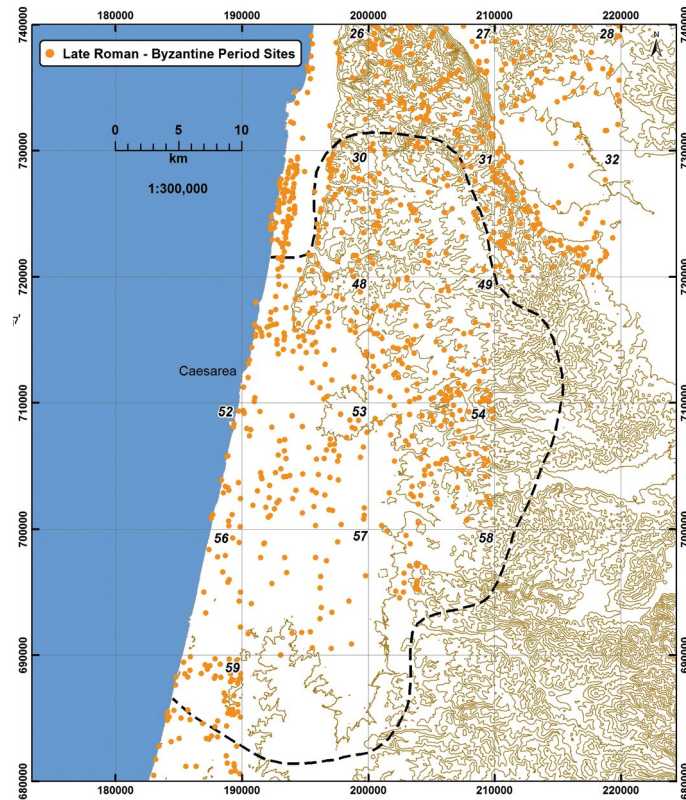


Fig. 3: Late Roman/Byzantine period sites in the territory of Caesarea.

Survey Maps (fig. 3), in which the documentation is even more laconic. Extracting sites identified as settlements rather than installations or other non-settlement sites from the total number of sites listed in the Survey Maps, yields these results (Table 2):

The listed settled sites much differ in their dimensions (which in many cases are not provided). Only few extended over several dozens of dunams (1 dunam = 1,000 m²). More were much smaller, representing perhaps farmsteads or just small farmhouses. Military installations of the Roman and Byzantine periods are almost nonexistent. The actual area occupied by the Survey Maps is about 900 km², with a total of 185 settled sites. Namely ca. 20 settled sites of different dimensions per 100 km². How many of them were full-fledged villages is hard to tell in the present state of knowledge. As was indicated above, Holum estimated this number to be 100–120 in the entire territory, and on the TIR map only 54 villages, 4 forts and 9 farmsteads are marked within these confines. A better evaluation of the settlement pattern should include a thorough examination of aerial photographs of past years, taken before the intensive works of development that had changed the landscape considerably. In some cases, getting back to the field will be indispensable. Such a task is beyond the scope of the present study.

But another big lacuna in the archaeological data presented here concerns salvage excavations. This information, not all of which already published, is stored in another

Map Name	Number of Settled sites*
Dor (30)	25
Daliya (31)	20
Binyamina (48)	27
Regavim (49)	40 ?
Mikhmoret (52)	5
Ḥadera (53)	19
Ma'anit (54)	21
Netanya (56)	3
Kfar Yonah (57)	10
Tul Karem (58)	4
Even Yehuda (59)	11
Total	185

*Ranging in size from several dozens to just 3d and less, and dated to the Roman and Byzantine periods.

Table 2: Number of settled sites of the Byzantine period.

IAA server, not accessible to the public. The compilation and analysis of all this data requires a separate study. Faust and Safrai totally refrained from relying on survey results in their book on the rural settlement in Israel. They rather preferred to rely on salvage and initiated excavations. But ignoring entirely information derived from the Survey Maps seems to be going too far.

At the absence of more detailed settlement hierarchy in the Survey Maps, all that could be presented in Table 1 and in the accompanying map (fig. 3), are just the periods, not the size, or type, of each site. But one should note that the periods' definition (presented in different colors on the maps), is not the same in all maps; some surveyors had differentiated between Roman and Byzantine sites; in other maps the more general term "Roman-Byzantine" is applied; and in some cases the Roman period is divided into early Roman and late Roman.

The total number of sites per period presented in Table 1 is just one aspect of the settlement pattern emerging from a Survey Map, somewhat misleading when listing different sections of the same aqueduct as different sites, likewise sections of Roman roads, bridges, milestones, quarries, tombs, and all sorts of non-inhabited installations in the countryside.

Agricultural installations

Table 3 presents a summary of the distribution of wine and oil presses in the Survey Maps in the hinterland of Caesarea.

Map Name	No. of o/p	No. of w/p
Dor (30)	7	20
Daliya (31)	6	12
Binyamina (48)	10	2
Regavim (49)	15	30
Mikhmoret (52)	–	–
Ḥadera (53)	1	1
Ma'anit (54)	1	–
Netanya (56)	3	
Kfar Yonah (57)	3	6
Tul Karem (58)	2	12
Even Yehuda (59)	4	3
Total	52	95

At some sites the occurrence of an installation is indicated in the plural, without specifying a number. Hence, the numbers presented here are minimal.

Table 3: Numbers of oil and wine presses in the Survey Maps.

Interestingly, on average, the amount of wine presses recorded is almost twice the amount of oil-presses. On the map of Binyamina, that includes Caesarea, the picture is reversed, with 10 oil presses against just 2 wine presses. On the map of Even Yehuda, the numbers are almost equal: 4 oil presses and 3 wine presses. The almost absence of such installations on the maps of Ḥadera and Netanya may derive from modern over-cultivation and construction works that obliterated these remains, rather than from natural geological and geographical features. The total of 52 oil presses and 95 wine presses is much smaller relative to the 100 installations of each type mentioned by Dar for Mount Carmel alone.

Some particular cases

The studies of Shimon Dar on the rural settlements in western Samaria (of sites such as Qarawat Bani Ḥasan and Umm Reiḥan), and in the hilly southern Carmel,⁵ are at sheer variance relative to the Survey Maps discussed above. It was a thorough architectural and topographical survey, complemented by excavations in some cases. The extension of the arable land associated with each site was marked and analyzed as well. The largest settlement included in the northernmost confines of Caesarea was Ḥorvat Sumaqa, which Dar had extensively excavated between 1983–1995. Other sites explored by him in a similar method within the confines of Caesarea are Kh. Mansura, a rural settlement

occupying some 20 000 sq.m and two farmsteads, Kh. Umm ed-Daraj, a large farmstead, and Kh. es-Sulemanije, a farmstead well protected all around ($90 \times 137 \text{ m} = 12,330 \text{ m}^2$). The farmhouse in the center ($32 \times 53 \text{ m} = 1,696 \text{ m}^2$ in dimensions), was surrounded by workshops and other appended structures. Likewise Umm Reiḥan in western Samaria.⁶

Farms and their agricultural yield

There were numerous farms in the hinterland of Caesarea in the Roman and Byzantine periods. In the Samaritan revolt of 529/30, whole Christian estates were set on fire (Cyril of Scythopolis, *Vita Sabae* 70), especially in the region of Neapolis located to the SE of Caesarea, deep in the land of the Samaritans. The number of Christian estates of this kind must have been large as well in the rural area of Caesarea.

The most impressive farmsteads are those excavated by Hirschfeld in Ramat HaNadiv on the Carmel ridge – Manzur al-‘Aqeb/Ḥorvat ‘Aqav and Ḥorvat ‘Eleq, and that excavated by Seligman in Naḥal Ḥaggit.⁷

The archaeological-architectural report on the Ḥorvat ‘Eleq farmstead was complemented by a quantitative study, speculative to a certain degree, pertaining to the geophysical conditions, subsistence and potential agricultural yield of the dry farming at the site and population size. The arable lands cultivated by the inhabitants of the farm are estimated to be 15 km^2 ; only half of which was tilled each year, the other was laid fallow. The main commodities were cereals, olives and vines and various fruit trees, such as figs, pomegranate, almonds and some peaches, apples and pears. Since five members of a nuclear family could till 200,000–300,000 m^2 in pre-modern times, ca. 25–35 families could cultivate ca. 7 km^2 . The $4,800 \text{ m}^2$ walled area of the site could accommodate some 100–120 people, i.e. 20–25 nuclear families, if a coefficient of 20–25 people per residential dunam ($1,000 \text{ m}^2$) is applied. The other workers (estimated to be 350–500, emerging from 70–90 families), would have lived outside. Calculations are also presented about the yields of wheat, barely, lentils, wine and olive oil and the produce of the livestock.⁸

Palatial manors and mansions (extra-mural and in the countryside)

Ḥorvat ‘Eleq (following Hirschfeld’s interpretation), was not the only palatial complex in the countryside of Caesarea. The structure on top of Tel ‘Afar on the coastal plain (to the west of Giv‘at Olga, 6 km to the south of Caesarea) was a wealthy mansion overlooking the sea, like a *villa maritima*. Nearby stood a massive rectangular structure with thick walls, square towers at its corners, buttresses on each side and two vaulted openings. It might have served as a granary. Numerous roof tiles, marble fragments and many tesserae were also found in the entire excavated area. Porath had suggested that

the complex was an extra-mural governor's palace; Peilstöcker opined that it might have served as a monastery, but at the absence of a church, this seems to me a farfetched proposal.⁹

Wealthy dwellings (*villae suburbanae*) were also uncovered outside the city walls of Caesarea. The most impressive is the villa located to the northeast of the city, at a distance of a few hundred meters from the city walls. Its central courtyard was decorated with the so-called "Birds Mosaic". The villa was situated atop a hill overlooking the sea and the city.¹⁰

Monasteries were perhaps located on top of Tel Tanninim¹¹ and Tel Huwira/Tadvira, on the sea shore. From the literary sources it is known that a nunnery and a monastery existed in Aphthoria, 12 miles to the south or SE of Caesarea. The proposed identifications include Baḥan, Bir al-ʿAbd and Umm al-Ḥaled/Netanya, but there is no certainty. A laura might have existed in Naḥal Galim, descending from Mount Carmel. It is also known that in the mid 6th century a monastery existed outside one of the city gates. But altogether, there is only meager evidence concerning monasticism in the region of Caesarea, both literary and archaeologically.¹²

Summary

Theoretically, an analysis of the soils included in the countryside of a city may permit to evaluate its potential agricultural yield. This is not a simple task, but the available information and technology makes it possible.¹³ For this end a digital application that will present all geographical features and archaeological data that pertain to a particular region – a city and its countryside (*territorium*), should be developed, enabling to present each city in the context of its archaeological and geographical countryside. Such an application can show, on screen, all relevant archaeological data, to evaluate the agricultural yield and population size and to present these results in tables, charts and maps in GIS (Geographical Information System),¹⁴ or similar technology. Such technology permits to present geographical information as well as archaeological and historical data as superimposed cartographical layers.

The objective of such a project is to present a synthesis between the archaeological finds and the soil and geophysical features of the said *territorium*, in order to evaluate the land use, and provide the potential agricultural yield of the region. The agricultural installations, such as terraces, oil and wine presses, will permit to identify actual crops associated with a particular sort of soil in the arable zones and evaluate the potential agricultural yield of each zone within this territory, and hence – of the territory in its entirety. Animal pens and their relations to the topography and to non-arable zones will enable to mark grazing areas. Villages, farmsteads, terraced plots, water installations etc. will enable to trace the extension of the cultivated lands and their relations to the roads and to the city. Quarries, fish ponds, lime, pottery and glass kilns etc. will enable

to identify industries and other production areas. The agricultural produce can be translated into calories, and given the amount of calories necessary for the livelihood of a human being, an estimated size of the population living in the said territory can be evaluated.¹⁵

But it seems that the major obstacles lie in the paucity and poor quality of the archeological information in many of the Survey Maps. Yet, the possibility is there, and a move in this direction should start, if not in the rural hinterland of Caesarea, perhaps in that of another city, town, or region.¹⁶

Notes

¹ Portugali 1984; Rosen 1986; Ben David 1998; Dahari 1993; Dahari – Sion 2017; Tate 1992; Dentzer 1985/1986; Mango 2011.

² Holum 2016.

³ Avi-Yonah 1951; Notley – Safrai 2005; Faust – Safrai 2015 and Holum 2016.

⁴ Kister 1977, 43 f.; El'ad 1978, 163.

⁵ Dar 1982; Dar 1998; Dar 2014.

⁶ Dar et al. 1986.

⁷ Hirschfeld 2000, 13–87. 235–370; Seligman 2010.

⁸ Rosen 2000.

⁹ Porath 1988/1989; Peilstöcker 2009.

¹⁰ Spiro 1992; Porath 2006.

¹¹ Stieglitz 2006.

¹² Patrich 2016. Ayelet Dayan, in her Ph.D. dissertation (Dayan 2015), derived from still unpublished materials in the IAA archive files, had marked 10 sites in the area of Naḥal Ḥadera and Baḥan, where a monastery might have existed. The identification of these sites as monasteries is very dubious.

¹³ On the soils of Israel, see Gil – Rosenzafit 1955; Ravikovitch 1970. A digital soils map also exists in the Israel Institute of Geology, but a more detailed field work in the territory at our concern might be required.

¹⁴ Chapman 2006.

¹⁵ Chatfield 1953, 9–23; Wing – Brown 1979, 23–25; Guggenheim 1981, 17–19; Berdanier 2000, 17–28. Wheat provides 3300 calories per kg; lentils – 3400 calories per kg; beans – 3480 calories per kg. (Aykroyd – Doughty 1970, 30; Watt – Merrill 1963, 68). Since the daily requirements of calories of a 10 year old boy is 2200 and for a 22 year old lad is 2800, the total amount of population that could have been nourished by the land yields can be evaluated.

¹⁶ The outlines of such a project were first proposed by me in the framework of a conference on “Towns and Regions in the Mediterranean Area. A Diachronic Comparison”, held in Barcelona, Institut d'Estudis Catalans, 28–29 September 2015. A more detailed article on the present topic, entitled “The Settlement Distribution in the Countryside of Caesarea Maritima”, is forthcoming in „Ciutats mediterrànies: l'espai i el territori“, ed. Flocel Sabté, Barcelona, 2019.

Image Credits

Fig. 1: Holum 2016. – Fig. 2–3: Cartography: Dr. Mitia Frumin. – Table 1–3: by author.

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