

# A novel tool for quality-of-life assessment in the household context

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## ***Abstract***

*This article describes the development and application of an original tool that assesses quality-of-life in the household context: Part 1 reflects on how the practical challenges the Nova Institute faces in executing its vision and mission in the low-income context in South Africa demand the assessment of quality-of-life impact. We could not find a readily available tool comprehensive enough to justify its use for assessing a notion as broad as quality-of-life in the household context but still limited enough to be practical. This inspired us to develop an original quality-of-life assessment tool. Part 2 examines how this endeavour builds on the insights of quality-of-life studies as sub-discipline of sociology, but specifically also on the conceptual work of Manfred Max-Neef. Part 3 describes the methods used to design a quality-of-life assessment tool and explains how Max-Neef's concepts are expounded to develop the tool. Part 4 presents an example taken from the results of a general household survey in more than a thousand households, together with an in-depth quality of life assessment in forty-six of these households, to illustrate the application of the tool. We conclude that the tool provides a practical way to sensibly combine subjective and objective indicators in quality-of-life analysis.*

**Key words:** Max-Neef, needs theory, human scale development, quality of life studies, social indicators, fundamental human needs, quality of life assessment

## **Introduction**

In this article we will argue that it is of the utmost importance to develop and apply reliable tools to measure the quality of life of people in the context of their households. In *Part 1* of this article, we commence with a description of how the vision and mission, and specifically the practical execution of our day-to-day work at the Nova Institute motivated us to commence with the development of tools useful for quality-of-life baseline and impact measurement. As practitioners we respect the efforts of academics and experts continuously working towards an improved understanding of social indicators: although the quality-of-life assessment tool we discuss in this article is original, we exemplify in *Part 2* how the development and application of the tool, builds on the work of others. We are especially indebted to Manfred Max-Neef, whose conceptual work has proven to be

exceptionally valuable and practically applicable in our context. We show in *Part 3* how we further developed Max-Neef's concepts into a quality-of-life assessment tool and conclude the article in *Part 4* with an example illustrating the application of the tool.

## **Part 1 - practitioners take on the challenge**

Both the authors of this article work at the Nova Institute in South Africa.<sup>1</sup> Nova was established in 1994 with the vision of *a healthy household culture in Southern Africa*. Nova develops and promotes ways (models, products, technologies, and domestic practices) to improve the quality of life of low-income households together with households and network partners.

Nova explores, with low-income households and other stakeholders, *effective combinations of thoughts and things* that can improve quality of life.<sup>2</sup> This usually happens in a transdisciplinary process where a few household members and experts put their heads together to understand the challenges at hand and to then design and test possible solutions that can improve the quality of life of participating households and communities. For example, when an improved cook stove is introduced to a household, it is important that the mother in the kitchen and the professor at the University agree that the stove works well.

To readers involved in development work this introduction may sound very familiar. It is not the exception that governments, development agencies, churches, NGOs, and other service providers claim they improve quality of life. But how can these claims be verified? We believe it can best be verified through rigorous measurement. Dependable indicators and tools are needed to support the assertion that a specific intervention or project has indeed led to improved quality of life. In South Africa, the national census and general household survey gather extensive standard of living information from households.<sup>3</sup> However, we could not find readily available tools that gather both comprehensive objective and subjective quality-of-life information in such a manner, that the results of a single household can be assessed over time and be compared with other households and communities.<sup>4</sup> Therefore, we decided to take on the challenge to develop such tools ourselves.

## **Part 2 - Conceptual orientation**

### *(1) Background*

Quality of life studies is a sub-discipline of sociology with a history extending back to the 1960's (Noll, 2004: 1; Sirgy et al., 2006: 364). The field of study arose because of the belief

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<sup>1</sup> More information about Nova can be found at [www.nova.org.za](http://www.nova.org.za)

<sup>2</sup> A formulation of a founding member of Nova, Dr Attie van Niekerk.

<sup>3</sup> The census and general household survey results are published on the official website of Statistics South Africa: <https://www.statssa.gov.za/>

<sup>4</sup> Note that a household survey is usually conducted with an adult individual that represents his/her household. When comparing household results, it should be taken into consideration that subjective quality of life perceptions and/or ratings can differ between individual household members from the same household.

that better information about social factors in life could aid better decision-making (Carley, 1981: 1). In the mid-1960's a growing dissatisfaction with the amount and quality of social information available to government decision makers spawned what came to be known as the 'social indicators movement'(Noll, 2004: 1). 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 quality of life (Carley, 1981: 1).

Quality of life (QoL) is generally defined to include living conditions as well as perceived well-being ("Definition, Measures, Applications, & Facts | Britannica," n.d.; Glatzer, 2007: 172-177). An important theme of quality-of-life studies is the relationship between peoples' living conditions and their response to these conditions. There is indeed a correlation between how happy or satisfied people are and their living conditions, but this relationship is by no means simple.

Various research traditions place different emphases in their approach to the study object. In the Scandinavian tradition, for example, the assumption is that the satisfaction of basic needs determines people's well-being. Thus, the individual's command over resources is stressed because basic needs are satisfied by consuming resources. Objective living conditions receives more attention than perceived well-being (Erikson, n.d.: 68; Noll, 2004: 7). On the other hand, the Anglo-Saxon and especially the American traditions focus on the individual's subjective experience of his or her life. The American psychologist Campbell's dictum that 'quality of life must be in the eye of the beholder' captures the basic assumption of this approach (Møller and Huschka, 2003: 6-7; Noll, 2004: 8).

Both objective and subjective approaches have their advantages and disadvantages. The advantage of the subjective line of thinking is that it values what people say about the state of their own lives. On the other hand, it is very difficult to ascertain from a policy point of view what should be done to improve people's quality of life if the whole concept is defined in terms of people's evaluation of their own happiness or satisfaction. Asking people what they need to make them happier can sometimes be deceptive, since what people *desire*, is not necessarily aligned with what they *need* and what in fact will improve their quality of life. Evaluating satisfaction in different life domains helps to make this type of information more useful (Sirgy et al., 2006: 377).

Møller and Huschka (2003: 6-7) state that there is general consensus among quality-of-life researchers that only a sensible mix of subjective and objective indicators can paint the true picture of society. They conclude: "We need to ask questions such as *what do you have?* as well as *how do you feel about what you have?*"

## (2) *The household as social institution*

Nova focusses on the standard of living of people in their household context, as well as on people's perception of their quality of lives. Our focus on the household is because the household as social institution plays such a pivotal role in securing a respectable quality of life for its members. We do not limit our understanding of what a household is or could be, to a single definition. Instead, in our view, a household can be described in several ways

for example as a *micro system*, a *place where usage patterns are operating, observed, and influenced*, and a *satisfier of fundamental human needs*.

As a *micro system*, the household consists of various building blocks: the household members as conscious human beings, the physical features of the site and dwelling and all products and artefacts used. The household is furthermore a *place where usage patterns are operating, observed, and influenced*. We consider a usage pattern as an action that a specific person performs at a specific time and place for a specific reason with specific means. As a *satisfier of fundamental human needs* the household facilitates ways of being, doing, having, and interacting to actualise fundamental human needs.

### (3) Max-Neef's notion "fundamental human needs"

The notion "fundamental human needs" was coined by Manfred Max-Neef, a Chilean economist with vast experience in macro- and grassroots development (Max-Neef et al., 1991). He attributes the failure of development in Latin America to a failure of understanding of what human development is. Against this background, he analyses human needs as the basis for a new theory and praxis of development, which he calls human scale development. We have articulated our interpretation of Max-Neef's main concepts in a paper *The House as a Satisfier for Human Needs: A Framework for Analysis, Impact Measurement and Design* (Murray et al., 2005). We reiterate the argument because Max-Neef's work lays the theoretical foundation for the instrument we have developed for quality-of-life measurement in the context of the household.

In the tradition of development economics, a focus on human needs has been prominent since the 70's when the *basic needs approach* was accepted in place of a blind focus on GNP and other purely economic indicators of development. The basic needs approach, that defines the absolute minimum resources necessary for long-term physical well-being in terms of consumption goods, has a very limited understanding of what people's needs are (Jolly, 1976). 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 (Max-Neef et al., 1991: 16)?

The theory of needs that Max-Neef presents is thus an attempt to steer the development process towards an 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.

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 et al., 1991: 17).

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.

It is further of importance to grasp that, 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.

Max Neef's 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. 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.

The theory proposed by Max-Neef makes an extremely important contribution towards the development of quality-of-life assessment instruments, firstly by distinguishing needs and satisfiers and secondly by linking quality of life to the actualization of fundamental human needs. What Max-Neef did not work out extensively is the precise way in which satisfiers actualise needs in a specific context or institution, for example, how fundamental human needs are satisfied in the context of the household as a complex system.

### Part 3 - Tool development

The development of the Nova Quality of life assessment (Qola) tool involved designing a conceptual framework and database for need-satisfier interface analysis and thereafter generating a Qola-questionnaire and result charts to compare the general quality of life of people living in households and communities.

We started our tool development by extending Max-Neef's fundamental human needs typology to include aspects of needs as follows:

- A. *Subsistence* - intactness, arrangement, intake, waste, movement, temperature, receptivity, adaptability, growth, and will to live
- B. *Protection* - maintain physical subsistence, and maintain mental and emotional well-being
- C. *Affection* - pleasure, trust, loyalty, respect, beauty, and meaning.
- D. *Participation* – receiving, and giving
- E. *Understanding* - perception, cognition, emotion, and reflex
- F. *Creation* - transform matter, and transform symbols
- G. *Idleness* – catharsis, and revitalisation
- H. *Identity* - physical disposition and appearance, personality, past experience, and aspiration
- I. *Freedom* – choice, and value
- J. *Transcendence* - affirm life, and overcome meaninglessness

Next, we identified the constitutive elements of the household. We did this by listing every conceivable satisfier we could think of human beings employ whilst living and interacting in the household context. We relied on data we gathered through several years of fieldwork amongst households in particularly the low-income South African context, as well as on literature studies. Through a process of semantic clustering<sup>5</sup> the list of hundreds of satisfiers was later reduced to 25 elements of the household. These elements could – in the sense coined by Max-Neef – be considered satisfiers when they form part of usage patterns within the household contexts. We labelled them “elements” because we could not reduce them further.

The household itself could also be analyzed as “satisfier” of all the fundamental human needs, but in a more generic sense than its constitutive elements. We work with the elements in our analysis. For the purposes of systemisation, we have further applied thematic clustering<sup>6</sup> to arrange the 25 elements into six categories. The categories and elements of the household are:

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<sup>5</sup> A cluster is typically defined by its members and often by the “central concept” with which all the cluster's members are associated (McRoy, 1992: 13). According to Sierra and McNaught the identification of the central concept relies on the variables that are used to characterise the elements of the problem, either the characteristics, attributes, class memberships or other such properties. They focus their attention on semantic variables (Sierra and McNaught, 2000: 2). Note that we applied a manual process to do semantic clustering rather than a software driven computational process.

<sup>6</sup> Thematic clustering arranges a set of themes into meaningful clusters, similar to the way in which the text clustering task is to arrange a set of text documents into clusters such that the documents within each

- a. *Basic necessities* - water, food, waste removal and clothes
- b. *Localisation* - terrain, air, house, climate, and sound
- c. *Basic activities* - care, work, and rest
- d. *Relationships* - self, intimate or closest partner, household members and non-household members
- e. *Consciousness* - faith, values, motivation, thought, learning, communication, and beauty
- f. *Body structure*: sex and development phase

We proceeded by analysing the 25 elements of the household one by one to determine the function of each element as satisfier for all ten human needs with all its identified aspects. We also considered the functional requirements for each element to facilitate the actualization of needs in the context of the household. Practically, it meant, to name but one example of a need-element-interface, that we brainstormed on the function, as well as the functional requirements, for a household member to actualise his or her need for “affection” (pleasure, trust, loyalty, respect, beauty and meaning) through the element of “sound”.

Our decision to go through this extensive process of need-element-interface-analysis forced us to consider a comprehensive set of possible functions and functional requirements of elements in the context of the household. To be more precise, with 10 fundamental human needs and 25 elements this meant that there were 250 need / element-interfaces to contemplate on. The results of our considerations form the substance of our hermeneutic framework for quality-of-life assessment. We populated the need / element-interfaces in the conceptual framework drawing from our research and development experiences in the low-income context in Southern Africa, as well as through literature studies and continual empirical observations throughout the course of the design process of the framework.

We then utilised the hermeneutic framework to trigger all possible relevant questions we could think of to probe household members’ ability to actualise their needs in the context of the household. Hundreds of questions were generated. We subsequently systematically scrutinised the questions to eliminate unnecessary repetition. The aim was to identify the best question to assess need actualisation in each of the 250 need/element-interfaces of the conceptual framework.

We tested the Qola instrument in several low-income communities. The first pilot was in six families in the eMbalenhle community in South Africa in 2004. The results motivated us to carry on with the refinement and improvement of the tool. We have since used the Qola tool in several projects, including the 46 households in four communities that will be discussed in more detail in Part 4 of this paper. The development of the instrument is an ongoing work in progress, and we endeavour to continuously improve questions and our understanding of what the results entail.

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cluster are similar to each other. Compare the observations of Kim and Wilbur in the abstract to their paper, *Thematic clustering of text documents using an EM-based approach* (Kim and Wilbur, 2012).

## Part 4 - Tool application

### *(1) Background to the 2013 comprehensive quality-of-life baseline study*

Nova was commissioned in 2013 to establish a quality-of-life baseline in four communities in the South African Highveld in the vicinity of the Sasol Secunda complex.<sup>7</sup> The main objective was to better understand the living standards, needs and perceptions of community members surrounding the industry's operations and to provide a reference for measuring the impact of interventions aimed at QoL improvement in future.

The first research activity was a general household survey (GHS) in 1085 households that gathered information on the demographic profiles of four participating communities, their self-reported health status, information on services and infrastructure, education, as well as safety and security. The second activity was to do in-depth quality of life interviews in a sample of 46 of the 1085 households that participated in the GHS. The Qola tool that was discussed in *Part 3* of this article was used to do these interviews. The third activity was focus group interviews to drill deeper into usage patterns that might influence the acceptance of future interventions aimed at quality-of-life improvement. A fourth activity was a particular impact on quality-of-life assessment that consisted of a survey in 195 households in one of the communities to obtain in-depth insights on energy consumption patterns and behaviours, as well as detailed interviews with 20 households where air quality and temperature measurements took place. Nova further partnered with the North-West University who conducted ambient and indoor air quality measurements. Our discussion shall only touch on the first and second activities mentioned above. We briefly refer to the results of activity 1 (GHS), but our focus will mainly be on the results of activity 2 (in-depth quality of life interviews) that applied the novel Nova Qola tool.

### *(2) General Household Survey results*

For the GHS the sample was taken from all residential stands in four low-income communities: eMbalenhle, Lebohang, eMzinoni and KwaDela. A multi-level sample design was followed. On the first level the sample was stratified into four strata representing the four towns. In each stratum, except in KwaDela, the town was further stratified into its suburbs to make sure that all suburbs are covered. In each suburb a series of random street blocks were drawn and ordered. Interviews were conducted with an adult household member in all households in the first two selected blocks in each suburb.

The GHS questionnaire is based on the premise that quality of life is determined by the interaction between standard of living, perceived well-being, and bodily functioning. For this reason, sections on perceived well-being, health, and several aspects of standard of living were incorporated in the questionnaire including questions on water, sanitation, energy, general health and income and possessions. After the GHS we have a comprehensive set of indicators.

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<sup>7</sup> Sasol (<https://www.sasol.com>) is a global integrated chemicals and energy company. Sasol funded the project as part of a CSR intervention, Ikusasa, and it also linked with a larger programme to develop and implement an air quality offset pilot project.



- *Demographic indicators* include number of persons per household, number of households per stand, age, sex, number of maternal, paternal, and double orphans and dominant language
- *Health and well-being indicators* include employment status, household income, poverty lines, immunisation status, access to medical care, symptoms in the last 12 months, restricted activity days, active smoking, protein, and vegetable intake. We also include general and domain satisfaction questions including satisfaction with life-as-a-whole, as well as satisfaction with work, health, and food (scale 0-10)
- *Services and infrastructure indicators* include main source of water supply, water supply unavailable in last 90 days, access to piped or flush system in yard, flushing system failure report, access to waste collection service, waste collection failure in last 90 days, dirty energy carriers for cooking and heating and housing structure type. We also include domain satisfaction questions including satisfaction with water, waste removal, air, and house (scale 0-10)
- *Education indicators* include adult literacy level and working population that completed school (grade 12). We also ask respondents to rate their satisfaction with education (0-10)
- *Safety and security indicators* include safety perception as well as a list of victims of crime indicators

It is not within the scope of this article to discuss the results of the GHS. We only focus briefly on the perceived well-being results from the GHS, since we believe the way in which quantitative data and qualitative data are compared when the GHS and Qola instrument are both used, is relevant.

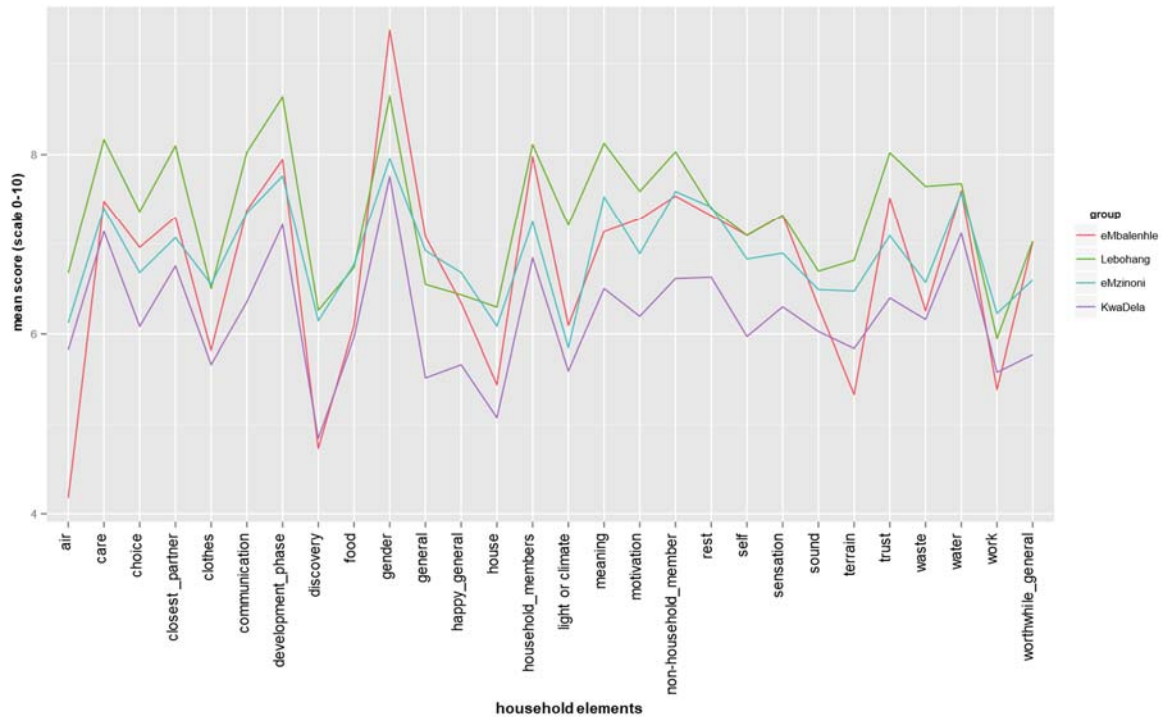
Respondents were asked three general life satisfaction questions, followed by 25 domain satisfaction questions. The general questions are:

- *All things considered, how satisfied are you with your life-as-a-whole these days?*
- *How happy did you feel yesterday?*
- *To what extent do you feel the things you do in your life are worthwhile?*

In all three cases respondents had to rate their satisfaction on a scale 0-10. The domain specific questions also asked respondents to rate on a scale 0-10 their satisfaction with each of the 25 elements of the household. In each case 0 meant completely dissatisfied and 10 completely satisfied.

**Figure 1** below shows the results of the section on perceived well-being as a line diagram where the three general questions on well-being and the 25 questions on the elements are represented by the x-axis and the mean score on the y-axis. The results per town are represented by a coloured line. In general respondents in all communities tend to be more satisfied with elements related to relationships (closest partner, household members, neighbours, trust, sensation, motivation, communication) than with their environment (terrain, air, house, light, sounds). The ratings for satisfaction with work and education (discovery) is also conspicuously low. Satisfaction with air was the lowest satisfaction score of all.

Figure 1: General and domain satisfaction in four communities (Scale 0-10; n=1085)



We calculated the association between all variables related to subjective well-being using Cramér's V (Cramér, 1946) and found variables to be generally strongly associated. We performed *Principal component analyses* (PCA) because it is a useful technique in dealing with high dimension, correlated datasets (Shlens, 2014). In PCA a set of observations of typically a large number of variables are transformed into a set of values of uncorrelated variables of the same dimensions in such a way that the first principal component accounts for the maximum variance in the data and each subsequent component accounts for the maximum possible remaining variance uncorrelated to the preceding components. The first few components therefore account for the bulk of variation in the data. This procedure allows one to interpret a data set of reduced dimensions using only the first few components (Husson et al., 2011).

Out of the 28 dimensions resulting from the PCA, the first five explains more than half of the variance in the original data set with the first component accounting for 29.8% of the variance.

All variables are positively correlated to dimension one. The variables with strongest correlation to dimension one (above 0.6) are *development phase*, *closest partner*, *household members*, *worthwhile*, *motivation*, *choice*, *communication*, *self*, *rest*, *meaning* and *trust*. The weakest correlation to dimension one is with *work* (0.29). Dimension one can be labelled general well-being.

Dimension two accounts for less of the overall variance than dimension one (7%). This dimension differentiates between material means and environment on the one hand and

aspects related to thoughts and relationships on the other. The variables *clothes*, *terrain*, *discovery*<sup>8</sup>, *house*, *food*, *air*, *work*, *happy*, *general*, *meaning* and *waste* are all positively correlated to dimensions two but the correlations with *work*, *happy*, *general*, *meaning* and *waste* are weak. The other variables are negatively correlated to dimension two but only *household members* and *gender* strongly so. Dimension two can be interpreted as relating to material circumstances.

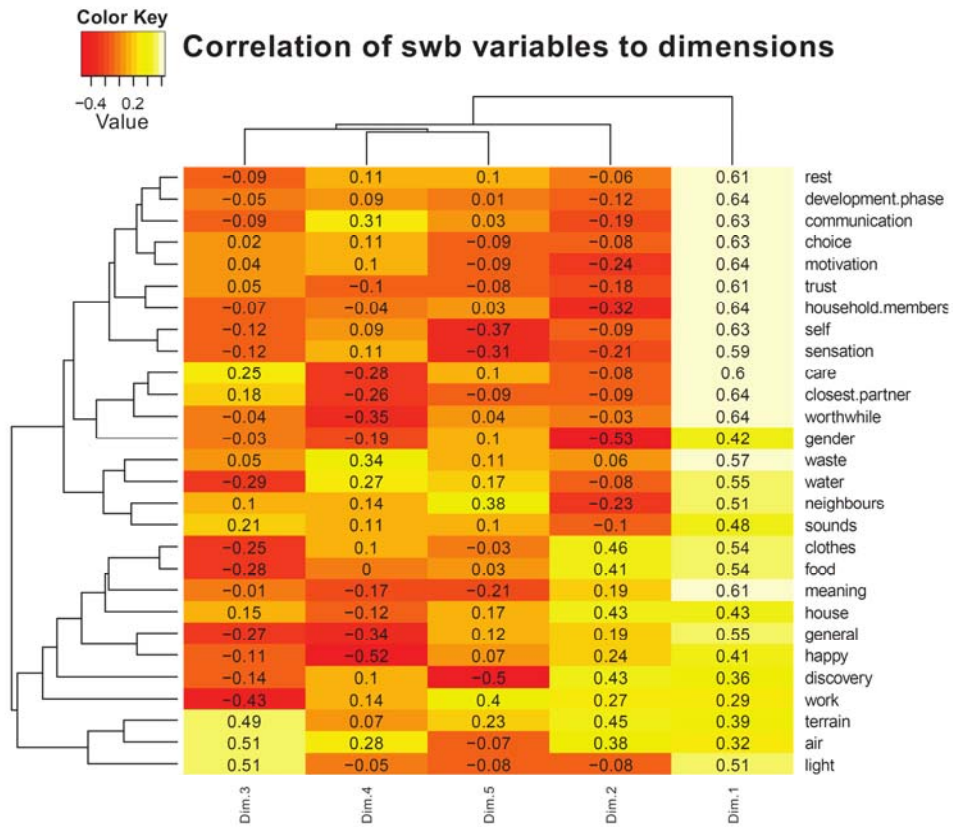
**Figure 2** shows a heatmap of the correlation between all the variables and the first five dimensions. The dendrogram on the left shows a hierarchical clustering of the variables. A number of the groupings make intuitive sense like the association of the variables related to the environment (*terrain*, *air* and *light*), general happiness and satisfaction (*general*, *happy*), basic necessities (*food*, *water*), love and the meaning of life (*care*, *closest partner* and *worthwhile*), general cleanliness and water (*waste*, *water*), respondents' perceptions of their own bodies (*self*, *sensation*). Variables related to the household (*trust*, *household members*) and social environment (*sound*, *neighbours/non-household members*) also cluster together.

The fact that the strongest correlations with dimension one is with emotional, relational, and cognitive aspects of life and not with life circumstances and that dimension two accounts for a much less variance than dimension one (7.13% vs 29.8%) points to a core of non-material aspects that to a large extent constitute well-being. Thus, although material means (*food*, *clothes*) and opportunities (*discovery*, *work*) and one's environment (*air*, *terrain*, *light*) play a role in general happiness (and therefore *meaning*, *general* and *happy* are also correlated to dimension 2), it does not determine general happiness as such.

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<sup>8</sup> Discovery entails respondents' satisfaction with their education.

Figure 2: Heatmap of subjective well-being variables

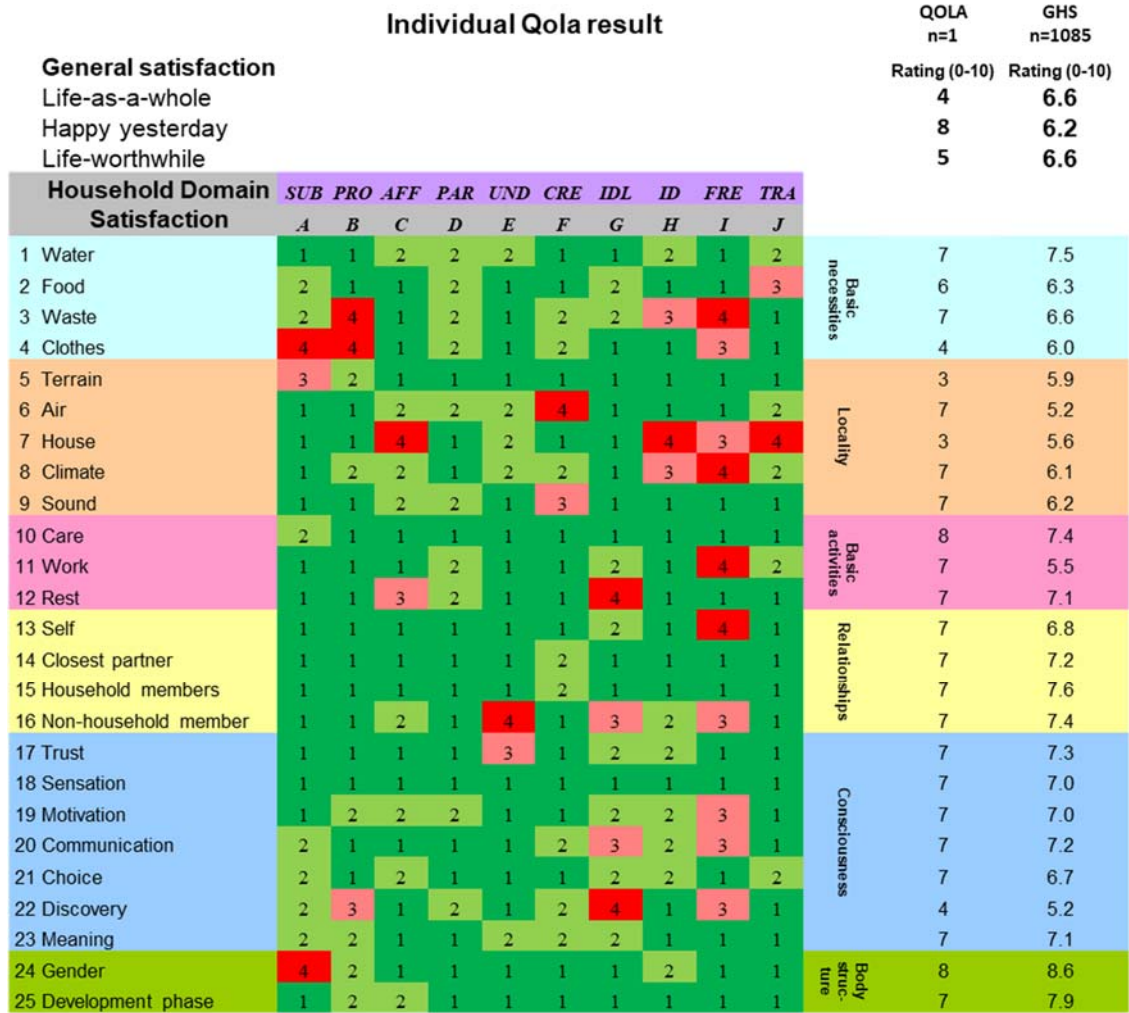


We shall now proceed with the discussion of our detailed quality of life interviews that applied the Qola tool referred to in *Part 3* of this article.

### (3) Qola tool results

The Qola tool generates three types of results charts: an individual, community, and inconclusive domain interface result chart. We briefly discuss each of these three types of result charts.

Figure 3: Individual Qola result chart



SUB (Subsistence); PRO (Protection); AFF (Affection); PAR (Participation); UND (Understanding); CRE (Creation); IDL (Idleness); ID (Identity); FRE (Freedom); TRA (Transcendence)

The chart in **Figure 3** above contains the results of the quality-of-life assessment of an individual. It starts at the top with “general life satisfaction” results. The green and red blocks in the centre part of the figure contain the 250 need-element interface results. The twenty-five household domain elements (numbered 1-25) are listed from top to bottom on the left, starting with water and ending with development phase at the bottom. The 10 fundamental human needs (marked A-J) start with *SUB* (*Subsistence*) on the left and end with *TRA* (*Transcendence*) to the right.

The tool explores all 25 elements of the household in relation to all ten fundamental human needs. For example, in the case of the second element “food” the respondent is asked to rate his/her satisfaction level with the food he/she has on a scale of 0 to 10, where 0 means completely dissatisfied, and 10 means completely satisfied.

To encourage respondents to freely reflect their views before the set of 10 Likert style statements are posed, the respondent is first asked: *could you tell me more about the food you have?* The narrative interview is recorded with the informed consent of the respondent, transcribed, and included in the Excel format on the result chart. Thus, after the interview, Nova has the narrative reflection of the respondent freely talking about each specific household domain, as well as the more structured results on the need/element interfaces as depicted in the result chart.

The column to the far right contains the GHS results for all persons that participated in the study, making it possible to compare the results of the individual with the mean score of the whole sample.

After the initial open domain question, the structured questions follow. The respondent is asked to strongly agree, agree, disagree, or strongly disagree with the following statements regarding food, that each probes the interface between food and each one of the ten fundamental human needs:

- A2 - I never go hungry because of a lack of food (food/subsistence)
- B2 - I am satisfied that I usually have enough healthy food to eat (food/protection)
- C2 - I generally find my food tasty (food/affection)
- D2 - I have the opportunity to share meals with good company when I want to (food/participation)
- E2 - I am satisfied that I know which foods are healthy and which not (food/understanding)
- F2 - I am satisfied that I have the knowledge to cook a variety of meals (food/creation)
- G2 - I seldom worry about my responsibility to provide daily meals (food/idleness)
- H2 - I can get good food to share with guests if I want to (food/identity)
- I2 - I am satisfied that I regularly eat the foods I like (food/freedom)
- J2 - I feel privileged to have the food I have (food/transcendence)

This process is followed for all 25 identified household domains. Colours are used to indicate either acceptable (green) or sub-standard (red) quality of life for each need/element interface. Dark green is used for “strongly agree” and light green for “agree”. Dark red is used for “strongly disagree” and light red for “disagree”.<sup>9</sup>

Numbers 1-4 are awarded as follows: strongly agree = 1; agree = 2; disagree = 3; strongly disagree = 4.<sup>10</sup>

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<sup>9</sup> The red categories are of particular interest since it indicates areas of sub-standard quality of life, or in the language of Max-Neef, areas where there are potential “poverties” (compare Max-Neef et al., 1991: 18-19).

<sup>10</sup> Including the numbers 1-4 in the result chart enables interpretation also when the chart is printed out in grey scale or black and white.

Figure 4: Community Qola result chart

Community Qola result											QOLA n=46	GHS n=1085	
General satisfaction											Rating (0-10)	Rating (0-10)	
Life-as-a-whole											6.0	6.6	
Happy yesterday											6.5	6.2	
Life-worthwhile											6.3	6.6	
Household Domain Satisfaction	SUB A	PRO B	AFF C	PAR D	UND E	CRE F	IDL G	ID H	FRE I	TRA J			
1 Water	98 00 64	98 00 62	98 100 51	85 00 15	93 33 30	87 00 48	96 00 36	89 00 20	93 00 26	100 00 15	Basic necessities	7.3	7.5
2 Food	89 40 27	80 00 27	100 00 24	80 11 32	96 00 36	93 00 28	85 00 23	78 20 25	78 30 25	91 25 31		5.8	6.3
3 Waste	89 20 15	72 23 03	98 00 51	89 20 22	93 00 44	74 25 12	78 00 11	76 18 03	39 25 11	93 00 19		6.5	6.6
4 Clothes	76 36 23	65 25 10	85 14 36	67 27 16	78 10 39	78 09 26	85 14 21	89 20 39	72 23 21	93 00 21		5.7	6.0
5 Terrain	59 32 04	70 36 22	78 20 39	85 00 26	80 22 19	65 19 30	96 00 30	98 00 27	87 17 20	100 00 59	Locality	5.7	5.9
6 Air	63 06 14	70 21 22	76 09 06	72 15 06	78 10 03	91 25 07	89 00 20	100 00 20	93 33 28	91 25 05		5.7	5.2
7 House	83 25 24	85 14 28	61 17 32	83 00 26	61 00 25	72 08 24	87 17 28	37 34 18	52 09 17	70 29 19	Basic activities	5.1	5.6
8 Climate	98 00 36	93 00 49	87 00 05	76 09 17	89 00 22	74 00 18	87 00 20	89 20 17	93 67 19	83 00 11		5.9	6.1
9 Sound	100 00 50	83 00 29	72 08 15	85 14 21	93 00 19	87 50 18	67 13 19	100 00 43	98 00 24	100 00 26		5.6	6.2
10 Care	87 17 13	98 100 31	89 00 41	98 00 40	100 00 37	100 00 28	78 00 14	98 100 53	96 00 32	100 00 72	Relationships	7.3	7.4
11 Work	67 13 23	85 71 21	83 50 26	30 28 26	89 40 17	78 30 19	80 44 22	76 45 23	54 43 20	63 12 34		6.7	5.5
12 Rest	91 00 36	74 00 21	65 13 23	78 20 14	91 00 36	74 08 24	83 13 21	89 40 27	100 00 26	96 50 34	Body structure	6.9	7.1
13 Self	85 43 23	72 15 42	91 25 29	85 43 51	87 00 40	87 00 20	83 13 13	98 00 27	09 43 00	96 00 32		6.2	6.8
14 Closest partner	96 00 39	96 00 45	93 00 42	87 00 33	91 00 40	83 00 29	93 00 28	96 00 41	93 00 30	61 22 21		7.1	7.2
15 Household members	91 00 24	96 50 20	98 00 47	100 00 43	100 00 43	96 00 27	100 00 30	100 00 37	98 00 31	72 31 24	Consciousness	7.3	7.6
16 Non-household member	83 00 05	87 17 20	91 00 14	93 00 23	59 32 19	98 00 27	76 09 14	98 00 13	80 33 11	98 00 20		6.7	7.4
17 Trust	89 00 22	48 21 41	91 25 29	76 27 23	65 06 13	96 00 27	74 08 26	74 00 26	63 06 28	100 00 52	Body structure	7.0	7.3
18 Sensation	72 08 27	70 07 34	87 00 35	96 00 36	91 00 26	100 00 41	83 00 37	96 00 23	87 00 33	93 00 26		6.5	7.0
19 Motivation	96 50 50	85 29 21	93 00 16	52 09 08	89 00 24	78 00 28	87 00 18	100 00 22	87 00 15	98 00 53		6.9	7.0
20 Communication	96 00 23	98 00 36	93 00 42	67 13 32	63 18 31	78 00 28	65 13 23	100 00 20	91 25 19	96 00 55		7.2	7.2
21 Choice	85 14 28	87 00 23	83 00 26	98 100 18	100 00 17	89 00 27	83 00 11	96 00 18	100 00 26	91 00 10		6.4	6.7
22 Discovery	80 00 14	39 14 17	70 07 44	52 09 25	96 00 25	91 00 14	52 18 13	93 00 21	41 15 32	100 00 30		4.9	5.2
23 Meaning	89 40 15	96 00 23	100 00 22	98 100 18	91 00 12	76 18 14	98 00 16	100 00 41	96 00 23	96 00 36		6.7	7.1
24 Gender	61 17 39	74 17 18	100 00 41	98 00 33	96 00 32	100 00 33	61 06 32	100 00 26	67 13 23	100 00 61	Body structure	8.5	8.6
25 Development phase	89 00 44	96 00 14	98 00 31	93 00 33	87 00 40	93 00 35	100 00 37	98 00 51	96 00 45	100 00 52		8.3	7.9

SUB (Subsistence); PRO (Protection); AFF (Affection); PAR (Participation); UND (Understanding); CRE (Creation); IDL (Idleness); ID (Identity); FRE (Freedom); TRA (Transcendence)

The results of all individuals that participated in the detailed quality of life assessment (Oola), can be combined to get an idea of the collective opinion. **Figure 4** above contains the self-ratings of respondents from all the sample communities. The two columns on the far right present the numeric scale (0-10) responses of both the GHS (most right) and the Full Qola Survey (second from right). Thus, the mean general satisfaction ratings and domain satisfaction ratings of the 46 respondents that participated in the Qola survey can be compared with the mean ratings of the 1085 respondents that participated in the GHS.

For example, the average score of the GHS (n=1085) was 6.6 and the average score of the Full Qola Survey (n=46) was 6.0 for the question, *all things considered, how satisfied are you with life-as-a-whole these days?* (Scale 0-10).

For the question, *how satisfied are you these days with the water you have?* the average score of the GHS (n=1085) was 7.5 and the average score for the Full Qola Survey (n=46) was 7.3.

The green blocks on the chart indicate that it can be stated with 90% certainty that agreement with the statement will be affirmed by the majority of the adult population in the target area. The white blocks indicate that neither a minority nor a majority view can be generalised with 90% confidence level. The red blocks indicate where there is a 90% certainty that a minority of the adult population will endorse the statement.

The small number in the top of each of the 250 need/element interface blocks indicates the percentage of respondents that affirmed (strongly agreed and agreed with) a particular statement. The two numbers below this percentage are negative and positive intensity scores. This indicates what percentage of respondents that disagreed with the statement, *strongly disagreed*, and what percentage that agreed with the statement, *strongly agreed*.

For example, the house/identity interface (H7) - the first red cell from the top of the chart in **Figure 4** - contains the following information: The block is red, indicating that, at 90% certainty, the statement will be endorsed by a minority of the population. Only 37% of respondents affirms the statement that probes this interface, namely: *I have the power to make my house to be the way I like it*. Of the 29 out of 46 respondents that disagreed with the statement 10 (34%) strongly disagreed (negative intensity score) and of the 17 that agreed 3 (18%) strongly agreed (positive intensity score).

The result chart provides a systematic overview of the 250 need/element domain interface results in response to the Likert style questions that probe each interface, indicating where decent, but also where sub-standard quality-of-life is experienced.<sup>11</sup> The result chart can be used to describe the views of respondents per element or per fundamental human need. For example, from a fundamental human needs perspective the following findings were made in this study:

- A. **Subsistence:** According to the perceptions of the majority of respondents the survival of people in the sample communities are not being threatened by insufficient access to water, food, sanitation or lack of income. Threats to their subsistence seem rather to be the health of the environment and the quality of the air.
- B. **Protection:** Vulnerabilities, according to the perceptions of respondents, include shoes for essential requirements, chances of becoming a victim of crime, health conditions due to poor air quality, trust in the police and quality of education.
- C. **Affection:** It is uncertain if a majority or minority of people generally find the sounds of the surrounding environment where they live likable, and it is also not

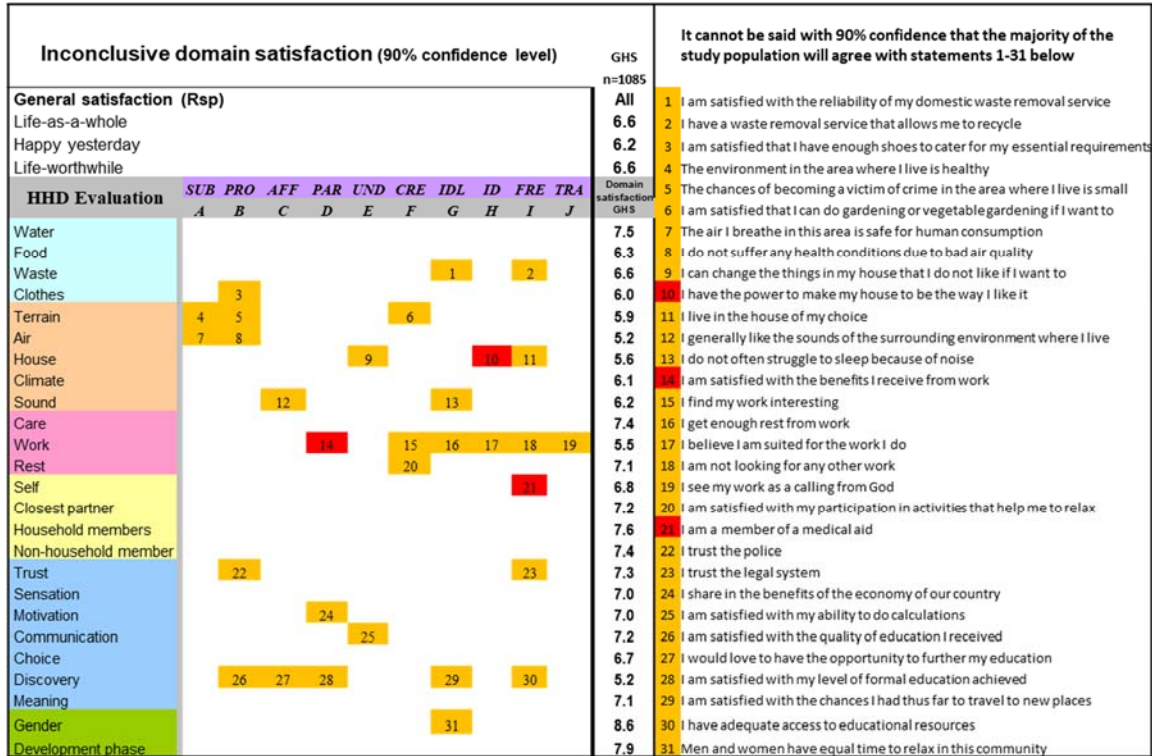
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<sup>11</sup> The full set of 250 Nova Qola Tool Questions is available at: <https://www.nova.org.za/nova-qola-tool>



- certain how many people would love to have the opportunity to further their education.
- D. **Participation:** A minority of people is satisfied with the benefits they receive from work. It is uncertain if a majority or minority of community residents believe they share in the benefits of the economy of the country. The same uncertainty exists regarding the satisfaction with the level of formal education achieved.
  - E. **Understanding:** The majority of people say they are satisfied that they use water sensibly, know which foods to eat and that they have sufficient knowledge about the air quality in their area. It cannot be said that a majority will affirm the statements, *I can change the things in my house that I do not like if I want to* and *I am satisfied with my ability to do calculations.*
  - F. **Creation:** The information indicates that it is uncertain if the majority or minority of people can do gardening or vegetable gardening if they want to. There is also uncertainty about the statements: *I find my work interesting,* and *I am satisfied with my participation in activities that help me to relax.*
  - G. **Idleness:** It is difficult to relax if you cannot rely on important services. From the results it cannot be stated that the majority of people in the sample communities are satisfied with the reliability of their domestic waste removal services. Further there are indications that a number of people struggle to sleep because of noise, that they do not get enough rest from work, and that they do not have the chance to travel to new places which can be a form of revitalization. It is uncertain if a majority or minority will affirm the statement: *Men and women have equal time to relax in this community.*
  - H. **Identity:** The majority of people are satisfied that their household uses energy in an environmentally responsible way. On the other hand, only a minority will affirm that they have the power to make their house to be the way they like it. It is uncertain if a majority or minority will affirm the statement: *I believe I am suited for the work I do.*
  - I. **Freedom:** Interestingly, it seems as if, apart from subsistence and protection, “freedom” could be the human need that is most under pressure in the target communities. A definite minority of people belongs to a medical aid service. It cannot be said that a definite majority lives in the house of their choice, do the work they want to do and have adequate access to educational services. But there are also some aspects related to freedom that seem encouraging: the majority of people affirm that it is possible for their household to cook with the fuel of their choice, that they can afford the clothes of their choice and that they want to stay in the area where they are.
  - J. **Transcendence:** It is fascinating how highly positive the transcendence scores are. The only transcendence interface where a positive majority was not attained was for the statement: *I see my work as a calling from God.* Unanimous positive affirmations were attained in the Full Qola sample in all of the following statements: *I do not have any disputes because of access to water, I am generally satisfied that people listen to me, I believe God loves me, I believe that prayer can change things for the better, I would like to show more respect to the traditions of my ancestors, I believe God favours man and woman equally and I experience God just as much as before in this phase of my life.*

Figure 5: Inconclusive domain interfaces chart



SUB (Subsistence); PRO (Protection); AFF (Affection); PAR (Participation); UND (Understanding); CRE (Creation); IDL (Idleness); ID (Identity); FRE (Freedom); TRA (Transcendence)

Figure 5 above is an example of an Inconclusive need/element interfaces chart that shows specific potential sub-standard quality of life<sup>12</sup> interfaces in the target communities.

The column under the heading GHS presents the general life satisfaction results (Scale 0-10) in all the study communities (n=1085). The yellow and red blocks indicate the 31 need-element interfaces (out of the total of 250) where a majority proportion could not be estimated at 90% certainty to the study population. The corresponding Likert statements for each block are in the column on the far right. The red interfaces (numbers 10, 14 and 21) are statements where a minority view can be generalised with 90% confidence to the study population - in this case the adult population of the study area. The yellow indicates areas where neither a minority nor a majority view can be generalised with 90% confidence level.

<sup>12</sup> This can also be called potential “poverties” (compare Max-Neef et al., 1991: 18-19).

## Conclusion

The aim of this reflection was not only to present the results of the novel Qola tool, but also to share our approach in the development process followed to design this tool. We divided the household as complex system into its constitutive elements and analysed it as a satisfier of fundamental human needs. It is possible to follow a similar approach to analyse other complex systems. We hope this article will inspire others to do so.

In terms of the tool itself, our aim was to be able to gather comprehensive objective and subjective quality-of-life information in such a manner, that the results of a single household can be assessed over time and be compared with other households and communities. We are of the opinion that the Qola tool meets this requirement. The tool enabled us to successfully gain an enhanced understanding of the living standards, needs and perceptions of community members that participated in the comprehensive quality of life baseline survey as described in Part 4 of this paper. The Qola tool allows us to keep record of detailed qualitative information in a systematic manner. This includes narrative information pertaining peoples' quality of life experience and perceptions in the household context. It is possible to compare the results of individuals and communities over time in 250 need/household domain interfaces. It was further possible to project if the opinions in the smaller sample (n=46), containing more detailed quality-of-life information, could be projected to a minority or majority opinion for the larger target population.

In our discussion we referred to the statement of Møller and Huschka (2003: 6-7) that there is general consensus among quality-of-life researchers that only a sensible mix of subjective and objective indicators can paint the true picture of society. By combining the results of our GHS and the Qola tool, we have a practical way to do quality-of-life baseline and impact measurements in a manner that follows this principle.

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