HABITABILITY, THE SCALE OF SUSTAINABILITY

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ABSTRACT

This paper will explore an alternative to so-called 'sustainable' models and strategies currently applied in the field of building, architecture and urbanism.

In front of irrational resource consumption and an ever-growing waste generation or other problems, seemingly inherent to the current industrial productive model and now transferred to the production of space, the most critical and concerned sectors within these disciplines keep on applying scale-segregated sustainable solutions, i.e. working and intervening at the scale of the single built unit, or at that of the urban model.

Instead, the paper will explain ongoing research related to the possibilities of generating another model based in the concept of "**global habitability**", that would allow the application of those and other new solutions and mechanisms at all scales in a much more holistic approach to the implementation of sustainability: working transversally and simultaneously, from the room to the city.

If current strategies aim at an increase in efficiency exclusively based in the reduction of resource consumption and waste generation, the new model would propose a redefinition of the other term intervening, namely utility. The very subject of sustainability is changed here through this redefinition; no more space but activity, no more the object but the process.

Utility and use within architecture can be identified with habitability, here understood as the achievement of adequate social and environmental conditions in order to satisfy the socially acknowledged basic needs of people.

Two different factors would determine such idea of utility: on the one hand the conditions of 'matter', as an expression of requirements related to space, resource flows and equipment needed to develop an activity; and on the other hand, the conditions of 'orgware' or 'privacy', another term that would include *synergy* – as the relation between the level of individuality and the level of collectivity - and *management*, as a combination of time, control and legislation.

The main aim of the paper will be thus to present this reformulation of the idea of 'habitability' as the only effective strategy towards an implementation of sustainability in the field of building. A systemic intervention, re-thinking the utility of architecture from the smallest spatial unit (the room) and extending its scale to that of the urban services (i.e. providers of any need that can't be fulfilled within the dwelling), allows achieving the maximum efficiency in terms of resource consumption; whereas social focus, incorporating individual, collective and organizational demands, allows the strategy to take roots in society expanding, thus, the likelihood of its success.

INTRODUCTION

Irresponsible use and consumption of resources and an ever-growing generation of waste, typical of the industrial productive model, are now also characteristic of the ways in which architecture is produced. This has lead to the need of thorough analysis of the building sector in order to understand its situation in relationship to the social demand for sustainability. A demand that is already facing global issues (like the fight against global warming) that require specific and concrete strategies and answers for each productive sector.

In front of such an urgent demand, the first sustainable strategy consists of an increase in efficiency of the production processes of architecture as well as in its maintenance; efficiency is here understood as the optimal balance between the use or utility provided and the degree of entropic degradation produced through resource use and waste generation.

In relationship to this issue, the most critical and concerned institutions and professionals have dedicated themselves to the implementation of technological innovations capable of reducing the environmental impact of both the building itself and the urban model, through the use of renewable energies and less pollutant building processes and systems. This tendency has also lead during the last few years to the implementation of laws and regulations aiming at an increase in energy efficiency of every new building.

Nevertheless, the effectiveness of such strategies is seriously limited, since they are based in the application of scale-segregated and linear solutions, and the individual intervention in the various elements that form the system. It is necessary to note here that 'life-models' or 'ways of life' are always determined to a great extent by the availability of a certain amount of resources, and thus, a variation or a change in their availability will never cause evenly distributed change but will be rather assumed in a discreet way, altering internal relationships and generating occasional change. They are systemic.

In that sense, the improvement of building sector efficiency requires a new integral vision that is, first of all, capable of explaining the mechanisms for human-needs satisfaction in relation to a resource base, and, second of all, oriented to the development of effective sustainable strategies in a general framework of environmental-impact reduction.

NEEDS SATISFACTION AND RESOURCE BASE

Social organization provides satisfaction of basic needs of most of the individuals that form it, in a process, continuous in time, based in the ability to obtain resources from the environment. The approach to needs satisfaction that allows their linking to the availability of resources includes, as conceptualized by Max-Neef and its group CEPAUR, three different main terms: Needs, Satisfiers, and Material Conditions. [1]

Fundamental human needs can be defined as universal aims essential for the survival and physical integrity of human beings, so that when they are not met, individuals are objectively harmed (Doyal) [2]. Theses needs can be considered, according to Max-Neef, as "few, finite and classifiable" (as distinct from the conventional notion that "wants" are infinite and insatiable). They are also constant through all human cultures and across historical time periods. Examples of these needs could be eating (feed) or personal hygiene. [3] Satisfiers must be understood in turn as the ways in which each need is satisfied – in the case of the examples above by having breakfast or having a shower. They are, thus, culturally determined processes, specific to each individual or group, and they undergo constant transformation according to variations in culture, time, place, circumstances, or according to one's limitations or aspirations. The relationship between satisfiers and needs would be, according to Riechmann, analogous to that of means and ends. [4] Finally, material conditions correspond to the physical conditions of culture and are thus the ones undergoing greater and faster

transformation – going back to the example, fruits or vegetables and water or soap. [5] In front of a need such as *keeping personal homeostatic balance*, a cultural satisfier like *wrapping up warm* can be developed on the basis of some material goods as a *woolen coat and scarf.*

The availability of resources must be added as a shaping factor to the sequence of needs, satisfiers, and material conditions. It determines the material conditions themselves as well as the cultural strategies developed to generate satisfiers. For instance, the technological and productive possibilities of the industrial system have allowed the massive development of mobile phones, significantly altering the characteristics of the social satisfier that covered the need for communication.

Additionally, there is an ever more powerful mechanism for adjustment between needs and material goods, related to the conditions of privacy with regard to other people. Conditions of privacy are here understood as the control of the information (be it visual, acoustic, tactile or related to smell) that enters or exits the space where the activity is taking place. One could argue that individuals establish links and organize collectively in groups in order to maximize the possibilities for satisfaction of their needs within a specific social model that is, in turn, acknowledged and supported on the basis of an also specific resource framework. This situation implies the generation of diverse agreements among people with the aim of sharing and collectively using certain available resources or goods as efficiently as possible. In other words, it is a process towards a balance between the individual and the collective, i.e. a process of continuous adjustment of the conditions of privacy regarding the satisfaction of each and every need.

One can find a complete range of examples of diverse nature in everyday life, from the sharing of a space such as that of the house, the workshop, terrace roof or garden, to the shared use of a material flow such as the water from a rainwater tank or the hot water coming from cogeneration energy plants, or even the collective use of goods and equipment such as a boiler, telecommunication antenna or a car.

The types of links established today in order to solve these individual needs end up getting a name: flat mates, relatives, friends, neighbours, sport team, cooperative, association, co-citizens, and so on… Each of these groups or economic units *decides* which will be the needs to be satisfied collectively through the available resources, finally coming to specific conditions in each specific situation. It is nevertheless necessary to understand that these management units are not stable, but rather constantly evolving according to the availability of resources, modifying its own structure, the needs to be satisfied and the material conditions to do so.

In a situation of growth or increase in the economic capacity or availability of resources, thus, the limitations to material conditions decrease, a fact that reduces in turn the demand to establish or form resource-sharing groups. Individuals do not need to share anymore and are thus able to carry out their activities in ways more and more individual, increasing the conditions of privacy regarding the satisfaction of their needs. This would be the first hypothesis for a social model with an ever-growing resource base: the unstoppable tendency towards the private satisfaction of needs.

In that sense, throughout the period of great economic growth spanning from the second half of the 20th century until today, important changes can be detected in social organization and lifestyles, specially regarding the conditions of privacy of their members. On one hand, domestic space has evolved as a consequence of an increase in the material conditions related to a greater availability of space, material flows and equipment for each individual. Spaces in dwellings today have specialized according to use, resulting in play-rooms, storage-rooms, bath-rooms, office-rooms, study-rooms, corridors and halls, etc… and additionally, they have

been individualized through the implementation of individual bed-rooms and as many bathrooms as possible. Simultaneously, the equipment installed or contained in the house has increased similarly, with a tendency towards a more and more private and individual use. The house incorporates now functions and uses that once took place collectively or in the public domain, such as cloth washing and drying (from the sink and roof terrace to the washing machine and tumble dryer), personal hygiene (from public bathing to the bathroom), evacuation (from latrine to water closet), or leisure and communication (from neighbourhood movie theatres to home-cinema), etc…

In the opposite situation, when available resources decrease, limitations to material conditions increase, forcing the establishment of new linkages and agreements in order to maximize the ability to satisfy needs. Such a mechanism affects the conditions of privacy given that individual must share a greater number of material goods, as well as carry out activities together or coordinate them.

Historical processes of growth of the family core, such as the one that took place during the European industrialization, can be understood from that point of view. Family homes were in that case forced to expand and hold parents in order to cope with the hard social and labour conditions of the time- such as a high price of housing rents and food, inexistent protection in the case of unemployment or illness, or the absence of social care to help families with kids [6].

Other processes taking place today can be also understood on the basis of the relationship of resources and conditions of privacy, when inequalities marginalize specific groups preventing their access to a growth in resources. The costs of accessing to or keeping a house today is preventing the emancipation of younger generations in some cases, and forcing the formation of groups to share it in other. One can understand then the persistence of large family units where several generations live together, and the emergence of new forms of residence and dwelling such as cohabitation groups – groups of people without kin relationships-, or reunified families, in the cases where for instance the parents of a recently divorced child return home.

Finally, this process of satisfaction of needs – articulated through satisfiers, material conditions and available resources, and structured through the demand for maximum privacy – has a very specific material translation, expressed in the organization of space, be it domestic or urban, since it determines built landscape, mobility systems and, ultimately, the use of space.

HABITABILITY

Architecture's first function is that of supplying adequate spatial conditions in order to shelter human activity, or in other words, the achievement of socially needed habitability. It is the discipline that arranges and organizes all these processes in space, and simultaneously and precisely for that reason, the reflection of growth and contraction phenomena in the ability to satisfy needs related to the availability of resources.

Current regulations in the field of habitability are conceived without a truly conscious distribution of basic human needs to be provided, but rather acting directly onto the material conditions, forgetting satisfiers and needs, and fixing a number of spatial and constructive solutions. The result of not working on the basis of needs often leads to a lack of adequate conditions for people's everyday life, and very significantly, to an excessive and inefficient consumption of resources.

Contrary to this approach, a new model of habitability, efficient in terms of the use of resources, should be referred to *needs* rather than to the material conditions that satisfy them - in a way similar to that of more recent regulations such as the Spanish 'Codigo Técnico de la Edificación' - and should be formulated from the acknowledgement of the wide range of basic needs related to dwelling, endorsing the corresponding satisfiers typical of today's society.

If habitability regulations today demand the implementation of specific goods within the space of the house, such as for instance a *kitchen* – through the specification of a number of square meters, a specific equipment and certain flows – a new model should guarantee the satisfaction of needs, in this case *eating* (feed), through the acknowledgement of a number of possible satisfiers such as the ability to eat, the ability to obtain food, the possibility of preparing meals or producing food… understanding that not all of them exist in all situations, and thus, accepting that they can not be all mandatory in all cases. A good example is the case of hotels or residences, where feeding needs can be satisfied without a specific space and equipment for it in one's room, since there is a collective food-related service in the same building.

Habitability understood as the ability to satisfy those needs depends thus on two facts: what is required to satisfy them and who to satisfy them with.

What does a person require to satisfy a need? **Material conditions** required to carry out a specific activity can be grouped in three types of requirements: those of space, those of equipment, and those of material flows. The first of them, requirements of space, have to do on one hand, with morphological conditions such as geometry, surface and dimensions, qualities, textures or colors of those surfaces… and on the other hand, with environmental conditions, such as light, air, temperature or humidity conditions. The second group of requirements associated to equipment has also into account the tools, belongings, furniture, appliances or machines that are needed in each situation. Finally, the requirements related to material flows include the whole of resources needed, the infrastructures required to supply them, the waste produced and the infrastructures needed to evacuate or take them out. The actual organization of all those requirements and thus, of the material conditions for the satisfaction of needs, is one of the functions of architecture.

It is necessary to note here that the set of material conditions includes those expressed in the same place where the need is satisfied – be it interior or exterior – as much as those implied in its achievement. In that sense, considering material conditions of the satisfaction of needs allows exceeding the domestic space extending out to the urban realm.

With whom is a need satisfied? The way in which a need is satisfied is determined by the group as well as by the political and social environment in which the activity is carried out, or in other words, by its **conditions of privacy**. These conditions are in turn determined by two factors: the set of individuals with whom a function is shared, and the ability to manage that function. The group of people with whom an activity is carried out is the group that shares certain resources in order to satisfy a specific demand, as for instance a couple sharing the same bathroom, neighbours sharing the staircase, or citizens moving around in the same bus or swimming in the same swimming pool. One can see that "sharing certain resources" refers to the already mentioned material conditions and can take place in many different ways: it could mean sharing just a space (staircase), or a space and some equipment (a library with books and tables), or even a space along with some equipment and some material flows (a bathroom with a shower and fresh water). The use of these resources can be organized in time differently, simultaneously, as in the case of a library, or taking turns, as in the case of a bathroom.

Besides the set of individuals, privacy conditions are also determined by management, an element that combines the degree of control over material conditions with the ability to regulate the inward and outward information-flows. The conditions of privacy will ultimately determine the degree of intimacy in the satisfaction of a need and, as shown above for the previous case, allow the expansion of the domestic realm into the more political city-space or urban space. A journey from the room to city-space that takes place as soon as the full range of needs is analyzed: those satisfied within the individual realm, those within the realm of the family, those within the neighbourhood, and ultimately, those satisfied within the public realm.

CONCLUSION: THE NEED FOR A NEW HABITABILITY

Habitability, understood in a wide sense, involves the organization, management and maintenance of socially established material conditions for the satisfaction of needs. Habitability is thus, the expression of a social organization derived from the availability of resources and its social distribution; an always-maximized distribution as a result of the tendency towards individualization in the satisfaction of needs.

As a consequence, in front of scenario of progressively growing restrictions in the emission of waste, an increase in efficiency in the production of socially needed habitability must necessarily include a redefinition of the function of the architectonic process itself. In other words, it must undertake the formulation of a model of habitability that allows an efficient use of resources and the reduction of emissions. The proposal is thus to define such a new habitability model as opposed to the current approach to habitability regulations, always defined from the point of view of specific material solutions and exclusively expressed within the realm of the house.

A new model that allowed considering the precise conditions for the satisfaction of socially acknowledged needs – from the domestic to urban – taking into account today's and future restrictions regarding the destruction of resources and the generation of emissions involving their fulfillment, and more specifically, the restrictions regarding green-house effect gases causing global warming.

A new model of habitability that understood the importance of its flexibility and adaptability regarding the restructuring of social organization and transformation of the conditions of privacy for the satisfaction of needs, not only to adapt to the new framework of restrictions, but most importantly as a primordial factor of its own definition, from the limitation of resource use itself.

In that sense, maximum resource-related efficiency must not be formulated today exclusively from the point of view of an increase in the efficiency related to the achievement of material conditions acknowledged to satisfy human needs (often achieved through technology). It must be rather conceived from another point of view that formulates the necessary tools for the evolution and transformation of those needs, one that would not only allow a much-wanted increased efficiency in the use of resources, but also prevent these efficiency-related achievements from being obsolete, once the inevitable change in material conditions arrives.

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