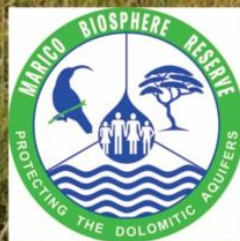


# Community well-being and development needs in the proposed Marico Biosphere Reserve, South Africa

**Researchers:**  
**Prof Hendri Coetzee**  
**Prof Werner Nell**  
**July 2017**





## Contents

Summary .....	4
Introduction .....	11
Background .....	11
Community well-being .....	13
Current interventions in the proposed Marico Biosphere Reserve .....	14
Method .....	18
Study area .....	18
Approach and strategy .....	19
Participants .....	19
Procedure .....	21
Data gathering methods .....	21
Data analysis methods .....	22
Results .....	23
Overall community well-being .....	23
Community commitment .....	26
Social ties .....	27
Global and domain satisfaction .....	28
Scale reliability .....	28
Overall life satisfaction .....	29
Domain specific satisfaction: The Community well-being index .....	30
Safety well-being .....	30
Social well-being .....	32
Leisure well-being .....	33
Family and home well-being .....	35
Political well-being .....	36
Spiritual well-being .....	38
Neighbourhood well-being .....	39
Environmental well-being .....	41
Transportation well-being .....	43
Education well-being .....	44
Health well-being .....	48
Work well-being .....	49
Financial well-being .....	50

Consumer well-being .....	51
Domain and global life satisfaction.....	52
Discussion.....	53
Relevance of current interventions (e.g. programmes and projects) in the Marico .....	55
Conclusion.....	56
Limitations of the study .....	57
Recommendations for future interventions .....	57
References .....	59
List of tables .....	61
List of figures.....	62

## Summary

A biosphere reserve is aimed at conserving the natural world, and at addressing the developmental needs of people. Given that the UNESCO is not too prescriptive about the development needs that must be addressed in / by a biosphere reserve; that current approaches to development are not holistic enough; that international and national development plans often lack local relevance and context; and the limitations of traditional needs and assets assessments, a new approach to identify the development needs of people living in biosphere reserves was needed. It was therefore decided to explore the use of community well-being indicators, and more specifically, the 14 different domains of community well-being proposed by Sirgy *et al.* (2009) to identify development needs. In addition, the study also set out to address two secondary objectives, namely to: (a) determine the relevance of current interventions (e.g. programmes and projects) in the Marico, and (b) make recommendations for future interventions that are likely to contribute to the well-being communities and increased levels of life satisfaction.

A concurrent mixed-methods approach was followed, which included the use of semi-structured interviews (n = 27) to gather qualitative data, and the use of a modified version of Sirgy's *et al.* (2009) measure of perceived community well-being and Diener's *et al.* (1985) satisfaction with life scale, that were administered in a questionnaire format (n = 373) to gather quantitative data. The qualitative data were digitally recorded and/or documented in the form of field-notes, and later analysed thematically. Quantitative data were collected by a group of 13 trained fieldworkers and captured and analysed by the North-West University's Statistical Consultation Services, using the SPSS 24 statistical program.

The following findings emerged from the study:

### **Overall community well-being**

- The participants have a significantly above average level of satisfaction with their quality of life in the Marico area.
- The average enjoyment of residents living in the Marico was moderately high, indicating that people, in general, enjoy living in the Marico.
- Most participants are carefully optimistic about the current conditions in the Marico.
- Most people living in the proposed reserve think that conditions in the Marico will be getting a bit better in the future.
- The majority of the people living in the Marico think that it is a desirable place to live in.

### **Community commitment**

- The majority (72.6%) of the participants indicated that they would not move away from the Marico, even if they were able to do so.
- A much smaller percentage of the participants (27.4%) indicated that they would move if able to do so, and that if they get the opportunity they will move to Mafikeng, Rustenburg or Gauteng (mainly for job opportunities).

## Social ties

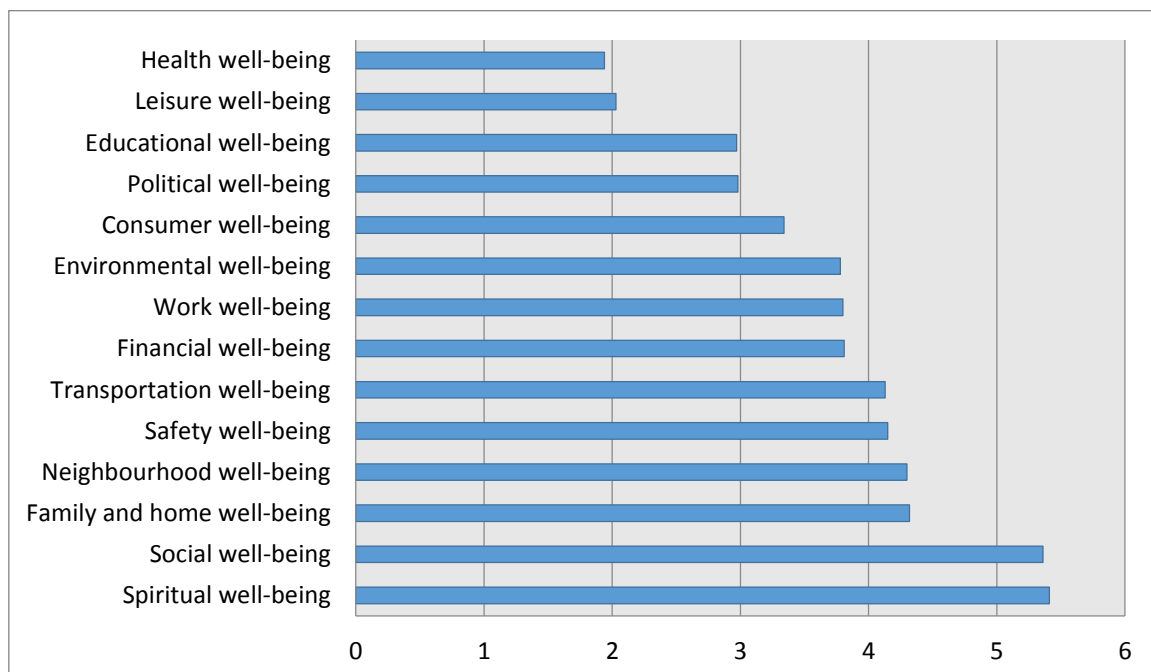
People in the Marico generally have fairly strong social ties, which can be very extensive.

*Taken together, these results indicate that generally speaking, residents of communities in the Marico enjoy living in the region and view it as a desirable place to live that offers good quality of life. Furthermore, they are of the opinion that conditions are not only improving presently, but are also hopeful that conditions will get even better in years to come. Given these findings, residents are generally likely to want to continue living in the area, and would in all probability find leaving the region distressing.*

## Overall life satisfaction

Findings reveal that the participant group's mean life satisfaction was fairly average (mean = 21.7; SD = 6.45), and somewhat lower than mean scores that have been found in previous studies within comparable communities. These results indicate that significant room exists for improvements in life satisfaction and that there are likely still a number of needs in these communities that need to be addressed.

## Domain satisfaction and well-being



**Figure 1: Community satisfaction and well-being across domains**

- As can be observed in figure 1, **health** was found to be the domain with which residents were the most dissatisfied of all (Mean = 1.94; SD = 1.08). As such, these findings suggest

that community structures related to health well-being currently serve as significant detractors of community well-being, and that a need exists for strategies and interventions aimed at ameliorating the current situation.

- The mean score related to the participants' **leisure** well-being was the second lowest of all dimensions that were assessed (Mean = 2.03, SD = 1.3), indicating that significant levels of dissatisfaction occur in relation to this issue. This finding suggests that attention should be given to enhancing their leisure well-being, as this is currently detracting from overall community well-being. When viewed on an item-by-item basis, participants were particularly dissatisfied with entertainment facilities and the parks/lack of public parks in their communities, and to a lesser extent with entertainment activities and recreational facilities and activities in the area.
- Results revealed that residents were somewhat dissatisfied with the **education** well-being of their community (Mean = 2.97; SD = 1.43). In particular, participants were found to be strongly dissatisfied with local colleges and universities (as there reportedly are none), and to have a very slight negative evaluation of public schools, and a neutral view of libraries in their communities.
- The results indicate that satisfaction with **political** structures was among the four dimensions with which participants were comparatively the least satisfied (Mean = 2.98; SD = 1.52). More specifically, some of the participants experienced very mild dissatisfaction with their community leaders, local government, and the services provided by the local government, and were even less satisfied with the property taxes in their part of the proposed reserve. Taken together, these findings suggest that a significant need exists for strategies and interventions aimed at enhancing political well-being in the region. Furthermore, a significant finding was that participants' income levels were found to be negatively associated with political well-being ( $r = -.31, p < .05$ ), suggesting that the higher participants' incomes were, the less likely they were to be satisfied with the political situation in their communities. In addition, the results also indicate that the more conservative residents were, the lower their political well-being tended to be, and vice versa ( $r = 0.31, p < .05$ ).
- The participant group's mean score related to **consumer** well-being (3.34; SD = 2.05) indicated that they tended towards mild levels of dissatisfaction with these community systems.
- Overall satisfaction with their **environmental** well-being was found to be very slightly below the neutral level (Mean = 3.78; SD = 1.08). However, significant variability occurred among the mean scores of the individual items comprising the subscale. When viewed on a single-item level, these findings confirm that community well-being could potentially be enhanced by the establishment of parks, and also via initiatives aimed at improving local garbage management attitudes, behaviours and practices.
- Survey results revealed that overall satisfaction related to **work** well-being was only fractionally below the neutral level (Mean = 3.8; SD = 1.58). However, given that overall life satisfaction of those who had full time employment was found to be significantly higher than that of those who were unemployed ( $t = -2.75, df = 293, p < .05$ , two-tailed; mean difference = 0.46, 95% CI: -0.79 to -0.13), and that a negative correlation was found between residents' age and their work well-being ( $r = -.32, p < .001$ ), and that satisfaction levels were average,

significant scope exists for enhancing community well-being through job creation, especially among older residents.

- The results reveal a fairly neutral to very mildly below average level of satisfaction with **financial** well-being (Mean = 3.81; SD = 0.83). Financial well-being was found to be inversely correlated with participants' age ( $r = -.41, p < .001$ ), which indicates that the older participants were, the lower their financial well-being tended to be. Expectedly, participants' income levels were found to correlate positively with financial well-being ( $r = .40, p < .001$ ) as well as work-well-being ( $r = .40, p < .001$ ).
- Mean satisfaction related to their **transportation** well-being was found to be fairly neutral (Mean = 4.13; SD = 1.39), although qualitative data indicate that many residents were somewhat dissatisfied with the conditions of the roads and with public transportation in the region.
- Participants were generally neither satisfied nor dissatisfied with the prevailing levels of perceived **safety** in their communities (Mean = 4.15, SD = 1.54). As such, safety considerations are neither promoting residents' well-being, nor detracting from it, although significant room exists for improvement. When analysing this well-being dimension according to participants' demographic characteristics, it was found that income levels were positively correlated with safety well-being ( $r = .22, p < 0.001$ ), suggesting that those with more disposable income are likely enabled to implement better security measures than those with lower incomes.
- Overall satisfaction with neighbourhood well-being only slightly exceeded the neutral point (Mean = 4.3; SD = 1.05).
- Participants' overall mean score of 4.32 (SD = 1.29) indicate slightly above neutral levels of satisfaction with the **family and home** well-being domain. However, an item-specific analysis of this result reveals that various community systems related to home and family differentially affect participants' well-being. Satisfaction with family life was comparatively much higher than other factors that were assessed (especially among males), whereas behaviour of children in the community was a significant detractor of well-being with this life dimension.
- **Social** well-being (along with spiritual well-being) was scored the highest (Mean = 5.36; SD = 1.1), indicating that residents are generally slightly to moderately satisfied with this life domain. As such, social systems in the community appear to be enhancing residents' well-being.
- Results revealed that satisfaction levels related to participants' **spiritual** well-being were well above average, and constituted the domain with which participants were most satisfied of all (Mean = 5.41; SD = 1.66), and along with the qualitative data, suggest that religion and spirituality play an important role in the well-being of residents in the Marico. Apart from family and home well-being, spiritual well-being was the only dimension found to exhibit variation between different gender groups. More specifically, an independent t-test confirmed that females had significantly higher levels of spiritual well-being than males: ( $t = -2.47, df = 359, p < .05$ , two-tailed, equality of variances not assumed; mean difference = 0.44, 95% CI: -0.79 to -0.10).

As integral part of the study, the associations between participants' domain specific well-being (as measured by the Community Well Being Index) and their overall/global satisfaction with life (as measured by the Satisfaction with Life Scale) were assessed. Given that the study was cross-sectional in nature and that direction of causality can therefore not be established, Pearson's product moment correlation coefficients were employed to assess the relationships between these variables.

- As reflected in Table 1 (page 28), the domains that had the strongest associations with overall life satisfaction were family and home well-being ( $r = .44, p < .001$ ) and financial well-being ( $r = .43, p < .001$ ). Whilst causal attributions cannot be assigned to these findings with certainty, given that the research design was not experimental in nature, the findings do suggest that residents' family and home lives and their financial situations are strongly interlinked with their overall well-being. This finding, as well as the likelihood of a causal relationship between them is supported by existing research that indicate that financial well-being (in resource poor communities) and social support are amongst the strongest of all predictors of life satisfaction (Diener, 2009).
- Furthermore, moderately strong associations were found between overall life satisfaction and neighbourhood well-being ( $r = .37, p < .001$ ) and environmental well-being ( $r = .37, p < .001$ ).
- Moderate, but highly statistically significant associations were found between life satisfaction and work well-being ( $r = .32, p < .001$ ), leisure well-being ( $r = .31, p < .001$ ), and spiritual well-being ( $r = .30, p < .001$ ).
- With the exception of political well-being (where the correlation failed to reach statistical significance due to the small subsample size), all other well-being subscales had weak to moderate positive correlations with overall well-being, suggesting that all these domains are significantly related to global life satisfaction.

*In combination with conclusions drawn from previous studies, these results suggest that any changes, interventions or other events that significantly impact one or more of these domains (and most especially those which correlate the most strongly with life satisfaction) are likely to be associated with concurrent changes in participants' overall life satisfaction .*

### **Relevance of current interventions in the Marico**

As was described in the introductory section of this report, current interventions in the Marico can be divided into three broad categories: (a) those that focus on social-economic development, (b) those that focus on arts, culture and tourism, and (c) those that have a conservation focus. Based on the results of the present study, it can be concluded that current interventions that focus on health (i.e. the EWT) and education (e.g. ECD centres, after-school support, etc.) , environmental well-being (work by EWT, MRCA, African Pride and others), work well-being (MRCA), and financial well-being are all addressing specific and relevant development needs (as reflected by domain specific community well-being levels) in the communities, and are therefore likely to make an impact and to be effective at enhancing overall community well-being.



However, there are at present no interventions (as far as the researchers ascertain) that currently focus on improving a number of other very important well-being domains with which participants were not very satisfied with. The findings of the present study point to a number of significant community needs (such as leisure, transportation and consumer needs) that appear to be currently not sufficiently recognised and/or addressed in the context of either current interventions in the study area, or in the broader context of current development guidelines such as the Sustainable Development Guidelines, SADEA's barometer and the South African National Government's National Development Plan.

*Taken together, even though Marico residents enjoy living in this specific region, it can be concluded that significant room exists for improvements in their life satisfaction and that there are a number of domain specific development needs in communities in the proposed Marico Biosphere Reserve that require attention. In particular, the domains that were found to most detract from residents' well-being were those pertaining to health, leisure, (especially tertiary) education and political structures, followed by the consumer, environmental, work, financial and (based on qualitative findings) transportation domains. As such, existing and new intervention programs and strategies could fruitfully be adapted or designed to specifically target and address these needs, as this will probably result in the most substantive difference being made in the lives of residents in these communities. In addition, results of the present study indicated that the spiritual and social domains, and to a lesser extent the family and home and neighbourhood domains are likely currently promoting residents' well-being. As such, interventions aimed at building on and leveraging these existing community assets are likely to make positive contributions to the satisfaction with life of residents and communities in the proposed Marico Biosphere Reserve. In particular, there might be significant value and synergy in exploring the ways in which current community strengths such as a strong sense of spirituality, social cohesion, neighbourliness and family and home could be leveraged to address those domains that are most inimical to residents' well-being.*

### **Recommendations for future interventions**

When it comes to future interventions, attempts should be made to continue supporting (strengthening) the well-being dimensions that were found to be associated directly (and strongly) with people's overall life satisfaction (i.e. family and home, financial, social, and spiritual well-being) and by focusing on effecting improvements in the domains with which residents' in the Marico were least satisfied with. More specifically:

- Health-related well-being should be improved.
- Leisure well-being should be improved.
- Education well-being should be improved, particularly when it comes to making tertiary education more widely available and improving existing infrastructure at some of the schools.
- Attention should be given to improve garbage management.
- Attention should be given to the reportedly problematic behaviour of some of the children in the Groot Marico/Reboile community.

- Given that political well-being was found to be comparatively low among residents in the Marico, it would be important for those involved in any programs or interventions in the region to take cognizance of the fact that political undercurrents and potential political instability might adversely impact such initiatives.
- Given that the overall life satisfaction of those who had full time employment was found to be significantly higher than that of those who were unemployed, and that existing research indicates that employment is a very strong predictor of subjective well-being (Diener, 2009), this finding suggests that any programmes or interventions that result in increased employment in the region are likely to significantly improve life satisfaction in these communities.
- The feasibility of more readily available transport in the Marico, especially to and from more remote places such as Rietvlei and Oberholzerskloof and even to and from Groot Marico should be investigated.

(More details and potential strategies are proposed in the original section of the report – see page 57)

# Introduction

## Background

The Marico River, which is the headwaters of the Limpopo Basin, currently supplies water to the town of Groot Marico, to a number of commercial and upcoming farms downstream of the town, to a number of rural communities (Koffiekraal, Pella, Uitkyk and Pachtsdraai), as well as to Gaborone, the capital city of the Republic of Botswana (through the Tswasa Agreement) (EWT, 2017). Given its importance as source of water supply in a comparatively arid region, it has been classified as one of the National Freshwater Ecosystem Priority Areas (EWT, 2017). A process is currently underway to propose that the Marico Bushveld catchment area be added to the list of biosphere reserves in South Africa, due to its importance as a water catchment area, and the high level of biodiversity in the area.

A traditional approach to conserving the Marico region would have entailed the removal of many, if not all residents in the area, so that conservation authorities could only focus on the biophysical aspects. However, given South Africa's political history, and the development needs of people living in the Marico, a traditional approach to conserving the Marico would not have been feasible, let alone sustainable.

The establishment of a biosphere reserve is a more contemporary approach to conservation, in the sense that it's aimed at both conserving the natural world (e.g. the physical environment, fauna and flora, etc.), and at addressing the developmental needs of people (which include the core protected area, the buffer area and the transitional zone) (UNESCO, 2017). As an approach, it is therefore more likely to be socio-politically acceptable and sustainable. It is however also more challenging, because the usual development needs of people are typically both diverse and extensive (see Coetzee & du Toit 2011; Coetzee & Nell 2016), and frequently at odds with a conservation agenda.

As a basic point of departure, as is the case with the biophysical aspects, the development needs of people living in the proposed Marico Biosphere Reserve will have to be identified. UNESCO, in their guidelines for the establishment of a biosphere reserve, do not offer much guidance in this regard, except for stating that it should focus on social and economic aspects, and that it should be sensitive to cultural and gender issues. It is however argued that if the establishment of a biosphere reserve is really aimed at benefiting people (i.e. improving their lives, livelihoods, and socio-economic status), that the developmental needs of people should be addressed in a holistic and contextually sensitive manner that is carefully balanced with a conservational agenda.

In this regard, and in a conservation-development context, the South African Department of Environmental Affairs (SADEA) (2015) provides some guidance. In its national barometer for inclusive development, the SADEA includes living standards (i.e. household goods, food security and safety); basic services (i.e. electricity access, water access, sanitation and housing); public goods (i.e. education and health care) and livelihoods (i.e. jobs and income) as the most prominent development needs of people. Whilst SADEA's expanded view on the development needs of people definitely represents a more nuanced approach to understanding developmental needs, it nonetheless still does not include all the developmental needs of people in a holistic manner.

The most comprehensive list of development needs can be obtained from the United Nation's Sustainable Development Goals – see <http://www.un.org/sustainabledevelopment/sustainable->

[development-goals/](#). It is clear that these goals represent a comprehensive and holistic conceptualisation of development needs. Furthermore, the emphasis on environmental well-being offers a good link between people and environmental conservation. However, these goals are very ambitious and higher level targets designed to serve as broad and general guidelines for national governments and large development agencies. As such, these goals lack contextual local specificity and relevance as far as their applicability in the Marico is concerned.

An alternative, and more contextually sensitive list of development needs, is South Africa National Development Plan (South African Government, 2017). In this plan, the South African National Government identifies 'five key pillars' which include job creation, rural development, education, health, and reducing levels of crime in society. Being South African based, this plan is more locally relevant by focusing on a range of critical contemporary community challenges. However, this development plan still appears to lack the requisite degree of specificity in terms of the developmental needs that characterise the Marico region. The same is true for the North West Province's Development Plan (NWPG, 2010), and the Integrated Development Plans for Ngaka Modiri Molema District Municipality and the Ramotshere Moiloa Local Municipality (of which the Marico is part), because although these plans are even more locally relevant, and slightly more specific for the area, they are still mostly based on national, rather than grassroots (community level) targets. As such, the extent to which the stated focus areas in the provincial and local plans are relevant to the Marico, will have to be assessed.

This aim can be achieved by conducting a typical needs assessment (Mulroy, 2013). In this approach, local community members' needs are investigated by means of either structured surveys or semi-structured interviews. A structured questionnaire is then developed on the basis of these findings, and used to verify and quantify the needs that were identified, which also helps to identify development priorities. However, a commonly encountered problem with this type of approach to the identification of development needs is that it often creates unrealistic expectations among participants. Using this approach, also makes it difficult to differentiate between actual needs and the things that people want (or think they need). Finally, given the nature of typical community development needs linked to protected areas (Coetzee & Nell, under review); it is also unlikely that the proposed Marico Biosphere Reserve will be able to realistically or effectively address all of the development needs that likely prevail in the area.

One strategy that can be used to address the latter concern is to conduct an assets assessment in addition to a needs assessment. Contrary to needs, which could be regarded as community deficits, assets are the positive attributes and resources that can be found in every community, notably resources of a human (e.g. skills, knowledge, ability to work and good health), social (relationships, e.g. organisations and groups within the community, political structures and informal networks), natural (local environment, e.g. land, trees, water, air, climate and minerals) and physical (man-made, e.g. buildings, transport, water supply, sanitation services, energy sources and telecommunications) nature (Mathie & Cunningham, 2003). Quite often, community members are unaware of the potential that exists within their own community, but even the poorest of communities have assets (capacities/strengths/resources) which can often be leveraged more effectively in the service of community need fulfilment. The identification of assets is however of little use, except when it is linked to actual needs. Furthermore, past experience shows that

community members often seem to find it difficult to identify their local assets, and even more so to use these to address their needs.

Therefore, given that the UNESCO is not too prescriptive about the development needs that must be addressed in/ by a biosphere reserve; that current approaches to development are not holistic enough; that international and national development plans often lack local relevance and context; and the limitations of traditional needs and assets assessments, a new approach to identify the development needs of people living in biosphere reserves was needed.

One promising strategy that can potentially be used to identify the development needs of people is to view and assess such needs from a community well-being perspective. This perspective is by far the most holistic manner in which the development needs of people can be viewed, because it includes: safety, social, leisure, family and home, political, spiritual, neighbourhood, environmental, transportation, education, health, work, financial and consumer aspects (Sirgy *et al.* 2009). It therefore covers all the aspects identified by South Africa's Department of Environmental Affairs (2015), and covers most aspects identified in the Sustainable Development Goals. Furthermore, it also makes South Africa's National Development Plan, the North West Province Development Plan and local municipal plan more context specific.

### Community well-being

Community well-being can be assessed in either a global, or a domain-specific, or facet-based manner. Global measures of community well-being is aimed at capturing residents' global feelings about the community in terms of "global satisfaction with one's community," "perception of community quality of life," and "perceived community quality of life," or simply "community satisfaction" (Sirgy *et al.* 2000; Sirgy & Cornwell, 2002; Zumbo & Michalos 2000). Global measures of community well-being are useful to understand the construct of community well-being, to study satisfaction with life, and to monitor levels of community well-being. It however lacks the specificity and diagnostic characteristics needed to improve community well-being and quality of life (Sirgy *et al.* 2009). A better option, according to Sirgy *et al.* (2009) appears to be a domain-specific, or facet-based measure, because it is theoretically driven and typically cluster people's development in concrete and specific clusters that makes it much easier to identify what development needs to focus on, and where to start. Most subjective facet-based measures of community well-being consist of six dimensions: (1) concern for crime, (2) concern for the availability of jobs, (3) concern for access to adequate health care, (4) concern for available housing, (5) satisfaction with public education, and (6) satisfaction with community (Christakopoulou *et al.* 2001). All of these dimensions seem to be very relevant in the South African, and more specifically, the Marico context. In addition, by assessing people's satisfaction with these aspects it does not create unrealistic expectations (unlike typical needs assessments). It has also been shown that when these community well-being aspects are addressed it leads to higher levels of satisfaction with life (Sirgy *et al.* 2009).

Sirgy and his colleagues (2009) reduced the number of community well-being domains to four and included a number of sub-domains that make the identification of development needs more concrete and specific. According to them a holistic measure of community well-being should include an investigation of people's: (1) satisfaction with business-related services (opportunities where



important goods and services can be obtained); (2) satisfaction with government-related services (public education, health and social services, transportation, protection/ law enforcement, housing, recreation, etc.); (3) satisfaction with non-profit related services (social, cultural and religious activities); and (4) satisfaction with community conditions (crime rate, climate, environmental pollution, quality of jobs and living costs).

The approach of Sirgy and his colleagues (2009) is based on the bottom-up spill-over theory proposed by Andrews and Withey (1976) and Campbell *et al.* (1976). The basic premise of bottom-up theory is that life satisfaction is functionally related to satisfaction with all of life's domains and sub-domains. Life satisfaction is thought to be on top of a satisfaction hierarchy. Thus, life satisfaction is influenced by satisfaction with life domains (e.g. satisfaction with community, family, work, social life, health). Satisfaction with a particular life domain (e.g. community satisfaction), in turn, is influenced by lower levels of life concerns within that domain (e.g. satisfaction with community conditions and services). That is, life satisfaction is mostly determined by evaluations of individual life concerns. Thus, the greater the satisfaction with individual community services (e.g. police, fire and rescue services, shopping malls, health care, banking services and churches), as well as community conditions (e.g. race relations, crime rate, cost of living, and environmental quality), the greater the satisfaction with community life (i.e. community satisfaction). Therefore, theoretically, if people are satisfied with these four life (well-being) domains, it should ultimately lead to life satisfaction. Furthermore, the greater the satisfaction with community life, social life, family life, work life, spiritual life, etc., the greater the satisfaction with life overall (e.g., life satisfaction, perceived quality of life, happiness, and subjective well-being). Similarly, this theory suggests that global satisfaction with a given life domain (e.g. community life) is mostly determined by satisfaction with the life conditions/concerns (i.e. community services and conditions) making up that domain (see discussion on bottom-up spillover theory in the literature review of Diener *et al.* 1999).

In light of this perspective, it is therefore going to be important to assess all of these life/well-being domains (in addition to the biophysical aspects) among residents in the Marico, as it will give the future management team of the biosphere reserve and development agencies a clear indication of the direction to take if they want to conserve and improve the satisfaction with life communities living in the Marico. In addition, the same information can also be used to assess the relevance (and potential sustainability) of current interventions and to make recommendations for potential/future interventions.

### Current interventions in the proposed Marico Biosphere Reserve

Current interventions in the Marico can be divided into three broad categories: (a) those that focus on social-economic development, (b) those that focus on arts, culture and tourism, and (c) those that have a conservation focus. The programmes and projects with a social and economic development focus are mainly driven by three main role-players: two local residents (in their private capacity) who are based in Groot Marico town, and government (local, provincial and in some cases national). These role-players are in partnership, and in some cases financially supported, by a number of national and international individuals and funding agencies. The biggest and most prominent of these is probably the German Government, which supports a student gap

year/volunteerism programme, and who also recently funded a multi-purpose/resource centre in Reboile part of the Groot Marico community (see figure 2).



**Figure 2: Multi-purpose/resource centre in Reboile**

The three main role-players (and their partners) currently run more than a dozen initiatives, including projects focusing on education and early childhood development (figure 3), the empowerment of the youth, unemployment, food production/security (figure 4), and tourism - to name a few.



**Figure 3: ECD learning centre in Groot Marico – an example of one of the education related projects in the area**



**Figure 4: Food security-related project in Groot Marico**

Permaculture projects, entrepreneurship projects, skills development and training, bee-keeping, blog-printing, catering, computer skills training, giving local residents access to the internet, farming, tourism, and a bicycle manufacturing project, is used to address needs related to social-economic development.

Related to this, are the efforts of a small group of residents that are hosting a “boot-sale” market in Marico town, which normally takes place on the first Saturday of each month. During these markets they sell mainly local goods and services to local residents and visitors to the area. In addition, the same group also created a very innovative network/ platform that local residents can use to advertise their goods, services and skills, or to advertise items that can be exchanged for other items that others want or need.

Efforts related to arts, culture and tourism in the area include a poetry project and linked to it, the Herman Charles Bosman Museum, where local volunteers not only recreated life as it was during the time of the well-known South African author, but where they also house a traditional Setswana village. The museum’s facilities are regularly used for education and awareness purposes. A number of local volunteers also present various programmes and training to local people (e.g. dance, art activities, etc.), and especially to learners from schools in the area. Opportunities are also created for tourists to experience the spirit of the Marico (its friendliness and hospitality), by encouraging tourists to stay at one of the numerous guest houses in and around the town of Marico or to undertake one of several tours in the area (that are linked to mampoer, Bosman’s stories, the natural environment, etc.).

In addition, tourism (and by implication the local economy) in the area is also boosted during at least five big events, which are mostly driven by local churches, and which take place on an annual basis: the safari carnival, the Bosman festival, the Marico Mile, the Marico Mountain-bike race and the Marico Bushveld festival. Some of the proceeds of these festivals are used to help members of their local congregations to pay school fees and to support local farmers. A local singing/dancing group also entertains people, and are hired from time to time to perform at functions.

At least five organisations focus on conservation efforts in the Marico area. The first, the Marico River Conservation Association (MRCA), has been in operation in the Marico for several years and has a very good track record of achieving their set aims. The MRCA focuses mainly on catchment rehabilitation (i.e. the removal of alien vegetation), and in the process creates job opportunities for many local residents, particularly those living in Reboile and Oberholzerskloof. The MRCA also engages in activities related to education and promotion of environmental awareness and leadership development, and also offers camps for school children. In addition, they also offer life skills and other types of training to their bush-clearing teams (employees), other staff members and partners.

A newcomer to the area, that also has a strong conservation focus, is the Endangered Wildlife Trust (EWT). In partnership with other stakeholders, this organization focuses mainly on catchment conservation as part of its Source to Sea Programme. Interestingly enough, EWT has adopted a blended approach that also includes a development focus. The latter is based on the Sustainable Development Goals (that was discussed earlier), and their interventions focus mainly on health, enterprise development and education. Some of the beneficiaries include people living in the Marico catchment, and more specifically the Koffiekraal village, and a newly formed local community driven conservation organization called the African Pride Nature Conservation Association.

African Pride, is a local community driven conservation and development organisation, run by a group of youths in the area. African Pride is supported by the EWT, who currently shares an office with them in Groot Marico town. Members of EWT and African Pride were previously linked to the MRCA.

WESSA, an organisation focusing on effective environmental, ecotourism, education and youth development programmes, recently entered the scene. They focus mainly on improving school curricula through the education for sustainable development principles, but also provide critical work skills training, which according to them is aimed at creating jobs and sustainable livelihoods in local communities. Their main program is known as the eco-schools programme.

Two individuals, who also support conservation and development, are engaged in a protracted struggle against big mine companies that want to mine in the Marico area. Their organisation, called Mmutlwa Wa Noko (the thorn of the porcupine), also focuses on providing sustainable jobs in tourism, farming and environmental activities.

It is clear that all of these organizations and individuals are addressing needs in the proposed biosphere region. It is however unclear if they are addressing the type of development needs that are likely to contribute to the quality of life and satisfaction with life of people living in the area. In order to determine whether existing projects and initiatives are congruent with community needs, it is first of all necessary to empirically investigate community needs. As was discussed earlier, one of the most promising strategies that can potentially be used to identify the development needs of

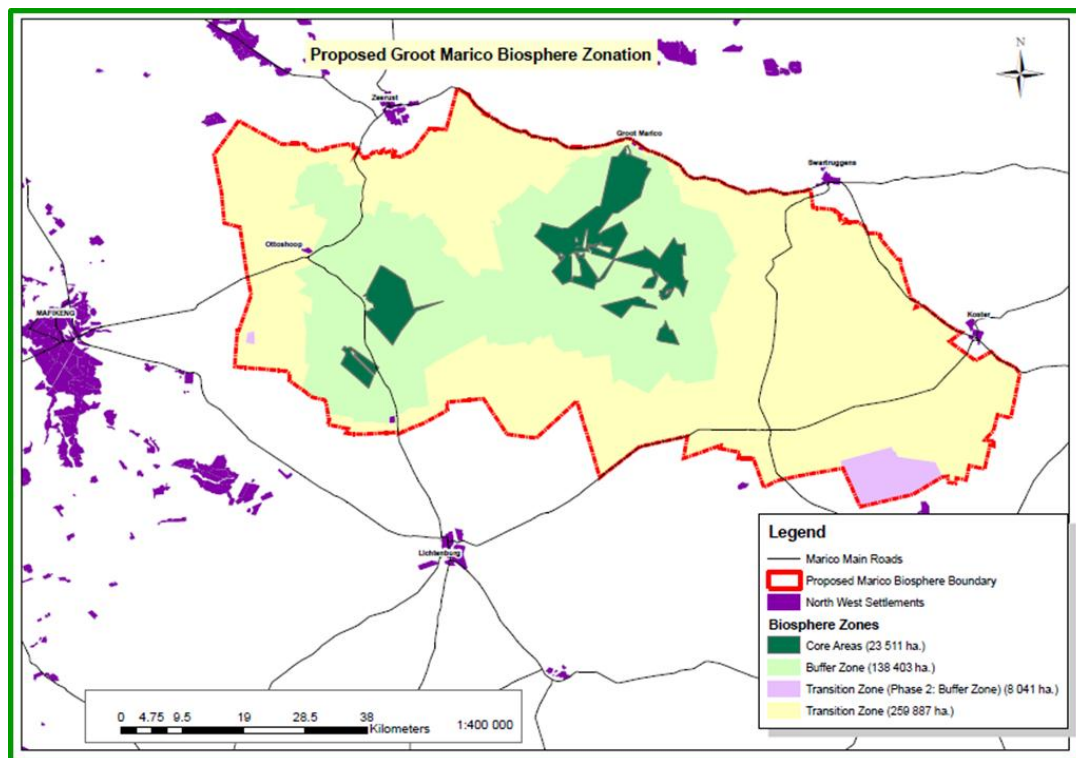


people is to view and assess such needs from a community well-being perspective. With all of this in mind, the aim of this study was to determine the state of both global as well as domain specific well-being of communities in the Marico as well as their satisfaction with life. In addition, the study also set out to address two secondary objectives, namely to: (a) determine the relevance of current interventions (e.g. programmes and projects) in the Marico, and (b) make recommendations for future interventions that are likely to contribute to the well-being of communities, and ultimately, the life satisfaction and quality of life of people living in and around the proposed reserve. These two secondary objectives are reported and discussed in the discussion and recommendation sections of the report.

## Method

### Study area

The study area is located in the north-western part of South Africa's North West Province. The area is commonly referred to as "The Marico" or the "Marico Bushveld".



**Figure 5: Map indicating the study area**

As can be seen in figure 5, the boundary of the proposed biosphere reserve starts at the town of Groot Marico/Reboile in the north (where the first core protected area is located), and runs along the N4 highway in a westerly direction towards the town of Zeerust (where it ends just east of the town), and down in a south-westerly direction towards another small town called Ottoshoop/Maroping. From there the boundary of the proposed biosphere reserve extends further south to the second core protected area, around the Molemane eye, and from there east, to where it ends west of two small towns, Koster and Swartruggens.



A number of medium to large commercial farms (mainly dedicated to livestock, game and small scale crop farming) as well as medium to small subsistence and lifestyle farms are found in the area. The latter are owned by so-called weekend farmers, who typically live outside the proposed biosphere reserve, and who, in most cases do not live in the proposed area permanently.

At least three other communities are also located in the boundaries of the proposed biosphere reserve: Oberholzerskloof, Bokkraal and Rietvlei. All three communities can be described as small, rural, and very isolated villages/settlements.

### Approach and strategy

A concurrent exploratory mixed-methods design (Plano-Clark & Creswell, 2007), based on a pragmatist epistemology (Reichardt & Rallis, 1994), and was adopted as basis for the study. This design consists of two phases: a qualitative phase to gather basic data related to community well-being, as well as a quantitative phase to quantify and verify the initial qualitative findings in relation to community well-being in the area. The benefits of using a mixed-methods approach to research is that it provides multiple perspectives on a phenomenon and contributes to the overall credibility of the study by offering an initial perspective from the participants' point of view, which is later verified and quantified statistically (Plano-Clark & Creswell, 2007).

### Participants

In total, 24 participants were recruited during the qualitative phase of the study. The final sample consisted of an almost equal number of male and female participants, and their ages varied between 22 and 84. These participants were purposively selected (Tracy, 2013) based on their experiences of living or actively working in the proposed Marico Biosphere Reserve area. The sample included 3 representatives from non-profit organisations (e.g. conservation, social and special interest groups), 3 religious leaders, 3 educational leaders, 1 political leader, as well as 1 local shop owner and 2 shop assistants/ employees, 1 clinic sister/manager, 2 home-base care givers, 2 police officers, 1 library assistant and the local municipal manager. The sample also included 4 ordinary community members, who were recruited by means of typical instance sampling (Tracy, 2013).

Following on the qualitative phase of the study, a further 373 participants were recruited to partake in the subsequent quantitative phase of the study. These participants were systematically and proportionally selected based on the size of the different communities that form part of the proposed reserve. In total, 24% were selected from Ottoshoop/Maroping, 23.1% from the Marico/Reboile community, 18.8% from the Rietvlei community, 18.3% from landowners, 9.1% from the Bokkraal community, and 2.2% from the Oberholzerskloof community. Based on the relative sizes of the communities, Ottoshoop/Maroping and Rietvlei were slightly oversampled. This was taken into consideration where differences between the communities were interpreted.

As part of the survey, a number of socio-demographic characteristics were assessed. This was considered as an important step in obtaining an accurate and specific picture of the social and demographic aspects of the region. In turn, such an outline provides an essential contextual backdrop against which the findings of the study has to be assessed and understood, and

furthermore plays an important role in guiding the development of any community based initiatives or interventions that might be considered. Given that the sample was reasonably randomized, the sample is likely to be sufficiently representative that its characteristics could be generalized to the larger (over 18) target population from which it was drawn.

The overall sample included 45.4% males and 54.6% females, with participants' ages varying between 18 and 79, with an average age of 40.2 years (SD = 14.69).

In total, 93.8% of the participants classified themselves as African, 4.6% as White, 1.1% as Indian and 0.5% as Coloured. The majority of the group indicated Setswana as their home-language (84.9%), followed by Afrikaans (4.6%), Sesotho (6%), English (2.7%), other (1.9%), isiZulu (1.6%), and isiXhosa (1.1%). Languages recorded under the category 'other' consist mostly of languages spoken in Zimbabwe.

Most of the participants indicated that they have some secondary education (28%), followed by some primary education (20.6%), no schooling (15.4%), completion of primary schooling (but did not attend secondary school) (14.6%), completed secondary schooling (12.9%), possessing a post-school qualification (diploma, trade, etc.) (6.6%), and only 1.9 % has some kind of university degree.

More than half of the participants reported that they are unemployed (59%), 22.4% that they have a full time job, 8.8% a part-time job, 6.6% report themselves as self-employed, 3% are retired, and 0.8% were students.

In relation to marital status, 83.5% of the participants report themselves as single. It was however discovered during informal conversations with members of the communities that most of these participants live with a partner, and even have families, although they are not formally married. The reason for the prevalence of this phenomenon, according to the participants, is that most of them cannot afford to pay *lobola* (a traditional custom in which a man has to pay a certain amount of money to a woman's family if he wants to marry her). In total, 13.7% of participants reported that they are married, 1.4% were divorced, and 1.4% were widowed. (Interestingly, the incidences of divorce and widowhood are significantly lower than that typically found in comparable communities elsewhere).

The average number of dependents reported is 4 (SD = 2.2), and range between 0 and 10 dependants.

Eighty three point three percent of participants said that they fall in the lower income bracket, 18.4% middle income bracket, and only 1.6% upper income bracket.

Most participants report their physical health as excellent (41.1%), 19.7% as below average, 16.2% as average, 14.1% as above average and only 8.9% reported their own physical health as poor.

Most participants indicated that they are completely connected to nature (61.7%). Their mean connectedness to nature was calculated at 5.97 (SD = 1.59), which is a promising indication for any attempts to conserve the area, because high levels of connectedness to nature are linked to pro-environmental attitudes and behaviours.

Finally, most participants reported that they have a liberal political orientation (69%), followed by 18.8% who see themselves as somewhere in-between, 6.8% as extremely liberal, 3.3% as conservative, and a small part of the sample reported their political orientation as extremely conservative (1.9%).

## Procedure

The need to explore the developmental needs of people living in the proposed Marico Biosphere Reserve was identified during an initial meeting that was held on May, 24<sup>th</sup> 2017. The following day, the chairperson of the proposed Marico Biosphere Reserve met with one of the researchers at the North-West University to further discuss the details and the logistics of the intended research project. An interview schedule was then developed by the researcher (based on the 14 community well-being indicators), and the first round of qualitative data was subsequently gathered between May 30<sup>th</sup> and June 1<sup>st</sup> 2017.

A structured questionnaire was then developed [based on a modified version of Sirgy's *et al.* (2009) measure of perceived community well-being], tested, and subsequently administered. Quantitative data collection was conducted from 12 to 15 June 2017. Ten people from the Marico community were sourced and trained as fieldworkers. As a group, together with three additional volunteers, they collected all the quantitative data. Each morning the group received a target number of questionnaires that they had to complete by walking from house to house to recruit the participants. Based on the size of each community, working radially from a central point in the community outwards, fieldworkers were instructed to approach every  $n^{\text{th}}$  household (with  $n$  being determined by the total number of households in the community divided by the required sample size), in order to attain a reasonable degree of randomisation of the sample. Potential participants were first told about the proposed biosphere reserve, after which the fieldworkers explained to them the purpose of the research before getting their informed consent to participate in the research.

After each working day the number of completed questionnaires were counted and assessed to ensure that all questions were completed correctly.

The questionnaires were then taken to the NWU's Statistical Consultation Services where data were captured and analysed. The first draft of the report was compiled between mid-June and mid-July 2017.

The results were then shared with community representatives from various stakeholder groups. During this time, they also had the opportunity to give final inputs which were incorporated into the report where relevant. The report was finalised and shared with the steering community in August 2017.

## Data gathering methods

A semi-structured interview schedule was used to support data gathering during the qualitative phase of the study. It included five main open-ended questions:

- Please tell me about your community?

- What are the most critical challenges in your community?
- What are the needs in your community?
- What are the assets in your community?
- If all needs outlined in the community well-being index were not addressed in one of these questions, more specific questions related to these were asked on a case by case basis.

During the second phase of the study, a structured questionnaire (Creswell, 2013) was used to collect quantitative data. Section A of the questionnaire was comprised of 13 basic questions that was aimed at collecting socio-demographic data as well as data about the participants' physical health and political orientation. Section B of the questionnaire consisted of a single item scale intended to measure participants' connectedness to nature. In the scale, the participants were asked to circle one of seven pictures that best describes their relationship with the nature/the environment. Section C of the questionnaire was aimed at assessing various aspects of community well-being. In the first question participants had to indicate on a scale ranging from 1 to 7 (1= strongly dissatisfied; 7= strongly satisfied) how satisfied they are with the quality of life in the Biosphere Reserve. Another scale was used to assess the extent that they enjoy living in the proposed reserve on a 5-point scale (ranging from 1 = not at all to 5 = to a great extent). Participants was also asked to indicate if they thought that conditions in the reserve is getting worse, remaining about the same, or getting better, and asked to indicate whether they believed that in the years to come, it will be worse, stay the same as today, or get better than today. Finally, participants were also requested to rate the Marico Biosphere Reserve as a desirable place to live on a 5-point scale (where 1 signifies one of the worst areas in SA, and 5 signifies that they regarded it as one of the best areas in SA as a desirable place to live). In Section D Sirgy's *et al.* (2009) original single item question about satisfaction with life was replaced with Diener's *et al.* (1985) psychometrically robust satisfaction with life scale, which consists of five questions, and which has been shown to provide a cross-culturally reliable measure of life satisfaction. Section E and F were aimed at measuring the participants' commitment and social ties respectively. To measure commitment the participants were asked to indicate if they would move away from the reserve if they were able to do so, and if so, inquired about where they would move to. Two questions were used to measure social ties in the various parts of the reserve, and these items centre on the extent that they have made good friends with other people living in the reserve, and how many other family members (brothers, sisters, aunts, etc.) they have living within their part of the Marico Biosphere Reserve, who do not live in their household (modified from Sirgy *et al.* 2009). Finally, section G was comprised of a scale that assessed the 14 different domains that form part of the community well-being index.

### Data analysis methods

Qualitative data were thematically analysed, following the procedures outlined in Creswell (2013) and Tracy (2013). The dataset was first read in detail to get an overview of the data. Words and phrases in the dataset that were relevant to the research topics were first identified and labelled with descriptive codes as part of an open-coding procedure. This was followed by the grouping of similar themes into categories, based on their conceptual similarities. Finally, where relevant, the categories were grouped into overarching themes and examined for interrelationships, a process referred to as axial coding.

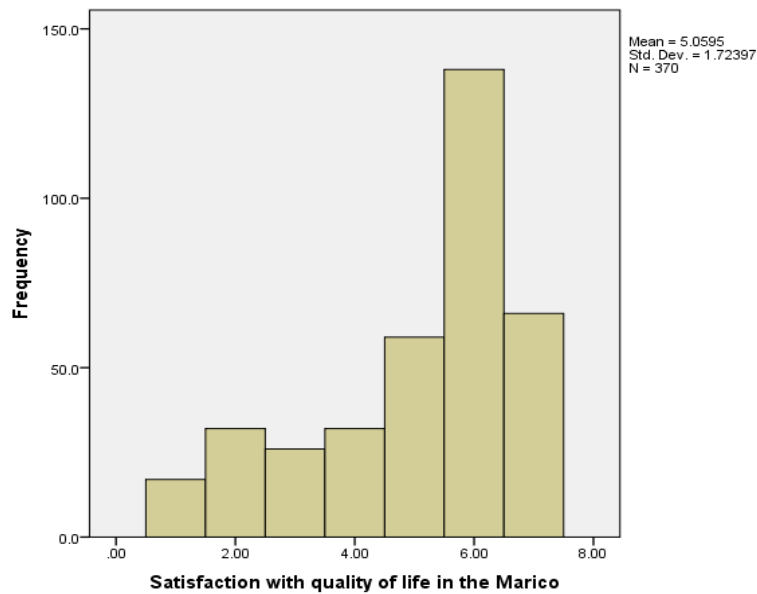
Quantitative data were statistically analysed by using SPSS-24 (Field, 2005). This analysis included the computation of basic descriptive statistics (e.g. frequencies, means, modes, standard deviations, skewness and kurtosis) for all variables. Cronbach's alpha coefficients were computed for all scales and subscales to assess their inter-item psychometric reliability. The results were also compared across demographic groups, using independent t-tests and analysis of variance (ANOVA) to verify the statistical significance of any differences that emerged (Field, 2005). To assess relationships between interval and ratio-level variables, Pearson's product moment correlations were calculated. In the case of all inferential statistics that were used, as is customary in social science research, the threshold for statistical significance was set at  $p < 0.05$  (Field, 2005). Furthermore, the cut-off level for substantive significance of correlation coefficients was set at 0.3, and as such, given their small effect size, correlations smaller than this figure were ignored.

## Results

### Overall community well-being

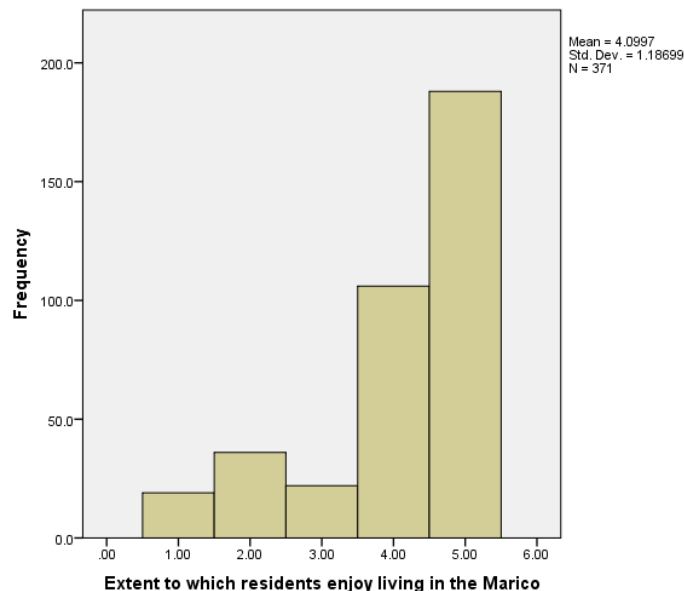
Five questions were used to determine the overall well-being of the communities living in the proposed Marico Biosphere Reserve. The first question was aimed at determining the participants' satisfaction *with the quality of life in the Marico*. This was measured on a 7-point scale ranging from 1 (strongly dissatisfied) to 7 (strongly satisfied). In the total group (all the participants/communities put together), most participants indicated that they are satisfied with the quality of life in the proposed Marico Biosphere Reserve (37.3%), followed by strongly satisfied (17.8%), slightly satisfied (15.9%), and only a low number of participants indicating that they are only slightly satisfied (7%), dissatisfied (8.6%) or strongly dissatisfied (4.6%). In total, 8.6% of the participants were neither satisfied nor dissatisfied. Overall, the mean (average) satisfaction with quality of life score was 5.06 (SD = 1.72). Figure 6 provides a visual representation of these results. This means that, in general, the participants have a significantly above average level of satisfaction with their quality of life in the Marico. Analysis of qualitative data reveals that the participants attribute this to "*good and down to earth people living in the Marico*", the atmosphere (peace and quiet), and low levels of crime, compared to the rest of South Africa.





**Figure 6: Satisfaction with quality of life in the Marico**

In the second question, participants were asked to indicate if they enjoy living in the proposed reserve. Responses were recorded on a 5-point scale ranging from 1 (not at all) to 5 (to a great extent). Results are displayed graphically in figure 7. Most participants indicated that they enjoy living in the Marico to a great extent (50.7%), followed by those whose enjoyment were moderate (28.6%). Only a small portion of the participants indicated that they only enjoy it slightly (9.7%) or not at all (5.1%). In total, 5.9% decided to stay neutral. Viewed in terms of a mean score, the average enjoyment of residents living in the Marico was moderately high (Mean = 4.10; SD = 1.18), indicating that people, in general, enjoy living in the Marico. This was confirmed by the qualitative data.



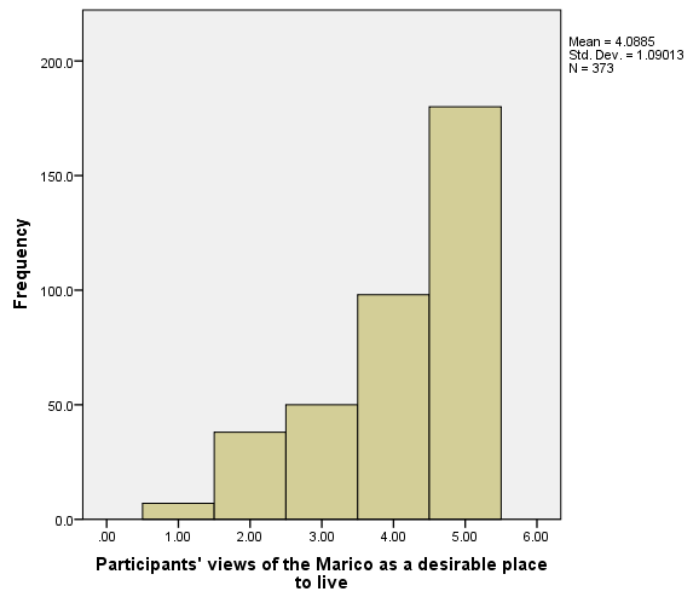
**Figure 7: The extent to which residents enjoy living in the Marico**

In the third question, participants were asked to indicate if they think that conditions in the Marico are getting worse, or whether they think they are remaining the same, or getting better. They were again asked to do so on a 5-point scale ranging from 1 (getting a lot worse) to 5 (getting a lot better).

To this, most participants indicated that they think conditions in the Marico are getting a bit better (50%), followed by the view that conditions remained the same (21.4%). In total, 5.9% indicated that they think conditions are getting a lot better. A much smaller part of the participants indicated that they think conditions in the Marico are getting a bit worse (14.1%) or a lot worse (8.6%). The average score related to perceptions of the current conditions in the Marico was 3.31 (SD = 1.06), suggesting that most participants are carefully optimistic about the current conditions in the Marico. Participants, in the qualitative phase of the research, attributed this to the current developments that are currently taking place in the area (e.g. improved roads, sanitation, etc.), and the possibility of finding employment as well as opportunities for skills development and training in the area (which is currently being offered by the Department of Agriculture and some of the NGOs that were mentioned in the introductory section of this report).

Fourth, to gauge their future orientation, participants were asked to indicate their views (measured on a 5-point scale) on whether conditions in the Marico will get worse, remain the same, or get better in the years to come. To this, participants were even more optimistic, with most participants indicating that they think conditions will get a lot better in the future (39.4%), followed by those who felt that such conditions are getting a bit better (31.4%). In total, 17.7% indicated that they think conditions will remain more or less the same, and only a small percentage indicated that they think it will get a bit worse (5.4%) or a lot worse (5.9%). When viewed as a mean score, (Mean = 3.94; SD = 1.15), it is evident that most people living in the proposed reserve think that conditions in the Marico will be getting a bit better in the future. For this reason (as well as others – see section on safety well-being), many people from nearby villages (e.g. Koffiekraal, Pella, Uitkyk and beyond) are moving in to the area. However, as an unintended negative consequence, this is putting strain on the resources in Groot Marico town, especially when it comes to housing and sanitation in Reboile.

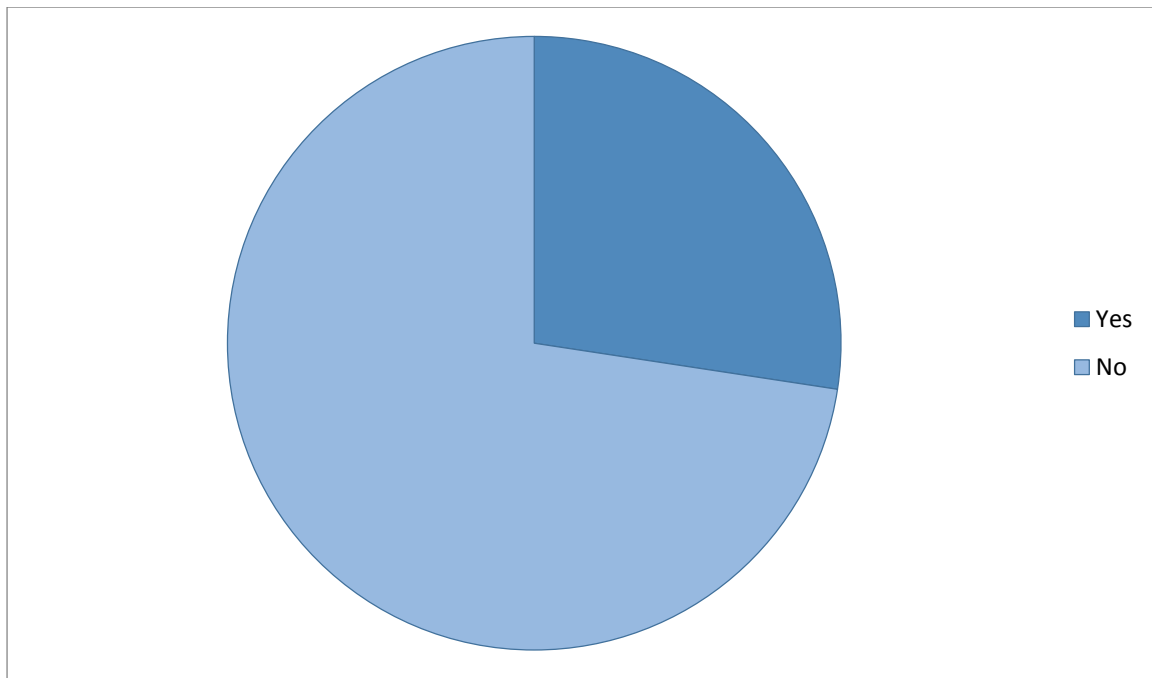
Finally, participants were asked to indicate whether or not they think that the Marico is a desirable place to live. Participants were again asked to do so on a 5-point scale, ranging from 1 (one of the worst areas in South Africa to live) to 5 (one of the best areas in South Africa to live). To this, as visually illustrated in figure 8, most participants indicated that they think the Marico is one of the best places to live (48.3%), with a smaller number feeling that it is a desirable place to live (26.3%). Only 10.2% indicated that it is not desirable, while a very low percentage indicated Marico as one of the worst areas in South Africa (1.9%). Thirteen point four percent decided to stay neutral. The mean score for this question was 4.09 (SD = 1.09), indicating that the majority of the people living in the Marico think that it is a desirable place to live in.



**Figure 8: Extent to which participants regard the Marico biosphere reserve area as a desirable place to live**

### Community commitment

To measure the participants' commitment to the Marico, they were also asked to indicate whether or not they would move away from the Marico area if they were able to do so. The majority (72.6%) of the participants indicated that they would not move away from the Marico (even if they could). A much smaller percentage of the participants (27.4%) indicated that they would move if able to do so, and that if they get the opportunity they will move to Mafikeng, Rustenburg or Gauteng (see figure 9). The main reason stated was that they would move in order to find work (which makes sense in light of the fact that the employment rate in the area is very low and that there are currently not many job opportunities in the area).



**Figure 9: Number of residents who would move away from the Marico if they could**

Taken together, these results indicate that generally speaking, residents of communities in the Marico enjoy living in the region and view it as a desirable place to live that offers good quality of life. Furthermore, they are of the opinion that conditions are not only improving presently, but are also hopeful that conditions will get even better in years to come. Given these findings, residents are generally likely to want to continue living in the area, and would likely find leaving the region distressing.

### Social ties

To measure the social ties in the Marico, participants were asked two questions: The first question was used to determine to what extent they have family members and/or good friends within the proposed biosphere reserve, and the second to determine how many friends or relatives they have living in the Marico (modified from Sirgy *et al.* 2009). To this, most participants indicated that they have made good friends or have family to a great (27%) or moderate (27.3%) extent. A lower number of participants indicated that they do not have many important others living in the area or were not able to make many friends (16.9% = slightly; 19.4% not at all). The number of important others that the participants indicated ranged from 0 to 75, while the average number of friends/family members per participant was calculated at 7.15 (SD = 10.12). This means that even though significant variability exists in this regard, people in the Marico generally have fairly strong social ties, which can be very extensive. This was confirmed during the qualitative phase of the study when participants indicated that many people living in and around the Marico are related and that people in each community tend to know most others. Given that more than half of the participants stated that they have satisfactory friendship or family ties with a significant number of people, any voluntary or enforced movements of residents out of the region will have significant implications in terms of likely adversely affecting their sense of relatedness and their social support networks and structures.

## Global and domain satisfaction

A major aim of the study was to assess Marico residents' global as well as their domain specific satisfaction and well-being. Global, or overall life satisfaction, was measured with the Satisfaction with Life scale (Diener *et al.*, 1985), and domain specific satisfaction was assessed via the community well-being index (Sirgy *et al.*, 2009).

**Table 1: Global and domain specific well-being results**

Item	N	Cronbach Alpha	Mean	SD	Correlations with overall life satisfaction
Overall satisfaction with life	365	0.78	21.69	6.45	-
Safety well-being	365	0.88	4.15	1.54	.25**
Social well-being	333	0.56	<b>5.36</b>	1.10	.15**
Leisure well-being	362	0.89	<b>2.03</b>	1.30	.31**
Family and home well-being	361	0.69	4.32	1.29	<b>.44**</b>
Political well-being	65	0.85	<b>2.98</b>	1.52	.25
Spiritual well-being	366	-.§	<b>5.41</b>	1.67	.30**
Neighbourhood well-being	305	0.82	4.30	1.05	.37**
Environmental well-being	312	0.81	3.78	1.08	.37**
Transportation well-being	369	0.73	4.13	1.39	.14**
Educational well-being	368	0.52	<b>2.97</b>	1.43	.14**
Health well-being	361	0.61	<b>1.94</b>	1.08	.18**
Work well-being	77	0.67	3.80	1.58	.32**
Financial well-being (item d removed)	58	0.73	3.81	0.83	<b>.43*</b>
Consumer well-being	313	-.§	3.34	2.05	.22**

§Note: As these dimensions were measured by a single item, Cronbach Alphas were not computed;

\*\* Correlation is significant at the 0.01 level (2-tailed);

\* Correlation is significant at the 0.05 level (2-tailed).

## Scale reliability

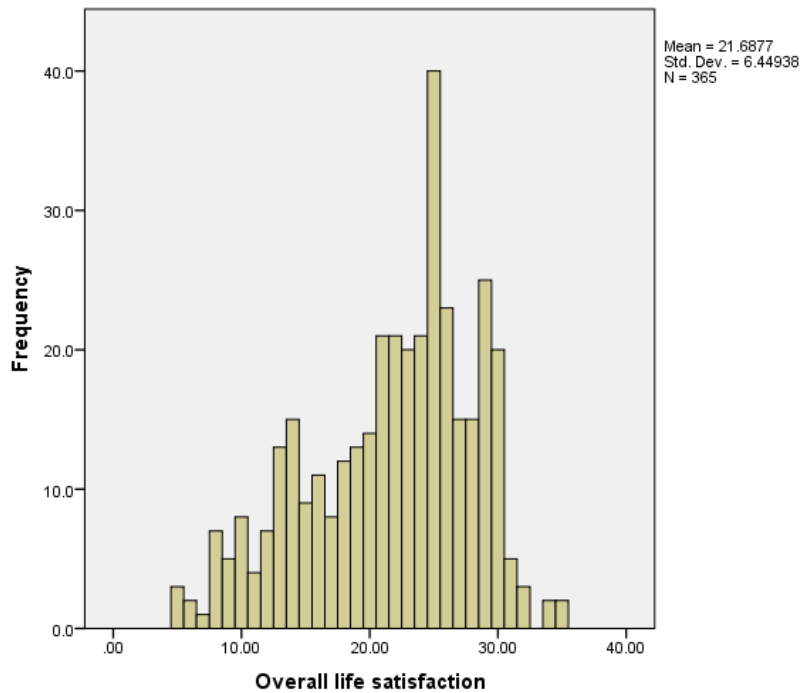
An essential first step in the statistical analysis of questionnaires such as these is to determine the extent to which the questions contained in the scale reliably measured their underlying constructs (or latent variables). To do so, Cronbach Alpha coefficients are computed for all the items in each scale and subscale. The resulting coefficients indicate the extent to which inter-item reliability occurs in the questionnaire. In social science research, Cronbach alphas equal to or exceeding 0.7 are regarded as being indicative of acceptable levels of reliability (Field, 2005), which indicates that the results emanating from the scale are likely to be psychometrically sound. As revealed in Table 1, most scales had Cronbach alpha coefficients that exceeded 0.7, indicating that they are likely to have measured their underlying constructs reliably. The family and home as well as the work well-being subscales of the CWBI are only fractionally short of this threshold, and are still likely to be reliable given the comparatively small discrepancy. The social well-being subscale however, has a Cronbach

alpha of 0.56, which suggests that results from this scale should be treated with caution and would ideally need to be replicated in future studies. This also applies to a lesser extent to the health well-being scale. Although the educational well-being subscale has a low reliability coefficient, this is not a concern as a substantive empirical reason exists for the lack of inter-item consistency. As there are a few schools in the region, but no universities, it is expected that questions pertaining to satisfaction with universities would yield very different answers than those inquiring about satisfaction with schools. As such, the results from this scale are likely to be reliable despite the low coefficient. Finally, the financial well-being subscale initially had a reliability coefficient of 0.39. Further statistical analysis revealed that this low coefficient was due to item d, which requested participants to rate their satisfaction with banks. However, given that most participants do not make use of banks and that no banks are available in Groot Marico and Ottoshoop (the two towns in the proposed reserve area), the reason for this discrepancy is clear. As such, this item was dropped from the subscale and the reliability was recomputed for the remaining items and found to be acceptable at 0.73.

### Overall life satisfaction

The Satisfaction with Life Scale (Diener *et al.*, 1985) was used to assess global/overall life satisfaction of participants. The measure consists of 5 items that are rated on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Total scores are obtained by summing all item scores and range from 5 to 35. Findings (see figure 10) reveal that the participant group's mean life satisfaction was fairly average (Mean = 21.7; SD = 6.45), and somewhat lower than mean scores that have been found in previous studies within comparable communities such as Tlokwe (Mean = 25.17; SD = 6.10), Mahikeng (Mean = 24.08; SD = 6.68) and Emfuleni (Mean = 24.58; SD = 6.58) (Coetzee & Nell, 2016), and among mine workers in the Rustenburg area (Mean = 24.93; SD = 6.90) (Coetzee & Nell, 2014). These results indicate that despite the fact that residents enjoy living in the Marico region, significant room exists for improvements in life satisfaction and that there are likely still a number of needs in these communities that need to be addressed.





**Figure 10: Overall life satisfaction of the participant group**

### Domain specific satisfaction: The Community well-being index

To assess domain specific satisfaction, the Community well-being index (Sirgy *et al.* 2009) was used. In each case, the participants had to rate their level of satisfaction with each of the 14 domains on a 7-point scale, ranging from 1 (strongly dissatisfied) to 7 (strongly satisfied). It should also be pointed out that as certain community systems impact more than one domain, some items are employed in more than one subscale. In order to determine whether participants' domain specific well-being varied according to their demographic characteristics, results from each domain were also statistically analysed according to gender, age, political orientation, self-reported health, and income levels. For the sake of brevity, results of these analyses are only reported in cases where significant differences were found between subgroups. As such, unless otherwise noted, it can be assumed that no significant differences in relation to a given well-being domain were found to exist between the various demographic sub-groups noted above.

### Safety well-being

As indicated in Table 2, participants were generally neither satisfied nor dissatisfied with the prevailing levels of perceived safety in their communities (Mean = 4.15, SD = 1.54). As such, safety considerations are neither promoting residents' well-being, nor detracting from it. However, this still implies that community well-being could likely be enhanced by measures aimed at addressing and enhancing safety in these communities.

In order to obtain a more nuanced analysis of this well-being dimension, Table 2 provides a detailed breakdown of the mean scores and standard deviations of each of the individual items comprising this subscale.

**Table 2: Safety well-being**

Item	Total	SD
Satisfaction with race relations	4.64	1.98
Satisfaction with personal safety	4.79	1.94
Satisfaction with personal safety in public places	4.80	1.86
Satisfaction with security against break-ins to their homes	3.96	2.09
Satisfaction with fire protection	3.54	2.09
Satisfaction with police protection	3.90	2.13
Satisfaction with crime prevention efforts	3.43	2.13

The results indicated that participants have a slightly above average level of satisfaction with the racial relations in their communities. During the qualitative interviews, a good and healthy relationship between different races was reported by a number of participants, and some substantiated this with specific examples of instances when they had to band together to fight a common cause, such as various perceived social injustices or in their efforts to conserve the area (e.g. against proposed mining).

Exceptions, were however also reported. Some of the participants reported conflict between some of the white community development workers and local political leaders. Also, a large number of farmworkers are currently encouraged to move off the farms of certain commercial farmers. Most of them are forced to settle in Reboile and in Rietvlei parts of the proposed biosphere reserve. This trend is starting to cause some racial tension in the area, especially among local politicians and activists. It was however not observed or experienced on a grass-roots level. According to some of the participants, this is a direct result of new legislation gazetted by the South African National Government that states that farmworkers have the right to stay on a particular farm for an indefinite period of time, if they have lived and/or worked on a farm for a specified period of time. This is causing further strain on local infrastructure and resources in Groot Marico town.

Participants were moderately to slightly satisfied with their personal safety and their safety in public places. This is somewhat surprising (especially given the current influx of people into parts of Groot Marico and Rietvlei), because local police stations in the area are severely understaffed. This means that the police can often not respond to cases as soon as they want to. Some of the participants said that they ceased to report cases, because they feel that nothing is done about these cases. However, possibly mitigating this is the finding that current levels of crime in the region appear to be relatively low compared to many other parts of South Africa. According to the local police in the area, they mostly deal with cases related to domestic violence and racketeering, and to a lesser extent, the neglect and abuse of women and children, and assault (2-3 cases per week) which they believe can mostly be directly linked to the misuse/abuse of alcohol and dagga. Preliminary investigation suggests that 'hard' drugs have likely not yet found their way into the communities to any significant

degree. Furthermore, contrary to other regions, rape and murder were reported to be fairly uncommon in the area.

Other typical cases that police have to deal with include theft/housebreaks (around 3 cases per month). This could explain residents' lower levels of satisfaction with security against break-ins to their homes. According to the police officers that participated in the research, landowners who do not live in the Marico on a permanent basis (the so-called weekend farmers) are particularly soft targets, because they are not always there to protect their property. Livestock and infrastructure such as electric cables were reported to be the objects most liable to theft. Two cases of rhino poaching also occurred in the recent past.

A major challenge that the local police currently have to deal with is break-ins into cell phone tower stations, where perpetrators steal generators and backup batteries. This is not only causing a lot of financial strain for mobile cell-phone operators, but is also a major cause for the interruption of cell-phone communication that the local residents in the Marico are experiencing from time to time. The local police officers indicated that most of the crime in the area appears to be committed by illegal immigrants, particularly those from Zimbabwe.

As is evident in Table 2, the participants were somewhat dissatisfied with crime prevention efforts in the area. Reportedly, structures like their local policing forums are currently not functioning. Local farmers in the area however, conduct patrols and are in radio communication with each other.

Fire protection, or the lack thereof, is a real threat in the area, and is something with which community members were found to be very slightly dissatisfied, even though, according to the participants, local farmers assist each other when there a fire breakouts on farms. Apparently, breakouts of veld fires occur from time to time, especially on the highveld area above the escarpment. In the past this also led to the death of local farmers and some of their farm workers. Many communities in the Marico do not have their own fire station and have to rely on other stations, for example from Zeerust to assist them. (There is a half-built fire station in Ottoshoop that is reportedly currently not functioning).

When analysing this well-being dimension according to participants' demographic characteristics, it was found that income levels were positively correlated with safety well-being ( $r = .22, p < 0.001$ ), suggesting that those with more disposable income are likely enabled to implement better security measures than those with lower incomes.

### Social well-being

Of all the dimensions of well-being that were assessed, social well-being (along with spiritual well-being) was rated the highest (Mean = 5.36; SD = 1.1), indicating that residents are generally slightly to moderately satisfied with this life domain. As such, social systems in the community appear likely to be enhancing residents' well-being. (However, it should be noted that the relatively low reliability score obtained for this subscale implies that this finding should be regarded as preliminary and subject to future verification).

A more detailed picture emerges when the results are considered on an item by item basis. The participants' satisfaction with systems affecting their social well-being was measured by 5-items (see

Table 3). Most participants indicated that they are satisfied with their neighbours, friends and acquaintances, and church-related activities, but comparatively less so with the racial mix in their part of the community. However, even in this case, satisfaction levels were significantly above average, and therefore positively associated with well-being.

**Table 3: Social well-being**

Item	Total	SD
Satisfaction with neighbours	5.89	1.32
Satisfaction with racial mix	4.73	2.02
Satisfaction with friends and acquaintances	5.15	1.69
Satisfaction with church-related activities	5.62	1.57

Observations and semi-structured interviews with the participants confirmed the presence of a strong sense of community. Church-related activities played an important role in this regard and are discussed in more detail under spiritual well-being.

### Leisure well-being

Five items were used to assess the participants' satisfaction with systems affecting their leisure well-being. The mean score related to the participants' leisure well-being was the second lowest of all dimensions that were assessed (Mean = 2.03, SD = 1.3), indicating that significant levels of dissatisfaction occur in relation to this issue and that this is currently likely detracting from overall community well-being. As such, this finding suggests that attention should be given to enhancing leisure well-being in the region through the establishment of recreational infrastructure and/or opportunities.

**Table 4: Leisure well-being**

Item	Total	SD
Satisfaction with entertainment facilities	1.99	1.46
Satisfaction with entertainment activities	2.17	1.65
Satisfaction with recreational facilities	2.40	1.76
Satisfaction with recreational activities	2.44	1.81
Satisfaction with parks	1.22	0.76

When viewed on an item-by-item basis, participants were particularly dissatisfied with entertainment facilities and the parks (in this case, the lack of public parks) in their communities, and to a lesser extent with entertainment activities and recreational facilities and activities in the area. This is because recreation and entertainment facilities and activities are reportedly very scarce. Among the few exceptions to this, is an informal recreation area which can be found in Reboile (see figure 11). This area is used by local residents to play soccer and netball.



**Figure 11: Informal soccer field and netball pitch in the Reboile community**

Analysis of qualitative data revealed that recreational activities of community members in the Marico centre primarily on socializing and the concomitant consumption of alcoholic beverages. Most participants stated that they spend most of their recreational time with family or friends, during which time they will have a barbeque and drink alcoholic beverages. Many residents reported spending the majority of their recreational time in local taverns, drinking, and indicated that this is so because there are hardly any of the conventional entertainment facilities available in the proposed reserve. The few residents who can afford it have to travel far (between 20 and 50 kilometres) to get access to typical entertainment facilities such as malls, movie theatres, sporting facilities, etc. There are also no public parks located in the communities that are situated in the proposed biosphere reserve. The children in communities such as Reboile, Rietvlei, Oberholzerskloof and Ottoshoop/Maroping are the most affected, because they have, as one participant put it 'nowhere to play and nothing to do', so they end up 'wandering the streets or getting up to mischief'.

### Family and home well-being

Five items were used to determine the participants' satisfaction with systems affecting their family and home well-being. Participants' overall mean score of 4.32 (SD = 1.29) indicate slightly above neutral levels of satisfaction with this life domain. However, an item-specific analysis of this result reveals that various community systems related to home and family differentially affect participants' well-being. Satisfaction with family life was comparatively much higher than other factors that were assessed, whereas behaviour of children in the community was a significant detractor of well-being within this life dimension.

**Table 5: Family and home well-being**

Item	Total	SD
Satisfaction with the number of children in their community	4.45	1.95
Satisfaction with the behaviour of children in their community	3.55	2.07
Satisfaction with their own family life	5.65	1.53
Satisfaction with the interior of their home	4.00	2.02
Satisfaction with the exterior of their home	3.94	2.00

In spite of the fact that the item-specific level of analysis of the data indicated that participants had comparatively high levels of satisfaction with their own family lives, many households in the community are run by single (unmarried) parents or are child-headed households. Participants also reported that the men in their community are often uninvolved in the upbringing of their children. Many residents were also reported to live in Marico, but to work in other places. However, the survey results suggest that family, even if it does not conform to the ideal of a conventional intact nuclear or extended family, is still a significant source of satisfaction and community well-being in these communities.

Participants were very mildly satisfied with the number of children in their communities, but somewhat dissatisfied with the behaviour of some of the children in their communities. In case of the latter, a number of participants voiced their concerns about a group of delinquent street children who were said to terrorise people in the town of Groot Marico. According to the participants, these children do not attend school, but spend their days begging for money, stealing and vandalising people's property. One of the participants also indicated that this has a negative effect on local tourism. It also appears that the lack of recreational facilities and outlets might be compounding this problem.

Most participants were neither satisfied nor dissatisfied with the exterior and interior of their homes which range from informal corrugated iron structures to formal housing (figure 12).





**Figure 12: An example of some of the housing structures that can be found in the proposed reserve (that range from informal to formal)**

Family and home well-being was (along with spiritual well-being) among the only dimensions found to exhibit variation between different gender groups. More specifically, an independent t-test reveals that males had significantly higher levels of family and home well-being than females: ( $t = 2.31$ ,  $df = 354$ ,  $p < .05$ , two-tailed, mean difference = 0.31, 95% CI: 0.05 to 0.58).

### Political well-being

Community systems affecting political well-being were measured by means of four 4-items. The results indicate that satisfaction with political structures was among the four dimensions with which participants were comparatively the least satisfied (Mean = 2.98; SD = 1.52). More specifically, the participants experienced very mild dissatisfaction with their community leaders, local government, and the services provided by the local government, and were even less satisfied with the property taxes in their part of the proposed reserve.

**Table 6: Political well-being**

Item	Total	SD
Satisfaction with community leaders	3.51	2.17
Satisfaction with local government	3.54	2.07

Satisfaction with local government services (generally)	3.47	2.02
Satisfaction with property taxes	3.18	1.53

Although some of the participants indicated during the interviews that they are fairly satisfied with their leaders, several other participants explained that there were many challenges related to local leadership. Some of these include rumours of corruption, the mismanagement of community resources, and the existence of conflict between leaders.

Participants were also mildly dissatisfied with local government services. Some communities do not have access to basic services (such as water, electricity and sanitation), due to their remoteness. The municipal area is also large and rural, which makes it difficult and expensive for the Ramotshere Moiloa Local Municipality to render equal services to all communities from their main base in Zeerust.

In addition, because of the strain on current infrastructure, the waste water works in Groot Marico overflows from time to time and contaminates the river (figure 13). There are several reports of people getting sick because of this.



**Figure 13: Example of where waste water overflows and end up contaminating the Marico River**

Many people in the proposed reserve do not pay property taxes, because they live in government funded houses (so-called RDP houses). The satisfaction with property taxes (among those that pay property taxes) were somewhat lower compared to other systems affecting their political well-

being. It is however not clear if this is because taxes are perceived to be too high or because of the fact that they have to pay taxes in the first place.

The participants were also asked three additional questions to gauge their levels of trust in government and their views of their own capacity to influence governmental decisions. All questions were scored on a 5-point scale where higher scores represent higher degrees of trust (in the case of question 1 and 2) or power to influence (question 3). In the first question, participants were asked how much confidence or trust they have in their local government. To this the participants indicated a slightly below average level of trust (2.71; SD = 1.44). In the second question, participants were asked if they have confidence or trust in the national government. A slightly higher score was achieved here (2.96; SD = 1.41), suggesting a neutral response where there is neither trust nor distrust. Finally, they were asked how much power they feel they have to influence the decisions made by their local government. Participants' moderately low mean score (2.53; SD = 1.38) suggest that they generally feel that they have comparatively little influence in this regard. Finally, participants' income levels were found to be negatively associated with political well-being ( $r = -.31$ ,  $p < .05$ ), suggesting that the higher participants' incomes were, the less likely they were to be satisfied with the political situation in their communities. Taken together, these findings suggest that a significant need exists for strategies and interventions aimed at enhancing political well-being in the region.

As part of the survey, participants' political orientation (in terms of ranging from extremely politically liberal to extremely politically conservative) were assessed and correlated with all dimensions of well-being. Only one substantive and significant correlation emerged in this regard in that the more conservative residents were, the lower their political well-being tended to be, and vice versa ( $r = 0.31$ ,  $p < .05$ ). As such, around 10% of the variation in participants' political well-being scores can be explained solely by their personal political orientation ( $R^2 = .096$ ).

### Spiritual well-being

A single item was used to assess systems affecting Marico residents' spiritual well-being, which inquired about their satisfaction with church related activities. Results revealed that satisfaction levels were not only well above average, but that spiritual well-being received the highest rating among all the domains that were assessed (Mean = 5.41; SD = 1.66). Two additional questions pertaining to religion were also asked to obtain additional contextual information about the religious activities of participants. First, participants were asked to what extent they were active members of a local church, with answers being assessed on a 5-point scale ranging from 'not at all' (1) to 'to a great extent' (5). The participant group's mean score (4.03; SD = 1.29) suggest that most community members are moderately active members of local churches. Participants were also asked how frequently they attended church services. Answers were assessed on a 4-point scale ranging from 'never' (1) to 'almost every service' (4). Results revealed that church attendance tended to be quite high in the region (Mean = 3.35; SD = 0.94). Overall, these findings suggest that spirituality/religion and local churches likely play a very important role in sustaining the well-being of Marico residents.





**Figure 14: A local church in the Reboile community**

Data extracted from the interviews revealed that there are at least five different religious groups/denomination in the Marico area which include a spiritual home-based group in Groot Marico town, a Dutch Reformed Church and a Reformed Church, also in Groot Marico town, a Baptist Church in Reboile, and a group of Buddhists who live in around the village of Oberholzerskloof. Reportedly, a degree of conflict exists between people attending the Dutch Reformed and Reformed churches.

Apart from family and home well-being, spiritual well-being was the only dimension found to exhibit variation between different gender groups. More specifically, an independent t-test confirmed that females had significantly higher levels of spiritual well-being than males: ( $t = -2.47$ ,  $df = 359$ ,  $p < .05$ , two-tailed, equality of variances not assumed; mean difference = 0.44, 95% CI: -0.79 to -0.10).

### Neighbourhood well-being

Fourteen items were used to assess systems affecting the participants' neighbourhood well-being. Overall satisfaction with neighbourhood well-being only slightly exceeded the neutral point (Mean = 4.3; SD = 1.05). Viewed on an item-by-item basis, participants seem to be fairly satisfied with most systems, but comparatively satisfied to a lesser extent with the behaviour of some of the children in their community, with security against home burglaries, fire protection, and police protection. These findings all serve to confirm those reported in earlier sections.

**Table 7: Neighbourhood well-being**

Item	Total	SD
Satisfaction with neighbours	5.75	1.35
Satisfaction with the number of children in their community	4.61	1.85
Satisfaction with the behaviour of children in their community	3.57	2.02
Satisfaction with personal safety	4.78	1.90
Satisfaction with racial mix	4.60	2.04
Satisfaction with security against break-ins	3.76	2.14
Satisfaction with the number of trees	5.44	1.59
Satisfaction with the appearance of homes	4.20	1.95
Satisfaction with the amount of traffic on their own street	4.95	1.66
Satisfaction with fire protection	3.58	2.06
Satisfaction with police protection	3.90	2.13
Satisfaction with garbage collection	2.77	2.08
Satisfaction with grocery stores	3.03	1.96
Overall satisfaction	4.97	1.80

The participants indicated that they are fairly satisfied with the number of trees in the Marico. However, what is somewhat concerning to many participants is that many of the residents in Reboile, Maroping, Oberholzerskloof and Rietvlei are harvesting large amounts of wood in the area to cook or to warm themselves (figure 15). This may have a devastating effect on the natural vegetation and Marico landscape in the future.



**Figure 15: Residents from the Reboile community collecting wood**

Participants had fairly neutral levels of satisfaction in relation to the appearance of homes in their communities. In general, participants had a mild level of satisfaction with the amount of traffic on their own street. All the communities in the Marico can be classified as rural and therefore do not experience a lot of traffic, except on the N4 highway. This is particularly so at the start and end of weekends and public/school holidays.

One of the aspects that the participants were least satisfied with is garbage collection. This relates to the provision of basic municipal services that was already discussed.

The participants are also somewhat dissatisfied with grocery stores in the region. (This will be discussed in more detail under consumer well-being).

### **Environmental well-being**

Twelve items were used to assess systems affecting the participants' environmental well-being, and overall satisfaction was found to be very slightly below the neutral level (Mean = 3.78; SD = 1.08). However, significant variability occurred among the mean scores of the individual items comprising the subscale.



**Table 8: Environmental well-being**

Item	Total	SD
Satisfaction with the number of trees (natural vegetation)	5.29	1.74
Satisfaction with the appearance of commercial and business area	3.48	1.88
Satisfaction with the appearance of public places (generally)	3.87	1.88
Satisfaction with the appearance of residential area	3.77	1.85
Satisfaction with the appearance of homes	4.21	1.90
Satisfaction with the appearance of the Marico biosphere (generally)	4.94	1.74
Satisfaction with the interior of their home	4.00	1.97
Satisfaction with the exterior of their home	3.99	1.97
Satisfaction with the conditions of the streets	3.03	1.90
Satisfaction with the climate in the Marico biosphere	4.73	1.72
Satisfaction with parks available in and near their part of the community	1.26	0.87
Satisfaction with garbage collection in their community	2.74	2.09

The participants were satisfied with the number of trees (natural vegetation) in the area, as well as with the general appearance of the Marico biosphere, suggesting that the natural environment is likely supporting residents' well-being. However, this was contrasted by the fact that respondents were comparatively particularly dissatisfied with the parks available in or near the areas where they live, and, to a lesser extent, with garbage collection (or the lack thereof) in the region. These finding suggests that community well-being could potentially be enhanced by the establishment of parks and by initiatives aimed at improving garbage management.

Participants were slightly dissatisfied with the conditions of the streets in the region. Qualitative data revealed that this is due to the fact that some of the dirt roads in the area are very corrugated and that there are some potholes, especially in the residential areas of towns like Groot Marico and Ottoshoop. In relation to their urban environments, participants were also very slightly dissatisfied with the appearance of commercial and business areas in their communities. This was confirmed by data from the qualitative interviews, where several participants mentioned that the central business areas in Groot Marico and Ottoshoop have 'gone down' a lot in recent years.



**Figure 16: Appearance of commercial and business area in Groot Marico**

### Transportation well-being

Four items were used to assess systems affecting transportation well-being, and mean satisfaction was found to be fairly neutral (Mean = 4.13; SD = 1.39). More specifically, participants were mildly satisfied with the amount of traffic on their street as well as with general traffic conditions in the Marico biosphere area, but tended to be mildly dissatisfied with the conditions of the roads and with public transportation in the region.

**Table 9: Transportation well-being**

Item	Total	SD
Satisfaction with the conditions of the roads in the Marico biosphere area	3.30	1.99
Satisfaction with the amount of traffic on their own street	4.62	1.75
Satisfaction with traffic conditions generally in the Marico biosphere area	4.79	1.63
Satisfaction with public transportation in the Marico biosphere area	3.80	2.16

A lot of road construction is currently taking place around Groot Marico town, with 'stop and go' points commonly occurring. This is causing frustration among some of the residents, who are of the opinion that the project is taking 'forever' to finish, and that it should have been completed by now.

Whilst the survey data indicated only a mild degree of dissatisfaction in relation to transportation, data from the qualitative interviews suggest that this might be a significant challenge for many local residents in the Marico. This refers to the availability of transport from remote places such as Rietvlei and Oberholzerskloof and even to and from Groot Marico. Most residents have to rely on taxi transportation, which can be very expensive when they have to travel to the nearby town of Swartruggens and to Zeerust to get goods and services that they cannot find in some of the smaller places.

Related to transport in the area is the establishment of a very expensive tollgate just outside the town of Groot Marico on the N4 highway. Local residents get a discounted rate, but are worried that the tollgate will have a negative impact on the town's local economy when it comes to tourists and people who want to visit the annual festivals in town, because these visitors and tourists have to pay R75.00 one way, or R150.00 for a round trip, just to get to or to and from the town. This leaves them with less money in hand to spend on other goods and services in town.

According to some of the participants, a transportation-related resource that is currently totally underutilised is the local train station in Groot Marico. In their view, this train station could potentially be used to transport people and goods (such as agricultural products) to markets in other parts of South Africa. Unfortunately, the main building at the station burned down recently. It is therefore going to require a substantial financial investment to restore it.

### Education well-being

Three items were used to assess the systems affecting educational well-being, and results revealed that residents were somewhat dissatisfied with this aspect of their community (Mean = 2.97; SD = 1.43). Viewed comparatively, this domain received the third lowest satisfaction rating. In particular, participants were found to be strongly dissatisfied with local colleges and universities, and to have a very slight negative evaluation of public schools, and a neutral view of libraries in their communities.

**Table 10: Education well-being**

Item	Total	SD
Satisfaction with local colleges and universities in the Marico biosphere area	1.15	0.65
Satisfaction with public schools serving their community	3.74	2.18
Satisfaction with libraries in their community	4.03	2.50

The participants' satisfaction with local colleges and universities in the proposed reserve was the lowest of all indicators. Participants attributed this to the fact that there are currently no

opportunities in the area for people to further their education. As such, this is a major obstacle to educational well-being in the Marico, and consequently strategies aimed at addressing this gap would likely do much to enhance this dimension of community well-being.

Participants had very mild feelings of dissatisfaction in relation to local schools. There are three schools in Groot Marico (two primary and one secondary school), and a primary school in Ottoshoop. Noted as a challenge was that one of the primary schools in Groot Marico is approximately 4 kilometres from town, which means that children from Reboile have to either walk to school or they have to be transported to and from school on a daily basis.

Furthermore, this primary school and a number of secondary schools are currently experiencing a lot of challenges related to unsuitable buildings (in the case of the primary school) or damaged infrastructure (in the case of the secondary school – see figure 17). A large part of the high school is also without electricity.



**Figure 17: Example of poor infrastructure and conditions at local secondary school in Groot Marico**

There are no schools in Oberholzerskloof and Rietvlei. Most of the children from these villages therefore have to attend boarding school at Klippan, in the Mafikeng area.

In addition, the participants who are involved in the schools (e.g. as teachers or principals) are particularly worried about the large percentage of learner dropouts between grades 1 to 7, and particularly between grades 8 and 12. Apparently, comparatively few children enter high school (60 per year from the local primary school), and even fewer (+20 per year) matriculate. According to some of the teachers, their biggest challenge consists of parents who do not care about the education of their children.



On a positive note, learners also receive food from the schools on a daily basis. This is for many the only decent meal they get per day, and as such, contributes to community well-being (figure 18).



**Figure 18: Feeding scheme at a local high school**



**Figure 19: Unused infrastructure at a local school**

No sports activities are reported to be available at some of the schools (i.e. primary school in Groot Marico). Former sport fields at the Thuto-ke-Matla High School were also not maintained, and are therefore no longer available for sports and recreation. Although there is a brand new tennis court at the high school, the necessary equipment to make use of this facility are lacking. Children from some of the primary and secondary schools do however take part in singing, dancing and art competitions from time to time.

Furthermore, in many cases existing infrastructure at the secondary school (such as classrooms, and the hall at the high school) is currently either being underutilized, or not being used at all (see figure 19 and 20).



**Figure 20: Example of a building that is not currently being used by the local schools, which can also be used for additional education purposes**

The two libraries that exist in the region offer a lot of support to local learners and also host awareness and educational campaigns from time to time. The library in Groot Marico also has computers that are regularly used by residents from the Reboile community.





**Figure 21: Library building in Groot Marico showing some of the resources available here**

### Health well-being

Four items were used to assess systems affecting Marico residents' health well-being. This was found to be the domain with which residents were the most dissatisfied of all (Mean = 1.94; SD = 1.08). Analysis of individual items reveals that participants indicated moderate to strong dissatisfaction with local hospitals, and with medical doctor and dental services. Garbage collection was a source of mild to moderate dissatisfaction. As such, these findings suggest that community structures related to health well-being currently serve as significant detractors of community well-being, and that a need exists for strategies and interventions aimed at ameliorating the current situation.

**Table 11: Health well-being**

Item	Total	SD
Satisfaction with medical doctor services	1.85	1.55
Satisfaction with dental services	1.92	1.55
Satisfaction with garbage collection	2.67	2.07
Satisfaction with hospitals	1.32	0.86

Analysis of the qualitative data provides a number of explanations for the high levels of dissatisfaction. Participants explained that there are currently no medical doctors available in any of the communities, and consequently, they all have to travel to one of the larger towns in the area (such as Zeerust or Mafikeng) in order to obtain medical services. This same is true for dental services. In most cases their only option is to use the local clinic in Groot Marico or in Ottoshoop. However, these clinics are very busy (and severely understaffed in the case of Groot Marico). This means that many local residents cannot get the medical attention that they need.

A mobile clinic also does the rounds to visit remote villages such as Oberholzerskloof, Rietvlei and Bokkraal (Somerplaas shop). However, some of the participants complain about the service they receive from the nursing staff, for example that they are unhelpful and rude.

Some of the most common health related problems in the Marico region, according to one of the local clinic nurses, include Tuberculosis, HIV/AIDS, and malnutrition. Patients also regularly report symptoms related to depression and anxiety. Some of these patients are supported by home-based care givers, who are fairly active in the Reboile community.

### Work well-being

Community systems affecting work well-being were assessed by means of three items. Survey results revealed that overall satisfaction was only fractionally below the neutral level (Mean = 3.8; SD = 1.58), suggesting that this domain does not particularly detract from or enhance community well-being. Item-specific analysis indicates that participants were least satisfied with job opportunities in the region, and to a significantly lesser extent with their own jobs.

**Table 12: Work well-being**

Item	Total	SD
Satisfaction with job opportunities	2.68	1.87
Their own job	3.76	2.18
Satisfaction with their partner's job	4.08	2.14

Job opportunities in the Marico are scarce. The biggest employers in the area are the commercial farmers. They are however reluctant to employ more people, because of new legislation. Many people living in the Marico work in other areas such as Rustenburg, Mafikeng or in Gauteng. Community members from Reboile are also employed by road works companies and on a railway-bridge projects. All of these projects are however of a temporary nature. Furthermore, some of the participants voiced their concerns about some of the contactors bringing people in to work on some of the projects from outside the communities.



**Figure 22: One of the construction projects (a railway-bridge project) in Groot Marico that provides employment to local residents**

Work well-being (along with financial well-being) was the only dimensions found to correlate with participants' age. More specifically, work well-being was found to be negatively correlated with age ( $r = -.32, p < .001$ ), suggesting that the older residents are, the less work-well-being they experience. Perhaps more significantly, overall life satisfaction of those who had full time employment was significantly higher than that of those who were unemployed, as confirmed by an independent t-test: ( $t = -2.75, df = 293, p < .05$ , two-tailed; mean difference = 0.46, 95% CI: -0.79 to -0.13). Whilst causality cannot be determined with certainty from a cross sectional study such as this, in light of existing research indicating that employment is a very strong predictor of subjective well-being (Diener, 2009), this finding suggests that any programmes or interventions that result in increased employment in the region are likely to significantly improve life satisfaction in these communities.

### Financial well-being

Satisfaction with systems affecting participants' financial well-being was assessed by means of three items, and reveal a fairly neutral level of satisfaction that marginally tends towards dissatisfaction (Mean = 3.81; SD = 0.83).

**Table 13: Financial well-being**

Item	Total	SD
Satisfaction with their family's income (husband and wife)	3.22	1.80
Satisfaction with property taxes in their area	3.69	1.44
Satisfaction with cost of living in the area	3.02	1.73

Data from the qualitative interviews revealed that many people do not work and rely on government grants as their only source of income. However, that fact that all the necessary goods and services are not available in all the communities, forces local people to travel large distances to get access to it. This effectively results in an increase in the cost of living in the area, especially if travelling costs are included.

Access to cash is another big challenge reported by many participants. There are currently no banks in any of the communities. Only two ATMs are currently operational in Groot Marico town. Some of the participants however complain that these ATMs are not regularly serviced, and are therefore not usable a lot of the time. As an alternative, some of the local residents in Groot Marico draw money from the local post office, whereas others have to travel large distances to obtain cash. According to the participants, the closing of two major banks (Standard Bank and First National Bank) had a big negative impact on the local economy of towns such as the Groot Marico.

As already noted in the previous section, financial well-being was found to be inversely correlated with participants' age ( $r = -.41, p < .001$ ), which indicates that the older participants were, the lower their financial well-being tended to be. Related to this, participants' income levels were expectedly found to correlate positively with financial well-being ( $r = .40, p < .001$ ) as well as work-well-being ( $r = .40, p < .001$ ).

### Consumer well-being

Participants were asked about their satisfaction with grocery stores in their communities, which is regarded as a proxy measure for consumer satisfaction. The participant group's mean score (3.34; SD = 2.05) indicated that they tended towards mild levels of dissatisfaction with these community systems. One reason for this is that there are no large retail grocery stores in any of the communities in the Marico. At present it appears that consumers have to rely on a number of smaller, family owned shops in the towns of Groot Marico and Ottoshoop that sell basic goods.



**Figure 23: Example of grocery stores in the area**

There are however also a number of smaller spaza-type shops in communities such as Reboile and Maroping. This gives local residence access to basic goods, which means they don't have to travel to town to obtain the necessities.

### Domain and global life satisfaction

As integral part of the study, the associations between participants' domain specific well-being (as measured by the Community Well Being Index) and their overall/global satisfaction with life (as measured by the Satisfaction With Life Scale) were assessed. Given that the study was cross-sectional in nature and that direction of causality can therefore not be established, Pearson's product moment correlation coefficients were employed to assess the relationships between these variables. Generally, in the context of the social sciences, correlations of around 0.1 are regarded as representing a very weak relationship, 0.3 as indicating a moderately strong relationship, 0.5 a strong relationship, and correlations larger than this are taken to represent extremely strong associations (Field, 2005). As reflected in Table 1, the domains that had the strongest associations with overall life satisfaction were family and home well-being ( $r = .44, p < .001$ ) and financial well-being ( $r = .43, p < .001$ ). Whilst causal attributions cannot be assigned to these findings with certainty, given that the research design was not experimental in nature, the findings do suggest that residents' family and home lives and their financial situations are strongly interlinked with their overall well-being. More precisely, each of these domains individually account for 19% of the variance in life satisfaction scores ( $R^2 = .19$  in both cases). This finding, as well as the likelihood of a causal relationship between them is supported by existing research that indicate that financial well-being (in resource poor communities) and social support are amongst the strongest of all predictors of life satisfaction (Diener, 2009).



Furthermore, moderately strong associations were found between overall life satisfaction and neighbourhood well-being ( $r = .37, p < .001$ ) and environmental well-being ( $r = .37, p < .001$ ). In both cases, each of these domains therefore individually accounted for 14% of the variance in life satisfaction scores ( $R^2 = .14$  in both cases).

Moderate, but highly statistically significant associations were found between life satisfaction and work well-being ( $r = .32, p < .001, R^2 = .10$ ), leisure well-being ( $r = .31, p < .001, R^2 = .01$ ), and spiritual well-being ( $r = .30, p < .001, R^2 = .09$ ). Expressed statistically, work well-being and leisure well-being each individually accounted for 10% of the variation in life satisfaction scores, and spiritual well-being for 9% of the variation.

With the exception of political well-being (where the correlation failed to reach statistical significance due to the small subsample size), all other well-being subscales had weak to moderate positive correlations with overall well-being, suggesting that all the domains of well-being that were assessed likely play a significant role in affecting residents' global well-being and life satisfaction.

In combination with conclusions drawn from previous studies, these results suggest that any changes, interventions or other events that significantly impact one or more of these domains (and most especially those which correlate the most strongly with life satisfaction) are likely to be associated with concurrent changes in participants' overall life satisfaction.

## Discussion

The aim of this study was to determine the state of both global life satisfaction and domain specific well-being of communities in the proposed Marico Biosphere Reserve in order to identify their development needs. In addition, the study also set out to address two secondary objectives, namely to: (a) determine the relevance of current interventions (e.g. programmes and projects) in the Marico, and (b) make recommendations for future interventions that are likely to contribute to the well-being of communities, and ultimately, the life satisfaction and quality of life of people living in and around the proposed reserve. A concurrent mixed-methods approach was followed, which included the use of semi-structured interviews ( $n = 27$ ) to gather qualitative data, and the use of a modified version of Sirgy's *et al.* (2009) measure of perceived community well-being and Diener's *et al.* (1985) satisfaction with life scale, that were administered in a questionnaire format ( $n = 373$ ) to gather quantitative data.

Results indicated that health well-being was the domain with which residents were the most dissatisfied of all. Interview data suggest that this is due to the fact that there are no medical or dental practitioners in the area, even in the larger towns of Groot Marico and Ottoshoop. The fact that doctors and dentists can no longer be found in these towns is probably indicative of the fact that it is no longer financially viable for them to work in these smaller towns. Furthermore, local clinics are reportedly very busy, severely understaffed, and the services obtained from mobile clinics are reportedly not as good as it should be. The fact that health promotion is included in SEDEA's barometer, the UN's Sustainable Development Goals and in South Africa's national and provincial development plans for the North-West Province all serve to confirm that the comparatively low level



of health well-being that was found in this study does likely indeed reflect an authentic community need.

The participants' leisure well-being was rated the second lowest of all dimensions that were assessed, indicating that significant levels of dissatisfaction occur in relation to this issue. More specifically, the findings suggest that attention should be given to entertainment facilities and the parks/lack of public parks in their communities, and to a lesser extent with entertainment activities and recreational facilities and activities in the area. The development of typical entertainment facilities such as malls, movie theatres, etc. is probably not feasible given the low density of people in the area, and the financial investment required to maintain these facilities. Innovative and creative alternatives are therefore needed (see second recommendation). These aspects are not included in any of the development guidelines noted in the previous section, and would therefore have been missed if the development needs was not viewed and assessed from a well-being perspective. The establishment of parks in the biosphere reserve, which can also contain entertainment facilities such as areas where children can play or where adults can socialise, seems to be one potentially viable strategy to enhance residents' leisure well-being. In addition, parks can also be used to expose more people to the natural environment (which fits in with the conservation mission of the area). A current challenge related to urban parks in South Africa is that it is managed by local municipalities, and most do not have the resources to maintain these parks (Cilliers *et al.*, 2012). Consequently, these parks are often subject to severe degradation which undermines their intended purpose. A potentially more viable alternative might be to establish a community driven parks (e.g. gardens) (Davoren *et al.*, 2016), perhaps with some private donor funding.

Thirdly, results revealed that residents were somewhat dissatisfied with the education well-being of their community. In particular, participants were found to be strongly dissatisfied with local colleges and universities, and to have a very slight negative evaluation of public schools, and a neutral view of libraries in their communities. The main reason provided for the dissatisfaction with local colleges and universities centered on the fact that residents felt that they have extremely limited access to tertiary education (compounded by the fact that there are no institutions of this kind in their area). Education is identified as key component in the Sustainable Development Guidelines, SADEA's barometer and the South African National Government's National Development Plan, which again confirms that the lower levels of education satisfaction noted in this study are likely indeed indicative of a substantive community need. The establishment of a partnership with an FET college or a university or both is probably the best option to address needs related to tertiary education. The future management of the proposed reserve will also have to work closely with the Department of Education, to make sure the educational needs of learners are addressed – especially when it comes to the maintenance of existing infrastructure.

The results also indicate that satisfaction with political structures was among the four dimensions with which participants (and most especially those with conservative political orientations) were comparatively the least satisfied. More specifically, the participants experienced very mild dissatisfaction with their community leaders, local government, and the services provided by the local government, and were even less satisfied with the property taxes in their part of the proposed reserve. This is another development need that is not identified in any current development guidelines, and as such, represents a significant finding. These findings do suggest that it would likely be important to get 'buy-in' and support from local leaders for a biosphere reserve. Effective and

regular communication is also likely to play an important role in reducing the likelihood of misperceptions and negative attitudes related to the establishment of a biosphere reserve (UNESCO 2017).

The participant group's mean score related to consumer well-being indicated that they tended towards mild levels of dissatisfaction with these community systems. This implies that a need exists to enhance this aspect of community well-being, in spite of the fact that consumer needs are not included in any current development guidelines. People living in the Marico have to travel far to obtain more specialised goods and services. Creative plans to address this should be investigated.

Participants' overall satisfaction with their environmental well-being was found to be very slightly below the neutral level. However, significant variability occurred among the mean scores of the individual items comprising the subscale, for example related to parks and municipal services. To address needs related to service delivery, special attention should be paid to improve local refuse management attitudes and practices within these communities.

The results revealed that overall satisfaction related to work well-being was only fractionally below the neutral level. However, given that overall life satisfaction of those who had full time employment was found to be significantly higher than that of those who were unemployed, and that a negative correlation was found between residents' age and their work as well as financial well-being, and that satisfaction levels were average, significant scope exists for enhancing community well-being through job creation, especially in light of existing research that reveals employment to be one of the most consistently powerful predictors of subjective well-being (Diener, 2009), and also indicates that the need for jobs is normally the biggest or at least the second biggest need identified in many rural communities (Coetzee & Nell 2016), as well as the fact that it is also very prominent in all the different development guidelines. A number of programmes and projects in the Marico currently focus on job creation, and it seems probable that they are addressing at least some of the work-related needs in the area.

Community well-being levels in relation to safety, neighbourhood as well as social and spiritual well-being were all found to be above average (with those with higher incomes having higher levels of safety wellbeing, and women having higher levels of spiritual well-being than men), and as such, will not be discussed in any detail here (the reader is referred to the results section for a comprehensive discussion of these findings). One exception which has been identified in the context of safety and neighbourhood well-being, and which does need to be addressed, is the behaviour of the group of delinquent street children who are reportedly terrorising the town of Groot Marico. Given that this phenomenon might potentially affect tourism in the region, and that it detracts from community well-being in a number of ways, it seems prudent to implement initiatives aimed at resolving, or at least ameliorating this situation.

### Relevance of current interventions (e.g. programmes and projects) in the Marico

As was described in the introductory section of this report, current interventions in the Marico can be divided into three broad categories: (a) those that focus on social-economic development, (b) those that focus on arts, culture and tourism, and (c) those that have a conservation focus. Based on the results of the present study, it can be concluded that current interventions that focus on health

(i.e. the EWT) and education (e.g. ECD centres, after-school support, etc.) , environmental well-being (work by EWT, MRCA, African Pride and others), work well-being (MRCA), and financial well-being are all addressing specific and relevant development needs (as reflected by domain specific community well-being levels) in the communities, and are therefore likely to make an impact and to be effective at enhancing overall community well-being.

However, there are at present no interventions (as far as the researchers ascertain) that currently focus on improving a number of other very important well-being domains with which participants were not very satisfied with. The findings of the present study point to a number of significant community needs (such as leisure, transportation and consumer needs) that appear to be currently not sufficiently recognised and/or addressed in the context of either current interventions in the study area, or in the broader context of current development guidelines such as the Sustainable Development Guidelines, SADEA's barometer and the South African National Government's National Development Plan.

Even among those needs that are addressed, room exists for improvement. The results showed that the most pressing development need in the Marico area relates to health. This domain might therefore represent a good place to start for those who want to improve the residents' satisfaction with life. In this regard, the EWT is ahead of other development organisations and individuals driving development in the area, because it is the only organisation that currently focuses on health. Unfortunately, they currently only do so in selected villages outside the proposed biosphere reserve. The results of the study suggest that it might add a lot of value if they can also focus on communities such as Groot Marico / Reboile, Ottoshoop, and especially the small isolated villages such as Oberholzerskloof, Bokkraal and Rietvlei. In order to do so, EWT will have to expand its capacity or investigate the feasibility to include more health-related partners in its interventions.

## Conclusion

Taken together, even though Marico residents enjoy living in this specific region, it can be concluded that significant room exists for improvements in their life satisfaction and that there are a number of domain specific development needs in communities in the proposed Marico Biosphere Reserve that require attention. In particular, the domains that were found to most detract from residents' well-being were those pertaining to health, leisure, (especially tertiary) education and political structures, followed by the consumer, environmental, work, financial and (based on qualitative findings) transportation domains. As such, existing and new intervention programs and strategies could fruitfully be adapted or designed to specifically target and address these needs, as this will probably result in the most substantive difference being made in the lives of residents in these communities. In addition, results of the present study indicated that the spiritual and social domains, and to a lesser extent the family and home and neighbourhood domains are likely currently promoting residents' well-being. As such, interventions aimed at building on and leveraging these existing community assets are likely to make positive contributions to the satisfaction with life of residents and communities in the proposed Marico Biosphere Reserve. In particular, there might be significant value and synergy in exploring the ways in which current community strengths such as a strong sense of spirituality, social cohesion, neighbourliness and family and home could be leveraged to address those domains that are most inimical to residents' well-being.

## Limitations of the study

No study is without limitations, and it is therefore important to acknowledge any factors that may have adversely impacted research related endeavours. First, as the present study was cross-sectional in its design, and also as this was not the aim of this study, from a statistical point of view no certain causal inferences can be made in relation to variables that have been found to correlate. (However, such relationships can be argued for on the basis of logic and past research findings). As such, causal relationships between dimensions of well-being and factors such as global well-being and demographic factors would need to be established via additional, experimentally based research.

Second, using domain specific well-being as proxy for identifying community needs has a wide range of advantages over most other commonly employed methods (see introductory discussion), but is still, like all other methods, not a fool proof approach. However, by employing a mixed-method design and multiple different data sources and data analysis methods, this limitation has likely been adequately addressed.

## Recommendations for future interventions

When it comes to future interventions, attempts should be made to continue supporting (strengthening) the well-being dimensions that were found to be associated directly (and strongly) with people's overall life satisfaction (i.e. family and home, financial, social, and spiritual well-being) and by focusing on effecting improvements in the domains with which residents' in the Marico were least satisfied with. More specifically:

- *Health-related well-being should be improved.* Given that they already have a focus on health, a logical initial strategy might most probably be for the EWT to expand their health-related focus to Groot Marico, Ottoshoop, Oberholzerskloof, Bokkraal and Rietvlei. An attempt to establish or re-establish medical and dental practices, especially in towns such as Groot Marico and Ottoshoop, could also be encouraged. A third option is to increase the capacity at local clinics. In this regard one strategy might be to engage in co-operative ventures with local universities in which nurses could work at local clinics as part of their service learning/work integrated learning or even their community service year. A fourth strategy could be to improve the effectiveness of mobile clinics (and especially of their staff). The North-West Province Department of Health can be contacted in this regard. A fifth alternative is to investigate the feasibility of establishing one or more private clinics in the area. Quali-health (see [www.quali-health.co.za](http://www.quali-health.co.za)) has devised an innovative and very successful business model to address the health related needs of people who cannot afford medical aid, but who can afford to pay R50 or R100 for a doctor's visit, which suggests that this model might be feasible in the context of the communities in the Marico.
- *Leisure well-being should be improved.* In this regard, existing, unused (or mostly unused) infrastructure (for example buildings at the train stations and central business areas in Groot Marico and Ottoshoop and the school hall at Thuto-ke-Matla High School) could be converted into entertainment venues. Local and national artists could be invited to perform at the latter venue, while more local recreational and/or entertainment facilities such as local shops and restaurants are likely to stimulate more tourism activities in the area (one of

the major aims of a biosphere reserve – UNESCO, 2017). Another potential strategy to increase leisure well-being could be to focus on the development of parks (as a pathway to addressing additional community needs such as those for recreation and environmental well-being). It is however very important that local residents are involved in the identification of the site/s, as well as having some input in deciding what such parks (community gardens) should look like and what facilities should be available, because this is likely to contribute to the sustainability of the intervention (Cilliers *et al.*, 2012).

- *Education well-being should be improved, particularly when it comes to making tertiary education more widely available and improving existing infrastructure at some of the schools.* There are many long-distance education models available that could serve to address the need for higher education. Two of the universities that are particularly operational in this regard in the University of South Africa (UNISA – see [www.unisa.ac.za](http://www.unisa.ac.za)) and the North-West University (NWU – see [www.nwu.ac.za](http://www.nwu.ac.za)). The latter university is also in partnership with Docenda (<https://www.facebook.com/docenda/>), a not-for-profit organisation that specialises in taking education to rural communities. They currently offer degree courses in theology, education and nursing, the latter two of which will be particularly useful in the Marico, because of the many challenges related to health and education. Furthermore, a number of funding and bursary schemes exist that could serve as basis for funding the education of deserving students. In relation to schools, a need exists to renovate existing infrastructure which are often in a very dilapidated state.
- *Attention should be given to improve garbage management.* Attempts should be made for the small towns and villages in the area to become self-sustaining in terms of their waste management attitudes and behaviours. In light of the proposed biosphere reserve, it seems additionally important to implement strategies aimed at countering all forms of environmental pollution or degradation such as littering or other forms of improper waste disposal.
- *Attention should be given to the reportedly problematic behaviour of some of the children in the Groot Marico/Reboile community.* A combined effort between local police and child/welfare services is needed to address the challenge related to the behaviour of the group of delinquent street children who are reportedly terrorising the town of Groot Marico.
- *Given that political well-being was found to be comparatively low among residents in the Marico, it would be important for those involved in any programs or interventions in the region to take cognizance of the fact that political undercurrents and potential political instability might adversely impact such initiatives.* The findings suggest that effectively negotiating a balance between different political interests and agendas might be a significant and important determinant of the degree of success of any such ventures.
- *Given that the overall life satisfaction of those who had full time employment was found to be significantly higher than that of those who were unemployed, and that existing research indicates that employment is a very strong predictor of subjective well-being (Diener, 2009), this finding suggests that any programmes or interventions that result in increased employment in the region are likely to significantly improve life satisfaction in these communities.* In particular, the results also suggest that interventions aimed at increasing the work and financial well-being of especially older residents (which tend to be significantly lower than that of their younger counterparts) should be considered.

- *The feasibility of more readily available transport in the Marico, especially to and from more remote places such as Rietvlei and Oberholzerskloof and even to and from Groot Marico should be investigated.*

## References

- Andrews, F. M., & Withey, S. B. (1976). *Social indicators of well-being*. New York and London: Plenum.
- Campbell, A., Converse, P. E., & Rodgers, W. J. (1976). *The quality of American life: Perceptions, evaluations, and satisfaction*. New York, NY: Russell Sage Foundation.
- Christakopoulou, S., Dawson, J., & Gari, A. (2001). The community well-being questionnaire: Theoretical context and initial assessment of its reliability and validity. *Social Indicators Research*, 56(3), 321–345.
- Cilliers, S.S., Siebert, S.J., Davoren, E., Lubbe, C.S. (2012). Social aspects of urban ecology in developing countries, with an emphasis on urban domestic gardens. In: Richter, M. & Weiland, U. (eds.) *Urban Ecology, a global framework*, pp. 123-138, Blackwell Publishing.
- Coetzee HC & Du Toit I. (2011). *Integrated community needs assessment report for the North West Province, South Africa*. Unpublished report.
- Coetzee HC & Nell W. (2016). *The North-West University's perceived impact on local communities and the needs, assets and well-being of these communities*. Internal report. Commissioned by NWU.
- Coetzee H & Nell W (under review). *The feasibility of national parks in South Africa endorsing a community development agenda: The case of Mokala National Park and two neighbouring impoverished rural communities*.
- Creswell, J.W. (2013). *Qualitative Inquiry and Research Design Choosing Among Five Approaches*. Thousand Oaks: Sage.
- Davoren, E., Siebert, S.J., Cilliers, S.S., Du Toit, M.J. (2016). Influence of socioeconomic status on design of Batswana home gardens and associated plant diversity patterns in northern South Africa. *Landscape and Ecological Engineering*, 12, 129-139.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95(3), 542–575.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125, 276–302.
- Diener, E. (2009). Subjective well-being. In E. Diener (Ed.), *The science of well-being: The collected works of Ed Diener* (pp 11-58). New York, NY: Springer.
- Endangered Wildlife Trust (2017). Official website of Source to Sea Programme. Available at: <https://www.ewt.org.za/SOURCETSEA/sts.html> (Accessed 11 Augustus 2017).



- Field, A. (2005). *Discovering statistics using SPSS*. London: SAGE Publications.
- Mathie, A. & Cunningham, G. (2003). From clients to citizens: asset-based community development as a strategy for community driven development. *Development in Practice*, 13 (5), 474-486.
- Mulroy, E.A. (2013). Community needs assessment. In *Encyclopaedia of Social Work*. DOI: 10.1093/acrefore/9780199975839.013.73.
- North West Provincial Government (2013). Provincial Development Plan. Available at: <http://www.nwpg.gov.za/Documents/Provincial%20Development%20Plan.pdf> (Accessed 11 August 2017).
- Clark Plano, V. L. & Creswell, J. W. (2008). *The mixed methods reader*. Thousand Oaks, CA: Sage.
- Reichardt, C. S. & Rallis, S. F. (1994). Qualitative and quantitative inquiries are not incompatible: A call for a new partnership. *New Directions for Program Evaluation* (61), 85–91.
- South African Department of Environmental Affairs (2015). National barometer for inclusive development. Available at: <https://www.environment.gov.za/projectsprogrammes> (Accessed 11 August 2017).
- Sirgy, M. J., & Cornwell, T. (2001). Further validation of the Sirgy et al.'s measure of community quality of life. *Social Indicators Research*, 56(12), 5–143.
- Sirgy, M.J., Widgery, R.N., Lee, D. & Yu, G.B. (2009). Developing a measure of community well-being based on perceptions of impact in various life domains. *Social Indicators Research*, 96, 295–311.
- Sirgy, M. J. (2002). *The psychology of quality of life*. Netherlands: Kluwer.
- South African Government (2017). National Development plan 2030. Available at: <http://www.gov.za/issues/national-development-plan-2030> (Accessed 11 August 2017).
- Tracy, S. J. (2013). *Qualitative research methods: reflecting evidence, crafting analysis, communicating impact*. London: Wiley-Blackwell.
- UNESCO (2017). Available at: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/> (Accessed 11 August 2017).
- Zumbo, B. D., & Michalos, A. C. (2000). Quality of life in Jasper, Alberta. *Social Indicators Research*, 49(2), 121–140.

## List of tables

Table 1: Global and domain specific well-being results

Table 2: Safety well-being

Table 3: Social well-being

Table 4: Leisure well-being

Table 5: Family and home well-being

Table 6: Political well-being

Table 7: Neighbourhood well-being

Table 8: Environmental well-being

Table 9: Transportation well-being

Table 10: Education well-being

Table 11: Health well-being

Table 12: Work well-being

Table 13: Financial well-being

## List of figures

Figure 1: Community satisfaction and well-being across domains

Figure 2: Multi-purpose/resource centre in Reboile

Figure 3: ECD learning centre in Groot Marico – an example of one of the education related projects in the area

Figure 4: Food security-related project in Groot Marico

Figure 5: Map indicating the study area

Figure 6: Satisfaction with quality of life in the Marico

Figure 7: The extent to which residents enjoy living in the Marico

Figure 8: Extent to which participants regard the Marico biosphere reserve area as a desirable place to live

Figure 9: Number of residents who would move away from the Marico if they could

Figure 10: Overall life satisfaction of the participant group

Figure 11: Informal soccer field and netball pitch in the Reboile community

Figure 12: An example of some of the housing structures that can be found in the proposed reserve (that range from informal to formal)

Figure 13: Example of where waste water overflows and end up contaminating the Marico River

Figure 14: A local church in the Reboile community

Figure 15: Residents from the Reboile community collecting wood

Figure 16: Appearance of commercial and business area in Groot Marico

Figure 17: Example of poor infrastructure and conditions at local secondary school in Groot Marico

Figure 18: Feeding scheme at a local high school

Figure 19: Unused infrastructure at a local school

Figure 20: Example of a building that is not currently being used by the local schools, which can also be used for additional education purposes

Figure 21: Library building in Groot Marico showing some of the resources available here

Figure 22: One of the construction projects (a railway-bridge project) in Groot Marico that provides employment to local residents

Figure 23: Example of grocery stores in the area