

NUMBER

'WE WERE BUILDING A CAMP, THEY WERE BUILDING A CITY'

Refugee camps as a spatial laboratory for social inclusion

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ABSTRACT

Refugee camps are an issue where socio-cultural relations to space are more than a theoretical issue, but rather an essential requirement, if not even an ethical imperative. Despite their emergency purpose and their official qualification as temporary structures, yet the exceptional nature of the events refugees escape from and their persistence often make camps to stabilize and become permanent settlements, fully fledged cities destined to endure over time. It is hence evident that, when it goes at planning a refugee camp, the pressing requirement of an emergency structure, strictly aimed at receiving people and ensuring their survival, gives way to the wider need for an urban structure, whose spatial features actually correspond to the behavioural pattern of the population.

The recent experience with a large number of camps, whose original layout has been subjected to the relevant spontaneous transformation by the population, testifies to how the adherence of the spatial features to the behavioural pattern is needed by the hosted refugees in their progressive becoming inhabitants of the new city. In basic terms, this poses the question of the compatibility of an emergency response, entrusted to standardized planning solutions and subject to few basic regulations, with the flexibility of an informal settlement, destined to evolve according to needs of the population.

In this paper, we argue that a configurational approach could play a key role in facing this problem, and that space must serve as an essential reference for the development of refugee camps. Convinced that the social and cultural backgrounds of refugees should act

as an essential framework for the development of their own lives inside camps, and assuming Za'atari refugee camp, in Jordan, as a case study, its grid configuration was analysed, as referred to the original layout and to the present state, and compared to the actual distribution of activities in order to appreciate the spontaneous adaptation the settlement has undergone. Besides, the configurational pattern of the refugees' home cities was investigated, in order to point out the main spatial features they present and the behavioural phenomena they reproduce. The purpose is the proposal of a basic spatial layout the camp should comply with, suitable for matching the behavioural pattern of the hosted community while also available for any spontaneous development process.

KEYWORDS

refugee camps, grid configuration, urban space, informal settlements

1. INTRODUCTION

Refugee camps are an emergency response to humanitarian crises determined by natural events or man-made disasters, fulfilling the urgent need to give shelter to masses of displaced people and provide them with decent and hygienic living conditions.

Nonetheless, despite the pressure of emergency, several reasons - in addition to ethical considerations - suggest the need of regarding the camp not as a mere issue of quantity, but as a real urban settlement, whose spatial features cannot be unrelated (or indifferent) to the social and cultural fabric of its inhabitants, and to the behavioural pattern it involves.

First, and most obvious, despite the stated purpose of favouring refugees to return to their home towns, yet it is not granted to know when the emergency that caused the displacement will end; as a matter of fact, the refugee camp will hence be likely to remain in operation for a long time, or even to stabilize and become a permanent settlement. Moreover, and less obvious, the provision of a standardized and alienating urban space negatively affects its efficiency, as it triggers disruptive reactions of refugees – including the physical modification of the camp and the disuse of the provided services – which eventually lead to second order consequences such as running cost increase and hardening of living conditions. Furthermore, transforming the camp into a viable social and economical alternative to the places refugees are fleeing helps their social cohesion, relationships, and behaviours to survive within the camp, making it a preparation laboratory for return and reconstruction.

In view of all those considerations, when it comes to planning a refugee camp, the pressing requirement of an emergency structure, strictly aimed at sheltering people and ensuring their survival, gives way to the wider need for an urban structure, whose spatial features ought to match the behavioural pattern of the population. Such issue will here be addressed by means of the space syntax techniques, hence regarding space configuration as the connecting element between the social context of the hometown and the spatial features of the camp, so that the latter can be shaped to meet the first and comply with it.

2. BACKGROUNDS: SOCIALITY AND SPACE IN REFUGEE CAMPS

Sectorial manuals refer to refugee camps as the least desirable option for the response to humanitarian crises (UNHCR, 2007, p.208; Corsellis and Vitale, 2005, p.57), a distrust that appears justified by their history and has led many scholars and aid workers to question their appropriateness.

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Starting from the 1970s, well known aid expert F. Cuny revolutionized the practice of camp design by changing the way shelter were traditionally laid out – i.e. a uniform military grid – to obtain a more fragmented urban form made up of ‘communities’ or ‘wards’ (as he called them), small scale clusters of shelters laid out around a central square, used for shared facilities and socialization. This layout was first introduced in El Coyotepe refugee camp (Nicaragua, 1972) and then in Khulna (Bangladesh, 1973-74, where it was expressly adapted to the typical layout of Bengali villages); later field reports and academic studies presented these camps as economic and social successes, demonstrating how providing social and culturally sound spaces could radically improve the refugee experience (Cuny, 1977; Hartkopf and Goodspeed, 1979).

This approach is believed to have inspired sectorial manuals and other guidelines in their sections about site planning (UNHCR, 1982; 2007; Corsellis and Vitale, 2005; Norwegian Refugee Council, 2008; Sphere Project, 2011), even though those handbooks seem to elevate some particular solutions implemented by Cuny – e.g. the ‘community’ approach - to universally applicable norms, instead of following his general guideline of assessing socio-cultural peculiarities of refugee populations before defining camp planning strategies (Kennedy, 2008, p.106). Parallel to this, since a small-scale element is taken as generator of the whole layout, the large scale – that is the camp’s city-like dynamics - is automatically overlooked, despite Cuny (1977) had already warned about the necessity of addressing camp planning issues in the same way usually followed in urban planning.

Given these considerations, it can be argued that the misinterpretation of Cuny’s work has made camp design policies tend towards over-standardized refugee camps, suitable for quick emergency responses but inefficient in the long run both economically and socially. The issues highlighted by scholars and aid workers about the cheapness of infrastructures (that need to be replaced with permanent ones as the crises endures), the cultural inadequacy of shelters, and the way they are laid out at a local scale (Cuny, 1983; Vannucci, 2013; Kennedy, 2005, p.100-104) only partially describe the problem, as they regard direct economic and social consequences. Nevertheless, as we will argue in our case study, inefficiency is also correlated to the layout of infrastructures and shelters at the urban scale, something that inevitably affects the way refugees use the camp as a whole and can trigger a vicious circle - of inadequacy, disruption, money waste, and policy stiffening – that yields high economic and social costs as indirect by-products.

3. CAMP SPACE AND SPACE SYNTAX

If (Hillier’s words) ‘the city is two things: a large collection of buildings linked by space, and a complex system of human activity linked by interaction. We can call them the physical city and the social city. Urban practice and theory must connect one to the other.’ (Hillier and Vaughan, 2007), space syntax analyses the physical city, calculating the relationships between its spatial elements, in order to understand, predict and manage the phenomena and the behaviours within it: that is the social city.

To the extent to which a refugee camp can be seen as a city, its space – that is the organization of shelters, the streets along them and their mutual intersections, the open spaces – not only responds to the need to collect and shelter people, but intrinsically expresses (or should express) the way the hosted community is expected to live and socially interact - what a configurational approach can reveal and make to emerge.

A vast amount of literature demonstrates how configurational values appear suitable for reproducing several significant aspects of human behaviour: for example integration as a reliable indicator of centrality, assumed in terms of accessibility and attractiveness towards activities, and choice as a useful value for narrowly describing the distribution of movement flows. Due to their correspondence with movement (Hillier, 1999, p.99) – and in a broader sense, ‘patterns of human co-presence’ Hillier (2005) - other social issues appear described by the configurational indices, such as, for instance, the distribution of crime events - burglaries or car theft (Hillier, 2004) -, or the location of major social activities such as cathedrals or municipal buildings in European towns (Cutini, 2010; Karimi, 1998), or mosques and bazaars in Muslim towns (Loumi, 1988; Karimi, 1998).

Coming hence to the matter of this research, the potential of space syntax with reference to refugee camps seems twofold. On the one hand, space in its purest form can be used as common ground for the comparison of two distant entities like a refugee camp and a formal city, disregarding the conceptual and factual distance between the two. On the other hand, development and improvement proposals can be objectively substantiated by the configurational approach, that in this sense can act as framework to overcome all accountability, economic, and political constraints that often limit practical action in such difficult contexts.

4. THE CASE STUDY: ZA’ATARI REFUGEE CAMP

Za’atari is a Jordanian refugee camp located some kilometres off the Syrian border, operational since summer 2012, few months after the beginning of the Syrian civil war. It has gained considerable notoriety, especially in the first year of its life, for a combination of factors. First, since its aperture, it has steadily been one of the highest concentrations of Syrian refugees, but despite the demographic pressure, as former camp manager K. Kleinschmidt noted (2014), camp design and service provision standards were consistently met in Za’atari. Shelter space per person – usually hard to meet when facing high influxes of refugees - hit its lowest in May 2013 (UNOSAT, 2013a) with an approximate amount of 2.5 sqm per refugee, but rapidly increased to fall within the standard of 3.5 by the end of the next month (UNOSAT, 2013b), and have never decreased since then.

Secondly, protests and demonstrations by refugees (both pacific and violent) were very frequent in Za’atari, and have led to serious problems of security, with major negative consequences such as the death of a Jordanian policeman and injuries to refugees, policemen and aid workers (UNHCR, 2014k). As in many of these occasions refugees protested for standard-related issues (lack of electricity (UNHCR, 2014f), shelter (UNHCR, 2014b; 2014c), service provision (UNHCR, 2013a; 2014a) and work opportunities (UNHCR, 2014g; UNHCR 2014h)) and despite the meeting of standards: Za’atari was in this sense a powerful demonstration of the inadequacy of camp planning policies, as former camp manager K. Kleinschmidt noted (2014).

Last, Za’atari has brought to the international attention refugees’ resilience and active pursuit of autonomy and wellness, displayed through informal economic and spatial attitudes. Just some example of these are the creation of a complex wholesale-retail market system with an economic flow estimated at 14 million dollars a month (REACH, 2014c, p.24; Beiser, 2015); the institution of an electrician squad to illegally deliver electricity to standard houses (namely ‘caravans’ in Za’atari’s common lexicon); and the developing of a rudimental system for shelter transportation, by which caravans are moved from the assigned plot to join relatives or fellow citizens’ shelters in other parts of the camp (UNHCR, 2013b).

Nevertheless, these coping mechanisms are clearly not enough to guarantee social and economic wellness, and aid experts has warned about the dangers of considering Za'atari a functioning city (Crisp, 2015) and thus attributing it a normalcy that does not exist. Suffice it to say that in mid-2014, 75% of Za'atari's population relied either on cash from charities (32%), begging (23%) or sale of household items (20%) as first source of income, compared to a ratio of only 2% prior to leaving Syria (REACH, 2014a).

As a matter of fact, Za'atari is far from promoting the well-being and autonomy of its inhabitants: this inadequacy clearly calls for a spatial and development oriented improvement plan to provide refugees with economic opportunities and an appropriate urban space where to use them. More precisely, since refugees' coping mechanisms – modification, disuse, privatization - materialize into spatial actions (or inactions), the improvement measures we hereby propose draw from two main questions: Why is Za'atari camp's space inadequate to materialize the social structure of Syrian refugees?; and how can this inadequacy be objectively described, and reduced?

5. THE METHOD AND ITS TEST ON ZA'ATARI CAMP

The research carried out on Za'atari camp consists of three main stages. First, the camp was analysed by means of the space syntax techniques. Then, three Syrian cities - Daraa, Izra, and As Sanamayn, main urban areas where Za'atari's refugees comes from (UNHCR, 2014a) - were investigated in the same way. In these stages, urban grid maps were obtained thanks to the combination of geographic data sets (OpenStreetMap, 2016), GIS databases (only for Za'atari camp, retrieved from UNHCR crises management website, 2012) and satellite photography (Google Earth Pro, 2015). Thanks to the software DepthmapX (Varoudis, 2015), each map was then converted into an axial map, and integration values were calculated for each axial line.

Leaving the purely morphological considerations to the following sections, we hereby seek to discuss how the configurational approach is capable of objectively describing the social dynamics that were only qualitatively introduced so far, by means of the mutual relationships of the configurational indices as well as their correspondence with human behavioural patterns.

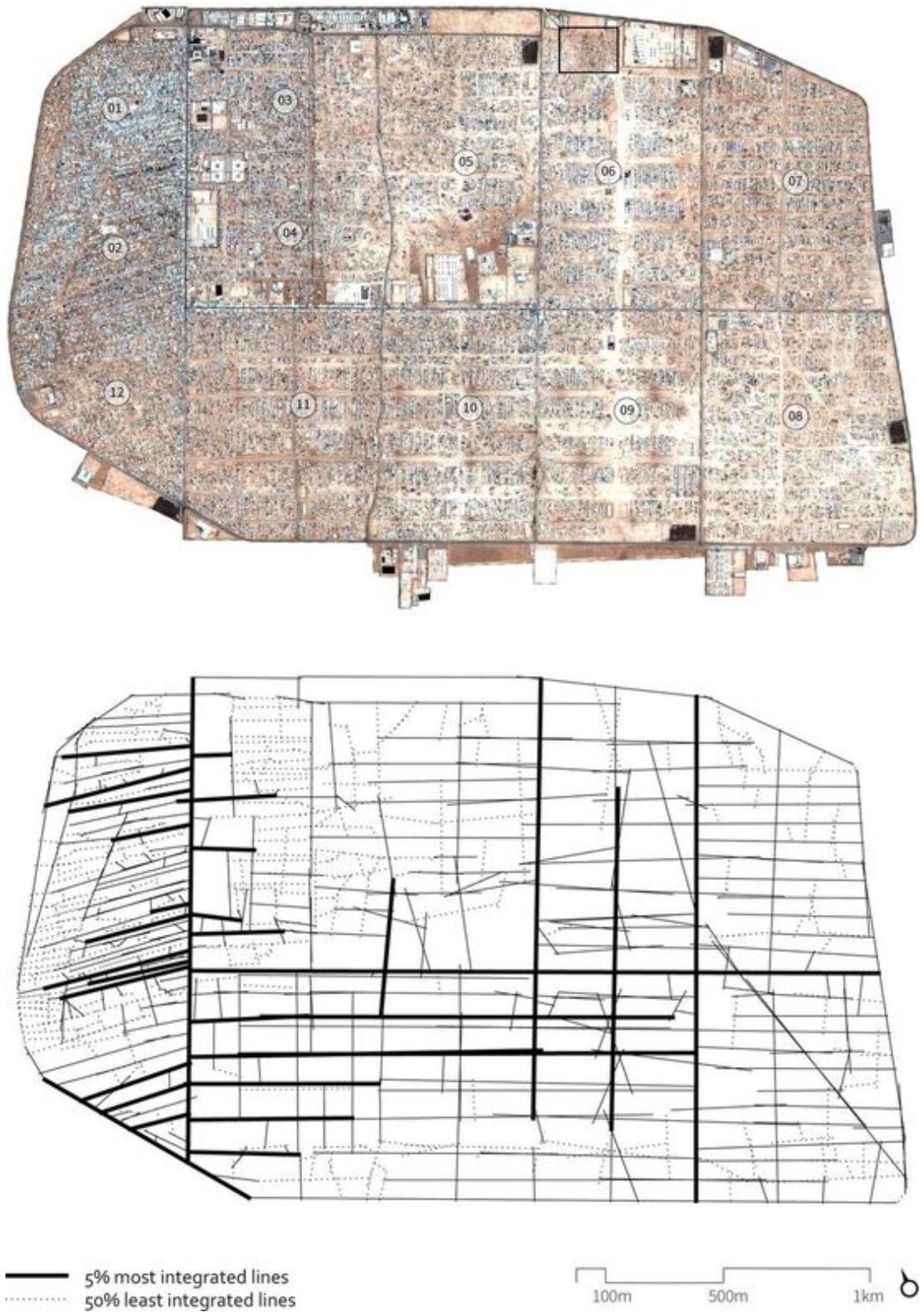


Figure 1: Aerial view of Za'atari at April 2015 and related axial map showing the global integration pattern.

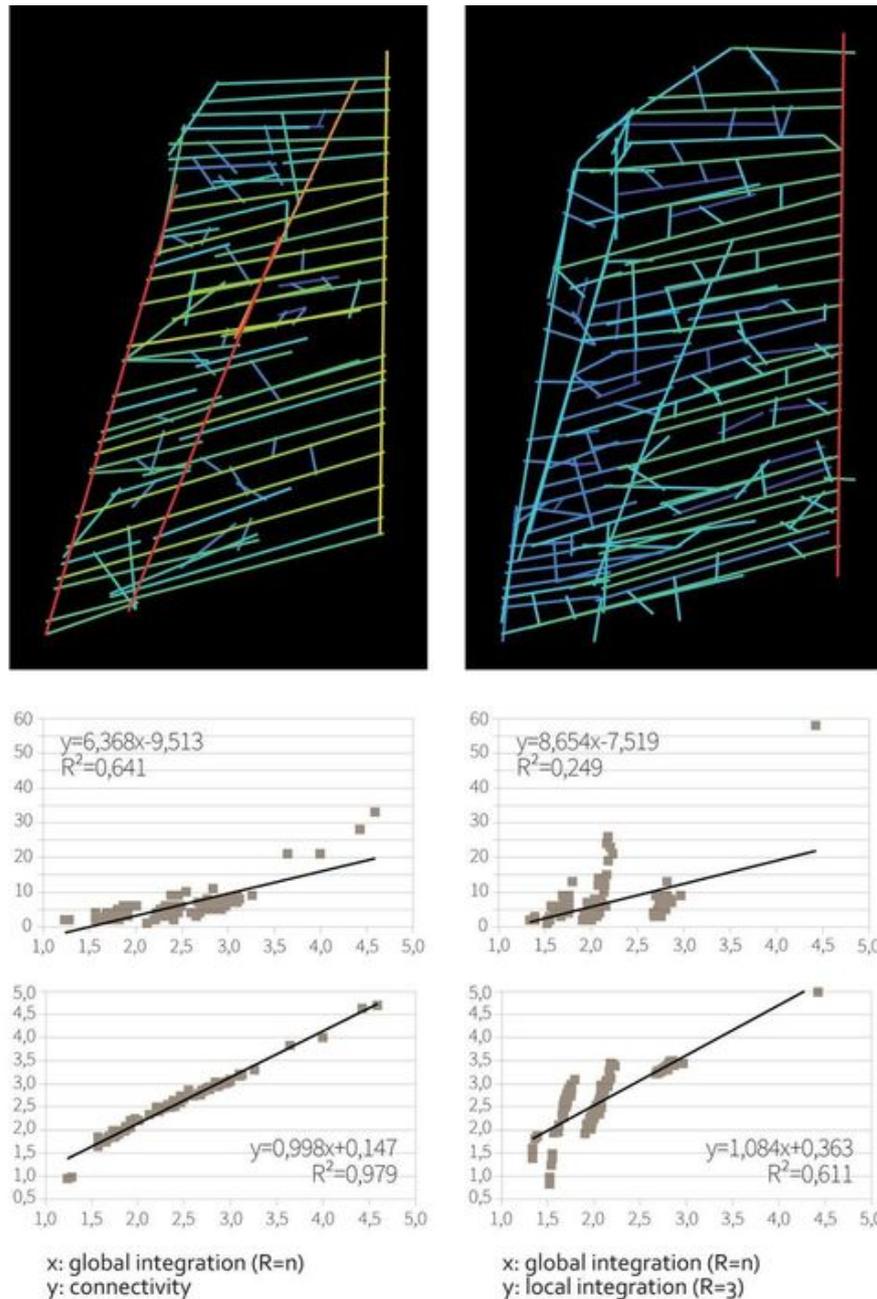


Figure 2: Evolution of the old town from September 2012 (left column) to September 2013 (right column): global integration (top), intelligibility (middle), synergy (bottom).

For instance, the spatial enterprise took on by refugees to modify the camp to their own advantage appears to be readable through the changes of two configurational 'combined' indexes during the first year of Za'atari's existence, that are the correlations of global integration with connectivity (intelligibility), and with local integration (synergy) (Hillier, 1999). In fact, aerial images (UNOSAT, 2012; 2013c) document a set of spatial modifications – mainly creation of informal paths and closure of long axes – occurred in the first year of Za'atari's life, reflected by a severe reduction of intelligibility and synergy (respectively from 0.641 to 0.249 and from 0.979 to 0.611) to meet values more similar to those of unplanned (or not entirely planned) cities [Figure 2].

As for the correlations that regard human behaviours inside the camp, three remarkable correspondences can be observed [Figure 3]. The first one relates to Za'atari camp at September 2013 (UNOSAT, 2013c), providing the correlation between the local (R=3) integration patterns and the number of shops for each 25 m of axial line (Trigwell 2013) (with the total number of lines divided into 10 groups based on integration intervals of equal width). The diagram yields a remarkable coefficient of determination ($R^2=0.793$, increasing to 0.931 if the two least integrated groups of lines are excluded), with the most integrated line, Al Souq (literally, 'market' in Arabic), being also the one crowded with the greatest number of shops.

The second diagram shows a similar correlation related to the situation at November 2014 (UNOSAT, 2014), having the global integration values in the x-axis, and the number of shops per 25 m in the y-axis. In this case, the only data available were the number of shops in the four main commercial streets (REACH, 2014c), but the correlation is still narrow ($R^2=0.950$).

The third diagram, dating April 2015 (UNOSAT, 2015), compares the mean local integration of all the axial lines and the mean local integration of the axial lines where the 76 mosques of Za'atari were located (UNHCR 2015c), both grouped per districts. The rationale of this analysis is that the 12 districts in which Za'atari is 'administratively' divided [Figure 1] (except 1 and 2, belonging of the so called 'old town') are effectively separated - physically and perceptually - by wider roads, according to site planning guidelines. The remarkable R^2 coefficient of 0.790 suggests that, even where mosques were not located on the most accessible lines of each district, a correlation between their location and the overall configuration of the district in terms of accessibility actually exists.

Apart from proving the efficacy of space syntax in a seemingly uncharted territory as the refugee camp, these findings show how the process of informal self-determination has affected both the spatial and the functional structure of the camp, and both its economic and social tissue. In fact, while commercial informality is well-established and evident from the large number of shopping stalls throughout the camp, a more subtle network of mosques is just as important, as it fulfils not only religious needs, but also other important functions like education and recreation (UNICEF, 2015), actually acting as social connective tissue of the camp.

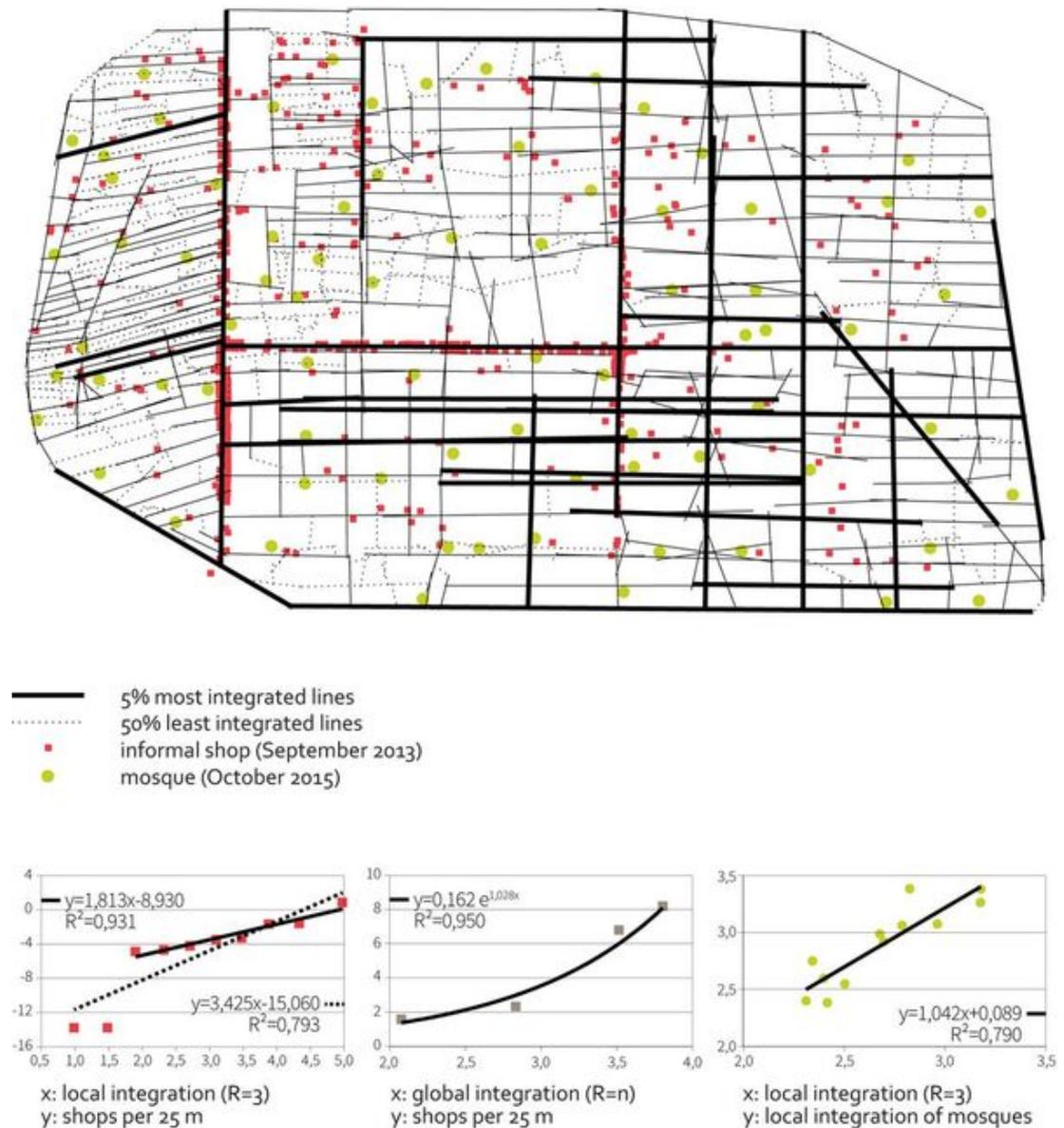


Figure 3: Local integration pattern of Za'atari at April 2015, and correlation of integration versus commercial activities (left, middle) and mosques (mean values per district).

Given the impossibility of retrieving quantitative data on spatial behaviours regarding the Syrian cities, the research focused on highlighting their similarities in terms of spatial structure and key functional features, also in relation to more general and acknowledged characteristics of Islamic urban environments. In the axial maps of Izra [Figure 4], for example, the pattern of global integration shows a tendency to limit the macro-scale accessibility to a main axis - with the souq (main city market) and the Friday mosque (religious reference point) placed in its proximity - with some smaller branches jutting out from it like the teeth of a comb. This kind of integration core is typical of Islamic cities (Loumi, 1988; Karimi, 1998), in contrast to the 'deformed wheel' structure common to many European cities (Hillier, 1999, p.137).



Figure 4: Global (top) and local (bottom) integration pattern of Izra, Syria.

Contrarily, the most locally ($R=3$) integrated lines are spread in a quite uniform way across the city. Since the local integration pattern is highly correlated with pedestrian presence, this means that the city districts are linked via a 'super-grid' (Loumi, 1988, p.357) that homogeneously distributes pedestrian movement. From a functional point of view, district mosques and smaller commercial clusters have been correlated in Islamic cities with relatively highly integrated streets at a local level (Karimi, 1998, p.174-181). Predictably, also the 50% least accessible streets are homogeneously distributed across the city: This means that, even when walking along a poorly accessible street, pedestrians can find a well-integrated area (where mosques or local shops are likely to take place) within a few corners, that is to say that privacy is achieved without excessive segregation, coherently with the general tendency of Islamic cities (Hakim, 1986, p.24-27; Loumi, 1988, p.372).

The spatial structure of Za'atari shows substantial differences from the one of the typical Syrian city. First of all, part of the most globally integrated lines are grouped together to

form an orthogonal grid of long axes, which clearly contrast with the 'comb-like' structure of the Syrian cities and intrude into the residential areas.

While accessibility seems so widely distributed at the global level, at a local level Za'atari fails to provide the 'super-grid' that should connect its districts and facilitate pedestrian movement. The 5% most accessible streets are indeed excessively clustered, leaving entire districts segregated. The combination of these discrepancies at the global and local scale leads to a total absence of privacy in the residential streets near the most accessible areas, while involving, at the same time, an undue segregation of large zones (50% least integrated lines can indeed be found in large clusters), which are cut off from the most populated (in terms of co-presence) areas. These discrepancies can be defined 'morphological', and can be blamed for spatial modifications such as the movement of shelters to obtain courtyards and semi-private areas (REACH, 2014b) – proof of the insufficient privacy provided by the initial layout.

Other differences between Za'atari and the Syrian cities can be defined 'functional', in that localization of key urban functions in the camp did not match the patterns of refugees' hometowns. For example, Za'atari's largest mosque (Trigwell, 2014) is located in a poorly integrated street, causing the weakening of an important feature – the Friday mosque – of refugees' urban background. As for the other mosques, it should be noted that they are homogeneously distributed across the camp (UNHCR, 2015c), and so happens in Islamic cities (Fusaro 1984; Loumi, 1988). Nevertheless, while in the Syrian cities also local accessibility is well distributed, in Za'atari this does not happen, and so mosques are not linked to the super-grid that regulates pedestrian movement throughout the camp. Likewise, local shops are in some cases cut off from the most integrated streets.

6. URBAN SPACE IN CAMP PLANNING POLICIES

Given that camps are going to be the response (if only as the least worst option) to refugee crises for some time to come (Kennedy, 2008, p.117), rather than wishing them out of existence, the scientific community should tackle – and is actually tackling - the conceptualization of new policies that can effectively better the refugee camp experience and ease the strain on host governments and NGOs, reaching back into the very principles of aid provision: refugees' right to autonomy and development (UNHCR, 2007, p.190) above all. Scholarly works in the fields of law (Deardorff, 2009), economics (Collier, 2015) and sociology (Grbac, 2013) support this hope for a shift towards developmental - rather than relief oriented - strategies to be implemented in a systematic (yet not standardized) way in refugee camps. Since refugees, by trying to improve their lives, actually modify or produce space, it is clear that these strategies should spatially suits their needs and habits, being at the same time capable of internalizing and potentiating their autonomous strive for self-development.

Development measures, as we seek to introduce them, can be seen as the third step of an analysis–diagnosis–cure process, where the first two are represented by the comparative spatial analysis (as previously introduced) of the refugee camp at its present state and the refugees' hometowns, followed by the weighing up of analogies and discrepancies. The third step itself can be conceived as a process aimed at obtaining a new spatiality, closer to that of refugees' hometowns, by the addition of new urban devices. These structures can be seen as 'anchor points' (Kennedy, 2008, p.214-215), that is elements that provide basic services and let refugees organize the space around them informally; Or, as an alternative, they can be purposely left incomplete, acting as 'incremental spaces' that represent

opportunities for occupancy, utilization, and future informal expansion. As Stevenson and Sutton (2000, p.145) point out, this kind of strategies have already been implemented in slum upgrade or development interventions, both at a small scale (for instance in a social housing project in Iquique, Chile, by architectural firm Elemental) and at an urban scale (for instance in the development of some slums in Bogota, Colombia).



Figure 5: Intervention strategy of nodes and routes to reduce spatial inefficiencies.

Instead of being encompassed in zoning policies, these spatial devices are introduced in the camp in two ways [Figure 5]:

- construction of urban nodes, namely reference points around which refugees can develop commercial and residential structures;
- improvement of the existing route system, with the aim of establishing a network of active paths that function as the camp's social and economic spine.

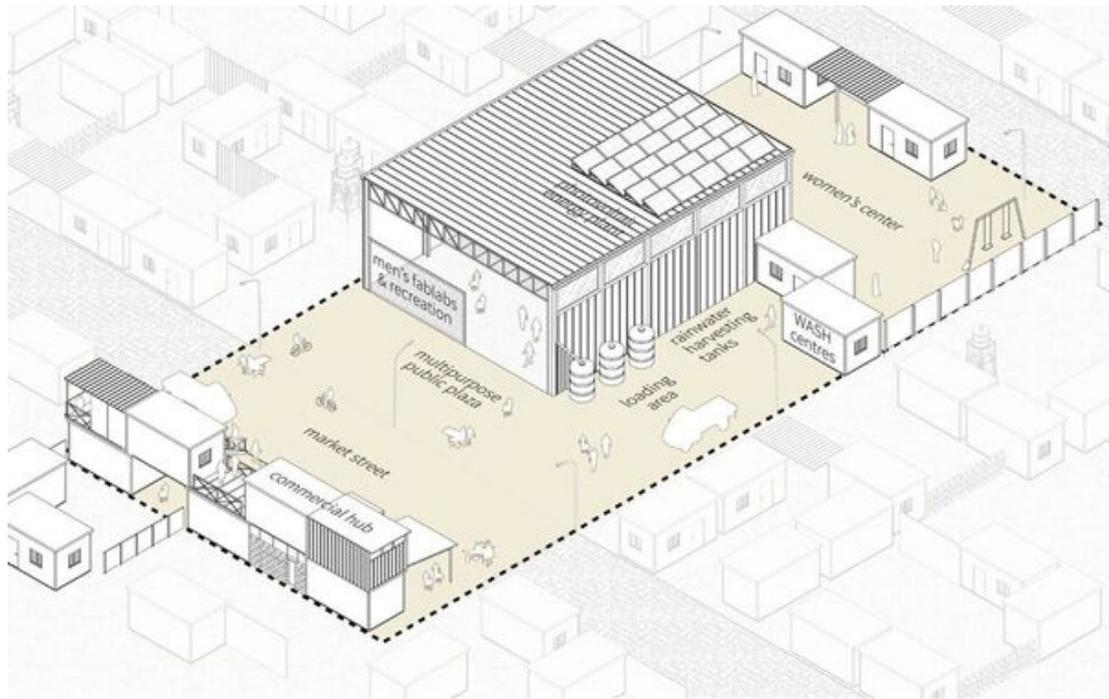
Each device, be it nodal or linear, can be tailored to specific needs of the camp and solve specific problems – for instance waste management, provision of social spaces, etc. –, still maintaining its spatial aim, which means that its localization will help solving all those spatial discrepancies between the camp and the refugees' hometowns, that had previously emerged.

Especially in the case of a large and populous camp like Za'atari, the introduction of nodes and the improvement of routes is intended as a process subject to continuous assessments and adjustments, at the end of which the urban layout will result more suitable to the refugees' needs, with all the districts incorporated in the super-grid of most locally integrated routes and the new urban nodes distributed along it [Figure 9].

The most representative of these nodes is the service centre [Figure 6], a modular and flexible space suitable for working as production, commercial, and/or recreational venue. It features simple architectural typologies and open spaces for outdoor informal activities, with tailored architectural solutions such as the gender-based subdivision of the service centre into two separate areas: one for the men, open towards the accessibility network and thus optimal for trading, and the other for the women, open towards the inner side of the district so as to provide more privacy to its users; given that women reportedly find it difficult to get authorized jobs within the camp due to cultural hindrance to work far from home (UNHCR, 2015a).

Another key urban node is the school, for which a cheap and efficient typology already implemented in Za'atari (Sinclair, 2015) has been taken as element to be reproduced along the main locally integrated routes. This would significantly improve children's safety and hence school attendance, given that one of the main reasons for school dropout in Za'atari is the insecurity of routes (UNICEF, 2014, p.59).

The third proposed urban node is a Friday mosque to be realized in a large space along the main market road, used as distribution point but set for possible dismantlement and replacement with a daily market extension (UNHCR, 2014j). The new mosque would be commissioned after an international design competition, under the constraint that the structure could be totally disassembled, and eventually replace one of the numerous damaged mosques, once return to Syria is made possible. Like in traditional Islamic cities, the Friday mosque would open onto the most integrated street and be directly related to the souq, resulting in the recovering of a key spatial feature.



urban node as space breaker

urban node as space structurer

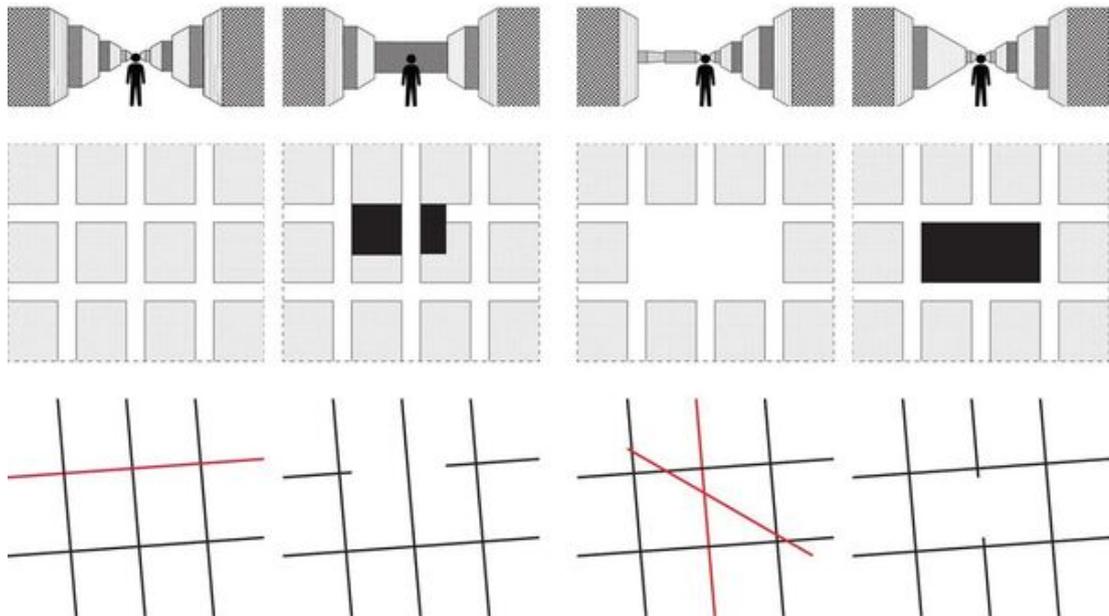


Figure 6: Service centre urban node (above) and its possible spatial function.



Figure 7: Route interventions and their possible spatial functions.

As for the street network improvement, to be obtained via linear devices, several solutions can be proposed. The most important is the redressing of street lighting [Figure 8], which is currently unevenly distributed and has concurred in the disuse of many kitchen and WASH (water, sanitation and hygiene) facilities, too insecure to reach at night (UNICEF, 2015; Siren Associates, 2015). The redistribution plan, to be implemented in progressive steps and subject to assessments and optimization, would lead to the optimal scenario where the most locally integrated lines will be illuminated, meaning that the majority of pedestrians will be able to safely reach key facilities.

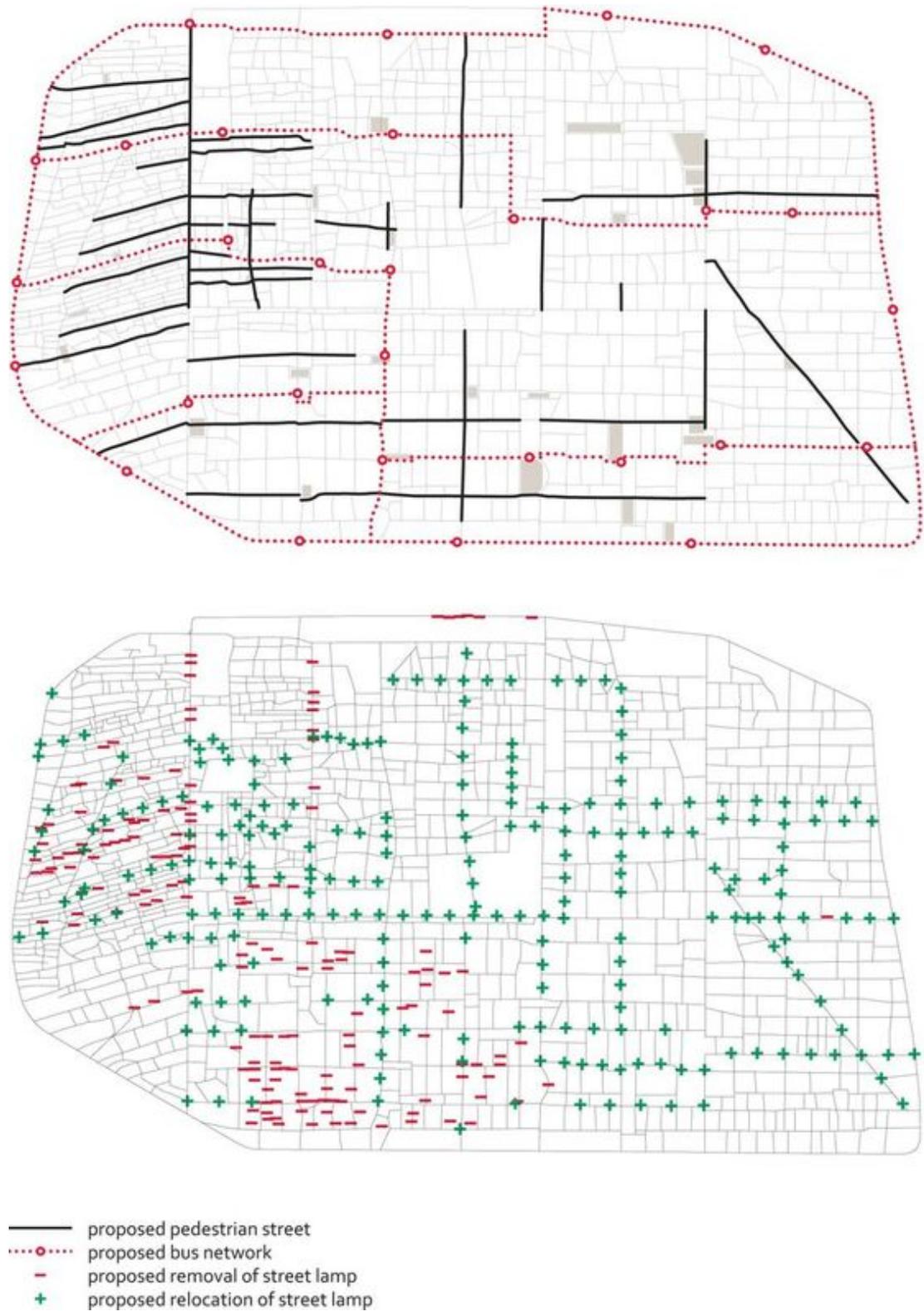


Figure 8: Proposed pedestrian and bus routes (above) and street lighting redressing plan (below).

Other proposed routes improvements are the creation of a network of pedestrian friendly areas and a new bus network, the improvement of unused spaces with ecological areas, the implementation of the so called 'incremental housing' developments, and the 'face lift' of selected streets. The first proposal was hoped for by UNHCR due to numerous street accidents involving refugees (UNHCR, 2015b), and the fact that better transports were often indicated as key improvement by refugees themselves (REACH, 2014a). In the proposed network, streets indicated as pedestrian friendly are the ones belonging to the super-grid of most locally integrated lines according to the camp's new configuration, while the bus network develops along central but less integrated routes, so as to limit co-presence with pedestrians. The second proposal aims at improving the camp's space quality by introducing green features that can also serve as space structurers and ecological elements, limiting erosion and ground pollution. Examples of these are the desert trees planted in water-catching devices called negarim, widely used in the Middle East (African Development Bank, 2008), and gardens of reeds and other grey water cleaning devices, already widely implemented in Za'atari (UNHCR, 2014d; 2014e). The third proposed improvement is the implementation of 'incremental housing' in the most overcrowded areas (prevalently the 'old town'), i.e. the replacement of caravans with improved temporary shelters that can optionally expand to the second story at the initiative of refugees, aimed at providing new open spaces for social and commercial activities where they are most needed. The last and 'softest' proposal is to apply face-lifting techniques (like wall painting, art decorations, and similar, all already implemented in Za'atari (UNHCR, 2014i)) in an extensive way along selected strategic routes which need to be revitalized and structured, following succeeding examples of Brazilian favelas upgrades (Boa Mistura 2012).

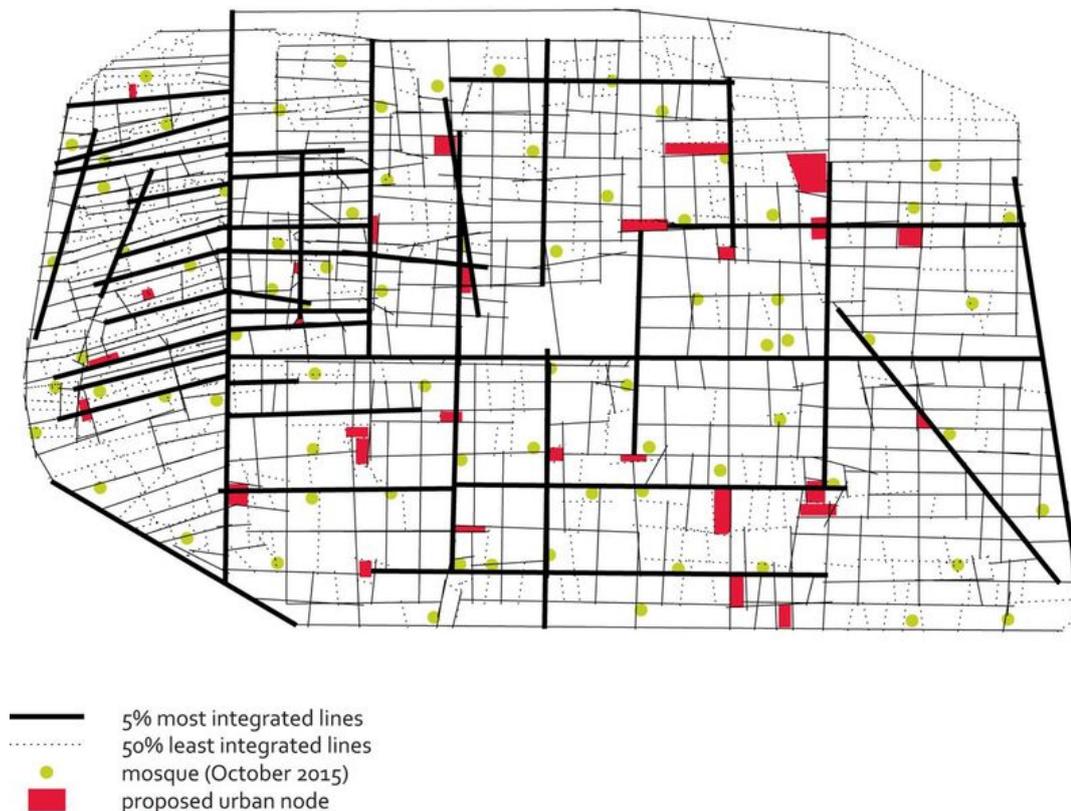


Figure 9: Local integration pattern of Za'atari after the improvement measures.

7. CONCLUSIONS

Decades of failed experiences with an amount of refugee camps, whose original layout has been subjected to the relevant spontaneous transformation by the population, provide motivation to the present research, which faces the problem of the analysis and improvement of refugee camps from a new perspective, relying on space syntax's proven ability to link spatial features and social patterns of settlements. The assumption of a camp as a city, and not a provisional and temporary device, suggested to use space syntax to support its development in order to match its spatial layout to the behavioural pattern of the refugees, as they appear materialized within the configurational features of their respective hometowns. Tests on the case study of Za'atari camp have showed that strategies of adaptation actually implemented by refugees are objectively describable, as they materialize in spatial patterns that correlate with the analytically obtained indices: on such basis, they can be predictable with a reasonable degree of accuracy. What is even more interesting, through spatial adaptations refugees tend to reproduce social structures similar to those of their hometowns, and they do it by aligning the camp's functional apparatus (such as commercial and religious buildings) to its morphology, as well as changing the morphology itself.

The proposed method appears suitable for addressing the question of the compatibility of an emergency response, entrusted to standardized planning solutions and subject to few basic regulations, with the flexibility of an informal settlement, destined to evolve according to needs of the population.

Although improvement measures have been proposed for an existing refugee camp, nonetheless the method hereby delineated can be as easily applied to the design of new camps: here the anchor points and infrastructural routes would be a set of spatial 'suggestions' - set in a top down way to ensure safety and hygiene without giving up cultural affinity - from and around which refugees could start to auto-define space and development strategies from the very beginning. In this sense, further studies could lead to the definition of a design tool potentially suitable not only for refugee camps, but also for the reconstruction of destroyed cities, the urban upgrade of slums, and whatever situation that entails mass migration and fast resettlement.

This means transforming the camp into a viable social and economical alternative to the war-torn places refugees are fleeing, making it a preparation laboratory for return and reconstruction. Space can play an important role in this process, as the social ties it represents have survived war, have been living inside the camp, and will shape the future cities where refugees will eventually return.



Figure 10: Possible future streetscape of Za'atari according to the described vision.

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