

The House as a Satisfier for Human Needs: A Framework for Analysis, Impact Measurement and Design

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Abstract

The house is such a universal satisfier for human needs that in general discourse people tend to speak of the need for housing. This paper develops a conceptual framework that uses the distinction between needs and satisfiers to analyse the complex variety of ways in which a house facilitates the actualisation of human needs. The categorisation of human needs proposed by Manfred Max-Neef is used as a basis for the analysis. It is argued that the needs theory of Manfred Max-Neef that links quality of life to the actualisation of all human needs rather than a hierarchy of needs could help to contribute to the conceptual foundation necessary for designers to transform environments to become more human. Implications of a non-hierarchical needs theory for housing design are given. In conclusion the authors briefly discuss two tools they have developed: the first tool is used to assess the general quality of life of a person and the second tool to analyse the specific impact of a housing development and/or design on quality of life in the household environment. The value of the methodology is demonstrated by drawing on research recently done by the authors themselves in eMbalenhle in Mpumalanga, South Africa.

1 Introduction

In the following reflection our assumption is that design is an expression of an underlying anthropology. In any view of human nature the concepts of quality of life and human needs are of key importance. The hierarchical human needs theory that played a prominent role in certain design traditions for subsidy housing has led to designs of houses as physical shelters rather than homes. To transform environments to become more human it is necessary to adopt an anthropology that is not based on a hierarchy of needs.

It was none other than the well-known architect Le Corbusier who saw that housing design is intimately linked to human needs and that a designers' theory of human nature will determine the way

in which he or she designs. He should be credited for emphasising the link between design and the human needs theory designers adhere to. Unfortunately he still had a hierarchical needs theory as can be seen by his remark: “We must make our way back to the wellspring of human nature. We must take an inventory of its needs. Final aim: to satisfy those needs and those needs only” [1]. Pauw evaluated the anthropology of Le Corbusier as found in his writings in the light of the needs theory of Abraham Maslow. He found that Le Corbusier made a great contribution to the prerequisites for need satisfaction as well as the need for aesthetics and especially the need for regard by others. The needs for physiological functioning and protection are addressed satisfactorily, but Le Corbusier fails dismally when it comes to the needs for *belongingness* and *self-actualisation*.

Pauw has demonstrated that the work of an architect can be analysed in terms of its underlying anthropology and evaluated against a needs model. The hierarchical needs theory of Maslow has such inherent shortcomings that it places severe restrictions on the exercise of analysing a design in terms of its potential to create an environment in which human needs could be satisfied. We are convinced that the human needs theory of the development expert Manfred Max-Neef, who relates the actualisation of all human needs to quality of life, lays a healthier anthropological foundation for a human environment than the hierarchy of needs proposed by Maslow [2]. In this article we will show how we have taken Max-Neef’s theory further as well as what the implications of a non-hierarchical theory of needs are for housing design.

2 The notion Quality of Life

Our presupposition is that the ultimate goal of *transforming housing environments through design* is to improve the quality of life of people living in these environments. The claim that a certain product or service improves quality of life is a popular notion that is commonly exploited. It is frequently not clear how this concept is understood by those that claim their products and services contribute to the improvement of quality of life. On the one hand the multifaceted nature of this notion is more than often neglected; on the other hand the complexity of the subject matter is employed as an excuse not to stipulate how *quality of life improvement claims* could be verified.

2.1 Background to quality of life studies

In the mid-1960's a growing dissatisfaction with the amount and quality of social information available to governments and decision makers spawned what came to be known as the *social indicators movement*. Within a few years the term social indicators came to encompass a wide variety of diverse attempts to specify indicators of socio-economic well-being, from very specific measures, such as those of housing quality, to broad measures of the quality of life [3]. Quality of life studies, a sub-discipline of sociology, arose because of this fervent desire for better information about social factors that would aid better decision-making [4 & 5].

Many researchers argue that a distinction can be made between the objective and subjective components of the concept quality of life. Objective indicators are usually based on the counting of occurrences, events or activities, while subjective indicators are based on reports or descriptions from individuals on their feelings and perceptions about themselves and the world around them [6&7]. Indicators used in the subjective approach are measurements of *life satisfaction and happiness*. Objective indicators measure a range of aspects such as income, life expectancy, living standard and living conditions [8,9,10]. Examples of recent studies that attempts to *give dimensions to and measure* quality of life are numerous for example Jacksonville Florida; New Zealand Social Report; the Australian Unity Well-being Index; and in the *South African context* the HSRC Quality of Life Trends

project; Buffalo City Quality of Life Project; Doornkop (Soweto) Project as well as projects in Potchefstroom and Durban [11, 12, 13].

Although the above mentioned indicators and approaches are all suitable for a specific purpose, it remains difficult to analyse subjective quality of life and link it to objective measurements, while at the same time developing a theoretical basis for systematisation and comparison. The objective approach makes comparison possible, but at the cost of denying the inherently subjective nature of quality of life. The subjective approach takes personal and cultural differences seriously but it has proven difficult to determine the statistical correlation between subjective feelings and objective indicators (the correlation between health and life satisfaction are a notable exception). Both the objective and subjective approaches are in need of a theoretical basis for the analyses of quality of life that will allow comparisons between vastly different scenarios and at the same time utilise the progressive accumulation of data to continuously improve the knowledge base. There is a need for an instrument that is comprehensive enough to justify its use as an indicator for a notion as comprehensive as quality of life, but is still limited enough to be practical.

2.2 Manfred Max-Neef's human needs theory

The work of Manfred Max-Neef has made a great contribution to clarifying the conceptual problems related to quality of life and development policy issues. Max-Neef is a Chilean economist with vast experience in macro- and grassroots development. He attributes the failure of development in Latin America to a failure of understanding of what human development is. With this in mind, he analyses human needs as the basis for a new theory and praxis of development, which he calls *human scale* development [14]. The main concepts of his theory will be briefly discussed.

In the tradition of development economics human needs has been a key concept since the 70's when the *basic needs approach* was accepted in place of a blind focus on GNP and other purely economic indicators as indicators of development. The basic needs approach has a very limited understanding of what people's needs are. Max-Neef formulated a new theory of needs for development that, to a significant extent, overcomes the deficiencies of the basic needs approach. The first principle of his theory is that development is about people and not about objects. According to Max-Neef there has to be a measure or indicator for progress in people in much the same way as the object orientated paradigm, on which the GNP measure is based, has indicators of progress:

In the traditional paradigm, we have indicators such as the gross national product (GNP) that is in a way an indicator of the quantitative growth of objects. Now we need an indicator about the qualitative growth of people. What should that be? Let us answer the question thus: The best development process will be that which allows the greatest improvement in people's quality of life. The next question is: What determines people's quality of life? Quality of life depends on the possibilities people have to adequately satisfy their fundamental human needs. A third question therefore arises: What are those fundamental needs and /or who decides what they are? [15]

The theory of needs that Max-Neef presents is thus an attempt to steer the development process toward improved quality of life. Satisfaction of fundamental human needs is for Max-Neef the definition of quality of life. To understand this, one needs to bear in mind that Max-Neef does not share the *basic* needs paradigm and does not believe in a hierarchy of needs. The next section will make his definition of needs clearer.

2.2.1 Needs and satisfiers

Max-Neef differentiates between needs and satisfiers. Contrary to the popular conception that human needs are infinite and variable, Max-Neef believes that needs are finite, few and classifiable and do not

differ between cultures. The observed variations between cultures are not because their fundamental needs differ, but because of the different satisfiers they employ to satisfy their needs.

...food and shelter, for example, must not be seen as needs but as satisfiers for the fundamental need for Subsistence. In the same way, education (either formal or informal), study, investigation, early stimulation and meditation are satisfiers for the need for Understanding. The curative systems, preventative systems and health schemes in general are satisfiers for the need for Protection.

Max-Neef takes a systematic view of needs and satisfiers. Needs are interrelated and interactive. In the same way there is no one-to-one correspondence between needs and satisfiers. A satisfier may satisfy various needs at once while one need may require more than one satisfier in order to be met.

For Max-Neef the term *need* refers not only to deprivation but also to potential. For example: The need for creativity is the motivation and potential for creativity. Because of his view of needs as deprivation and potential Max-Neef uses the term *actualise* instead of *satisfy*. His typology of needs is based on nine values: subsistence, protection, affection, understanding, participation, creation, idleness, identity and freedom. His typology of satisfiers is based on an existential categorisation. A satisfier is a way of being, doing, having (in the sense of social institutions) or being situated (in time and space) that people use to actualise their needs.

2.2.2 Satisfiers and artefacts

Satisfiers are ways of being, doing, having and interacting that contribute to the actualisation of needs. Because development is about the qualitative growth of people and not the quantitative growth of objects Max-Neef does not focus on objects per se. Objects and artefacts facilitate ways of being, doing having and interacting and increase or decrease the efficiency thereof.

While a satisfier is in an ultimate sense the way in which a need is expressed, goods are in a strict sense the means by which individuals will empower the satisfiers to meet their needs.

2.3 Quality of life in the context of the household

The theory proposed by Max-Neef makes an extremely important contribution by distinguishing needs and satisfiers but it does not elaborate on the precise way in which satisfiers actualises needs. More refined instruments could help researchers especially when results have to guide policy formulation or when design implications will be drawn from the research. In expanding Max-Neef's model we commenced by identifying aspects of all fundamental human needs.

2.4 Aspects of needs

We divided the needs into aspects as follows:

Subsistence: intactness, arrangement, intake, waste, movement, temperature, receptivity, adaptability, growth, will to live. **Protection:** maintain physical subsistence, maintain mental & emotional well-being. **Affection:** pleasure, trust, loyalty, respect, beauty, meaning. **Participation:** receiving, giving. **Understanding:** perception, cognition, emotion, reflex. **Creation:** transform matter, transform symbols, procreate. **Idleness:** catharsis, revitalisation. **Identity:** physical disposition and appearance, personality, past experience, aspiration. **Freedom:** choice, value. **Transcendence:** affirmation of life, overcome meaninglessness

2.5 Elements of the household

Based on this typology of needs, which is of course not the only possibility, we identified the most important satisfiers in the context of the household. We did this by listing every conceivable satisfier in the context of the household associated with a specific aspect of a need. Through a process of semantic clustering the list was later reduced to 25 elements of the households, which can be divided into six main categories:

The six categories and 25 elements of the household are:

Basic necessities: water, food, waste removal, clothes. **Localisation:** land, air, house, light, sound. **Basic activities:** care, work, rest. **Relationships:** self, intimate partner, household members, non-household members. **Consciousness:** faith, values, motivation, thought, learning, communication, beauty. **Body structure:** gender, development phase

The ten needs and 25 elements of the household form the outline of a database that describes need satisfaction within the household. Each element of the household is analysed for its possible links to all the aspects of all the needs. This forces one to consider the interfaces between an element such as sound with an aspect of a need, for example the respect aspect of affection. This database is first populated with information from past experience and accumulated scientific knowledge. As more and more empirical research is done, the database is updated and refined. We used this database to develop two instruments, which are discussed later in this paper.

2.6 The usage pattern as focus of research and planning

We have chosen the household as a focus because in Africa there is only one social institution that – on a significant scale - continuously takes care of the orphans, the jobless, the sick, the elderly, and all those in need - ...not governments, development institutions or even churches, but the family [17] . That makes the family, from a strategic point of view, a very important institution. The temporal-spatial manifestation of the family as institution is the household. We regard a household as a micro-system consisting of a number of interdependent sub systems including the household members as conscious human beings, the physical features of the site & dwelling and all products & technical artefacts used.

The sub-systems of the household manifest themselves in concrete usage patterns. A usage *pattern* is observed as people being motivated by certain values using artifacts for a specific purpose in a particular environment. It is thus an integrated pattern of thinking and doing that is part of the household culture. A usage pattern can be determined through observation by the researcher or through self-evaluation by users. This pattern is observable and to some extent understandable independently of a particular model of human needs. It is thus important that usage patterns form the basis of research on the way in which people satisfy their needs by living in a house. The instruments described later in this paper are means to analyse the interplay between usage patterns and experienced quality of life.

3 The implications of a non-hierarchical theory of human needs and satisfiers for housing design

In the housing market it is especially in the area of subsidy housing that the underlying theory of human needs held by the designer makes a great difference to the quality of life of residents. This is because the end users do not have the economic power to force their wishes on the designer. Max-Neef's differentiation between needs and satisfiers and the resultant methodological priority of usage

patterns makes it possible to overcome some conceptual confusion that surrounds current subsidy housing implementation in South Africa.

- i. **It prevents one from confusing concepts such as *need*, *satisfier* and *requirement*:** *Need* is an anthropological category. One can thus not say that a person needs a house of even certain feature in a house. People need to stay alive, be safe, experience love, understand, create etc. Even a house should technically not be seen as a satisfier. Living in a house is a satisfier. Being at home in a house is a satisfier. A house is an artefact that facilitates these satisfiers with certain efficacy. Every need, with its different aspects, has dimensions - like the temperature range that constitutes thermal comfort - on which a design feature is orientated. The dimensions of needs and the current satisfiers determine a set of requirements for their satisfaction.
Example: In the South African context there is general talk of the need of people for houses. Although one can obviously understand and agree with the sentiments expressed in such language, a lot is being hidden by the specific semiotics of the word *house*. The formulation *people need houses* implies that if someone receives an object called a house his or her need in this regard have been satisfied. The formulation *a house facilitates the satisfaction of human needs*, on the other hand, immediately begs the question what the needs are that are addressed, how effectively they are addressed and what needs are inhibited by the use of a specific house in a particular environment. This change in vocabulary emphasises the importance of analysing concrete usage patterns in order to evaluate the effect of a design on quality of life. In fieldwork in eMbalenhle we found that the average informal house is twice the size of a subsidy house. Although the structure of the subsidy house is of a better quality than the structure of an informal house respondents reported that the higher density of people in their subsidy houses impairs their quality of life.
- ii. **It transcends the distinction between needs and wants:** The differentiation between basic needs and wants prevailed during much of the 20th century. The earlier quote from Le Corbusier is an example. The underlying assumption is that the designer could decide what needs are truly basic and then design for the actualisation of those needs alone. The preferences of end-users are seen as an expression of their wants and not their needs and could therefore safely be ignored. A view of human needs that is not based on some imagined hierarchy of needs respects people's need to express themselves aesthetically or to align or differentiate themselves from certain traditions. Where the designer is not the sole judge of the efficacy of need satisfaction in the household it automatically leads to a much enhanced appreciation of research into the worldview and household culture of the end users.
Example: In studies we have done in eMbalenhle, it was found that most people close their windows at night for fear of crime but also for fear of witchcraft. The design implication is that end-users want witch proof ventilation. The fact that the designers (including us) have no idea what this means is an indication of the need for deeper understanding of the issue [18].
- iii. **It overcomes a limited view of the function of a house:** A non-hierarchical view of human needs means that one does not think of a house as a mere physical shelter but as a synergic satisfier that influences the satisfaction of all human needs. At the same time the designer will not design as if poor people have fewer needs than other people just because they are poor.
Example: Privacy is an issue for poor people as well as for rich people. In subsidy houses without interior partitioning walls this becomes a problem. People often buy expensive furniture on credit to use as room dividers. A designer that is aware of the importance of these issues will have a better chance of designing a structure in which people could later add inside walls and arrange furniture in an optimal way.
- iv. **It forces a more detailed analysis of current usage patterns in households, as well as of usage patterns people adopt when moving into new houses.**

Example: It was widely believed electrification would mean the end of domestic coal burning devices. It was recently found that coal use is higher in both formal and informal structures that are electrified than in non-electrified structures [19]. Clearly policy makers and designers have not yet done enough to understand the reasons why people use coal. Coal provides space heating and cooking energy at the same time and at a low cost. When people have electricity their electrical lights and in many cases television sets, encourage them to stay up later at night. In the evening when it is cold they use the cheapest source for space heating, namely coal, as long as they are active or watching TV. The challenge of space heating or thermal comfort should be approached in a manner that takes all the abovementioned usage patterns into consideration. Current subsidy houses have extremely poor thermal qualities. Recent models developed by Nova have shown that it is possible to design a subsidy house as small as 30m² to be thermally comfortable in a climate as harsh as Bloemfontein. In terms of the energy needed to achieve thermal comfort this represents a hundred-fold increase in efficiency [20].

- v. **It makes a detailed analysis of the relationship between a design feature and a comprehensive set of human needs possible.**

Example: The QOLA and PIQOLA instruments are discussed below

4 The NOVA quality of life assessment tools

4.1 Quality of Life Assessment (QOLA) Instrument

B2 QOLA CHART	SUB PRO AFF PAR UND CRE IDL ID FRE TRA											Element total	Element inclination percentage	Category satisfaction total	Category inclination percentage										
	HAPPY	I	II	III	IV	V	VI	VII	VIII	IX	X					HAPPY-C									
Water	1	X	1	1	1	1	1	1	1	1	1	1	1	9	90	Basic necessities									
Food	0	0	0	1	1	1	0	0	0	0	0	0	0	4	40										
Waste	1	0	0	1	1	1	0	0	1	1	0	1	0	5	50										
Clothes	0	0	0	1	0	0	1	0	1	0	0	1	0	4	40	22	55								
Land	1	1	1	1	0	1	1	X	1	0	1	1	1	7	70	Localisation									
Air	0	0	0	1	1	1	0	0	1	0	1	1	1	4	40										
House	1	1	0	1	0	1	1	1	0	0	1	1	1	6	60										
Light	1	1	1	0	0	1	X	1	0	0	1	1	1	5	50	Basic activities									
Sound	1	1	0	1	0	1	1	0	1	1	1	1	1	7	70		29	58							
Care	1	1	1	1	1	1	1	1	1	1	1	1	1	10	100										
Work	0	0	X	X	1	1	1	1	1	1	0	0	0	6	60	Relationships									
Rest	1	1	0	0	0	0	1	0	1	1	1	0	1	4	40		20	66,67							
Self	1	1	1	1	0	1	X	X	1	1	1	1	1	7	70										
Intimate Partn	1	1	1	1	1	1	1	1	1	1	1	1	1	10	100	Consciousness									
HH members	1	1	1	1	1	1	1	0	1	0	0	0	0	7	70										
Non HH memt	1	X	1	0	0	0	0	0	0	1	1	1	1	3	30		27	67,5							
Faith	1	1	1	1	1	1	1	1	1	1	1	1	1	10	100	Body structure									
Values	1	1	1	1	1	1	1	0	0	1	1	1	1	8	80										
Motivate	1	0	1	1	0	1	1	1	X	1	1	1	1	7	70										
Thought	1	1	1	1	1	0	1	1	1	1	1	1	1	9	90	78,57									
Learn	1	1	1	1	1	0	1	1	1	1	0	1	1	8	80										
Communicate	1	1	1	0	1	0	0	1	0	1	1	1	1	6	60										
Beauty	0	0	1	1	0	1	1	0	1	1	1	1	1	7	70	55	78,57								
Gender	1	1	0	1	X	1	1	1	1	0	1	1	1	7	70	80									
Development	1	1	0	1	1	1	1	1	1	1	1	1	1	9	90		16								
	20	17	15	18	14	19	18	13	18	16	21	21	21	80	68		60	72	56	76	72	52	72	64	84
Need inclination percentage																									
Element satisfaction total				169				Element inclination percentage				67,6													
Need satisfaction total				169				Need inclination percentage				67,6													

Figure 1: Example of the summary output of the QOLA instrument for one household in eMbalenhle

The *Quality of Life Assessment (QOLA) Instrument* makes it possible to assess the quality of life of a specific household in terms of the *estimated ability* household members have to actualise their *fundamental human needs*. This makes comparisons of estimated quality of life between households possible. Each of the 25 elements is introduced with a question related to the general satisfaction of the respondent regarding the specific element in the household. Example: Are you happy in general with the food you have? This is followed by ten questions gauging the respondent's satisfaction with the interfaces between the specific element and the 10 fundamental human needs. An example the results for one household are given in the QOLA chart below.

4.2 Particular Impact Quality of Life Assessment (PIQOLA) Instrument

The ***Particular Impact Quality of Life Assessment (PIQOLA) Instrument*** measures the particular impact of a specific *usage pattern* on quality of life in the household. What the PIQOLA instrument concretely does is it assists researchers in generating between 800 and 1 000 questions about the impact if a specific usage pattern on the quality of life of a household. For this purpose it utilises the abovementioned database as a matrix for generating questions on the interface between each of the 25 *element of the household* and all 10 *fundamental human needs*. The 1 000 questions are for practical purposes reduced to approximately 80-120 questions. This method is useful when doing research on the impact of a specific design feature on the quality of life of households.

Example: The matrix can be used to generate questions to scrutinise the possible influence of thermal comfort on people's quality of life.

5 Final Remark

The first step towards transforming subsidy housing environments to become more human is to adopt a non-hierarchical approach to the understanding of human needs.

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