Towards Sustainability: Self-organising Communities

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ABSTRACT

This paper explores the self-organising processes of urban communities supported by the connection of a variety of functional elements on the smaller urban scale through physical interactive elements for social collaboration. These processes acquire a local dimension through the proactive involvement of self-organised communities in the dynamic development of the socio-cultural heritage as an organised context for the evolution of the urban system. This approach is based on the geometrical linkage through permeable membranes, fractal interfaces and urban structures which support a hierarchical organisation of nested scales of urban units providing large scale coherence. The study is delivered through the case-study of a traditional community-based housing system within its urban context, with the aim of identifying linking elements which lead to a certain level of self-organisation, likely to be extrapolated to different urban sets. Finally, these connective elements are considered in a contemporary context so as to provide a design framework towards self-organisation, considering the potential of new technologies.

Keywords: Self-organizing Communities; Socio-cultural Heritage; Social Interaction; Sustainability; Social-urban Flexibility; Socio-geometry.
INTRODUCTION

Sustainable development, seen as a long term project, aims to achieve a balance between economic, social, environmental and cultural issues, integrating all of these concepts within the context of the posed built environment. New perspectives, with potential for innovation, bring dynamism to individual and collective initiatives to enhance the urban realm and minimise the impact on the natural environment. New urban theories tackle urban sprawling into the green belts of the cities through the compact city concept and increased housing density, thus favouring the reclamation of urban identity through the regeneration of older districts and former industrial zones (Gauzin-Muller, 2002). This approach fosters the mixed use city, for social sustainability and inclusion. It thus encourages re-population of the city centres and the avoidance of mono-functional projects which lead to a higher demand for mobility (Lehmann, 2010). Moreover, sustainable urban regeneration and redevelopment combines energy and water conservation, waste management, noise abatement and the creation of a pleasant living environment. It also improves the microclimate and biodiversity through external planting and gardens. The socio-economic factor has been considered in this complex equation by stating the necessity of involving residents both in design, management decisions and construction strategies. Therefore, active co-operation from the population and other stakeholders is required in order to sustain this whole urban model. This involvement fosters a civic responsibility for their environment among the population, by the sense of ownership and social identity derived from the process of consulting them (Gauzin-Muller, 2002).

From the social point of view, transforming the city districts into more compact communities and flexible typologies for inner-city living and working, aims to increase the urban and social resilience against de-generation (Lehmann, 2010). These new urban approaches towards sustainable communities set specific targets to achieve, but seem to be inconclusive when it comes to their definition and integration: What is the level of compactness required without compromising socio-economic factors? How is population co-operation implemented in the existing urban environment? Is the link between sustainable urban realm and social resilience really defined? This paper aims to provide insights into the relationship between the urban morphology and social interaction, so as to present an integrative model for socio-economic self-organisation towards social and urban resilience. This study is conducted through the case-study of a community-based life-style delivered in the cities of Andalusia, southern Spain, within the specific built form of the ‘patio’ town-house in the historic cores of the cities. A fractal analysis of the ‘patio’ town-house and the urban morphology developed through this built unit is therefore undertaken to identify the relationship between geometrical form and social interaction. Although this community-based life-style has certain homologies throughout the rest of Spain, the case study considered in this paper focuses on the region of Andalusia, due to the morphological aspects of these buildings and its socio-cultural connotations. The social and economic evolution through history to present day is taken into account. This is done in order to pave the way for an analysis regarding socio-economic stressors which configure the social-urban fabric using a historic-correlational research strategy.
CASE STUDY

The community-based housing typology ‘casa de vecinos’ is a multifunctional space which has traditionally included artisanal workshops, vicinal and cultural associations as well as different commercial uses, apart from the main dwelling use. This housing typology has traditionally been delivered within the built form of Andalusia’s ‘patio’ town-house, which forms a structure of homes or dependencies clustered around a social ‘patio’, mostly in a tenancy scheme. The term ‘casa de vecinos’ can be literally translated as ‘neighbour’s house’. However, for practical reasons, the present paper will refer to this community-based building typology with the Spanish term in order to avoid confusion with the English term used by a not-for-profit, faith based, American community development organisation with different connotations. With regards to the context considered in this paper, ‘patio’ is a central courtyard, focal point of the building’s interactive social life, and a typical characteristic of this community-based housing typology. Although this housing typology for community-based living is somehow shared in certain urban areas of Spain, each area has different morphological features, giving them specific senses and social connotations. This study is focused on the Andalusian ‘casa de vecinos’ and ‘patio’ town-houses, given the distinctive morphological aspects and social development to present times, along with its relevant contribution to the contemporary urban fabric within the historic cores of the cities.

Historic evolution of the Andalusia’s ‘patio’ townhouse

Andalusia’s ‘patio’ town house is a distinctive building form which constitutes the core of the vernacular architecture in the generation of the historic urban fabric of cities in Andalusia. The ‘patio’, in terms of its architectural elements, finds its origins in classic Greek architecture, developed afterwards by Etruscans and subsequently adopted and spread within the Mediterranean by the Roman Empire. The disposition of the rooms clustered around this ‘patio’ without any windows in the outer skin of the building, allowed this kind of building to add to other buildings in the development of the urban fabric without compromising natural lighting. This building typology continued its evolution within the Iberian Peninsula through the Visigoth to the Al-Andalus period, being adopted by emergent Islamic culture with little structural changes, most recognisable in ornamental features, and the evolution of the ‘patio’ as a socialising element (Romeo, 2011). This building typology continued its evolution through the catholic period, adopting the different stylistic and ornamental characteristics of the time in its design. The transition between the different periods did not generally mean the total destruction of the prior cities due to a variety of socio-economic and political reasons. Therefore, today’s result is that the historic cores of most Andalusian cities resemble a continued evolution of the former accretive urban structures with the same former urban morphology (Ladero, 1987).

Urban morphology analysis

This analysis draws its fundaments from Nikos Salingaros’ work regarding fractals surfaces applied to complexity and urban coherence. In his work ‘Complexity and Urban Coherence’, Salingaros applies structural principles developed in biology, computer science and economics to propose theoretical rules for the assembling of coherent urban environments,
developed outside urbanism, to analyse the urban fabric on successive scales. These rules are applied in the analysis of the case-study proposed in this paper so as to establish a correspondence between the different urban elements considered and its hierarchy within the organisation of the social-urban realm. The study goes from the smallest organised social scale, identifiable with the community-based housing typology ‘casa de vecinos’, to the larger scales, identifiable with districts, local urban environment and, to some extent, the regional dimension. This approach finds its foundation in the notion that any urban element is constituted by diverse sub-elements defined on a hierarchy of different scales. For this purpose, it is assumed that the urban and social elements on the small scale support the large scale coherence (Salingaros, 2000). The purpose of this analysis is to identify linking elements within the urban realm leading to a certain level of self-organisation, with an adaptive capacity and likely to be extrapolated to different urban sets.

Smaller self-organised urban scale: community-based housing buildings

The central ‘patio’ of the ‘casas de vecinos’ housing systems resembles a folding of the urban fabric, establishing an enclosed space with enough privacy for human interactions to occur on the smaller social-urban scale, thus leading to a certain social organisation. This element is a semi-public space which forms the transitional area between the private dwelling and the urban public space. Since all of the inner dwellings are clustered around the central ‘patio’, the permeability of the dwellings is focused on this element, fostering social encounters among the community. The access from the street is commonly formed by a small corridor leading to the central ‘patio’, which is usually formed by a colonnade in the ground floor and a communal corridor with windows to the central courtyard, or eventually an upper colonnade on consecutive floors (Fig. 1). This arrangement is reinforced by the coherence provided by the geometrical proportion on the human scale of the inner patio facades, along with the contrast of light and shadowed areas provided by the colonnade, giving certain aesthetical value to the whole ‘patio’ element. Therefore, the coupling of the different homes units is achieved by totally surrounding a void (‘patio’) with a structured thick boundary of the same scale (Alexander, 2000).

Despite this geometrical coherence, the patio element cannot lead by itself to the social organisation of the community, but instead acts as a catalyst element. This catalyst element leads the neighbours to co-operate in the ornamentation and maintenance of the patio and communal areas, for which a level of self-organisation is essential. This process of self-customisation constitutes the process in which the neighbours co-operate to make it a place of their own, establishing links with the building and between them, thus reinforcing the sense of place. Therefore, the geometrical structure of the clustered homes around the ‘patio’ along with its aesthetical value is interdependent on the social interaction: the neighbour’s community take pride in and time to ornament, maintain and show off this semi-public space, providing an identity to the community building in the process. This space is usually visible from the street during day time, providing certain dynamism to the urban environment and nourishing people who walk by.

Moreover, the urban realm (streets, public spaces) couples with the community-based housing building through interpenetration (Salingaros, 2000), by creating this semi-public space. The central courtyard catalyses the coupling of the homes clustered around it for greater
coherence, unifying them into a higher-level module with new emergent social properties. Hence, the coupling of the ‘patio’ with the clustered dependencies is reinforced by the permeability of its surfaces, provided by its geometrical coherence on the human scale, along with a coupling through contrast. This structural arrangement acquires completeness, thus creating an overall boundary sustained by the strength of the couplings on the smaller scale (Salingaros, 2000).

Traditionally, this central community space has also served as a place for celebrations and events within the community, providing a valuable space for social interactions to occur. In 1964, the Associations Law provided a legal framework with which vicinal communities could associate. This formerly represented the interest of the individual families, but ultimately served as a catalyst for the so called ‘Vicinal Movement’ which later largely supported the transition from the dictatorial government to the democracy with the consolidation of democratic local councils (Gonzalo, 2010). In the beginning, these vicinal associations called for improvements within decadent urban environments (Gonzalo, 2010; Mendez, 2012; Sequera, 2011). From late 1950’s, the foreign capital investments on the Spanish economy localized in the most important cities caused a significant migratory movement of the population of rural areas to the developing cities (Sequera, 2011). Furthermore, in the late sixties, the unviability of the agricultural practices aggravated this rural exodus (Antolin, 1992, cited in Gonzalo, 2010). Hence, some of the cities of Spain were significantly affected by the effects of the uncontrolled urban overdevelopment and the construction of modern housing states in the suburbs for the incoming population. Additionally, these new developments were hardly planned and the urban services and infrastructures were usually missing (Gonzalo, 2010; Mendez, 2012; Sequera, 2011).
Thus, the historians have traditionally explained the Vicinal Movement as a spontaneous reaction to the living conditions of the modern metropolitan areas -consequence of a chaotic urban overgrowth- in the context of the Associations Law of 1964 (Gonzalo, 2010; Mendez, 2012; Sequera, 2011). This research approach was supported by the fact that the cities with a more proactive Vicinal Movement were the ones that suffered an uncontrolled urban overgrowth and migratory income demanded by a developing economy (Gonzalo, 2007). Apart from the political connotations of this movement, not relevant to this analysis, the socio-cultural achievements of this social movement are very significant. Such achievements include the integration of rural communities into urban environments (Gonzalo, 2007), the self-organization processes of the population and the social construct of a collective identity (Fuentes & Contreras, 2012). However, in some regions of Spain this associative movement was slowed down due to the lack of communal spaces for gathering -largely ignored in modern housing states developments- and where the social interaction was flawed by the disconnection between different levels within the housing blocks.

Many of the first gatherings of these vicinal associations of northern Spain -such as Burgos (1976), Leon (1970), Zamora (1966)- took place in bars and dependencies of the local churches, and consequently becoming entities dependent of churches. Most of these associations only remained during the first stages of the political transition and disappeared before they could be self-managed by the neighbours (Gonzalo, 2010). The regular participation and diffusion on the lower levels of the population of these associations were also very poor (Bayona, 1978, cited in Gonzalo, 2010). In the case of the city of Leon, the interactions between different vicinal associations were also very poor. This situation has been blamed by the local press in the early 1970’s to the lack of competent leaders to deal with the local authorities and the absent participation of the neighbours to organise the Vicinal Associations (Temez, 1971, cited in Gonzalo, 2010). In the other hand, the city of Valladolid had a very strong Vicinal Movement, although the movement was not significant until late 1970’s. Likewise, the first Vicinal Associations of the city of Segovia were founded in the late 1970’s and the Vicinal Movement of the city of Avila was absent until late 1980’s. However, it can also be explained by the low demographic and urban increase of the city (Gonzalo, 2010). In other cities of Spain with a more controlled and steady urban growth the Vicinal Movement was also less active in political concerns and focused on the improvements of public ornamentation and urban services, such as Barcelona and some cities of Pais Vasco (Gonzalo, 2010; Sequera, 2011).

In the case of Andalusia, the same socio-economic and political context mentioned above applies. In the cities of Sevilla, Granada and Jaen, new districts were built during the 1950’s and 1960’s in the suburbs to dwell factory workers and the incoming rural population. These districts did not have the same ratio of urban services and equipment in comparison with the city centres and certainly not enough for the population standards. Consequently, Granada and Jaen vicinal associations called for better urban services and the improvement of the public transport (Fuentes & Contreras, 2012). In 1962, the dwellers of the ‘El Carmen’ neighbourhood of Sevilla asked for help to the public entity that promoted the construction of this modern housing state for better urban services. It must be noted that this housing state did not present any decadency and it was regularly maintained by the neighbours (Méndez, 2012). However, the first vicinal association of Sevilla was founded in 1970, although it started a decade before as a ‘families association’ (Cabezas de Familia) under the Associations Law of 1967 (Méndez, 2012). The urban improvements, green areas and public services demands
began to include oppositions to future urban developments that the population considered inappropriate to their collective identity. Hernandez (1999) stated that the physical disconnection and the social classes dwelling in these modern housing developments of Sevilla lead to social interactions at the district level, linked by a shared problem and leading to a collective district identity.

However, Cobo & Ortega (2008) proposed a different research approach to the Vicinal Movement more adequate to the Andalusian case. Their research paradigm considers these social movements as processes of social interaction founded in the everyday life among the people. This approach differs with the previous research paradigm in that it does not explain the Vicinal Movement as a causal product of the legal framework of its social context, but as social construct of the collective identity and values of the population. Therefore, this social movement cannot be solely explained by the poor conditions of the urban environment, economic recession or the political opportunities. Although these elements influenced the social movement, the constructivist research approach can provide a framework to perform an in depth analysis of the Vicinal Movement. Thus, the way in which the people got involved in the movement, got identified with it and how they behaved consequently in its social, political and economic context (Fuentes & Contreras, 2012).

Therefore, to truly understand how a person gets involved in the vicinal movement, in which the social interactions occur within the everyday life is fundamental to understand how people interact at the lower scales and become part of a larger social structure (Fuentes & Contreras, 2012). This larger social structure then acquires new emergent properties that demands higher organisation at the larger scales, and that is coherent with the structure at the smaller scales. Therefore, this social movement is considered as the result rather than the beginning of the analysis. It is in these networks where the new emergent properties of the groups experiment and create new cultural values that challenge the dominant values of the society. Thus, the vicinal groups founded through the everyday life and domestic networks related to a housing building or district lasted longer and were reinforced through affective and emotional links (Carrillo, 2008, cited in Fuentes & Contreras, 2012).

Hence, the Vicinal Movement acted as a catalyst for the formation of the collective identities of the districts, as a diagnosis element of the urban problems and to propose possible solutions for their problems (Fuentes & Contreras, 2012). Therefore, the vicinal associations acted within a macro-scale of the social movement and were supported by the social interactions and organization processes at the micro-scale (everyday life). Consequently, in the buildings and urban environments where the social interactions at the lower scales were restricted by physical disconnection and by the lack of socializing spaces, the social movement was negatively affected. Therefore, a close-knit social fabric supported by a geometric coherence of the buildings and urban spaces support the self-organisation processes at the larger scales. In any case, the intangible entity of the vicinal associations support this processes by acting as a common ground not linked to a physical space for social interaction.

Although in the beginning these vicinal associations called for improvements within decadent urban environments, lately the creation of vicinal associations in new dis-connected housing state developments has been delivered as an organisation framework for the building’s management. These associations are constituted democratically with a governmental structure, president, treasurer, secretary, etc. by its components, which have a certain level of
self-similarity with local, regional or national governments. In many cases these associations do not contribute to the self-organisation of the community, as recent times have seen the functions of the building management frequently delegated to real-estate management companies, in a process of alienation and dis-linkage with the community building. Therefore, the provision of a well-connected communal space within collective multifunctional housing models linking the different units into a whole, is fundamental for the self-organisation of the communities.

This self-organisation of communities has been recognised by Andalusia’s regional government as a platform for co-operation between the authorities and the population regarding the task of detecting the necessities of urban society, protecting the environment and fostering social inclusion (CAVA, 2008). The Urban Regeneration Offices within the historic cores of certain cities have been delivering a collaborative work with the communities to support the refurbishment of materially degenerated buildings and urban elements, under the initiative of the communities prioritising community-based housing systems as a cultural and ethnographical urban heritage which gives identity to the social fabric.

**Subsequent organised social-urban scales: district, local urban environment and regional dimension**

These ‘patio’ buildings add themselves to the formation of the urban blocks, incorporating other functional building typologies or individual town houses. This agglomeration of a diversity of building typologies and sizes constitutes a reciprocal coupling through boundaries of the different units to a higher level of coherence and completeness (Salingaros, 2000) (Fig. 2). On the one hand, the individual housing and other functional buildings reinforce the clustering of the units in the generation of an overall boundary; in contrast, the socially organised community-based buildings mitigate the random organisation of the individual units, thus placing them into an organised context. The social interaction of the individual housing and other functional buildings typologies is therefore focussed on the subsequent social-urban nodes or focal elements self-similar to the ‘patio’ element: squares, markets, churches, schools and other communal spaces and buildings. These urban elements establish a link with the smaller elements through their functionality, which is reinforced through visual and structural coherence (Salingaros, 2000).

Moreover, this variety of housing typologies, rather than counteracting the self-organisation, provides choices for different living and contributes to the geometrical coherence of the block in the consequent hierarchical scale. In this hierarchical scale, the permeability of the buildings is delivered through the street facades, allowing physical movement through gaps proportionate to the human scale (Salingaros, 2000). It is not common to find street colonnades providing coupling through contrast in the historic cores of the cities of Andalusia. However, the reduced dimension of the pedestrian-oriented street network provides a sense of certain enclosure and pleasant shadowing. Therefore, this new module acquires new emergent social properties reuniting non socially-organised units into an organised context in the creation of districts (Fig. 3).

The design of the street facades plays a relevant role in the legibility of the urban environment through its surfaces, whilst the design and geometrical proportion play a significant role in
identification and interaction among users: example given. The stone-carved main door frame provides identity through its unique design which clearly signifies that it constitutes the main gate through which the community or individuals interacts with the public space. Therefore, the urban block’s facades constitute a permeable urban interface with folding to create semi-public enclosed spaces, thus leading to a higher level of organisation on the smaller scale (Fig. 3). To foster the permeability of this urban interface, and allow physical movement, the gaps are efficient when they are proportionate to the human scale, 1 to 3 metres (Salingaros, 2000). Therefore, the fractility and geometrical coherence of the surfaces reinforce the coupling of the building block with the public urban environment, along with the coupling by interpenetration provided by the ‘patios’, as mentioned above (Salingaros, 2000).

Figure 3. Neighbourhood showing the façades lines forming public and semi-public spaces. The urban blocks cluster around the plaza with a self-similar structure to the patio town house.

According to Salingaros (2000) the focal elements or nodes at this scale could not be understood without the smallest scales to give coherence to the whole. Some nodes establish links with the smaller scales through functionality as the main purpose for interaction (markets, schools, churches, workplace, etc.) as well as other nodes, mainly through visual and structural coherence (parks, squares, etc.). However, a combination of all these factors is more likely to occur in any case. The strongest connections are the small scale, local ones, although in contrast, connections between smaller and larger elements are weaker. Functional nodes establish strong links with the smaller scales and provide a certain level of organisation. With this said however, visual nodes establish weak coupling with the smaller scales. Hence, functional nodes reinforce this interaction via an intermediate catalyst, the primary function of the node. With regards to the visual nodes and small scale nodes, the potential social interactions are reinforced through a variety of connective elements. Salingaros supports this variety of connective urban elements theory based on recent findings in evolutionary molecular biology, revealing that the probability of a reaction increases with the number of
different molecules which are in contact with each other and certain catalytic molecules. Therefore, a molecular mixture becomes auto-catalytic rather than simpler systems.

Urban life is thus generated spontaneously when a critical mixture and density of urban elements have been achieved, and disappears when essential urban elements are removed, isolated or concentrated (Salingaros, 2000). Therefore, the segregation of urban functions counteracts with this variety in the urban mixture and halts the connective process (Jacobs, 1961; cited in Salingaros, 2000). Although these interactions constitute the dynamics of urban everyday life, they rely largely on the randomness of the system. A larger number of these random interactions may induce a virtual state of organisation within an urban context with a large number of random connective elements. Therefore, a self-organisational process on a scale similar to that of the smaller scale must be identified to support a hierarchy of nested scales towards self-stability.

Salingaros (2000) states in his rule five for Geometrical Coherence of Organisation that: “long-range forces create the large scale from well-defined structure at the smaller scales. Alignment does not establish, but can destroy, short-range couplings”. Therefore, elements at the smallest scale provide the foundations for the entire structure (Salingaros, 2000). Likewise, the social-urban coherence is founded at the smaller scales. Therefore, a certain balance of self-organised communities at the smaller scale contributes to a higher level of organisation at the larger scales. This process is delivered through the cooperation of self-organised communities or districts in the development of projects at the larger local dimension. This cooperation finds its meaning in the recursive process of continuation and contribution to the local socio-cultural heritage and takes its form in a diversity of events through the year. Moreover, these organised communities contribute to the organisation and management of different socio-cultural events within the local cultural agenda with a single functional unit in the creation of the whole event, coupled with its functionality, which takes place within the public space at a determined time. Thus, the involvement of local authorities is an indispensable element for this process to occur, providing infrastructure and supporting the continuum of the local socio-cultural agenda. Each functional unit provided by each community, social collective or individual initiative, resembles the cultural identity of its creators taken to the local scale, acquiring new socio-cultural emergent properties within the whole event. Thus, this socio-cultural agenda gathers random interactions into an organised context which provides opportunities for economic development, culture and local product promotion, together with social interaction at a larger scale. Ultimately, the socio-cultural heritage provides time-marks and meaning to its local community, contributing to the formation of its collective memory in the knitting of the social fabric, which provides identity to the local community as a whole in a determined urban context through time.

Traditionally, these local socio-cultural agendas have served as a functional and economic link not only at the local scale but at the regional scale. Lately, due to the development of media and global mobility, these events are gathering people at a national and international scale attracted by the urban and cultural identity of the Andalusian cities. This fact may have different negative effects on the social-urban fabric: on one hand, the attracted floating population has fostered the creation of temporary dwelling within the historic cores of the cities, creating a dis-linkage between the local communities and its urban environment; on the other hand, this floating population may create a local economic overreliance on the tourism and leisure industry, which has been proven to be unstable.
The self-organisation at the smaller scale therefore supports the self-organisation at the larger scale with the evolution of the socio-cultural heritage of the population, also reinforced by a mixture of random social-urban interactions. These self-organisation processes make a footprint in the collective memory of the locality contributing to the creation of a tight-knitted social-urban fabric. Thus, the socio-cultural heritage must not be seen as a static entity rooted in the traditions of the past, but as a dynamic entity always evolving towards a higher level of organisation. A resilient social-urban fabric can therefore provide an organised context in which new additions are likely to be metabolised by the physical urban environment and the social community. A good example here is the collective memory of self-organisation which provides a model or framework for self-organisation to new housing developments implemented within the urban environment. Hence, it must be considered that the uncontrolled addition of un-connected urban elements may damage the social-urban fabric, thus also affecting its ability to metabolise new changes towards the evolution of the system.

Socio-economic context and urban evolution of the ‘Patio’ townhouse

Since the fifteenth century, business development and incipient trading relations with the Spanish American Indies has attracted a large number of incoming populations to the main cities of Andalusia. On the one hand, this economic climate has attracted populations from the rural areas, whilst on the other, it has attracted a significant number of national nobility families and international traders from Europe (Flores, 2005), willing to establish mercantile relations with the Indies. As an extreme example of this situation, there are those cities on the Atlantic coast of Andalusia which have the privilege of trading with America. This economic and demographic climate led to a quick overgrowth of the urban environments of these cities (Gomez, 1995). Indeed, a large number of ‘patio’ town-houses were built by noble families and the ‘casa de vecinos’, within the same ‘patio’ house structure, in order to provide dwelling to the less favoured and floating incoming population (Laredo, 1987). The ‘patio’ nobility town-house was designed and built with a double function: as an individual family dwelling and as a headquarters and storehouse for the Indies’ trading operations. Therefore, the historic cores of these cities include a large number of former ‘patio’ town-houses and palaces developed by the wealthy Indies traders (Gomez, 1995).

On the other hand, the former ‘casa de vecinos’ was developed as community-based housing typology, with a communal interactive space formed by the ‘patio’ with washing facilities, shared kitchen and toilets. The private dependencies for each family unit were usually one or two rooms for the other normal family uses, clustered around the central ‘patio’. This clustered multi-home arrangement constituted by itself a distinctive life-style, delivered traditionally by the less-favoured and poor social sectors. Therefore, this kind of community building has negative connotations derived from the fact that was mostly tenancy scheme housing and usually hosted less-favoured social classes. This life-style created a very strong bond between the families living within the same building. The regular use of communal facilities and common shared socio-economic problems fostered a sympathetic feeling among the community which led to self-supportive attitudes (Muriano, 2011). This shared system evolved through time to its present individual flats form, where the kitchen and toilets are no longer shared and the main communal interactive space is the ‘patio’ and commonly the roof terraces.
From the XVII and XVIII centuries these cities suffered different socio-political and economic changes. Firstly, the decadency experimented with by the nobility houses within the Andalusian region after several agricultural crises and the confiscation of agricultural land, deeply affected the economic resources of the cities. Secondly, the America’s trading operations began to decrease, leading the America’s mercantile families to gradually lose their properties and the palaces where they lived in the urban area (Gomez, 1995). In this context, some of these buildings were transformed into housing complexes in the form of ‘casa de vecinos’ for the continuously incoming population and some dependencies adapted for small commercial uses and artisanal workshops. The owners rented the rooms to these people as well as other dependencies they adapted to familiar dwellings, thus achieving a certain level of uniformity of social classes living within this community-based housing system. This also allowed small businesses to establish themselves within these urban communities (Fig. 5). This process of adaptation of housing buildings to multifunctional ‘casa de vecinos’ has been delivered progressively throughout history to the present day. This process of adaptation regarding the functional uses of these buildings without altering the building’s main structure and contributing to an adjustment of urban fabric therefore shows a significant level of flexibility to adapt to socio-economic changes.

Hence, from a positive economic imbalance, the cities experimented with an overgrowth based on an external un-sustainable large scale economic resource. Once this external economic imbalance was removed or balanced, a system likely to collapse self-adjusted to a smaller socio-economic scale based on local resources. This self-adjustment is largely supported by the flexibility and geometrical coherence of the urban environment and its social resilience. Therefore, the urban environments considered in this study allowed for a self-adjustment of the social-urban fabric, due to socio-economic changes. This self-adjustment fostered the distribution of population into well-connected community-based housing systems, which calls for greater organisation at the larger scale; and a self-adjustment of the local economic model to small and medium scale businesses based on local production. Ultimately, this self-adjustment provided a mixture of functional nodes on the smaller scale supported by the urban structure towards a greater coherence and self-organisation of the whole urban system, delivered progressively until the twentieth century.
Over the last decades, the current economic model has led to major urban changes within the cores of the Andalusian cities and has fostered the urban sprawling. Moreover, the current economic system is absorbing or eliminating the small and medium scale local businesses, segregating almost all of the commercial uses into large scale commercial complex systems. Therefore, the local decentralised economic system has moved to a variety of centralised multinational companies. Hence, the damage provoked to the social-urban fabric through uncontrolled socially disconnected developments and the centralisation of the economic system is deeply affecting the dynamics of the cities. The extent of this damage is still to be completely defined and the test for new urban developments is to metabolise these changes and self-adjust to new conditions.

The purpose of this study is not to propose that urban environments must follow the same traditional urban and economic structure analysed in this paper, but to identify interactive elements leading to the self-organisation of the social-urban realm. This study recognises the synergistic action of both concepts, urban and social, as one interdependent entity acquiring new properties. Therefore, the dynamics of the cities must not be understood as independent morphological and societal aspects. Hence, flexibility is defined as the ability of an urban system to metabolise the different socio-economic and demographic changes towards the evolution of the system. This concept of social-urban flexibility is based on its capacity to allow for the inclusion of incoming and floating population within its social-urban fabric and its capacity to reciprocally self-adjust the economic system between larger and smaller scales. Thus, a resilient and coherent social-urban fabric is likely to metabolise demographic changes within a set of self-organised communities. This, coupled with the fractal geometrical structure of the city, is likely to allow for economic adjustment between smaller and larger scale systems, based on local resources, into the social-urban fabric. Thus, both approaches are interdependent, since they support each other.

Furthermore, the inclusion of this incoming and floating population within the social fabric of the urban environment requires its participation on the social dynamics of the city. This is, to
participate in the social interactions at the building’s community scale and to participate at the
district and local scales in the socio-cultural agenda. As mentioned above the everyday life
social interactions that occurs at the community levels are fostered by the geometrical
coherence of the community building and its connection to a socialising communal space.
Additionally, to assure the evolution of the system, these incoming populations should be
integrated within existing self-organised communities. The resilience of the social-urban
system at the smallest scale to metabolise this demographic change is then provided by the
collective identity of the community. Likewise, the resilience of the system at the district and
local scales is provided by the existing socio-cultural agenda, based on the local traditions and
the collective identities of the communities. This is also supported by the geometrical
coherence of the socialising public spaces, self-similar to the smaller communal spaces of the
buildings.

As mentioned above, the social-urban flexibility concept also includes the self-adjustment of
the economic system between larger and smaller scales. Therefore, the evolution towards
sustainability requires adjustments in the current economic model and in the way people live,
as well as how they improve the well-being of the society and the quality of the social fabric,
while reducing the ecological footprint. With this approach, the relationship between
environmental and social dimensions of sustainability calls for social innovation so as to
evolve to new sustainable living models. In this context, Manzini proposes the concept of
‘cosmopolitan localisations’, as the result of the balance between being rooted in a
community and being opened up to global flows of ideas, people, information, etc. The
innovative character of these new models relies on the concept of collaborative networks
catalysing interested people towards the development of an open common future project,
towards an optimisation of local resources and exchanging within the network which cannot
be locally provided. This concept does not refer to a little self-contained entity but to a highly
interconnected system (Manzini, 2011). The challenge is to design socio-technical systems
whilst avoiding macro-systems and mono-logical solutions. The systems must be able to auto-
organise themselves, thus fostering socio-economic innovation based on a different
combination of already existing local capacities (Manzini, 2011).

CONCLUSIONS

The provision of interactive communal elements which linking a varied group of functional
units on the small scale fosters the co-operation of its users towards self-organisation. These
elements give the community access to a physical space for sharing, social interaction and
support. This approach fosters self-supportive attitudes among the community through
proactive involvement within its environment, thus fostering the sense of place. Therefore, the
capability of these interactive elements as connective elements linking the functional units at
all levels is fundamental. As mentioned above, this connective property may be enhanced
through geometrical coherence and configuring the urban character of the element as a
transitional area for better coupling with the public urban space. The challenge is to design
connective elements incorporating cutting-edge socio-technical systems towards social
innovation at a higher level and new dimensions, all the while fostering the collaboration
inter-communities for creativity and sustainable potential. Therefore, the aim is to create a
highly interconnected, resilient community with a strong sense of place and cultural identity.
A level of self-organisation on the small scale supports the self-organisation at the larger urban scale, and in turn fosters the participation of the community at the local dimension. This is achieved by promoting the proactive involvement of self-organised communities in the dynamic development of the socio-cultural agenda, as an organised context for the evolution of the socio-economic urban system. As mentioned above, the socio-economic and cultural agenda provide linking elements for social interactions to occur in an organised context. Therefore, the challenge is to design a responsive environment for a responsive community. Hence, the design of urban public spaces must be flexible to deliver an evolving socio-cultural agenda and provide physical and technological means by which to foster the collaboration of the community within an extended network for socio-economic innovation, whilst also promoting local products and resources. The aim is to create a decentralised local economic system within a resilient social-urban fabric, thus giving a meaning to the local cultural identity towards the evolution of the urban system.

REFERENCES


