Settlement Patterns as a Mirror: Resilience and Renovation Subsistence Strategies of the Southern Levant Communities in the Aftermath of the Late Bronze Age Crisis

Maria Tamburrini[1]

Abstract
During the last quarter of the second millennium BC, the entire Levantine area was affected by a multifactorial crisis that led to the great empires imploding and the end of the city-states entities with the subsequent rearrangement of their whole administrative system. A recent study of the Southern Levantine region conducted in my PhD dissertation has highlighted the advent of small village communities located in the area according to a dendritic pattern imposed mostly by the river's network features. Starting from the observation of the settlement patterns, this paper aims to explain how the anthropic landscape changed in the aftermath of the crisis and what the weight of the environmental component in the development of these communities was through both qualitative and quantitative analysis of the sites, their distribution, and above all through a comparison of the Late Bronze and Early Iron Age systems.

The Clustered Arrangement
Settlement studies conducted since the 1990s have shown for the Early Iron Age a site distribution organized through small groups, characterized by the concentration of numerous settlements around a pivotal site distinguished often by a dimensional factor. Finkelstein first recognized some clusters in the Ephraim area, particularly around the sites of Tell Sheik Abu Zarad, Khirbet 'Urma, Deir el-Mir, and Khirbet Seilun (Finkelstein 1988: 191; 1993; 2013: 24, 26) but also in the Manasseh region, close to the sites of Tell Balata, Tell Dothan and Samaria and again in the region further south of Benjamin in the sites of Tell el-Ful and Khirbet ed-Dawwara (Finkelstein 1988: 66, 80-81, fig. 14).

A similar clustered arrangement was identified by Zertal in the Jordan Valley (1998: fig. 7), around the sites of Bedhat esh Sha'ab and Yafit 3, two sandal-shaped enclosures considered to be cultic outposts (Hawkins 2013: 122; Zertal and Bar 2009; 2017: 6-7, 84-85; Ben-Yosef 2017a; 2017b); a recent analysis of the two sites showed, on the contrary, their possible use as enclosures for herds like so many others in the area (Zertal 2001: 46; Faust 2012: 149-159), therefore, the origins of the clustering might be sought in the need for mutual protection and in the willingness to leave the valleys free for agricultural purposes, more than in the cultic function.

Two other scholars who have finally distinguished the grouped arrangement in the hill area are Miller and Palmisano, the former through the application of pre-established size

1 Sapienza University of Rome.

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classes and thus hierarchical relationships based on sites dimension (Miller 2012: 30-40),[2] and the latter through predictive models (Palmisano 2013: 755-760, 765). The main issue affecting both studies is neglecting the possibility that the function, rather than the extension or distance, may have generated the layout.

The Occurrence of the Dendritic Layout

Unlike previous studies, focused mainly on the site dimensional factor and relationships derived from it, the analysis here conducted is supported by a multidisciplinary approach that involves both archaeology, meant as a functional study of settlements and their interconnections, and landscape archaeology meant as the observation of *ecofacts* (Tamburrini 2019).

Starting from the east, it is possible to recognize three different macro-regions: the desert and semi-desert areas, the most impervious central mountain area, and the foothills zone characterized by valleys and plains. The analysis of the settlement typologies and their disposition show a clear matching between the models adopted and these sub-regions. The whole area is affected by a strong process of ruralization: fences with a pastoral function were identified mainly in semi-desertic and dry zones, domestic/rural villages are differently located in the innermost region, and urban centers, with a more pronounced public character, were found in the foothills and valleys. Proper from this correspondence, it is possible to glimpse how the choice of the planimetric model, can be interpreted as a true adaptation strategy.

From a distributive point of view, compared to the previous period is observed a reversal settlement trend with an increase of small settlements and a decrease of the large urban centers, already in a downturn than the Middle Bronze Age (Fig. 1). Concurrently it can observe the occupation of the innermost hilly area previously considered unsuitable for permanent settlement except for a few sites like Tell Balata, Jerusalem, and Hebron (Bieniada 2001).

Synchronic and diachronic analysis of the pottery repertoire has also stressed that this progressive occupation, started at the end of the Late Bronze Age from the most eastern fringes, reached its peak in the Early Iron Age with the occupation of the whole hilly area and shifting from a nomadic to a sedentary attitude of the residing groups (Frick 1991: 69; Finkelstein 1995: 353-354; McNutt 1999: 70; Lehmann 2003: 142; Zertal 2004; 2008; Zertal and Mirkam 2016).

From this new spatial analysis, a different disposition defined as dendritic has emerged, very similar to that modeled on the Wadi Farah and Wadi Malikh fluvial systems already observed by Zertal (2004; 2008; Zertal and Mirkam 2016). This term, usually referred to the drainage systems, is suitable to describe the site's network, emphasizing the strong interconnection between settlement, topography, and resources. The dendritic arrangement has been recognized from north to south, along the main wadis but also along the secondary branching (Fig. 2).

The disposition along the wadi banks is well known starting from the Chalcolithic; a cross-study of water flow rate, wadis volume, and sites position, conducted in the northern Negev, revealed the importance of wadi features in the settlement process. Placing along the wadi was probably an intentional choice to facilitate the managing of water and avoid the community from challenging constructions (Gibson 2001: 119-120; Winter-Livneh, Svoray and Gilead 2010: 293; Langgut *et al.* 2015: 229; Gadot *et al.* 2016: 452). The branched lay-

2 The extension remains often conjectural, especially for the surveyed sites, and this disparity gives rise to an altered reconstruction in which the excavated site – often regarded as larger – automatically assumes a key role.

out was also observed in the Jordan Valley during the Chalcolithic (Lovell and Bradle 2011), and in the Zarqa River area where communities practiced floodwater farming exploiting the rainfall, thus proving a real opportunistic attitude (Kaptijn 2019).

Resizing of the Human Impact on Ecology

The different water management, here hypothesized, led to reconsider the previous theories which assume a widespread of wells, but above all assigned to the terraces the reasons for the growth and success of the Iron Age. According to these theories, terracing would have allowed the spreading of horticulture without the washing away of the slopes caused by the deforestation carried out by man to make liveable the wooden hilly areas (Stager 1982: 111-112, 116; 1985: 178-179; Callaway 1985: 39; Hopkins 1985: 180; Borowski 1987: 15; Bieniada 2001: 181-182; Gibson 2001: 119-120, 134-135; Golden 2009: 24; Finlayson *et al*. 2011: 210; Van Bekkum 2011: 90; Gadot *et al.* 2016: 439).

Pollen records released in the last decade showed that the decrease in woodland was not caused by human-made deforestation but by the progressive drying up of the climate. In addition, a re-examination of the archaeological terracing evidence has led to mitigation in the human impact on ecology, less than that proposed so far. Limited evidence of large-scale terracing in Iron Age I, as well as the possibility of a lowering in their chronology (Porat *et al*. 2017: 643-644), suggests moreover that horticulture was not the main source of livelihood as previously assumed, despite a slight increase in Olea europaea pollens (Ron 1966: 34; Rosen 1994: 345-346; Barton, Ullah and Bergin 2010: 5276; Langgut *et al.* 2015: 229). In general, the technique of terracing should be considered as an incentive for growth but not essential for the success of the settlements, the harvest in fact could grow even without these supports up to a maximum of 2-30° slope (Gadot *et al.* 2016: 452). It is probable that in the Early Iron Age, before the introduction of complex supply structures, collecting systems with special jars as well as the streambeds floodwater were exploited (Hopkins 1985: 96, 181-182), obtaining greater benefits from the optimization of the surface water than those derived from terracing (Gibson 1995; Liverani 2005: 55; Shahack-Gross and Finkelstein 2008; Finlayson *et al.* 2011: 192-193, 200; Bruins 2012; Bruins and Van Der Plicht 2017).

The Resumption of Short-distance Traffic Network

The end of the palatial system and Egyptian domination provided local populations with the possibility of re-establishing their communication network (Joffe 2002: 431). Along the entire area, it distinguishes four main routes with north-south direction: the Via Maris, parallel to the coast, the Patriarchs Route, passing through the central mountains, and two further lateral paths. These four paths are intersected by horizontal routes that follow the course of the wadi, in turn, punctuated by settlements. Differently from the Bronze Age during which was the north-south routes covered a central role in the traffic, it is the east-west routes to have the greatest momentum right now, connecting the lowlands with highlands previously considered marginal.[3] In addition to the trail network already mapped by Dorsey (1991), it was possible to recreate further paths used during the Iron Age: a north-south one leading from Tekoa to the Dead Sea and marked by different sites as well as the modern road, and a path below the Beth Shean Valley developing parallel to the Dead Sea (Fig. 3). The possibility that

3 Also, the similarity between the local pottery and the repertoire to the east of the Jordan river (e.g. Deir Alla) perhaps suggests a population shift in the E-W direction (Van Der Steen 2004; 2016: 173).

this precise network could have existed would seem to be confirmed by the correspondence of the fluvial system and site distribution.

Despite a first interruption of international trade routes during the beginning of the Early Iron Age, it is possible to hypothesize their resumtpion followed by a strong impulse of regional traffic (Jasmin 2006: 154, 156, pl. 46); the correspondence of routes, wadis, and sites according to the same dendritic trend, may suggest a measured recovery of interregional traffic, thus supporting the idea that the wadis network served not only for agricultural purposes but also as a communication network in which the sites were used as real outposts and supply points. In some sites as Lachish the presence of long-distance traffic is attested by the presence of special items: cedarwood, probably imported from Lebanon or Syria, Mediterranean shells (*Glycymeris violacescens*), and finally a considerable number of perch (*Lates niloticus*) and catfish (*Bagrus*) fishbones coming from the Nilotic areas (Lernau and Golani 2004; Routledge 2015: 213, 217, 219) are just some remains that could confirm the existence of long-distance trade.

The Late Bronze Age Urban Landscape

The Late Bronze Age settlement pattern indirectly suggests different management than the Early Iron Age. The city-states, subjected to a regime of vassalage towards the pharaonic authority (Van der Steen 2016: 161, 174), generally present a remarkable urban layout, a modest dimension, and are arranged in clusters, a scheme probably inherited from the Middle Bronze Age (Bunimovitz 1989; 1995; Na'aman 1992; Falconer 1994; Joffe 2002: 427; Savage and Falconer 2003; Jasmin 2006; Kennedy 2013). The Tell el-Amarna letters describe a strongly hierarchical organization based on 15-17 territorial units consisting of relatively small key site and a rural hinterland made of small- to medium-sized centers controlled and exploit through corvee. These peripheral towns provided primary goods in exchange for market opportunities, access to some luxury goods, and above all protection in case of threatening; part of the products was probably sent to Egypt, while the rest was used for the maintenance of the stationed troops and the local administration (Nakhai 2008: 123; Savage and Falconer 2003; Jasmin 2006; Finkelstein *et al*. 2017: 253-255).[4] Unlike these minor unfortified centers, isolated and poorer (Joffe 2002: 428; Van der Steen 2016: 161, 172, 174), the main Late Bronze city-states were organized on a strictly specialized economy based on full-time producers (Bieniada 2001: 190) and were concentrated along the coast and major valleys where the main routes passed through (Panitz-Cohen 2014: 543).

The Early Iron Age Post-crisis Solutions

Compared to the previous period, innovation seems to concern not only the settlement distribution but also the work management. The crisis and the demise of the Egyptian empire led to the disappearance of the great hierarchized hubs and the recalibration of the entire economic system. What happened was a real decentralization of the economy based on fragmented self-sufficient units, unlike what previously emerged from the clustered distribution (Nakhai 2008: 122).

In the Early Iron Age, especially in the hilly area, a type of village economy dominated, where diversification was preferred over intensification, without specialized full-time oper-

4 Egyptian interest in Canaan was of a strategic rather than an economic nature (Aḥituv 1978: 93-96, 105; Na'aman 1981: 177-178, 180-185; Bieniada 2001: 171-172; Joffe 2002: 427).

ators as in the Late Bronze (de Miroschedji 2009; Cline 2014; Knapp and Manning 2016; Ilan 2019: 298-299); the survival family-based economy defined day by day, was aimed at minimizing risk and consuming foodstuff shortly, a strategy that would seem to reveal a resilient and polymorphic society able to reply to a potential sudden collapse (Butzer 1982: 21; Faust 2003: 152; de Miroschedji 2009: 101, 120; Hammer 2018: 64-65). It is interesting how this strategy, probably chosen for a transitory purpose to cope with the crisis, proved to be successful in the long term, paving the way for the political entities of the following period.[5]

Final Remarks: Reorganization from a Landscape Perspective

In the aftermath of the crisis, all regions underwent a recalibration of livelihood strategies as well as of the organizational structures around new needs defined 'eco-anchors' (Lovell and Bradle 2011). In contrast to the initial grouped arrangement which proposed an image quite similar to that of the Late Bronze Age where elites were promptly replaced by the so-called dimorphic chiefdom, the new dendritic layout recognizes in the wadi the main factor in the composition of the sites mesh, followed by the springs and permanent sites. The identification of the dendritic network does not preclude the possibility of further relationships based on the social dimension but helps to re-establish a hierarchy of priorities recognizing the environment as the major factor in human choice. The above-mentioned arrangement almost completely coinciding with the roads and the wadis network, underlines the key role played by the environmental features, revealing the strong connection with the less stable water sources at the basis of rain-fed agriculture, despite what so far hypothesized.

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5 The adoption of this more autonomous model involved firstly the hilly areas where the early withdrawal of the Egyptian power encouraged the stabilization of some groups which had been forced to a nomadic lifestyle (Ofer 1994: 109; Faust 2006b: 120; Marom *et al.* 2009; de Miroschedji 2009: 122; Burke 2018: 246).

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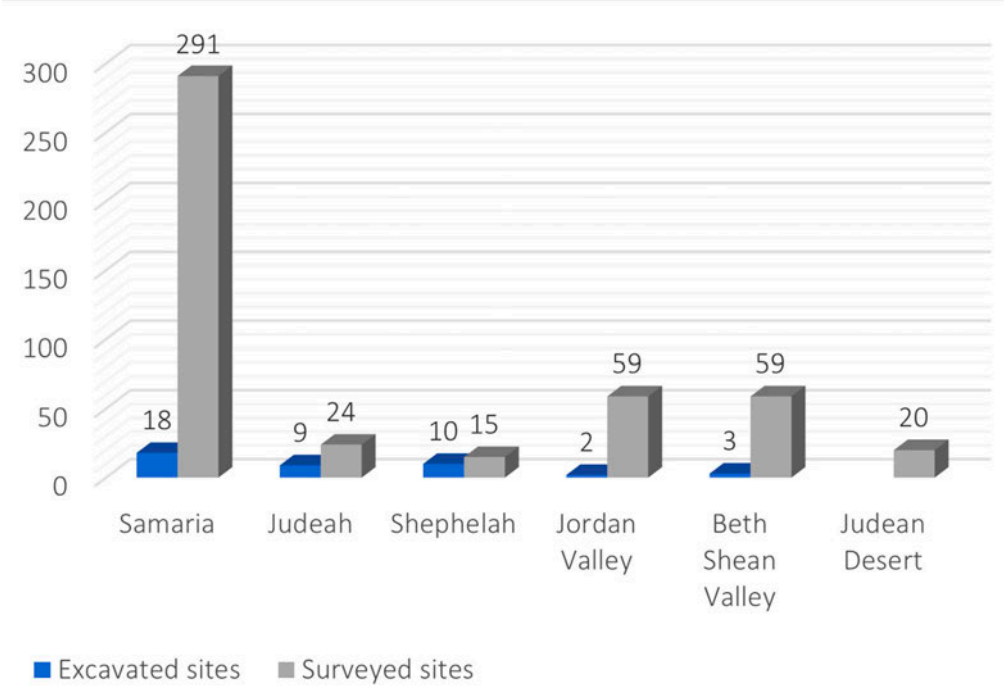

Fig. 1: Iron Age I settlement trend in the different sub-regions (illustration by the Author)

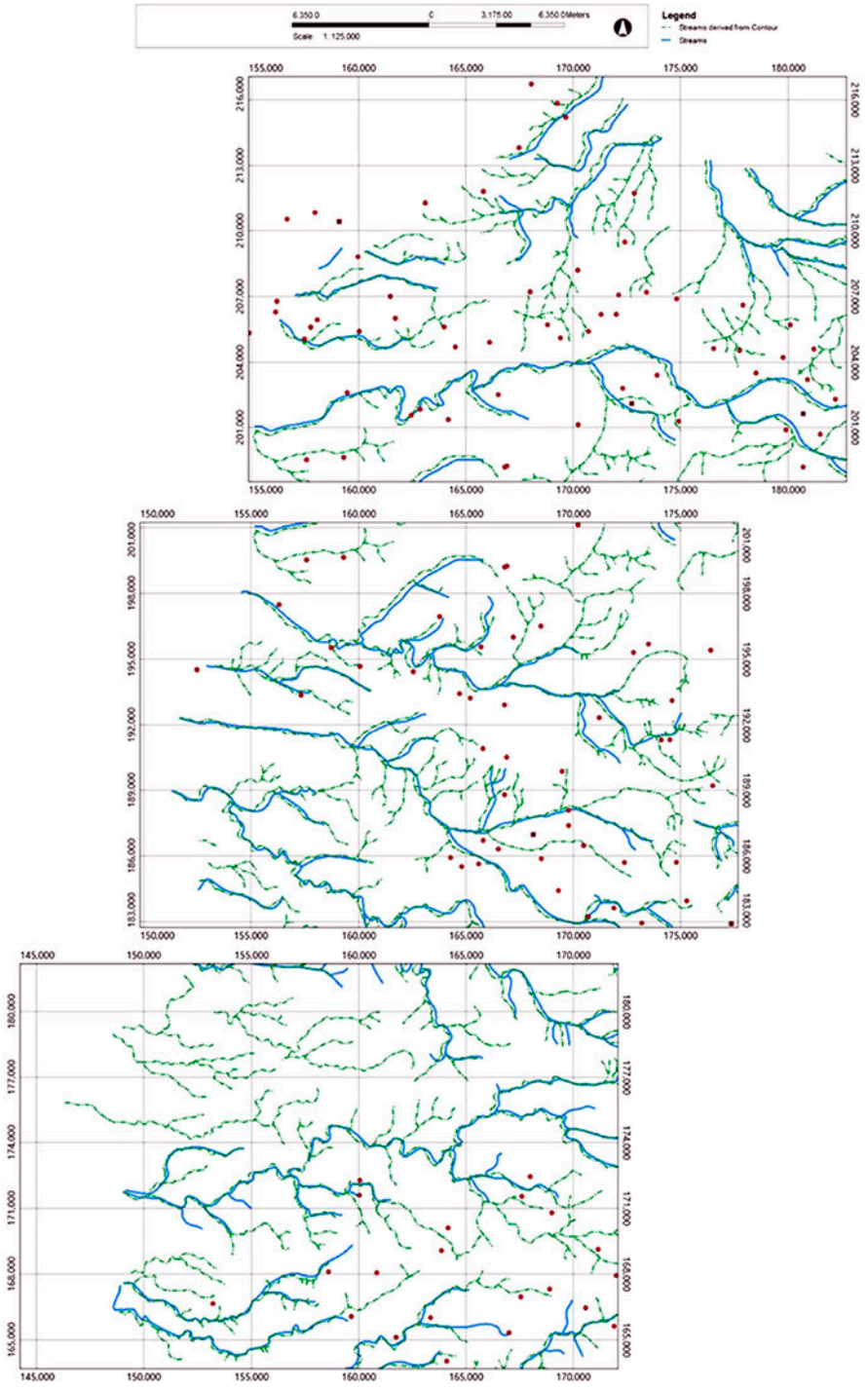

Fig. 2: The dendritic layout in the western area of Samaria (illustration by the Author)

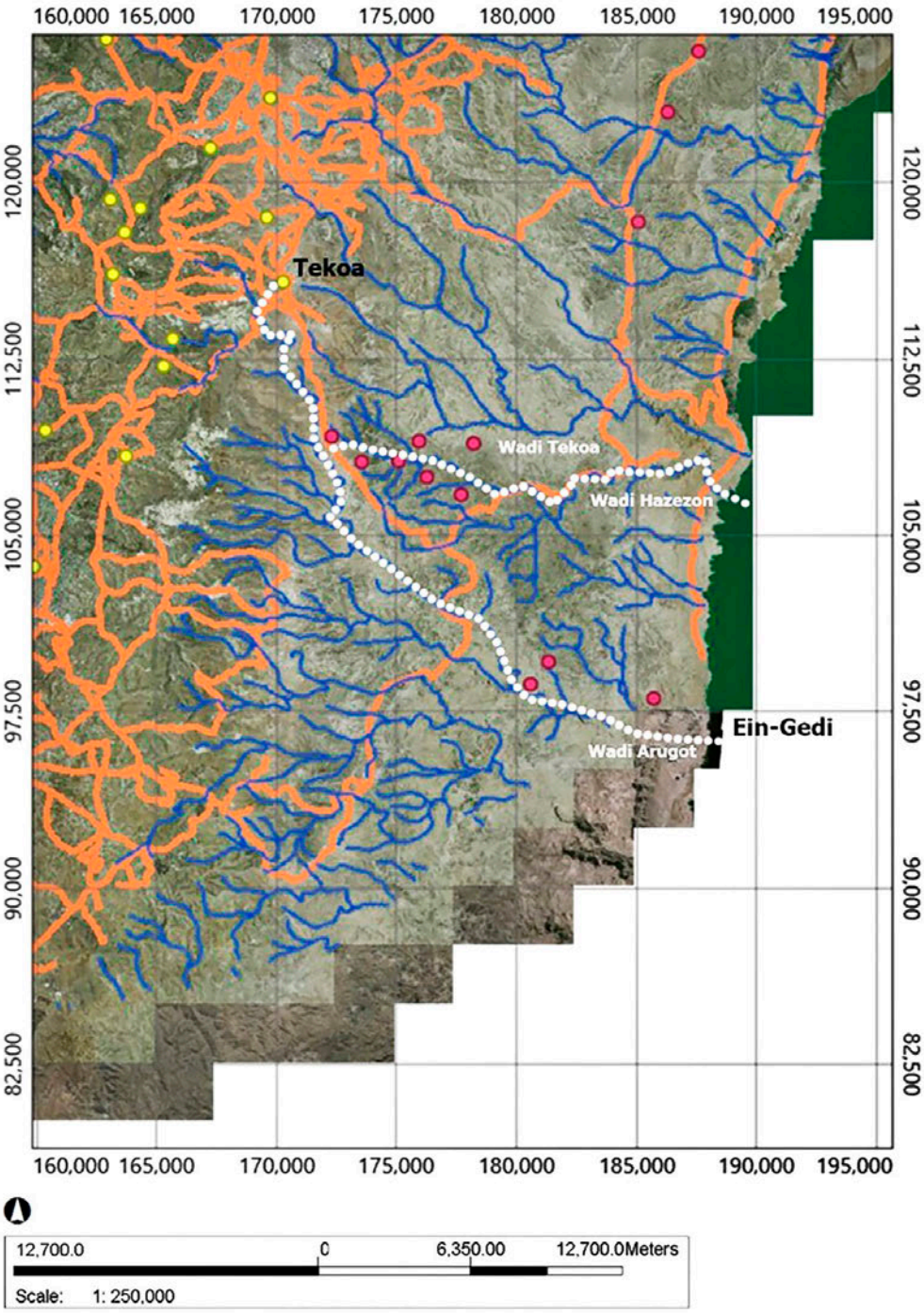

Fig. 3: The presumed route Tekoa-Dead Sea based on the wadis and modern road network (illustration by the Author)

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