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## **South African quantity surveyors: issues of gender and race in the workplace**

*Peer reviewed*

### **Abstract**

A web-based questionnaire survey of the opinions of SA quantity surveyors was undertaken to establish gender- and race-based differences in job satisfaction. Issues explored included demographic factors, issues of gender and race in the workplace, and gender and racial harassment and discrimination at work.

'Significant' differences on the basis of gender exist on a number of issues. Women, more than men, have strong positive feelings regarding their levels of job satisfaction, feel that their career expectations have been fulfilled, would choose the same career again, and would unequivocally recommend the career to others. Females see QS practices as male-dominated, see themselves as being blocked from advancement to managerial ranks, participating less in decision-making, and remunerated at a lower level than equivalent colleagues. Issues important to women include: gender representivity in the profession, flexible working hours and maternity leave above the statutory minimum. Although both gender groups report racial harassment and discrimination at work, women experience significantly more sexual and gender harassment and religious and gender discrimination than do males.

'Significant' differences on the basis of race are evident concerning: feelings of job satisfaction and views on maternity / paternity leave above statutory minima. 'Highly significant' differences on the basis of race arise over issues of: being subjected to greater supervision because of race, not being allowed to contribute meaningfully to the decision-making process, viewing PDI status as a valid basis for promotion, seeing race representivity in the profession as important in combating discrimination at work, having personally experienced racial harassment and discrimination at work, and seeing respect for individual diversity in the workplace as important - with 'Whites' viewing these issues less 'empathically' than their 'Non-white' counterparts.

The results provide valuable indicators for how the quantity surveying firms can create a more conducive work environment for professional staff, particularly females.

Keywords: Job satisfaction, gender, race, harassment, discrimination, quantity surveyors, South Africa

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## Abstrak

'n Internetgebaseerde vraelys opname is gedoen oor die opinie van Suid-Afrikaanse bourekenaars rondom geslag- en rasverskille ten opsigte van werkstevredenheid. Sake soos demografiese faktore, geslag en ras in die werksplek, geslag- en rasteistering asook diskriminasie by die werk is ondersoek.

Merkwaardige verskille oor verskillende sake op die basis van geslag is gevind. Vrouens, meer as mans, het sterk positiewe gevoelens oor vlakke van werkstevredenheid, voel dat hul loopbaanverwagtinge vervul is, sal dieselfde loopbaan weer kies en sal onomwonde dieselfde loopbaan aan andere aanbeveel. Vrouens beskou bourekenaarpraktike as mansgeoriënteerd, sien hulself as uitgesluit van bevordering tot bestuursposte, neem minder deel in besluitneming en ontvang vergoeding op 'n laer skaal as mans op dieselfde vlak. Sake wat belangrik is vir vrouens sluit in: geslagsverteenvoording in die profesie, fleksiewerksure en kraamverloftyd meer as wat wetlik bepaal is. Alhoewel beide geslagsgroepe rasseteistering en diskriminasie in die werksplek aangedui het, het vrouens meer seksuele-, geslags- en gesloofsteistering rapporteer as mans. Merkwadige verskille op die basis van ras sluit ook in: gevoelens van werkstevredenheid en die beskouing dat kraamverlof meer moet wees as die wetlike minimum. Hoogs merkwadige verskille op die basis van geslag sluit in: persone voel onderworpe as gevolg van hulle ras dat daar meer toesig oor hulle gehou word, word nie toegelaat om by te dra tot betekenisvolle besluitnemingsprosesse, beskou 'Voorheen Benadeelde Individu' status as 'n geldige basis vir bevordering, sien rasverteenvoording in die profesie as belangrik in die bekamping van diskriminasie in die werksplek, het persoonlik rasseteistering en diskriminasie by die werk ervaar, en beskou respek vir individuele diversiteit in die werksplek as belangrik - 'wittes' is minder empaties teenoor hierdie sake as hulle 'nie-wit' ampsgenote. Die resultate verskaf waardevolle aanduidings vir hoe die bourekenaarsprofesiefirmas 'n meer bevorderlike werksomgewing vir professionele personeel in besonder, vrouens, kan skep.

Slutelwoorde: Werkstevredenheid, geslag, ras, teistering, diskriminasie, bourekenaars, Suid-Afrika

## 1. Introduction

According to Fogarty (1994), job satisfaction refers to the extent to which persons gain enjoyment or satisfaction from their efforts in the workplace. Locke (1976: 1300) puts it more simply, defining job satisfaction as "... a pleasurable or positive emotional experience resulting from the appraisal of one's job or job experience." Positive attitudes towards one's job are associated with high levels of job satisfaction. The converse is also true (Wilson & Rosenfeld, 1990).

There is a subtle difference between job satisfaction and motivation. Job satisfaction describes or measures the extent of a person's 'contentment' in his or her job. Motivation, on the other hand, explains the driving force(s) behind the pursuit or execution of particular activities or a job. Put in another way, job satisfaction measures 'what is' – the level of job satisfaction while motivation measures 'why' – the

explanation(s) for the level of job satisfaction. The concepts are clearly linked and invariably used interchangeably in practice.

Loosemore, Dainty & Lingard (2003) have highlighted the importance of job satisfaction and motivation to the wellbeing of the construction industry. However, despite the wealth of research into job satisfaction and motivation generally, comparatively little research has been undertaken concerning its application to the construction industry (Asad & Dainty, 2005). This is particularly true in respect of the job satisfaction of building design team professionals. 'Job satisfaction' research in the construction industry has almost solely dealt with 'motivation'. Moreover, it has almost exclusively focused on construction 'worker' motivation (see Ogunlana & Chang, 1998; Baldry, 1995; Olomolaiye, 1990; 1988; McFillen & Maloney, 1988; Olomolaiye & Ogunlana, 1988; Maloney & McFillen, 1986; 1983). No study to date has focused solely on the job satisfaction of quantity surveyors. Even more scarce is literature examining the differences in job satisfaction of quantity surveyors on the basis of either gender or race.

The purpose of this article is to report on a study examining levels of job satisfaction of male and female, and 'Non-white' and 'White' (see Notes 1 and 2) professional quantity surveyors in South Africa. A web-based national questionnaire survey of the opinions of South African quantity surveyors was undertaken to establish their levels of job satisfaction. Issues explored included demographic factors; gender and race issues at work; and gender- and race-based harassment and discrimination at work.

The article provides valuable indicators for how quantity surveying firms can create a more conducive work environment for professional staff. Recommendations for future research are made.

## **2. Gender and job satisfaction**

A number of researchers have examined the relationship between gender and job satisfaction (e.g. Mason, 1995; Goh, Koh & Low, 1991), but the results of many studies have been contradictory. Some studies have found females to be more satisfied with their jobs than males (e.g. Clark, 1997), whilst other have found the reverse to be true (e.g. Forgionne & Peeters, 1982). According to Campbell, Converse & Rogers (1976), such differences can be explained on the basis that women have different expectations with regard to work; in essence, careers are of central importance to men but not as important to women. Research has indicated that men and

women may use different qualitative criteria in their assessment of work (Oshagbemi, 2003). Arguably, women are socialised to have different expectations, or society expects women to have different expectations. According to Oshagbemi (2003), however, there is no compelling reason to believe that, given equal education, employment and advancement opportunities, women should be any less (or more) satisfied than men with their jobs. A relationship is, however, said to exist between employee age and job satisfaction, regardless of gender (Oshagbemi, 2003).

Kiely & Henbest (2000) report on sexual harassment at work (see Note 3), noting that the increase in the numbers of women at work has been accompanied by a rise in the number of complaints. Whilst many women choose not to formally report sexual harassment (Baugh, 1997). Gutek (1985) report that this misconduct is widespread and that about 10% of women leave their jobs because of it. Sexual harassment and discrimination exact a high price from both employers and employees alike, representing a serious risk to employees' psychological and physical wellbeing (Schneider, Swan & Fitzgerald, 1997).

The issue of women in construction has been examined by, for example, Gurjao (2006), Gilbert & Walker (2001), Court & Moralee (1995), Sommerville, Kennedy & Orr (1993), Dorsey & Minkarah (1993), and Gale & Skitmore (1990). An examination of this literature reveals similar global issues (Gilbert & Walker, 2001), namely, justification of the need to increase the number of women in construction, perceptions of the industry by female school-leavers, increasing but unequal numbers joining the industry, and low retention rates of qualified women. The issue of male dominance within the industry has been highlighted. This dominance is said to have led to male orientation of the industry (Court & Moralee, 1995), and a lack of promotion prospects, maternity leave, child care facilities and flexible working hours (Sommerville *et al.*, 1993). Ellison (2001) comments on organisational barriers to promotion of women in firms of chartered surveyors, and the low representation of women at senior management levels.

Gurjao (2006) and Court & Moralee (1995) highlight the issue of retention of female labour within the industry. Women are leaving the industry in their early thirties (Court & Moralee, 1995), often to start a family. The perception on the part of many women that they feel obliged to make a choice between a career and a family is noted by Dainty, Bagilhole, & Neale (2000). Factors resulting in women leaving the construction industry in the UK can be

classified into two groupings: working environment characteristics and private life demands (Court & Moralee, 1995). Sinclair (1998) proposed the existence of a number of masculine subcultures, and that these encourage ritualism relating to sex and sports, bullying, and paternalism.

### **3. Race and job satisfaction**

A number of North American studies have examined the racioethnic differences in various job-related outcomes. Friday, S.S. & Friday, E. (2003) report that such research has focused on differences in job satisfaction (e.g. Lankau & Scandura, 1996), organisational commitment (e.g. Tsui, Egan & O'Reilly, 1992) and turnover intentions (e.g. Davis, 1985). With respect to job satisfaction, mixed results have emerged. For example, studies by Brenner & Fernstein (1984) and Jones, James, Bruni & Sell (1977) found that 'black' employees reported higher levels of job satisfaction than did 'white' employees, whilst studies by Tuch & Martin (1991) and Greenhaus, Parasuamn & Wormley (1990) found the opposite to be the case. These studies covered a variety of occupations; *inter alia*, blue-collar employees, white collar workers, nurses, and social work staff members. Friday, Moss & Friday, (2004) concluded that the literature clearly provides conflicting empirical evidence on racial differences in job satisfaction. None of the above studies relate to the South African context, nor do they focus on design team professionals in general, and quantity surveyors in particular.

Recent literature (e.g. Friday *et al.*, 2004) has suggested that the descriptive variable 'race' is not sufficient in explaining racial differences in job satisfaction. They suggest that other dimensions of racioethnicity, such as the socioethnic dimension, may better explain or provide additional insight into differences in job attitudes between races. Friday *et al.* (2004) propose the use of 'orthogonal cultural identification theory', in terms of which an individual may identify with cultures other than the racial group to which he or she belongs, without 'losing' identity with that original group. A unique facet of this theory is that it acknowledges that an individual's cultural environment is constantly evolving (Friday *et al.*, 2004). The application of orthogonal cultural identification theory is clearly beyond the scope of this article given its purpose.

None of the above studies focused on the quantity surveying profession in general or on gender or race differences in particular.

#### **4. Post-apartheid South Africa: a contextual background to the research**

The *apartheid* legacy in South Africa provides a unique context to examine gender- and race-based differences in quantity surveyors' job satisfaction. In terms of *apartheid* legislation, persons were racially classified as 'White', 'Black', 'Coloured', or 'Asian'. The term 'Coloured' was used to describe South Africans who are from mixed descent. The 'Asian' classification included Indians (a large minority grouping in South Africa). For the purposes of enforcing *apartheid*, persons were generally categorised as either 'White' or 'Non-White' (see Notes 1 and 2).

Post-apartheid South Africa saw the introduction of 'positive discrimination' or 'affirmative action' as a vehicle to assist previously disadvantaged persons (PDIs) ('Non-whites' and women) (South Africa, 1996). Black Economic Empowerment (BEE) and affirmative procurement policies are examples of mechanisms used to facilitate change. Within the context of the construction industry, affirmative action has, for example, taken the form of preferential procurement in the award of building contracts and the appointment of professional consultants. The latter point has relevance here, as anecdotal evidence suggests that some quantity surveying practices accelerate the advancement of PDI staff ('window dressing' or 'fronting') in order to gain an advantage in the award of public sector commissions, in terms of which the number of PDIs in the practice in general, and in managerial positions in particular, are important considerations.

Given the legacy of *apartheid* and the current policy of the government to address the inequities of the past, it is considered appropriate to provide the racial 'classification' of respondents i.e. 'Non-whites' and 'Whites'. This classification will be referred to where considered appropriate in the analysis of the data.

#### **5. The quantity surveying profession in South Africa**

In South Africa only persons registered with the South African Council for the Quantity Surveying Profession (SACQSP), a statutory body in terms of the *Quantity Surveying Profession Act* (No. 49 of 2000) (South Africa, 2000) and Regulations promulgated in terms of the Act., are permitted to call themselves 'quantity surveyors', adopt the letters 'Pr.QS', and perform work reserved for quantity surveyors. The requirements for registration generally consist of the holding of a 4-year degree in quantity surveying, 3-year's post-graduation

practical experience ('articles') under the mentorship of a Pr.QS, and successfully passing an Assessment of Professional Competence (APC). As at June 2007, the SACQSP report 1756 registered quantity surveyors. Of this total, 218 (12.4%) are women. No such figures are available with regard to race.

## **6. Methodology and data collection**

The data for this study were collected via a web-based, online questionnaire survey. This data collection instrument was adopted as it would facilitate the comparatively easy (and inexpensive) national coverage of every registered quantity surveyor in South Africa. The range of issues included in the survey instrument was drawn from the previous studies undertaken by, for example, Uppal (2005), Asad & Dainty (2005), Gilbert & Walker (2001), Smithers & Walker (2000), and Olomolaiye (1988).

A pilot web-based study was conducted with the co-operation and involvement of the Cape Town branch of a national firm of quantity surveyors. The questionnaire was tested with regard to respondent understanding, as well as in terms of the mechanics of data collection *per se*. The pilot study demonstrated that all questions were easily understood, data were collected successfully on the system, and so no changes were made. The full survey was launched in May 2007. The SACQSP emailed all registered quantity surveyors for whom email addresses were on record ( $N = 1448$ ), requested their participation in the survey, and provided a link to a URL where the questionnaire could be completed on-line (see <http://webdav.uct.ac.za/research/cemjobsat/index.html>). A period of 3 weeks was allowed for responses and contact details were provided in the event of queries. By due date 98 responses had been received, representing a response rate of 6.77%. To increase the number of returns the deadline was extended by two weeks, by which time 146 submissions had been received. Of these, 23 (16%) are women; exceeding the proportion of women (12.4%) registered as quantity surveyors (population). The final response rate of 10.08% ( $n = 146$ ) is considered adequate for a survey of this nature (Oppenheim, 1992). The data were analysed using SPSS for Windows.

## **7. Discussion of the results**

The findings indicate that the majority of the respondents may be considered to be 'White', male South Africa citizens, senior professionals, with considerable experience. Most consider themselves to be paid an average, to above average, salary. Most report being

employed in the private sector, in professional quantity surveying practices, and holding a four-year full-time degree or equivalent. All respondents are members of the ASAQs, with membership of other professional bodies (e.g. RICS) being considerably less. The vast majority of participants report being married (or in a relationship) and having children. Whilst the single largest age grouping for both male and females is the '45 and older' age group (males: 49%; females; 26%), racial differences exist. More specifically, although 51% of 'White' respondents fall into the '45 and older' age category, the single largest grouping for 'Non-whites' is the '30-34' year category (30%).

### **7.1 Issues relating to gender at work**

Earlier work by Gale (1991) and Gilbert & Walker (2001) investigated whether men and women perceive the same issues (variables) at work to be motivating and de-motivating. The relatively low numbers of women in the industry is said to be related, directly or indirectly, to perceived male 'domination' at work. As stated earlier, this dominance is said to have led to male orientation of the industry (Court & Moralee, 1995), and a lack of promotion prospects, maternity leave, child care facilities and flexible working hours (Sommerville *et al.*, 1993). In South Africa, women, together with 'Non-white' persons, have been classified as PDIs for the purposes of affirmative action.

The majority of quantity surveyors rate highly the 'principle' of remuneration being fair and equitable regardless of gender, and there was no significant difference between responses from males or females in this regard ( $p=0.13$ ). The same holds true for the rating of the need for equality in recognition by the employer, with no differences between gender ( $p=0.59$ ). When the 'reality' of the situation is examined, significant differences are apparent between males and females regarding remuneration ( $p<0.01$ ) with 35% of females compared to 6% of males stating that they feel that they are being remunerated at a level lower than equivalent colleagues due to gender. The fact that the proportion of women participating in the survey (16%) exceeds their representivity in the general population of registered quantity surveyors (12.4%) permits the assertion that gender differences are significant based on evidence from the data. There is no difference between the groups ( $p=0.76$ ) regarding the recognition by their employers of achievements regardless of gender. These results accord with those of Ellison (2001).

Whilst there is considerable support for flexible working hours, significant gender differences of opinion exist in respect of both the



importance ( $p < 0.01$ ) and presence ( $p = 0.05$ ). More specifically, women had a higher tendency to support strongly the need to be away from work during normal working hours and consider such flexibility to be very important. The same gender differences are apparent with respect to the 'importance' of maternity and paternity leave above statutory minimum entitlements ( $p = < 0.1$ ). Whilst it appears that the vast majority of employers adhere to statutory minima, 68% of the females hold the view that entitlements above the minimum are 'important' or 'very important'. Only a third of the males support this contention. These results mirror the findings of Sommerville *et al.* (1993).

Whilst a secure working environment [safety needs] is deemed important by the vast majority of both male (89%) and female (96%) quantity surveyors, a greater proportion of females (87%) compared to males (41%) see it as a very important issue. Over a quarter of both groups claim not to work in a safe and secure environment. There was no significant difference between the way males and females responded to the presence of a secure working environment ( $p = 0.60$ ), but women did find this factor to be more 'important' than males ( $p < 0.01$ ). Given current crime levels in South Africa, security is an important consideration.

In keeping with the findings of Court & Moralee (1995), the management of the vast majority of respondent quantity surveying firms is male dominant, although significant differences are apparent between the two groups over this issue ( $p < 0.01$ ). Where such male dominance exists, nearly 50% of female respondents (males: 3%) feel that advancement of females to managerial ranks is blocked by management. Clearly, perception differences by gender exist regarding advancement possibilities for women ( $p < 0.01$ ). These findings support those of Ellison (2001). Similar views are held by women in respect of not being allowed to contribute meaningfully to the decision-making process, albeit to a lesser degree where the gender difference is not significant ( $p = 0.23$ ). An important message stems from these results. Whether grounded in fact or not, the perceptions of women regarding barriers to advancement, lack of participation in decision-making, and consideration of issues such as flexible working hours are important and cognisance needs to be taken of them by management. Few male or female quantity surveyors feel that they are subject to a high degree of supervision in the workplace because of their gender, with no significant differences between the two groups ( $p = 0.24$ ).

Notwithstanding the fact that 'affirmative action' or 'positive discrimination' is permitted (for PDIs) in terms of the Constitution of South Africa (South Africa, 1996), the vast majority of male and female respondents see promotion on the basis of PDI status (positive discrimination) to be 'unacceptable'. No significant differences in the opinions of men and women exist in this regard ( $p=0.92$ ).

Regarding whether or not professional status is important in combating perceptions of discrimination in the workplace, the vast majority of quantity surveyors (males: 71%; females: 78%) stated that it was ( $p=0.34$ ). When similarly questioned regarding gender representivity, 26% of males and 52% of females 'agreed' or 'strongly agreed' that it was important. Females had a greater tendency than men to support the issue of gender representivity ( $p=0.03$ ).

## **7.2 Issues relating to race at work**

Unlike the work of Gale (1991) and Gilbert & Walker (2001) dealing with the perceptions of men and women, no similar, race-based research appears to have been conducted in the construction industry.

The majority of quantity surveyors ('Non-whites': 88%; 'Whites': 93%) rate highly the 'principle' of remuneration being fair and equitable regardless of race, and there was no significant difference between the two groups ( $p=0.69$ ). When the 'reality' of the situation is examined, whilst a majority of 'Non-whites' and 'Whites' stated that they are not discriminated against in terms of salary, large proportions of both groups ('Non-white': 42%; 'White': 28%) claim that they are. The difference between the groups is not significant ( $p=0.27$ ). Both groups consider equality in recognition of achievements by employers to be important ( $p=0.88$ ). In reality, however, significant differences ( $p=0.01$ ) in this regard between the groups emerge with 44% of 'Non-white' compared to 76% of 'Whites' 'agreeing' or 'strongly agreeing' that this is in fact the case. Employers need to take account of these feelings of marginalisation on the part of 'Non-whites'.

Whilst there is considerable support from both groups (>70%) for flexible working hours, differences by race in respect of both the importance ( $p=0.14$ ) and presence ( $p=0.63$ ) of this factor are not significant. A clear majority of both groups (>80%) report that their organisations adhere to the statutory minimums with respect to maternity and paternity leave ( $p=0.88$ ), although 'marginally' significant differences ( $p=0.06$ ) exist between the groups with more

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'Non-whites' (55%) than 'Whites' (37%) seeing entitlements above the minimum as 'important' or 'very important'.

Regarding a secure working environment [safety needs], there was no significant difference between the way 'Non-whites' and 'Whites' responded to the presence ( $p=0.23$ ), or importance ( $p=0.67$ ), of a secure working environment.

Insofar as 'race in the workplace' is concerned, significant differences are clearly evident. Whilst the majority (84%) of all respondents see promotion on the basis of one's PDI status rather than on ability as unacceptable, clear differences between the two race groups are evident ( $p<0.01$ ); with 22% of 'Non-whites' compared to 3% of 'Whites' viewing it as an acceptable practice. Management needs to be sensitive to this issue.

Although a majority of both race groups ('Non-whites': 57%; 'Whites': 90%) do not see themselves as being subjected to a high degree of supervision because of their race, more 'Whites' (55%) than 'Non-whites' (17%) are emphatic about this. Significant differences exist between the two groups on the issue of supervision and race ( $p<0.01$ ). Significant differences also exist between the two groups regarding not being allowed to contribute meaningfully to the decision-making process ( $p=0.02$ ), with 33% of 'Non-whites' (compared to 10% of 'Whites') claiming this to be the case. Most respondents ('Non-whites': 96%; 'Whites': 87%) stress the importance of participation in decision-making, with a marginally significant difference between the groups ( $p=0.07$ ). Management needs to be cognisant of this issue.

Regarding whether or not professional status is important in combating perceptions of discrimination in the workplace, although more 'Non-whites' (83%) than 'Whites' (71%) state that it is, the difference between the groups is not significant ( $p=0.13$ ). When similarly questioned regarding race representivity, the difference in responses between the groups is significant ( $p=0.02$ ); with 42% of 'Non-whites' compared to 27% of 'Whites' stating that it is important.

### **7.3 Gender and racial harassment and discrimination at work**

Respondents were requested to provide details regarding the extent to which gender- and/or race-based harassment and discrimination at work had personally been experienced. Whilst incidences of 'harassment' do occur, their frequency is comparatively small with females experiencing proportionately more sexual (17%), racial (17%), and gender (30%) harassment than their male colleagues.

Statistically significant differences between the two groups occur in the cases of sexual ( $p=0.01$ ) and gender ( $p<0.01$ ) harassment. Although a larger proportion of women experience racial harassment (see Gutek, 1985), though there is no significant difference on the basis of gender ( $p=0.51$ ). Of those who claim to have experienced racial harassment, a larger proportion are 'Non-white' (29%), with a significant difference between the two groups ( $p=0.02$ ). Few respondents from either race group report sexual harassment at work ( $p=0.26$ ). Harassment on the basis of gender ( $p=0.65$ ), sexual orientation ( $p=0.17$ ), and religious affiliation ( $p=0.13$ ) appears minimal. Clearly, any form of harassment is unacceptable and management needs to be alert to these practices and implement remedial and supportive action where necessary.

Perceived 'discrimination' in the workplace appears to be more widespread, particularly with regard to race, gender, and educational background. Racial discrimination appears to be the most widespread, being reported by more than a third of all respondents. There is a statistically significant association between gender and discrimination on the basis of gender ( $p<0.01$ ) and religious affiliation ( $p=0.05$ ). Close to a majority of female respondents (48%) report having experienced gender discrimination at work. These results mirror those of Gurjao (2006). Incidences of discrimination on the basis of sexual orientation and physical disability are minimal.

Racial discrimination appears to be the most widespread, being reported by 58% of 'Non-whites' and 31% of 'Whites' ( $p=0.02$ ). It is not clear whether the incidences of racial discrimination are 'active' rather than in a 'passive' form associated with affirmative action. More 'Non-whites' (17%) than 'Whites' (5%) report discrimination on the basis of educational background, with a marginally significant difference between the groups ( $p=0.06$ ). This feeling of discrimination may result from the fact that 39% of 'Non-whites', compared to 19% of 'Whites', do not hold a 4-year university degree or its equivalent. Respondents from both groups (13%) have experienced gender discrimination, but the group differences are not significant ( $p=1.00$ ). Incidences of discrimination on the basis of sexual orientation, religious affiliation and physical disability are minimal and differences between the groups not significant. These results support those of Ellison (2001). Again management needs to be sensitive to these issues.

Finally, whilst an overwhelming majority of both male and female respondent groups regard respect for individual diversity in the workplace to be important, there is a significant difference between

males and females ( $p < 0.01$ ), with more women (78%) than men (44%) citing it as 'very important'. Whilst the majority ('Non-white': 100%; 'White': 87%) regard respect for individual diversity in the workplace to be 'important' or 'very important', there is a significant difference between the two race groups in this response ( $p = 0.01$ ) with 45% of 'Whites' (compared to 71% of 'Non-whites') seeing it as 'very important'. Such intolerance is contrary to the provisions of the South African Constitution (South Africa, 1996).

#### **7.4 Overall levels of job satisfaction – gender and race perspectives**

Although the vast majority of participating quantity surveyors appear to like the work they do, significant differences exist between the male and female respondents ( $p < 0.01$ ) with 68% of females reporting that they 'like it very much' or 'love it', compared to 38% of the males. These results conflict with those of Oshagbemi (2003). When asked whether or not they would recommend a career in quantity surveying to others, significant differences are apparent between the two gender groups ( $p = 0.02$ ). More specifically, whilst a majority of males (75%) and females (79%) said they would 'probably' or 'definitely' do so, far more females (48%) than males (19%) were emphatic. Over a quarter of both gender groups said they were unlikely to recommend the career to others.

Most male (85%) and female (83%) respondents claim to have 'probably' or 'definitely' experienced fulfilment with regard to their career expectations, although far less males (19%) than females (48%) said so with absolute conviction; giving rise to a significant difference between the groups ( $p = 0.01$ ). When asked if they would choose the same career again, significant differences exist between the two gender groups ( $p < 0.01$ ) with a greater proportion of females (44%) than males (17%) stating that they would. Again, these results conflict with those of Oshagbemi (2003).

Whilst more 'Whites' (46%) than 'Non-whites' (22%) report that they 'like it very much' or 'love it', the differences overall are not significant ( $p = 0.22$ ). A small minority of both race groups appear indifferent to the job. When asked if they would choose the same career again, whilst a clear majority of each racial group said that they 'definitely' or 'probably' would, nearly 30% of both race groups claimed that they most likely would not. Differences between the race groups are not significant ( $p = 0.57$ ). Interestingly, 'Non-whites' and 'Whites' differ significantly ( $p = 0.03$ ) as to whether they would consider moving into a different field of employment within the built environment, with

more 'Non-whites' (21%) than 'Whites' (10%) emphatic about this. When asked whether or not they would recommend a career in quantity surveying to others, no significant differences exist between the race groups ( $p=0.85$ ) with 79% of 'Non-whites' and 75% of 'Whites', respectively, stating that they would 'probably' or 'definitely' do so.

Comparatively few quantity surveyors experience high levels of job dissatisfaction at all times; certain aspects of the work obviously giving rise to job dissatisfaction to a greater or lesser degree – most notably the measurement of builders' work, project administration, and the preparation of final accounts. Reasons cited under 'Other' included: perceived incompetence of other professionals; poor documentation from, and lack of faith in, designers; bureaucracy; dealing with government officials (political interference); disparaging attitudes displayed towards 'White' women by 'Black' male clients; contractual disputes; professional appointments made on the basis of affirmative action; and dealing with 'incompetent' emerging contractors. The provision of cost estimates appears to give rise to the least job dissatisfaction. Differences between the gender and race groups are not significant.

## **8. Conclusions**

The focus of this article has been a gender- and race-based comparison of the opinions of quantity surveyors in South Africa regarding job satisfaction. An overview of research relating to the nature of job satisfaction was provided. Previous research into job satisfaction and motivation in the construction industry was discussed. The dearth of literature relating to quantity surveyors' job satisfaction in general, and gender and racial differences in particular, was noted. The focus of this research centred on a number of issues, namely: issues relating to gender and race at work; personal experiences of gender- and/or race-based harassment and discrimination at work; and levels of job satisfaction experienced by the different groups.

'Significant' differences of opinion between the male and female respondents exist on a number of issues. More women (68%) than men (38%) have strong positive feelings regarding their levels of job satisfaction. Similarly, considerably more women (48%) than men (19%) feel that their expectations regarding the career have been fulfilled. Proportionately far more females (44%) than males (17%) would choose the same career again, and considerably more women (48%) than men (19%) would emphatically recommend a

career in quantity surveying to others. The females rated having flexible working hours far more highly than men.

It is common cause that the management structures of quantity surveying practices are male dominated. Female quantity surveyors see this as giving rise to male-dominated management actively blocking female advancement to the managerial ranks (50%) and being remunerated at a lower level than equivalent colleagues (35%). Although the difference is not significant, more females (25%) than males (12%) claim not to be allowed to contribute meaningfully to the decision-making process. Women, significantly more than men, see gender representivity in the profession as a means of combating discrimination at work. Issues of maternity / paternity leave above the statutory minimum and working in a secure environment are significantly more important to women than men.

Instances of sexual, racial and gender 'harassment' at work are not uncommon. Women experience significantly more sexual (males: 2%; females: 17%) and gender (males: 2%; females: 30%) harassment at work than their male counterparts. Both males and females report suffer from racial harassment (males: 12%; females: 17%), but the difference between the two groups is not significant. Similarly, instances of 'discrimination' occur in the workplace. Significant differences between the two groups occur in the cases of religious affiliation (males: 2%; females: 13%), and gender (males: 6%; females: 48%). It is noteworthy that nearly half of all female respondents report gender discrimination. Both groups report racial discrimination (males: 37%; females: 26%), but group differences are not significant. Whilst a vast majority of both groups consider respect for individual diversity within the workplace to be important, the females are more emphatic in this regard.

'Significant' differences of opinion between the 'Non-white' and 'White' respondents exist on a number of issues. More 'Whites' (46%) than 'Non-whites' (22%) have strong positive feelings regarding their levels of job satisfaction. Conversely, more 'Non-whites' (21%) than 'Whites' (10%) would consider moving to a different field of employment in the built environment. More 'Whites' (82%) than 'Non-whites' (68%) have positive feelings about recognition by employers of achievements regardless of race, this disparity becoming more pronounced when considering those who are emphatic about this issue. 'Non-whites' (55%), significantly more than 'Whites' (37%), see maternity / paternity leave above statutory minimums to be important.

'Highly' significant differences between 'Non-whites' and 'Whites' arise over issues of: being subjected to greater supervision because of race; not being allowed to contribute meaningfully to the decision-making process; viewing PDI status as a valid basis for promotion; seeing race representivity in the profession as important in combating discrimination at work; having personally experienced racial harassment and discrimination at work; and seeing the importance for respect for individual diversity in the workplace – with 'Whites' viewing these issues less 'empathically' than their 'Non-white' counterparts.

These results provide valuable indicators for how quantity surveying firms can create a more conducive work environment for professional staff, particularly with regard to a safe and secure working environment; feelings of marginalisation on the part of 'Non-whites'; attitudes of 'Whites' to promotion on the basis of PDI status; feelings of 'Non-whites' regarding the need to be included in decision-making and being subjected to greater levels of supervision on the basis of race; and combating harassment and discrimination at work.

Further research could explore the discrepancy between women being more satisfied in their jobs than men, but displaying greater levels of dissatisfaction than their male counterparts with the way they perceive themselves to be treated in the profession. Similarly, the intersection between race and gender is worthy of examination; particularly the low levels of job satisfaction being experienced by "Non-white" females.

## Notes

1. In terms of the *apartheid* legislation of the pre-1994 government in South Africa, persons were racially classified as 'White', 'Black', 'Coloured', or 'Asian'. The term 'Coloured' was used to describe South Africans of mixed descent. The 'Asian' classification included Indians. For the purposes of enforcing *apartheid*, persons were generally categorised as either 'White' or 'Non-White'. While the latter term has some pejorative connotations, it remains a useful label for categorising several groups of people who were formerly disadvantaged due to their ethnicity. It has been solely used in that capacity in this research.

2. Given the legacy of *apartheid* and the policy of the current government of South Africa to address the inequities of the past using mechanisms of 'positive discrimination' and 'affirmative action', it has been considered appropriate to use the racial classifications



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of survey respondent groups for some of the data analysis. In most cases, however, the complete sub-groupings were too small for reliable analysis, and the larger 'White' and 'Non-White' sub-groups (as explained in Note 1 above) have been used.

3. The definition of sexual harassment is sometimes subject to wide interpretation. In 2001 the US Supreme Court defined sexual harassment as discrimination based on the sex of the employee dealing with their compensation, terms, conditions or privileges of employment (Moyes, Williams & Koch, 2006).

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## **Dimensions of a mature quantity surveying profession**

### **Abstract**

The initiative of this article was to identify those dimensions that are important determinants in establishing and developing an instrument/indicator to measure/indicate the level of maturity of a profession, in general and the South African profession.

A questionnaire based on previous research results done by the authors (research on project management maturity) was compiled to identify and weigh the most important dimensions of a mature quantity surveying learned society. Leaders in the profession and some identified imminent professionals in South Africa, were requested to evaluate these dimensions according to the level of importance of each. Professional development work done by the South African Council for the Quantity Surveying Profession (SACQSP) and the Association of South African Quantity Surveyors (ASAQS) also contributed to the study. The following dimensions were selected and used for this study: education, training, mentorship, continuing professional development (CPD), research, marketing, infrastructure, law & legislation, standardisation, management practices and total quality management. The opinions of the respondents of the quantity surveying profession as a mature and learned society were also tested. A weighting of these dimensions was used to propose a maturity model for the quantity surveying profession.

After the results were analysed it became clear that respondents regarded training to be more important than qualifications, thus identifying the need to clearly define the difference between education and training. Training, marketing and management practice were also evaluated to be of similar importance. However, this did not influence the identification of the various dimensions' importance. The results showed the dimensions that are perceived to be of substantial importance for a mature quantity surveying society. Analysis of results also enabled the proposal of a maturity model for the quantity surveying profession as a learned society.

Keywords: Learned society, mature profession, maturity model, quantity surveying

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## Abstrak

Die doel van hierdie studie was om daardie dimensies te identifiseer wat belangrike determinante is in die vestiging en ontwikkeling van 'n meetinstrument wat die vlak van volwassenheid van 'n professione die bourekenaarsprofessie in die besonder, kan bepaal/omskryf.

'n Vraelys gebaseer op vorige navorsingsresultate gedoen deur die outeurs (navorsing oor projekbestuur volwassenheid) is saamgestel om die gewig van die mees belangrikste dimensies van 'n volwasse bourekenaarsgeleerde-gemeenskap te identifiseer. Leiers in die profesie en sommige geïdentifiseerde prominente professionele persone in Suid-Afrika, is versoek om hierdie dimensies na gelang van die vlak van belangrikheid daarvan te evalueer. Professionele ontwikkelingswerk gedoen deur die Suid-Afrikaanse Raad vir die Bourekenaars Profesie (SARBP) en die Vereniging van Suid-Afrikaanse Bourekenaars (VSBR) het ook tot die studie bygedra. Die volgende dimensies is geselekteer en gebruik vir die studie: onderwys, opleiding, mentorskap, voortgesette professionele ontwikkeling (VPO), navorsing, bemaking, infrastruktuur, wetgewing, standardisasie, bestuurspraktyke en kwaliteitsbestuur. Die mening van respondente oor die bourekenaarsprofessie as 'n volwasse en geleerde gemeenskap is ook getoets. Die gewig toegeken aan elk van hierdie dimensies is gebruik om 'n volwassenheidsmodel vir die bourekenaarsprofessie voor te stel.

Na 'n analise van die resulte blyk dit duidelik dat respondente opleiding as meer belangrik as kwalifikasies beskou het – vandaar 'n behoefte om die verskil tussen onderwys en opleiding beter te definieer. Opleiding, bemaking en bestuurspraktyke is evalueer as ewe belangrik. Nogtans het dit nie die identifisering van die belangrikheid van elke dimensie beïnvloed nie.

Sleutelwoorde: Geleerde gemeenskappe, volwasse profesie, volwassenheidsmodel, bourekenkunde

## 1. Introduction

Literature on the contribution of the quantity surveying profession towards maturity currently shows a lack of awareness within areas of the profession in respect of determinants of maturity. The competencies required from a company, a nation or society depend on its context (Gasse, 2006: online).

According to The Free Dictionary (2008a: online) 'world class' are defined as: "Ranking among the foremost in the world; of an international standard of excellence; of the highest order." Nations, regions, industries and associations are continuously striving to become 'world class'. This is also true about the quantity surveying profession. The problem is, is the profession a learned mature society? This can possibly be answered by defining the concepts 'mature' and 'society' and evaluating different maturity models (see Figure 1 and Figure 2) that are required for analysing the maturities of different social systems. The Free Dictionary (2008b: online) defines society as: "a formal association of people with similar interests." Mature means: "fully considered and perfected" or "being changed over time" (The Free

Dictionary, 2008c: online). A mature society should concern itself with determinants of maturity such as learnership, education and training to be seen as a society that strive towards 'world class.'

The Project Management Group of the Wirtschaftsuniversität, Vienna, Austria initiated the research programme: *Project orientation [international]* at the beginning of 2005. The objective of the research programme was to analyse and benchmark about 350 project-oriented companies (in about 15 project-oriented nations). The models were based on the project-oriented company and management in a project-oriented society or nation. It therefore also addressed the most important elements of a project oriented nation referred to in Figure 2, in this instance reflecting South Africa. The results gained may lead to strategies on how to further develop maturity models, identified during the study, for the quantity surveying profession (Project Management Group, 2006.)

Project management maturity does not relate to function or knowledge only but is an integrated system dependent on a total measurable profile. This may also be true about the quantity surveying profession (Verster & Hauptfleisch, 2007).

The project management maturity model was used as a guide to develop a quantity surveying model. Project-oriented companies, organisations, enterprises or nations have specific strategies, structures and cultures. A maturity model may be thus divided into dimensions or processes and sub-dimensions. Various weights are allocated to the dimensions to indicate the importance of a specific dimension (Gareis, 2005: 32). This is analysed in a project-orientation maturity model as shown in Figure 1, illustrates the dimensions (processes) applicable.



Figure 1: Project-orientated maturity model

Source: Gareis, 2005: 32



This model was used as a viable structure to identify the most important dimensions of a mature quantity surveying learned society.

An organisation operates in a bigger system defined as a nation or society/association. The previous research project, describe above, also strived to provide an understanding of the maturity of a project-oriented nation. Fuessinger (2006: 3-4) proposes that the maturity of a project-oriented nation should also include the following additional project management related services:

- **Education** — Formal education programmes are provided
- **Research** — Research projects, publications and events
- **Marketing** — A national project management (professional) association (and it's activities)

The spider web model in Figure 2 shows the average project management maturities of South Africa in respect of the results obtained from the survey described above. This served as an example to establish a foundation for identifying the dimensions of a quantity surveying profession maturity model.

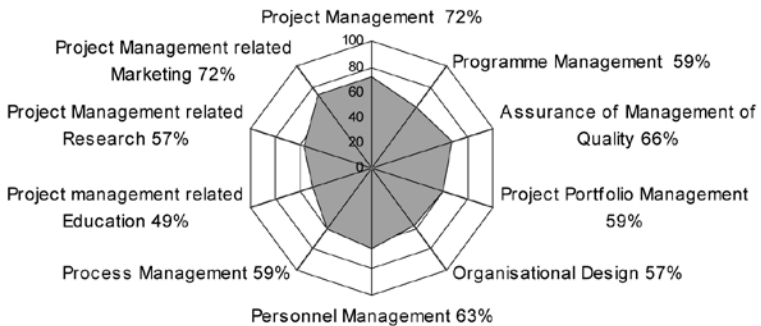


Figure 2: Average Maturities of South Africa based on the survey results (61.6%)  
Source: Project management Group, 2006a

Figure 2 shows that the average maturity ratio (including the three dimensions of a mature nation) for South Africa is 61.6%. South Africa shows a high maturity ratio in Project Management at 72%. Organisational Design (57%) and Project Management related Education (49%) show the lowest maturity ratios and are thus the development areas for South African organisations.

The research in respect of project management maturities of nations or societies concentrated on dimensions and processes related to key performance areas or functionalities within a specific social system. These dimensions and processes were influenced mainly by performance and perceived outcomes of the functions.

## **2. Research methodology**

The aim of the research project done by the by the University of the Free State (UFS) was to establish the most important dimensions (elements) that may determine the level of maturity of a social system, association or specified profession specifically as a learned society. A selected group of 107 professionals, including prominent quantity surveyors, board members of the Association of South African Quantity Surveyors, members of the South African Council for the Quantity Surveying Profession and academics who are seen as the leaders of the quantity surveying profession were requested to complete a questionnaire. 56 Responses were received from the invited group reflecting a 52% response rate. The questionnaire was based on research by the Project Management Group Wirtschafts University of Vienna, Austria as well as research by involved researchers of the UFS (Project Management Group, 2006a; University of the Free State, 2007). The questionnaire for the project management maturity analysis was structured according to the dimensions or processes of a mature profession. Based on 11 identified dimensions that are seen as important indicators of a mature and learned society, the questionnaire consisted of 20 questions.

## **3. Findings**

The questionnaire was answered individually by each respondent in order to determine their perceived opinion about the importance of each dimension's role and influence on the profile of the quantity surveying profession, specifically related to South Africa. However, the results may also be true in respect of quantity surveying in other social systems and/or nations and perhaps for other professions.

### 3.1 Education (Dimension 1)

Table 1: Education as dimension to determine maturity of the quantity surveying profession

Responses	Average rating											Total	
	1 = Not important					5 = Extremely important							
	1	2	2.5	3	3.3	3.5	3.8	4	4.3	4.5	4.8	5	
Number of respondents	0	0	2	4	1	1	11	8	12	12	3	2	56
Percentage of total	0	0	3.7	7.1	1.8	1.8	19.6	14.3	21.3	21.4	5.3	3.7	100
Average rating	4.0												

Education is perhaps the most important dimension to determine the level of maturity of a specific profession within the investigated social system per nation. This is evident in the registration policies of statutory councils, membership acceptance by institutions or associations and the level of education expected of entrants for membership or registration (RICS, 2005; 2007: online; ASAQS, 2007: online; SACQSP, 2007: online; 2007a; 2007c; CIOB, 2007: online).

In South Africa, as in many other countries, standards to be achieved by entrants are generated for each profession and for providers of education. It is important to evaluate the notion of a profession regarding education elements such as entry level qualifications, accreditation of providers, level and number of higher qualifications within the profession, and the provision of technical expertise within the system. For this reason these elements were indicated in the questionnaire.

### 3.2 Training (Dimension 2)

Table 2: Training as dimension to determine maturity of the quantity surveying profession

Responses	Average rating								Total
	1 = Not important				5 = Extremely important				
	1	2	2.5	3	3.5	4	4.5	5	
Number of respondents	0	0	2	9	9	11	10	15	56
Percentage of total	0	0	3.6	16.1	6.1	19.7	17.8	26.7	100
Average rating	4.1								

Most professions require an in-employment (in-service) training period after qualification to ensure that candidates within adjust to practice and are trained to practice as an independent functionary profession.

The South African Council for the Quantity Surveying Profession (SAC-QSP) requires an in-house candidatedship of three years after obtaining a recognised tertiary qualification with some allowances for recognition of pre-qualification employment (SACQSP, 2007a; 2007b).

### 3.3 Mentorship (Dimension 3)

Table 3: Mentorship as dimension to determine maturity of the quantity surveying profession

Responses	Unsure	Average rating					Total
		1 = Not important		5 = Extremely important			
		1	2	3	4	5	
Number of respondents	6	0	0	2	17	31	56
Percentage of total	10.7	0	0	3.6	30.3	55.4	100
Average rating		4.6					

The general accepted meaning of mentorship is that it is utilised to support a process of transferring knowledge and skill. Typically this entails that an older knowledgeable person imparts knowledge and skills to a younger *protégé* (Verster & Hauptfleisch, 2007).

The research aims at various interventions to uphold and promote improvement in standards regarding the development of a profession and of professionals. It is thus noteworthy that experiential training, supported by active mentoring, may be emphasised adequately. As is the case for professions such as medicine, accounting, engineering, law, etc. it is imperative that the scientific use of mentoring in developing a learned quantity surveying profession should be mandatory (Verster & Hauptfleisch, 2007).

### 3.4 Continuing professional development (CPD) (Dimension 4)

Table 4: Continuing Professional Development as dimension to determine maturity of the quantity surveying profession

Responses	Average rating									Total
	1 = Not important				5 = Extremely important					
	1	1.5	2	2.5	3	3.5	4	4.5	5	
Number of respondents	1	1	2	2	5	8	13	7	17	56
Percentage of total	1.8	1.8	3.5	3.5	8.9	14.3	23.3	12.6	30.3	100
Average rating	4.0									

Continuing Professional Development (CPD) is seen as one of the most important dimensions in ensuring that a profession or function within a specific society or association and the members thereof are continuously developed to keep up with the latest tendencies, skills and knowledge relevant to a specific profession. This must be done throughout professional life (Cruywagen, 2007).

Many professional bodies, councils and associations have policies in place to ensure that registered persons or members achieve the CPD requirements. Some examples are the Royal Institution of Chartered Surveyors (RICS), International Cost Engineering Council (ICEC), Chartered Institute of Building (CIOB) and the SACQSP (SACQSP, 2007: online; CIOB, 2007a: online; ICEC, 2007: online; RICS, 2007: online).

Previous research indicated that 77% of the quantity surveying respondents of that specific research project conceded that some CPD was necessary for a profession (Cruywagen, 2007: 98).

The perceptions of respondents were tested to establish the level of importance of CPD, and their opinions in respect of the current number of hours per year required by the SACQSP.

### 3.5 Research (Dimension 5)

Table 5: Research as dimension to determine maturity of the quantity surveying profession

Responses	Unsure	Average rating					Total
		1 = Not important		5 = Extremely important			
		1	2	3	4	5	
Number of respondents	5	1	2	8	25	15	56
Percentage of total	8,9	1,9	3,9	15,7	45,5	29,4	100
Average rating		4,0					

The research output of a specific society and its members is an important benchmark to establish the level of maturity of scholarship within a specific social system. The importance of research is underscored by noteworthy professional institutions. An education provider for instance cannot join the RICS partnership if they do not achieve the required research output (RICS, 2007a: online).

The latest requirements for accreditation of providers of quantity surveying education in South Africa also include the same level of research output as the RICS (SACQSP, 2007b). The level of importance given to research by respondents assisted with establishing the perceived importance of research as a dimension and also the

maturity of the society in understanding the role of research and the profile of quantity surveying in South Africa.

### 3.6 Marketing (Dimension 6)

Table 6: Marketing as dimension to determine maturity of the quantity surveying profession

Responses	Unsure	Average rating								Total
		1 = Not important				5 = Extremely important				
		1	2	2.5	3	3.5	4	4.5	5	
Number of respondents	1	0	0	3	3	4	19	16	10	56
Percentage of total	1.7	0	0	5.5	5.5	7.3	34.5	29	18.2	100
Average rating		4.1								

Referring to marketing as a maturity dimension within the profession of project management, Fuessinger (2006: 3-4) defines marketing as a national project management association. For the purpose of the research project, marketing is extended to involve an established identity and status of a profession, members' standing in a society, and a marketing strategy by the profession.

During 2006 the ASAQS engaged a re-vitalisation exercise; a national co-ordinated strategic plan to replace the 1990 model and strengthen the profession's image in the market. This exercise is currently ongoing (ASAQS, 2006).

### 3.7 Infrastructure (Dimension 7)

Table 7: Infrastructure as dimension to determine maturity of the quantity surveying profession

Responses	Average rating								Total
	1 = Not important				5 = Extremely important				
	1	2	2.5	3	3.5	4	4.5	5	
Number of respondents	0	1	2	4	5	16	16	12	56
Percentage of total	0	1.7	3.6	7.2	8.9	28.6	28.6	21.4	100
Average rating	4.2								

The creation and availability of infrastructure to support members of a profession is seen as an important element of maturity for a specific profession.

The ASAQS realised this in 1996 and the EduTech Centre was established in Port Elizabeth and later moved to Midrand (near

Johannesburg); the primary aim is to support membership in respect of education, training, CPD, technical support and the development of standard and model documentation (ASAQS, 2005: online).

### 3.8 Law and legislation (Dimension 8)

Table 8: Law and legislation as dimension to determine maturity of the quantity surveying profession

Responses	Average rating							Total
	1 = Not important		5 = Extremely important					
	1	2	3	3.5	4	4.5	5	
Number of respondents	0	0	1	3	6	10	36	56
Percentage of total	0	0	1.8	5.4	10.7	17.8	64.3	100
Average rating	4.7							

Not all professions within a specific country are governed by law and legislation. The status of many professions as learned societies rely on the need of the services required by the market. Discipline and control in respect of ethics and standards are upheld by an established professional body like the RICS, ICEC and CIOB. In South Africa, the ASAQS is a voluntary organisation of members elected to join the association if they possess the required entry level (South Africa, 2000).

The quantity surveying profession is however governed by an Act. The act aims at ensuring standards and discipline in respect of the profession in South Africa (South Africa, 2000). This dimension was tested to establish its relevant importance.

### 3.9 Standardisation (Dimension 9)

Table 9: Standardisation as dimension to determine maturity of the quantity surveying profession

Responses	Average rating					Total
	1 = Not important		5 = Extremely important			
	1	2	3	4	5	
Number of respondents	0	1	6	22	27	56
Percentage of total	0	1.8	10.7	39.3	48.2	100
Average rating	4.3					

The ASAQS and other professional institutions in South Africa have, separately and jointly, over many years, developed standards and

model documentation to assist the members to perform their duties and to enable the market to standardise in respect of systems, contract documentation, reporting and communication (JBCC, 2000: 9).

Standardisation as a dimension was included in the questionnaire to establish its role and influence on the profile of the profession as a mature profession and a learned society.

### 3.10 Management practices (Dimension 10)

Table 10: Management practices as dimension to determine maturity of the quantity surveying profession

Responses	Unsure	Average rating					Total
		1 = Not important		5 = Extremely important			
		1	2	3	4	5	
Number of respondents	1	0	1	8	32	14	56
Percentage of total	1.8	0	1.8	14.5	58.2	25.5	100
Average rating		4.1					

The evidence of management practices within a profession may also be seen as an important determinant of a mature profession. This was true in respect of the maturity research done previously (Garies, 2005: 32; Gasse, 2006: Online).

It was therefore necessary to include management practices as a dimension in the questionnaire to establish its relative importance in respect of role and influence on the quantity surveying profile.

### 3.11 Total quality management (Dimension 11)

Table 11: Total quality management as dimension to determine maturity of the quantity surveying profession

Responses	Average rating					Total
	1 = Not important		5 = Extremely important			
	1	2	3	4	5	
Number of respondents	1	2	15	26	12	56
Percentage of total	1.8	3.6	26.8	46.4	21.4	100
Average rating	3.8					

The evidence of total quality management systems present within a profession to ensure the delivery of quality services to clients is seen as a dimension and determinant of the level of maturity of a profession.



It needs to be pointed out that education, training, CPD, mentorship, research and discipline within an association are related to the governing of a profession and are therefore also quality indicators.

#### 4. Importance of dimensions

The respondents' responses to the twenty questions related to the 11 dimensions as determinants of the quantity surveying profession as a mature and learned society in South Africa are shown in Table 12 as averages of all questions answered related to each dimension.

Table 12: Importance of Dimensions

Dimension	Average on 1-5 point Likert scale	% of importance
Law and Legislation	4.7	94
Mentorship	4.6	92
Standardisation	4.3	86
Infrastructure	4.2	84
Training	4.1	82
Management Practice	4.1	82
Marketing	4.1	82
Research	4.0	80
Education	4.0	80
CPD	4.0	80
Total Quality Management	3.8	76

#### 5. Opinion on quantity surveying as mature learned society

The respondents were requested to give their opinion on the level of maturity of the profession related to the 11 dimensions. This was a perception test only but may be valuable to understand the anticipated difference between opinion of maturity and perhaps the under-valuation by respondents of a very important dimension or determinants of a learned society.

Table 13: Opinion of respondents on quantity surveyors as a mature learned society

Responses	Unsure	Average rating						Total
		1 = Not important		5 = Extremely important				
		1	1.5	2	3	4	5	
Number of respondents	1	1	1	4	17	26	6	56
Percentage of total	1.8	1.8	1.8	7.3	30.9	47.3	10.9	100
Average rating		3.6						

## 6. Conclusion

The first objective of the research project was to identify the most important dimensions. It was expected that some of the dimensions and sub-dimensions would have been identified as less important. The respondents did not respond in this manner. It is important to note that the research group achieved reasonable success in identifying 11 very important dimensions of a mature learned society.

It is also proposed that some dimensions may be combined to establish a viable maturity model based on the proposed eight most important dimensions. These combined dimensions are indicated in Table 14.

Table 14: The eight most important dimensions and their importance

Eight most important dimensions	% of importance
Law and legislation	4.7 (94%)
Training and mentorship	4.4 (88%)
Standardisation	4.3 (86%)
Marketing and infrastructure	4.2 (84%)
CPD	4.0 (80%)
Research	4.0 (80%)
Education	4.0 (80%)
Management practice and quality management	4.0 (80%)

Source: Verster, 2007: own table

## 7. Recommendations

The research previously done in respect of maturities of nations or societies concentrated on dimensions and processes related to key performance areas or functions within a specific social system, influenced mainly by performance and perceived outcomes. It is proposed that a model may be developed to determine the maturity profile of a social system (profession, society or nation) as a learned society.

It is proposed that associations, institutions, or a society can be measured in respect of its maturity as a learned society by measuring its strengths in respect of the eight suggested dimensions in table 14 relative to the importance levels as well as the standing and presence of

the various maturity dimensions. The importance levels are aspects that form the basis of further research. Importance levels are only important in respect of comparison within the proposed maturity model.

Figure 3 shows the following as a maturity spider web to suggest the form that a model for a profession's maturity may take. Three series are shown in the spider web, these are:

Series 1: The importance as identified by respondents (Response)

Series 2: The quantity surveying profession in South Africa as a mature, learned society: Average given by respondents (QS maturity)

Series 3: The research group's proposed maturity level: The yardstick that may be related to measure a social system's maturity as a learned against society (Research Group)

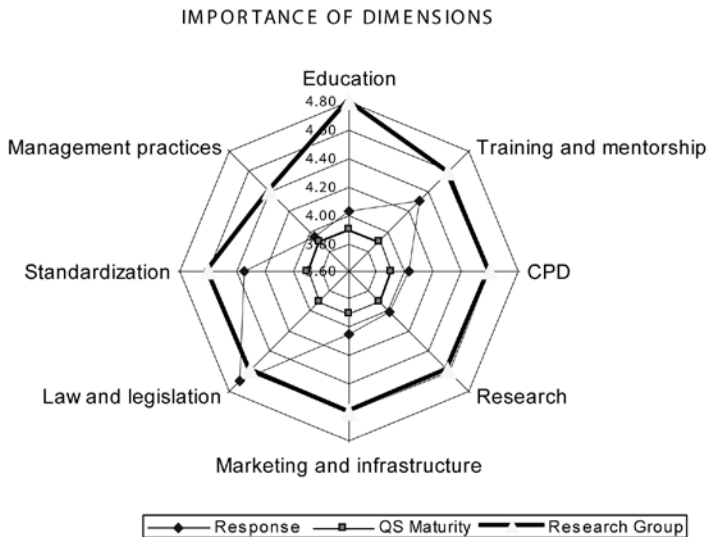


Figure 3: Spider web for a maturity model of a learned society  
Source: adjusted from figure 1 and figure 2

The dimensions of a learned society are identified, but to understand the maturity of a specific society, the standard relative levels of each dimension should be measured. The results of these measurements will support strategic development of such a society.

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## **An assessment of the feasible application of environmental valuation methods on Rand Water open-space**

*Peer reviewed*

### **Abstract**

Rand Water has contracted University of South Africa (UNISA) to develop a monetary valuation method for its open spaces and its inherent ecological functions. This article begins by reviewing existing contemporary definitions for open space in South Africa and then identifies the key characteristics thereof. Open Spaces in the Gauteng urban environment is in a crisis and factors such as open space coverage standards, sale of open space, crime and the impact of the apartheid legacy are briefly examined. Rand Water's open space contributes to the total open space stock of Gauteng province. Any shortage of open space and threats to the sustainable management and expansion of the open space network of the province therefore has a direct bearing on how Rand Water views and manages its open space resources.

Environmental resource economics provides economists and environmentalists with various instruments to place a monetary value on the environment. The available valuation instruments are briefly reviewed and questionnaires are developed from this to determine whether it can be applied by Rand Water staff to obtain values at a minimal cost, in a short space of time, and whether it assesses the various use and non-use values.

Keywords: Open Space, environmental valuation, environmental resource economics, use value, non-use value, consumptive use value, non-consumptive use value, indirect use value, existence value, option value, production function approach, restoration cost method, replacement cost method, travel cost method, hedonic pricing method, contingent valuation method, damage cost avoided method, defensive expenditure method, Rand Water

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## Abstrak

Rand Water het die Universiteit van Suid-Afrika (UNISA) ingekontraheer om 'n waarderingmetode te ontwikkel vir sy oopruimtes en inherente ekologiese funksies. Hierdie artikel begin dus met 'n oorsig van huidige kontemporêre definisies van oop ruimtes in Suid-Afrika en identifiseer dan die hoof eienskappe daarvan. Oopruimtes in die Gauteng stedelike omgewing is in 'n krisis en faktore soos oopruimte dekkingstandaarde, verkoop van oopruimtes, misdaad, en die impak van die apartheid nalatingskap word kortweg ondersoek. Rand Water se oopruimtes dra by tot die totale oopruimte voorraad van die Gauteng Provinsie. Enige tekort van oop ruimtes en bedreigings tot die volhoubare bestuur en uitbreiding van die oopruimte netwerk van die provinsie het dus 'n direkte uitwerking op hoe Rand Water sy oopruimte bates beskou en bestuur.

Omgewings-hulpbronekonomie voorsien ekonome en omgewingskundiges met verskeie instrumente om 'n ekonomiese waarde van die omgewing te bepaal. Die beskikbare waarderinginstrumente word kortliks ondersoek en vraelyste is ooreenkomstig ontwikkel om te bepaal of Rand Water personeel dit kan toepas teen minimale koste, oor 'n kort tydperk, en of die metodes die verskillende gebruiks- en nie-gebruiks waardes kan bepaal.

Slutelwoorde: Omgewings-hulpbronekonomie, oopruimtes, ekologiese funksies, omgewings-valuasie, omgewings-valuasie metode, omgewings waarde, produksiefunksie benadering, skade-onkostevermeidingsmetode, restourasiekosstemetode, vervangingskosstemetode, reiskostemetode, hedoniese-prysbepalingsmetode, kontingente-valuasietemete

## 1. Background

Rand Water is similar to other government utilities in being under pressure to provide goods and services at an affordable rate and of regulated quality. This means that there is a constant review of operational costs with reference to its core functions as an efficiency exercise. Rand Water owns several portions of land as part of its estates portfolio and is responsible for their management and maintenance. The question may therefore be asked whether these open spaces perform a function of any economic value that can be aligned with or complement Rand Water's core business. If these open spaces are not providing value, it would not be strategically sensible to retain them as non-performing assets. However, if the economic value of these open spaces could be clearly defined, this would enable objective decisions to be made that would more likely be in favour of its retention.

Rand Water has therefore contracted UNISA, through tender, to develop a valuation method for its private open space network. This article aims to review existing environmental valuation methods to establish the most suitable methods within the Rand Water context. The article briefly addresses current definitions of open space and the challenges faced by open spaces, and explore the possible interventions that environmental resource economics or the



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property valuation profession can provide. The article aims to establish a valuation methodology that can be applied to estimate the value of open spaces and ecosystems.

The Rand Water context and its terms of reference for this article will form the basis of selecting and developing suitable valuation methods.

The context of Rand Water and its open spaces may be delineated as follows:

- Rand Water's open space network is to a certain degree accessible and can be used for recreation and leisure use by its own staff.
- Public harvesting of natural resources on these open spaces is very limited and can be accounted for in valuation methods.
- Commercial agriculture, including crop production and grazing, is not practised on the Rand Water open spaces. Some of the open spaces do have agricultural potential and agricultural resource value; however, agricultural resource economics will not form part of this study.
- An estimated 95% of Rand Water's open spaces are located in close proximity to or in view of urban areas, meaning that they could provide a stream of environmental services to these areas, which is an important aspect in valuation studies.

## **2. Introduction**

### **2.1 Defining open space**

It is important to have a good understanding of the term 'open space' and what it encompasses in the context of this article. A review of current local definitions is necessary before any particular definition is adopted.

- Mogale City Urban Open Space Project (Mogale City Local Municipality, 2003):

*Any undeveloped vegetated land within and beyond the urban edge, belonging to any of the following six open space categories: ecological, social, institutional, heritage, agricultural and prospective (degraded land).*

- Cape MOSS (Chittenden Nicks de Villiers, 2000):

*Open space is principally the unbuilt component inside the urban edge that serves a variety of purposes and functions.*

- Durban MOSS (Durban Metropolitan Council, 1999):

Two types of open space were identified for the DMOSS:

- Urban open spaces

*... the human made or legally designated places and areas within the DMA that are developed for community use. They include parks, sports fields, agricultural fields, streets, town squares, road reserves, servitudes for services such as electricity transmission line, dams, private gardens.*

- Natural open spaces

*... the remaining undisturbed natural and undeveloped areas within the DMA. They are the areas that contain the core terrestrial, freshwater, estuarine and marine ecosystems. These ecosystems include land cover types such as grasslands, forests, beaches, estuaries, rivers, wetlands.*

Instead of drafting a new definition for open space, this article summarises the key characteristics of open space that contextualise it for this environmental valuation study. Open space is therefore regarded as the following:

- Public or private land within or outside the 'urban edge' that is mostly vegetated and may contain water bodies such as rivers, dams, wetlands or estuaries.
- Land that is undeveloped and in a natural state or has been landscaped to function as an aesthetic area and/or recreational facility and/or sporting facility.
- Land that is purposefully and in most cases legally set aside for conservation or zoned as 'open space', 'agricultural' land or 'undetermined'.

These criteria may not be all-encompassing and may not be suitable for all scenarios but nonetheless set a reference framework for this study.

## **2.2 The open space 'crisis'**

Open space in South Africa is increasingly under pressure as urban areas expand in density. While some may feel that open space plays an important role in a developing country such as South Africa, others argue that open space is a luxury in a situation where housing and basic infrastructure provision are high priorities which should take precedence in the context of limited resources. The general

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sentiment among environmentalists and parks managers is that open space is necessary for the long-term sustainability of cities.

The benefits of open spaces have been well researched and include the following in the urban context:

- Open space offers opportunities for active and passive recreation, which in turn reduces destructive and antisocial behaviour, builds family cohesiveness, promotes good psychological and physical well-being, and produces 'upstream' savings in health services owing to increased physical activity through recreation.
- Open space and recreation facilities are significant economic generators as they promote spending on leisure travel, sport and recreation equipment, draw tourism, and act as employment generators.
- Open space is often a place of learning, especially where the natural environment is introduced in an interactive manner, and it enhances people's understanding of their natural environment and environmental issues.
- Open space maintains ecosystems and preserves biodiversity, protects endangered fauna and flora species, and provides ecosystem services such as clean water and air (Naidoo, 2003: 2-11; PricewaterhouseCoopers, 2003: 4).

While most of these benefits appear obvious and necessary for sustainable development, the question has to be asked whether present management practice recognises these benefits.

Most metropolitan and larger local municipalities now have open space planning regimes in place, such as a Metropolitan/Municipal Open Space System (MOSS) and open space framework, which inform planners of the status of open space in terms of size, connectivity, quantity, and relationship with surrounding land uses. These planning instruments have not always been present in South Africa and were mostly initiated through *Local Agenda 21*, after the United Nations Conference on Sustainable Development held in Rio de Janeiro in 1992 (Durban Metropolitan Council, 1999).

South Africa's open space coverage standards have lagged behind international averages in that the old Transvaal province proposed 1.2 Ha per 1000 population, whereas international standards for open space coverage range from 6 to 8 Ha per 1000 (City of Tshwane Metropolitan Municipality, 2005). Depending on the density of an urban population, the international open space

coverage standards translated into approximately 10% of a city in the 1960's (Doell, 1963: 22) while it is presently at 14% according to Harnik (2000). An increase in the open space coverage standards has been evident over the past five decades since Doell (1963: 19) stated that the standard at that time was coverage of 7 acres (2.8 Ha) per 1000 population for American cities, while the current average according to Harnik (2000) is 6.8 Ha per 1000 population. These targets include social and ecological open space. It makes sense to provide social open space on the basis of an area-per-population standard, but the same rule cannot be justified for ecological open space. Ecological open space allocation should be based on criteria such as ecological processes, species diversity, and sensitivity of ecosystem functions, which after a thorough assessment can be expressed in percentage sustainable representation per bioregion.

The World Conservation Union set an international conservation target of 10% in February 1992 at the IVth World Congress on National Parks and Protected Areas in Caracas. It was later realised that such a target would conserve only an estimated 50% of species (GDACE, 2005). The IUCN has therefore set a new target to stop all loss of biodiversity by 2010 in Europe (Göteborg European Council, 2001), which means that each country has to adjust its conservation targets to its specific bioregion characteristics instead of a one-size-fits-all target, to prevent any further biodiversity loss.

The Gauteng Department of Agriculture, Conservation and Environment has set itself conservation targets of more than 30% since less than 1% of Gauteng province, within the urban edge, is currently formally conserved (GDACE, 2005). These targets are set to influence both open space provision in Gauteng province at local government level and privately owned land. Land use applications reviewed through the EIA process will be subject to decision-making tools such as the C-Plan 2 to ensure that conservation targets are reached, with specific reference to ecological open space.

The fact that allocation of open space targets and standards has increased over time means that knowledge about the implications of development impacts and lack of open space provision has increased. There are, however, a number of challenges that need to be considered which are likely to impact on the allocation of open space and its quality in Gauteng province.

The incidence of crime and perceptions around it are influencing people's willingness to use open spaces for recreation. Properties located close to open spaces pay a higher premium on household insurance due to the risk perception. Municipalities have in certain

instances sold off high-risk open spaces where incidents of rape and housebreaking have occurred. This may have been encouraged by community police forums and political pressure. Fencing and controlled access, security lighting and integrated land uses are often viable solutions to crime in parks and need to be explored before the irreversible sale and development of open space is considered.

South Africa's previous government planned and enforced segregated communities, where people of colour were disadvantaged in the provision of basic services. The provision of open space in these old affected townships was also inadequate and was generally characterised by sparsely allocated small park stands within dense residential developments. South African local government is now challenged to provide sufficient open spaces for these communities.

One may ask how these problems relate to the Rand Water case. Rand Water's open space contributes to the total open space stock of Gauteng province. Any shortage of open space and threats to the sustainable management and expansion of the open space network of the province therefore has a direct bearing on how Rand Water views and manages its open space resources. This context will also assist with the valuing of the Rand Water open space stock.

### **2.3 Environmental resource economics as management intervention**

Sustainability is both an ecological and an economic problem. In the early eighties it was realised that for science to make any progress with regard to the understanding of sustainable development, an integrated and interdisciplinary approach would be needed (Perman, Ma, McGilvray & Common, 2003: 8). Economists realised that economic development and welfare were dependent on the availability of resources and the ability of the environment to sustain human existence. Environmentalists realised that poverty, as the absence of welfare, was an environmentally destructive socio-economic problem that could to some extent be addressed with economic instruments (Dasgupta, 1997: 18).

Environmental resource economics developed, with these realisations, as an economics discipline. This is evident in that the majority of research work in this field is performed by economists. It was within this economics frame of reference that it was recognised that environmental resources were abused and neglected because market systems failed to attach appropriate values to them. This market

failure was a result of poorly defined property rights such as clean air (if nobody owns it, everybody can abuse it), failure to cost external effects or consequences of development on the environment, and failure to recognise environmental services and goods as an input in production (Perman, *et al.*, 2003: 124-126).

The realisation that markets had failed to attach a value to a resource or an external effect led to the development of valuation instruments. The fact that these resources had no price did not mean that they had no value. Perman *et al.* (2003: 11) argue that if well-being is affected by the presence or absence of a resource, then it must have a value, whether positive or negative.

The environmental valuation techniques have not been without controversy, as questions of ethics, validity and accuracy often emerge in the literature. Gen (2004: xviii) poses the question whether utilitarian ethics should be allowed to influence environmental policy. Non-economists reason that decisions about the future of environmental resources should not be based on monetary values, as attached values would only reflect society's current understanding of their importance. A case in point is the severe destruction of wetlands over the past century; only recently has their importance been realised. Such valuations may therefore discount the expectation of future growth in knowledge relevant to the implications of development (Perman *et al.*, 2003: 402). This brings to the fore the importance of the precautionary principle when evaluating environmental resources, and the fact that decisions about their future should be based on a suite of factors and not just monetary value alone.

In a recent study done to determine the value of grasslands in South Africa, De Witt & Blignaut (2006: 4) state that environmental valuation is not an elementary calculation that will produce stable, absolute values that can be traded off against development. They argue that economic valuation is not an absolute science but is rather reductionist and overlooks the value of a system in its totality.

The economic component of environmental considerations remains an important factor, despite the shortcomings in the environmental valuation studies. Sub-section 2(4)(i) of the South African National Environmental Management Act (NEMA), Act 107 of 1998 states as follows: "The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment."

It should be realised that environmental valuation is a fairly new and rapidly expanding field (Perman *et al.*, 2003: 399). The identification of many of the shortcomings in the methods has resulted in improvement and refinement. The results obtained from valuation studies are used as a guide to inform decisions and can be a valuable educational tool to inform decision makers about the 'value' of the natural environment. Decisions about the future of open spaces and ecosystems should not be based solely on the results of a valuation but should consider social, economic and environmental factors as given in the national environmental management principles of NEMA.

### 3. Total economic value

It is necessary to understand the various values that comprise the total economic value of an open space and its ecosystem functions before the methods that value them are discussed. Figure 1 gives a breakdown of the various values associated with open spaces.

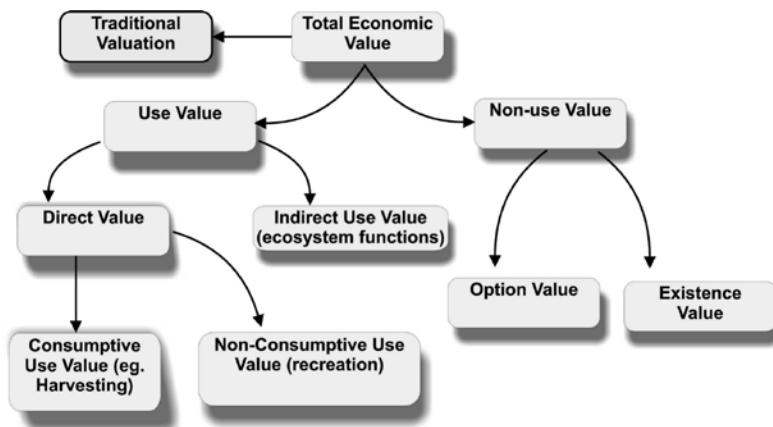


Figure 1: Conventional classification of the values of environmental amenities  
Source: Turpie, Joubert, Van Zyl, Harding & Leiman, 2001: 11

Ecosystems and open spaces differ from each other in terms of size, quality and types of ecological services and functions. Not all the various values associated with open space are applicable to each and every open space or environmental resource. In some cases the value may be of such insignificance that it is not feasible to perform a valuation on it. The valuer needs to use his or her own discretion when evaluating an open space to determine which values are relevant.

### 3.1 Traditional valuation

Municipalities are occasionally faced with the decision to sell open space. This may be because a developer has approached such municipality and indicated his or her willingness to purchase. The municipality's response to such an offer will depend on the policies, strategies and by-laws in place relating to open space management. A property valuation is required in the event that a municipality decides to sell open space. A property valuer, who is normally a municipal official, performs a valuation. Factors such as availability of services, accessibility, improvements on the property, zoning and size, and regional sales data are used to obtain a value. This results in an often very low monetary valuation for the open space in relation to, say, residential or business property. The traditional property valuation method does not consider value-adding factors such as the flow of environmental services including water purification, climate amelioration, nutrient cycling, carbon sequestration and biodiversity sustenance, and therefore overlooks potentially value adding benefits.

The purchaser would in most cases transform the open space and would not be willing to pay for 'benefits' lost to society. If the benefits that open spaces provide to the larger community were factored into its price, then it is most likely that no sale would be concluded and the open space would be preserved for the community who benefits from its services. Such an approach would also warrant that the purchaser pay for the loss of these services provided to a community, where a sale is approved and proceeds, or alternatively that the cost of the loss be compensated for in the price.

Fortunately the development or transformation of open spaces is a listed activity (activity number 20) in terms of sections 24 and 24 D of the South African National Environmental Management Act, Act 107 of 1998. The sale and development of open space will be more difficult with these regulations in place.

Unfortunately professional property valuers are not trained to recognise environmental goods and services in the holistic value of a property. Research and development into open space valuation therefore presents an opportunity for the integration of environmental valuation methods in the property valuation profession, which will certainly give more recognition to the importance of environmental goods and services.



## **3.2 Use values**

### **3.2.1 Consumptive use value**

This value is obtained from the economic benefits associated with the direct harvesting of goods from an open space. This may include a wide variety of goods such as building material, food, flowers and medicinal plants (Turpie *et al.*, 2001: 12). This value is not constant as it is affected by the market value of the harvested goods and the ability of the open space to supply the goods in a sustainable stream. This method is mostly applied to renewable resources or biotic populations that can regenerate, such as fauna and flora. Goods such as minerals are non-renewable and harvesting them is not a desirable or sustainable practice in open spaces and is for the purpose of this study excluded. Harvesting of minerals in open spaces is in most cases an illegal activity prohibited by municipal by-laws. The value of mineral stock in an open space would only be considered during a cost benefit analysis where mining is considered as an alternative use.

If the sustainability threshold is exceeded, then the volume of goods and flow of services supplied declines and subsequently their value. It is therefore important to ensure that the consumptive use value is not based on volumes that are not sustainably harvested, which would give inflated values at first but would be likely to depreciate over a short space of time. Sustainable harvesting, however, gives realistic values which appreciate in time provided the market demand remains constant. The question the valuer should ask is whether the level of current use is affecting future availability. The resource can be used indefinitely if harvest is equal to or less than the natural reproduction rate, and if the ecological systems that support reproduction are preserved (Perman *et al.*, 2003: 18).

Consumptive use value is applicable only where goods are legally harvested, such as communal land where harvesting rights are granted. A nature reserve will most often not permit harvesting, and a consumptive use value will not be applicable. The production function method is used to gauge consumptive use value (see section 4.1.1).

### **3.2.2 Non-consumptive use value**

Non-consumptive use value implies, as the name suggests, that the value is obtained from the use of an open space that does not involve harvesting or collecting any goods (Turpie *et al.*, 2001:

12). Activities such as recreational use and tourism add value to an open space as people are willing to spend money to use such recreation opportunities. People spend money on travelling costs to get to these open spaces, food and beverages and sometimes accommodation. If not well managed, non-consumptive use can have a negative impact on the use value. An example is the value of a wilderness area, which lies in the perceived absence of people and the sense of exclusivity, for which people are willing to pay a premium (Perman *et al.*, 2003: 127). Such an area would not be a great escape if it were crowded and noisy. Overuse could also directly impact on the quality of the facility through abuse of the amenity infrastructure, trampling of pathways, and unmanageable littering. Such overuse would result in a depreciation of the open space's non-consumptive use value. This value is also often reflected in nearby property prices and is alternatively referred to as hedonic value or pricing (see section 4.2.2).

### 3.2.3 Indirect use value

Indirect use value is the economic benefits that urban society obtains from the ecological services and functions that open spaces provide (Turpie *et al.*, 2001). These functions may include those shown in Table 1.

Table 1: Some environmental services and functions that open spaces may provide

• Water supply and purification	• Climate amelioration
• Sound and nuisance control	• Flood and erosion control
• Carbon sequestration	• Soil formation and nutrient cycling
• Pollination	• Refuges for biodiversity

Source: Adapted from Turpie *et al.* 2001: 12

The challenge in obtaining a value for these ecological services is that they are communal and free from market influences. There are, however, indirect methods which can be used to determine a value for ecological services. A change in the quality of an environmental service, such as increased air pollution, reduces property values of the affected area, while improvement results in an appreciation of the property values. These changes can be measured to value the change.

The cost of replacing an ecological service with an artificial substitute can also be used as a proxy to infer a value for it. A wetland has

water purification and storm-water retention properties which can be mimicked by engineering infrastructure such as water purification plants and storm-water retention systems. The cost of developing infrastructure to treat and manage the same quantity of water as the wetland would serve as the value indicator (see section 4.1.2).

### **3.3 Non-use values: Option and existence values**

Option value refers to the value that people place on reserving the option to use a resource in the future (Turpie *et al.*, 2001: 12). This optional use value could be either a use or a non-use value. This is normally expressed as a person's or community's willingness to pay to guarantee the availability of the open space for future use (Perman *et al.*, 2003: 402). There is also the quasi-option value which is expressed as a person's willingness to pay to avoid the irreversible loss of an open space or ecological service, considering the risk that the advancement of knowledge could in future prove that such loss had been catastrophic and ill-informed (Perman *et al.*, 2003: 402). An example would be the relative ignorance 50 years ago concerning the implications of wetland destruction, which led to the loss of a significant number of wetlands. This has resulted in the adoption of the precautionary principle whenever the holistic impact of a particular action is unknown. This could alternatively be expressed as a person's willingness to pay to avoid unknown risks. With option and quasi-option use value there is no certainty or there is incomplete knowledge about the future conditions of an open space or ecological service (Perman *et al.*, 2003: 402).

The comfortable knowledge of the existence of a resource can be referred to as existence value. Contribution to the conservation of far-off places such as rain forests or paleontological important sites could be measured to determine this value. This value, however, need not be applicable to far-off resources only, as willingness to pay for the conservation of any resource could be interpreted as existence value. Unlike option and quasi-option value, there is complete certainty with existence value about the future conditions of an open space and ecological services (Perman *et al.*, 2003: 402).

A farm portion with unique landscape and biodiversity features in close proximity to urban development can have the option to be developed as a residential township or to be preserved as a protected nature reserve. The value attached to the property will remain an option value until it is formally protected, where after it will assume an existence value. Once it is legally protected, alternative options are restricted by legislation.

## **4. Valuation methods**

Methods employed in previous studies for the valuation of open spaces and ecosystems are the same methods generally applied to value environmental resources. These methods can be broadly categorised into three categories, namely market value approaches, surrogate market approaches and simulated market approaches (Turpie *et al.*, 2001: 16).

Market value approaches use market-related pricing of goods and services used to establish a value, for example based on the net value of harvested cut flowers. The market value approach may apply to use and non-use values. There may for example be an option on a particular portion of land to harvest wild flowers and this 'option value' can be determined by using a market value approach based on the market value of the wild flowers in question.

Surrogate market approaches, also referred to as revealed preference approaches examine the economic trends in a particular situation and how an environmental resource influences these trends. A well-maintained and attractive open space will positively influence property values, which are then translated into a net benefit or premium and ultimately expressed as a value. In contrast, a poorly maintained open space will adversely affect property values and could be seen as a cost to the property market for not maintaining such open space in good order.

Simulated market approaches use surveys or questionnaires to obtain the perceived value or 'willingness to pay' for a service or amenity or to conserve a particular area. Mean values are then calculated from these surveys and multiplied by the number of affected households to obtain a value. This method is also valuable to test user responses to hypothetical scenarios such as the possible sale of park land or the impact of maintenance standards and crime on usage and ultimately value.

### **4.1 Market value approaches**

#### **4.1.1 Production function approach**

This method is used to determine the net annual value of goods and services produced by an open space or ecosystem. It therefore values the consumptive use of open space goods.

The annual use value =  $Q \times (P-C)$ , where  $Q$  is the quantity of goods produced,  $P$  is the market price at which the goods are sold, and  $C$

is the cost of harvesting, processing, transporting and marketing the goods. A net present value of the open space is then obtained by converting the annual use value (annual use =  $Q \times (P-C)$ ) into a rand value per hectare (R/Ha). Therefore, if the total annual use value of an open space is say R350,000 from flower harvesting and the property measures 10Ha, then the net present value would be R35,000 per Ha (Turpie *et al.*, 2001: 17).

This valuation method may not be often applied in the valuation of open spaces since the harvesting of fauna and flora is prohibited by most municipal by-laws, except for fishing in certain locations. It would be unethical to attach a use value to an open space based on products which have been illegally obtained. It would be the same as to say that the Kruger National Park is worth  $x$  based on the street value of its elephant tusks and rhino horns, while it is illegal to trade in these bio-products. Numerous indigenous plant species are under threat due to unscrupulous harvesting for medicinal use. This valuation method could become valuable if the free-for-all situation could be changed into a sustainable harvesting programme that is monitored.

The market value approach is also used to value agricultural or forestry land in support of normal property valuation techniques and this is where the method originated.

#### **4.1.2 Restoration cost or replacement cost method**

This method is usually used to value ecosystem functions and departs from the hypothesis that the value of the ecosystem is equal to its replacement cost or restoration cost. The replacement cost refers to the replacement of ecosystem functions with artificial structures and systems that will replicate the ecosystem function, such as water purification and retention (Turpie *et al.*, 2001: 18). However, not all ecosystems can realistically be replaced or replicated by artificial structures and systems, making its use rather limited. An approach with the replacement cost method for wetlands would be to obtain engineering costs for the construction of water purification plants per mega-litre treating capacity and to use the total water treatment output of the wetland over a certain time period to obtain a value for the ecological function

Use of the restoration cost method could be based on a hypothetical scenario postulating that the environmental service has been lost or damaged and needs to be restored through rehabilitation practice, which is difficult to calculate. The restoration cost method

is often used in lawsuits to determine actual damage caused by illegal activities or negligence, or to determine the negative environmental economic implications of a current production method.

The restoration cost method could employ landscape development costs including earthworks, irrigation, soft and hard landscape materials, and design and project management costs as proxy for value of developed open spaces. The application of the restoration cost method in valuing natural areas is far more complicated, as the restoration of sensitive environments to their original status, for example fynbos vegetation, wetlands or Bankenveld, is extremely difficult if not impossible at present. A number of species cannot be commercially cultivated and re-established in an area for example the common Sugarbush tree or *Protea caffra*. The restoration cost method would therefore be difficult to apply as the costs of complete restoration are unknown. It would therefore be advisable that the cost to restore an area as close as possible to its original status be used so that natural systems can continue with the restoration process. One could then attempt to value the 'benefits lost over time' where there is no alternative to an incomplete restoration. This could include the loss of benefits over time up to the estimated point of complete restoration. Lost benefits could include reduced levels of bio-diversity, reduced visitation rates and reduced efficiency in water and air purification. The lost benefits approach would most likely employ methods such as damage cost avoided, and replacement cost methods to form a multi-tier valuation approach with the restoration cost method.

#### **4.1.3 Damage costs avoided**

Wetlands play an important role in flood attenuation due to their good water retention capacity. The absence of wetlands increases the risk of flash floods and resultant flooding of adjacent properties. It is possible, with the assistance of hydrologists for instance, to delineate the areas along a water course that would be affected by floods if no wetland were present. The possible damages, linked to a probability analysis, are then calculated based on the value of affected infrastructure within the demarcated flood zone. Such probable damage cost or reparation cost is then assumed as the measure of value (Turpie *et al.*, 2001: 18).

The damage cost avoided method is normally used to argue for the retention of certain ecosystems and their beneficial functions that support human settlements.

#### **4.1.4 Defensive expenditure method**

The defensive expenditure method uses the cost of preventing damage opposed to the cost of repairing damage as a proxy for value (Turpie *et al.*, 2001: 18). The control of alien invaders, for instance on agricultural land, ensures that the land remains productive and economically active. The cost of removing invaders and regular follow-up programmes to minimise re-growth is for example compared to the net benefits of the programme such as increased water resource availability and bio-diversity preservation. If the programme's economic benefits outweigh the input costs then it has a positive value. This method is often used in Cost Benefit Analysis. The maintenance of coastal wetlands and estuaries has also proven effective in controlling the force of tidal waves and storms to prevent damage to infrastructure, and this damage avoidance cost or defensive expenditure is used as proxy for value (Turpie *et al.*, 2001: 18).

### **4.2 Surrogate market / Revealed preference approaches**

#### **4.2.1 Travel cost method**

The travel cost method is primarily used to value recreational and tourism attractions that are visited frequently. Data obtained from this method can be helpful to determine what visitors would be willing to pay as an entrance fee, based on the visitors' consumer surplus. The method therefore values non-consumptive use of an open space. It is based on the idea that the value visitors place on environmental amenity services is reflected in their willingness to spend money to experience such services (Perman *et al.*, 2003: 411). People spend money on transport to get to the facility, refreshments, time and often entrance fees. These costs are then used as proxy to determine value and therefore reveal spending patterns which are influenced by an attraction such as a park. A substantial amount of data is needed to obtain objective surveys, which include the number of visitors, distance travelled, mode of transport, socio-economic background, time spent at site and value of visitor's time. The travel cost method does entail some limitations and controversies, however, which need to be kept in mind when considering its application:

- One question is whether the opportunity cost of recreational time should be considered at all – in other words, whether the time spent on recreation should be valued against time that could alternatively have been spent on business.

- Visitors to these amenities and attractions often do not travel specifically to visit such locations but their journey forms part of a number of visits to multiple locations. This makes the travel cost method somewhat more complex to use. The apportionment of travel costs to each trip is not feasible, and the responses of respondents who visited more than the study area during the survey should be removed from the survey.
- Other visitors that live close-by may have travelled by foot or bicycle, which requires more extensive questionnaires to determine the value placed on the amenity by visitors. These values have probably been captured in adjacent properties, and the hedonic pricing method is then needed to determine this. If hedonic pricing is also used on the same environmental resource, then visitors from surveyed properties should be excluded from the TCM survey to avoid overestimation (Turpie *et al.*, 2001: 19; Perman *et al.*, 2003: 415-417)

#### **4.2.2 Hedonic pricing**

Property prices are often positively affected by the presence of green open spaces, lakes and areas with attractive natural scenery. The hedonic pricing method calculates the value added to private property due to the presence of an open space and uses this value to determine the total value of an open space. This calculation is based on the estimated increase in property value (often given by estate agents and sales data) due to the presence of an open space. The estimated increase is then averaged and multiplied by the number of the relevant properties (Van Zyl, Leiman & Jansen, 2004: 16-18).

As an example, a park positively influences approximately 420 property values by 8%. The mean property value for the area is R1,000,000 per property. A premium of approximately R80,000 per property is calculated and multiplied by 420 properties, which gives a total value of R33,600,000.

This method is, however, difficult to apply in areas where there is a limited market for properties, such as informal housing and other low income areas, or in rural areas where open space is more abundant and less of a value-adding factor.



### **4.3 Simulated market/ Stated preference approaches: The contingent valuation method (CVM)**

This method tests people's willingness to pay (WTP) for the use or presence of an open space or their willingness to accept compensation (WTA) for the loss of an open space. It is sometimes referred to as a stated preference method, whereas methods such as the TCM and hedonic valuation methods are revealed preference methods (Perman *et al.*, 2003: 420). It is called contingent valuation because the valuation is contingent on a hypothetical scenario put to respondents (Perman *et al.*, 2003: 420). This is normally determined through interviews and using open-ended questions, referendums, dichotomous choices (yes or no), bidding games, trade-off games, ranking techniques, costless choice options or the priority evaluator technique (Turpie *et al.*, 2001: 20). The survey is also dependent on socio-economic data to construct a demand curve for net social values (Perman *et al.*, 2003: 424).

The survey questionnaire should present, by way of a programme or policy, ways to improve or protect an environmental asset from a clearly defined environmental impact. Respondents are then asked about their WTP for such a programme or policy. The payment vehicle is normally presented as some sort of tax payment and the respondent 'votes' either for or against it. This form of survey is sometimes named a 'referendum model' (Perman *et al.*, 2003: 424). The respondent's WTP is tested by offering a choice of amounts that he or she would be willing to pay. The respondent then responds with a yes or no answer (dichotomous choice format). It is also important that the survey make provision for respondents to indicate that where the stated amounts are not within their WTP or where they are objecting to the payment vehicle, their 'no' vote is correctly interpreted.

This method is subject to several biases that make its application controversial and subject to criticism. Some of biases are the following:

- Strategic biases whereby respondents believe they could influence decisions by over- or underestimating willingness to pay
- Embedded biases whereby respondents do not give realistic answers in relation to their current financial constraints, budgets and needs

- Interviewer bias, information bias, starting-point bias and hypothetical bias, which can influence the respondent's answers and subsequently the results of the survey

The biases can be largely eliminated if the survey design is done correctly and tested before implementation.

In a CVM survey, the median is normally used to calculate total WTP as it is less affected by outliers. The total WTP is the median figure times the size of the relevant population.

The method bases its findings on hypothetical questions instead of observed, actual, behaviour (Perman *et al.*, 2003: 420). It is also very costly and time-consuming to execute as it requires several interviewers, detailed and tested site-specific surveys, data enumerators and statisticians. The method is also criticised for having been developed solely for First World economies, with the assumption of generally well-educated respondents and its subsequent (perceived) irrelevance in Third World applications. If the survey is not well designed it can produce insensitivities in terms of price and scope. Price insensitivity relates to WTP which statistically appears not to be influenced by the income levels of respondents, and scope sensitivity relates to statistical insensitivity to differing conservation targets hypothetically presented to respondents (Perman *et al.*, 2003: 427,429). An example of price insensitivity is where respondents' WTP does not appear to be influenced by their household income, where in practice it should. An example of scope insensitivity is where respondents' WTP does not change where different conservation targets are presented, e.g. 1000 Ha, 2000 Ha or 5000 Ha set aside for conservation, where in practice there should be a correlation.

Past experience has shown that respondents generally protest against WTA, as they refuse to accept any compensation for stated loss of a public good, and they would rather pay for its preservation, hence the predominant use of WTP (Perman *et al.*, 2003: 429). Socio-economic factors, education levels and moral values differ in Third World countries, however, and these respondents may be more inclined to WTA than WTP.

Respondents may also deny responsibility for conservation and generally vote 'no' for any WTP as they believe it to be a function of the state, for which they are already taxed. They may also feel that environmental problems should be the responsibility of those who caused them, or that those who stand to benefit the most from an environmental improvement should pay for it. The CVM assumes that the respondent has some sort of responsibility towards the environment

and therefore asks WTP questions. This may, however, not always be legally and constitutionally enforceable, especially with site-specific problems. The survey design needs to explore these dynamics and this should include briefing the respondent on his or her obligations, if any. It may be that a respondent has no obligation to the problem but would feel morally obliged to make a contribution (Perman *et al.*, 2003: 431-432).

CVM offers the benefit of valuing both use and non-use values, while the other instruments available can value only use-value. CVM has also been granted admissible by USA courts, the *Exxon Valdez* oil spill case being particularly well known (Perman *et al.*, 2003: 434).

## 5. Which environmental values need to be assessed?

Environmental amenities may not always have all the values represented. It is therefore important to determine which values are applicable and then which valuation method is most appropriate to determine the value. It may also be true that a particular value is not prominent enough to justify its valuation, considering factors such as budget and time restrictions.

The types of values were discussed in sections 3.1 to 3.3.

Table 2: Environmental values and suitable methods used to determine valuation

Type of value	Valuation Methods						
	Production function	Restoration and replacement	Damage cost	Defensive expenditure	Travel cost	Hedonic pricing	Contingent
Consumptive use	√√	√	√	√	√	√	√√
Non-consumptive use	√	√	√	√	√√	√√	√√
Indirect use	X	√√	√√	√√	X	√√	√
Option and existence value	x	x	x	x	x	x	√√

Source: Adapted from Turpie *et al.*, 2001: 15

## **6. Application of the environmental valuation techniques**

### **6.1 Production function approach**

The production function approach, as stated earlier in section 4.1.1, simply entails calculating the annual use value =  $Q \times (P-C)$ , where  $Q$  is the quantity of goods produced,  $P$  is the market price at which the goods are sold, and  $C$  is the cost of harvesting, processing, transporting and marketing the goods. A net present value of the open space is then obtained by converting the annual use value into a rand value per hectare.

This method requires the following data:

- 6.1.1 The size of the environmental amenity in Ha
- 6.1.2 The products harvested
- 6.1.3 The quantity of products harvested over time
- 6.1.4 The market value or price of the products
- 6.1.5 The cost of harvesting the products.

### **6.2 Restoration and replacement cost**

Before any costing is done, it is necessary to assess the environmental service that is provided in terms of the following:

- 6.2.1 The types of services provided (i.e. water purification, erosion control)
- 6.2.2 How the services are provided (water retention through wetland vegetation)
- 6.2.3 To whom they are provided (residential area  $x$ )
- 6.2.4 The measured levels at which the services are provided (2 megalitres per day).

The second step is to identify the least expensive alternative means of providing the identified service or services to the designated area. The third step is to determine the cost of the alternative means of providing the service or services. Finally it is necessary to determine whether the public would be willing to accept the substitute or replacement service in place of the ecosystem service (King & Mazzotta, 2006: 1).

### **6.3 Damage cost avoided**

The initial step of the damage cost avoided method also requires a thorough assessment of the services provided, as described in 6.2.1 to 6.2.4.

The second step is to estimate the potential physical damage to property, either annually or over a realistic time period. The final step is to calculate either the rand value of potential property damage, or the amount that people spend to prevent such damage (King & Mazzotta, 2006: 1).

### **6.4 Defensive expenditure method**

This method is simply the costing of existing programmes aimed at sustaining the integrity of an environmental service.

### **6.5 Travel cost method**

Zonal boundaries are drawn up with each zone representing an average distance from the environmental amenity. AA tariffs or SARS tariffs can be used based on vehicle capacity to determine cost per kilometre. The travel cost per kilometre is multiplied by the distance travelled to give a total travel cost per respondent.

The analyst then estimates a demand curve by determining the relationship between visitation rate and travel costs per zone. The statistical or functional form of the demand curve is chosen on the basis of best fit and applied to the data. This could either be linear, semilog or loglinear (Turpie *et al.*, 2001: 48). The demand curve explains the change in visitation numbers as the cost of travelling in relation to distance increases or decreases. Price is therefore a dependent variable. Factors such as income level may to a lesser degree also be a dependent variable, and factors such as race may be statistically independent of the visitation rates.

Consumer surplus is then calculated for visitors from each zone. Consumer surplus is the difference between the market price of a commodity, say R1,00, and what an individual is prepared to pay, say R3,00, with a resulting surplus of R2,00. In the TCM application, consumer surplus simply means the difference between what the person has paid in travel cost to visit the amenity and the cut-off point where no more visits are likely. This cut off point is where it simply becomes too expensive to travel to the amenity. The surplus is therefore the additional travelling cost (distance, time and mode of transport cost) a visitor is willing to pay to visit the amenity up to the point of resistance. The consumer surplus is a handy indicator where

access fees are under consideration. Say for instance a game reserve needs to increase entrance fees, but does not wish to do so to the extent that visitation numbers will be severely compromised. The consumer surplus will then in such a case give a good indication up to what point entrance fees can be increased where it will simply become too expensive to visit such reserve.

The consumer surplus for each zone is then summed to give the total recreational use value.

### 6.6 Hedonic pricing (calculation of influence of environmental amenities on property prices)

This method is dependent on sales data of properties in the survey area or, if this is not available, on the input of experienced estate agents or property valuers.

Sales data is used to determine the premium, if any, on property values due to close proximity to an attractive environmental amenity. Some of the benefits that properties get from such close proximity are easy access to recreational opportunities, scenic views, and sometimes serenity. These benefits contribute to property demand and the subsequent rise in values.

The average price of properties located in the area but not directly next to or close to the environmental amenity is calculated using sales data or inputs from estate agents. The premium (or discount) is then calculated for properties located next to or in close proximity to the environmental amenity by comparing their sales data with the average of the area. Supposing the average for the area is R1,000,000 per property, and the average value of properties that seem to benefit from proximity to the environmental amenity is R1,150,000, then the average premium is 15%.

The influence of the environmental amenity on property value is the total premium multiplied by the total number of properties.

Table 3: Property price increase due to proximity to environmental amenity

Number of affected properties	Average value of affected properties	Total value of affected properties	Premium	Value due to environmental amenity
31	R1,150,000	R36,650,000	15%	R4,650,000

Source: Adapted from Van Zyl *et al.*, 2004: 18

## **6.7 Contingent valuation method**

CVM elicits people's WTP for an environmental programme in a constructed hypothetical scenario. It therefore requires the development of a questionnaire.

The following describes a scenario and presents an example of a CVM questionnaire based on it. This questionnaire must be done one-on-one with the respondent by trained interviewers.

*The Mogale City Local Municipality and private individuals own land towards the west of the Walter Sisulu Botanical Gardens. It has been realised that this land contains unique biodiversity and geological features worthy of conservation. However, the land is under development pressure and these unique features may be lost if no intervention takes place. This land also forms part of the hunting ground of the Botanical Gardens' resident pair of Black Eagles. The Municipality, in partnership with the South African National Biodiversity Institute, wishes to purchase the remaining portions of land worthy of conservation but is in need of a one-off dedicated tax contribution to make possible the purchasing of land, erection of game fencing and launch of conservation programmes. The purpose of this questionnaire is for you to vote on your willingness to contribute and the amount you wish to contribute. It is important to note that the tax contribution is voluntary and will exclusively be applied for the purposes stated above.*

The median total WTP is then calculated and multiplied by the total relevant population. This will present the economic value of the environmental amenity.

## **7. Selection of the appropriate valuation methods for Rand Water open space**

Each of the valuation methods has its specific area of application and is somewhat limited in wider applications. Some of the methods are outright unsuitable for application at Rand Water and were eliminated from the onset based on consensus by the research project team.

The production function approach was eliminated as there are limited opportunities for harvesting of natural goods from Rand Water's open spaces. Rand Water's infrastructure is listed as National Key Points with resultant high security and access control levels. This inaccessibility limits harvesting and therefore the feasible application of the production function approach. The presence or not of harvestable goods is irrelevant because of this factor.

Limited accessibility also affects the application of the Travel Cost Method as well as the Contingent Valuation Methods as both methods are mostly applied where there are accessible environmental and recreational services and infrastructure. Both methods also rely on high user numbers to obtain representative interviewees, which is also unlikely in the Rand Water case. Contingent Valuation methods use taxes as a payment vehicle to determine WTP. Rand Water cannot implement taxes in any form as it is not a statutory revenue collector. Rand Water's recreation facilities are mostly used by its employees who often stay in close proximity to these facilities. This will result in insignificant travel costs when applying the Travel Cost Method.

As part of the participatory action research approach, a meeting was held on 22 November 2006 where selected Rand Water employees were asked to assist with the selection of appropriate valuation methods for the Government entity's open spaces. Participants were given an overview presentation on the values associated with open space and the methods used to value it. The participants were also offered an opportunity to perform the Replacement Cost Method on an open space located at the Rand Water Estates Nursery, for them to be familiarised with the application of the methods.

Some of the general conditions needed for the successful application of the methods were converted into a questionnaire that would enable the selection of the most appropriate methods. Within the context of Rand Water's open space, respondents reviewed these criteria and answered Yes, Maybe/sometimes or No. One point have been allocated for a Yes answer, 0.5 points for a Maybe/sometimes answer and 0 points for a No answer. The results for each answer are summed, then divided by the number of questions for each method and percentage suitability is then allocated. Twelve respondents completed the questionnaire.

The results of these questionnaires are presented as follows:

## 7.1 Replacement Cost Method

General condition or criteria to be met	Choose an appropriate answer and mark with X		
	Yes	Maybe / Sometimes	No
Is there an environmental service such as water purification, nutrient cycling, carbon sequestration, and water storage and storm water attenuation?	12	0	0



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Can this environmental service be readily quantified? i.e. volumes of water purified, volumes of carbon sequestrated, volumes of water stored, metric volume of soil preserved.	6	4	2
Can this environmental service be replaced or replicated with engineering infrastructure such as a water purification plant to purify water or storm water infrastructure to manage surface water runoff?	6	5	1
Are there costing guidelines available for such engineering infrastructure? i.e. Professional Institutes, Project Costing Guidelines.	6	3	3

The replacement cost method received a rated suitability of 74% based on the assessed results. Rand Water has a number of wetland areas within its open space stock and this method is particularly suitable for use on wetlands and waterways, which is perhaps the reason for its reasonably high suitability score.

## 7.2 Restoration Cost Method

<i>General condition or criteria to be met</i>	<i>Choose an appropriate answer and mark with X</i>		
	<i>Yes</i>	<i>Maybe / Sometimes</i>	<i>No</i>
Can this open space, park or ecosystem function be restored to its original state or as close to its original state as possible if it is hypothetically lost by either pollution or illegal development?	8	3	1
Can the status of the environmental service be determined, prior to the impact? i.e. species diversity, ecosystem functions etc. In other words are there records of the ecosystem functions, park infrastructure and bio-diversity of all Rand Water open spaces?	5	4	3
Are there costing guidelines available for such restoration/ rehabilitation work? i.e. landscape contractor costs, plant material and/or specialist studies.	10	1	1

The restoration cost method is relatively easy to apply and is perhaps closer to what horticulturists and estate managers may apply in their work environments, as it is essentially based on project costing. This method was also applied in a practical session prior to the completion of this questionnaire that may have contributed to the relatively high suitability rating of 75%.

### 7.3 Damage Cost Avoided

General condition or criteria to be met	Choose an appropriate answer and mark with X		
	Yes	Maybe / Sometimes	No
Is there any property, infrastructure, natural resource or quality of life (health) that will suffer measurable and likely damage if the environmental service discontinues? <i>i.e.</i> Deterioration of water quality on health and tourism value, increase in peak storm water volumes that causes flooding, air quality reduction impacting on health.	10	1	1
Can the probability of such damage be determined?	9	3	0
Can the extent of such probable damage be quantified?	4	7	1

A suitability rating of 79% indicates that it is evident that respondents feel that the Rand Water open spaces and ecological services perform an important damage avoidance function. One has to view Rand Water open spaces in relation to its core function, which is to provide water, and how these open spaces and their inherent ecological services contribute to the protection and maintenance of this key infrastructure. The many wetlands and open spaces also act as a buffer between Rand Water operations and surrounding land uses. The absence of these buffers may also increase the risk of probable damage should there be floods or infrastructure failure.

### 7.4 Defensive Expenditure Method

General condition or criteria to be met	Choose an appropriate answer and mark with X		
	Yes	Maybe / Sometimes	No
Are there any proactive measures to sustain the ability of an environmental resource to prevent any damage? <i>i.e.</i> An alien invader eradication programme to avoid erosion and sustenance of agricultural potential or estuary maintenance to avoid storm damage, or fire control?	12	0	0
Is the cost of such proactive measures available?	7	3	2

Respondents all agreed that there were programmes in place to maintain the integrity of Rand Water's open spaces, its environmental services and its operations. Rand Water supports eradication programmes as part of the 'Work for Water' programme which aims to

reduce alien plant invaders from water catchment and river areas. Such programmes can be valued against the cost or consequences of not controlling such plants within the context of South Africa as a water scarce country. The 'Water Wise' gardening campaign of Rand Water can also be valued using the same method. A suitability rating of 85% was calculated.

## 7.5 Hedonic Pricing

General condition or criteria to be met	Choose an appropriate answer and mark with X		
	Yes	Maybe / Sometimes	No
Are there any properties in close proximity to the environmental resource that may benefit from it in terms of view, serenity, recreation and leisure activities?	9	2	1
Is the environmental resource in question relatively unique and in relative short supply? In other words is there a demand for such environmental resource in the survey area to the extent that it influences property values?	4	7	1
Are the properties that may be benefiting from such environmental resource relatively tradable on the open market and in relative demand?	1	9	2
Are there any sales statistics that can be analysed, or property valuers, or experienced estate agents that can be interviewed regarding the affected properties?	5	4	3

The Hedonic Pricing method only achieved a suitability rating of 50%. Although most respondents agreed that there were properties in close proximity to environmental resources that may benefit from them, it was clear however that they may not necessarily affect property values. The reason for this is evident in the questionnaire results where benefiting properties are mostly those located within Rand Water's Estates, which being staff housing and workplaces is not tradable on the open market. This method may therefore only be suitable where surrounding private properties are benefiting from the Rand Water open space in terms of a view or benefit from its non-consumptive and indirect use values.

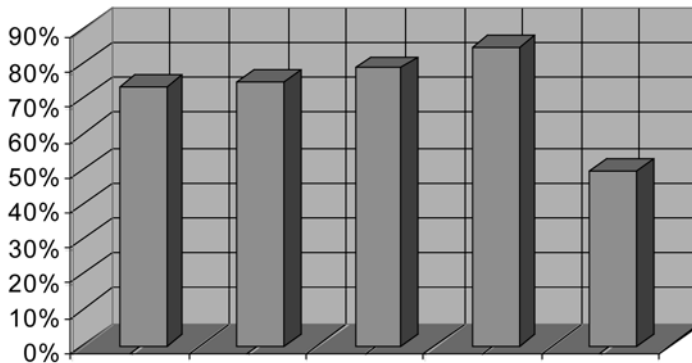


Figure 2: Percentage suitability rating for the application of valuation methods on Rand Water's open space

## 8. Conclusion

Open spaces and their inherent environmental services play an important role in the urban environment. There are however numerous challenges in achieving an equilibrium between sufficient open space allocation and urban development. Among these challenges is the need to densify cities in the wake of urbanisation and urgent housing needs, crime in parks, ignorance about the implications of development on sensitive environments, and restrictive budget allocations for parks management functions.

The nature of these challenges rather favours a reduction in the number and extent of park coverage, considering its economic argument that open spaces are not generators of income. Open space allocation is after all not a core municipal service. The question is then asked whether there is economic sense in providing open spaces within the urban environment.

Rand Water is asking the same questions about its open space network. Is there an economic case for keeping and maintaining these open spaces considering that this government entity's core function is to provide water? How do these open spaces and their environmental services complement the operations of Rand Water and contribute to its work, environmental, social and legal environment?

The recent three decades have seen the development of environmental valuation techniques under the wing of environmental

resource economics. Economists have realised that there has been market failures in that the economic benefits of the environment is not accounted for in economies. This effective discounting of the environment has led to abuse and a skewed favour towards development, at the expense of sustainability. These valuation methods have been developed to assist economists, and to a lesser degree environmentalists, in determining the economic value of the stream of benefits offered by the environment. Economists realised that the economy is operating within the environment and is reliant thereon, as a destroyed environment cannot support life, without which there is no economy.

This paradigm sets the stage for the assessment of the feasible application of environmental valuation techniques within the Rand Water context. Different methods are employed to value different environmental services and not all methods are therefore applicable in each scenario. Rand Water's open spaces are set within a unique environment characterised by limited accessibility. This excludability factor has a significant impact on the application of a number of valuation methods which relies on vast numbers of respondents to obtain efficient data. The Travel Cost Method as well as the Contingent Valuation Method acquires its data through questionnaires from a wide range of interested and affected parties, which are largely absent from Rand Water open space. The Hedonic pricing method is reliant on sales data of tradable private property which may benefit from its proximity to an open space or its environmental services. Although there are private properties that may benefit from Rand Water open space, this is fairly limited. The majority of residential areas that are benefiting directly from these parks and open spaces are owned by Rand Water and provided for its employees. These properties are therefore not tradable on the open market and sales data is non-existent. The application of the Hedonic Pricing Method is therefore limited.

The exclusion of these methods means that the values these methods have been designed to determine (non-consumptive use, option and existence values) are excluded as well. The total economic value may therefore not be attainable with the limited suite of methods available. There is therefore a need to develop specific methods that will fill this gap to ensure that valuations reflect the total economic value of the Rand Water open spaces. The standard suite of available methods is also limited in valuing the impact of the environment on human health, productivity and behaviour. Available methods also offer limited scope in valuing carbon sequestration, and there is vast scope for further research in this field.

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## Poverty alleviation of labour-based infrastructure delivery: the case of Dar es Salaam (Tanzania)

Peer reviewed

### Abstract

Labour-based technology (LBT) is a strategy popularised by international organisations such as the International Labour Organisation (ILO), United Nations Development Programme (UNDP) and the World Bank, to address poverty, unemployment and infrastructure provision especially in informal urban settlements. More emphasis has been placed on using the LBT approach in sub-Saharan countries where unprecedented urbanisation is taking place leading to the formation of informal settlements, high levels of unemployment accompanied by poverty. The LBT approach has been implemented in many developing countries. However, there is little available evidence of the long-term impact of LBT on poverty alleviation and employment creation opportunities. This article reports on employment creation opportunities and poverty alleviation while delivering infrastructure using LBT in informal settlements in Dar es Salaam, Tanzania. A qualitative research approach was used which included personal interviews of the residents who were directly involved in infrastructure provision in the Hanna Nasif informal settlement using LBT. The infrastructure delivery project in Hanna Nassif commenced in 1994 and was completed in 2000. The research was conducted four years after the project had been completed, namely in 2004. The findings reported in this article provide base line data for policy makers and researchers, while contributing to understanding the long-term impact on employment creation opportunities and poverty alleviation using LBT. The article concludes with a proposal for a LBT-Poverty Alleviation framework.

Keywords: Informal settlements, infrastructure, job creation, LBT, poverty alleviation

### Abstrak

Arbeidsgebaseerde tegnologie (AGT) is 'n strategie wat gewild geraak het onder internasionale organisasies soos die *International Labour Organisation (ILO)*, *United Nations Development Programme (UNDP)* en die Wêreldbank, om armoede, werkloosheid en infrastruktuurvoorsiening spesifiek in informele stedelike gebiede aan te spreek. Meer klem is geplaas op die gebruik van die AGT benadering in sub-Sahara lande waar ongekende verstedeliking plaasvind

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wat lei tot die vorming van informele woongebiede, hoë vlakke van werkloosheid gepaardgaande met armoede. Die AGT benadering is geïmplimenteer in baie ontwikkelende lande. Desnieteenstaande, is daar min beskikbare bewyse van die langdurige impak van AGT op armoedeverligting en werkskeppingsgeleenthede. Hierdie artikel doen verslag oor werkskeppingsgeleenthede en armoedeverligting gedurende die voorsiening van infrastruktuur deur die gebruik van AGT vir informele woongebiede in Dar es Salaam, Tanzanië. 'n Kwalitatiewe navorsingsbenaderings is gebruik wat persoonlike onderhoude met inwoners, wat direk betrokke was by infrastruktuurvoorsiening in die Hanna Nasif informele woongebied deur AGT, ingesluit het. Die infrastruktuurvoorsieningsprojek in Hanna Nassif is in 1994 begin en is voltooi in 2000. Die navorsing is gedoen in 2004, vier jaar nadat die projek voltooi is. Die bevindings in hierdie artikel gee aan beleidsmakers en navorsers basislyn data en dra terselfdertyd by om die langtermyn impak op werkskeppingsgeleenthede en armoedeverligting deur middel van AGT te verstaan. Die artikel gee 'n voorstel van 'n AGT-Armoedeverligtingsraamwerk.

Sleutelwoorde: Informele woongebiede, infrastruktuur, werkskepping, AGT, armoedeverligting

## 1. Introduction

Labour-Based Technology (LBT) is a construction technology, which aims to apply a labour/equipment mix that gives priority to labour, but supplements labour with appropriate equipment where necessary for reasons of quality or cost. While producing or maintaining infrastructure to a specified standard in a cost-effective manner, people are employed with fair working conditions (ILO, 1996). The ILO has promoted LBT over several decades under employment-intensive programmes (EIPs) as a means of creating employment opportunities and alleviating poverty. Further, these programmes also pursued the creation of infrastructure and other assets (Jinchang, 1997; ILO, 2003). In the late 1980s, the ILO in Tanzania transferred its experience in LBT rural works programs to the urban sector through its Special Public Works Programme using community participation and small-scale enterprises (Miller, 1995; ILO, 1996; Kedde-man, 1998; Jinchang, 1997).

The definition of poverty is a matter of considerable controversy with differing views that partly revolve around the personal perspective taken. According to Mbughuni (1994), one may take the global, continental, national, regional or the individual perspective. Accordingly, poverty is perceived on the basis of indices, which define the social status of a person or a group of people relative to the others or other social groups and social organisations of the respective community (Liviga & Mekacha, 1998). Poverty has also been described in terms of being as ability or inability to attain an accepted minimum standard of living (World Bank, 2000). In the urban context, it refers to those families, who fail to meet basic needs and enjoy

adequate access to social services and capital, which leads them to live below the official urban development standards (earning less than US \$1 per a day). Poverty alleviation can, therefore, be regarded as the creation of a social, economic, and political environment that enhances and promotes entrepreneurial activities particularly among the poorest and most deprived persons while at the same time eliminating the inequalities that have diminished their life chances (Mbaku, 2007).

This paper examines whether the primary objectives of employment creation and poverty alleviation, as defined, were indeed achieved in the execution of infrastructure projects in Dar es Salaam and particularly the project in the Hanna Nassif informal settlement. With this in mind the study was carried out in 2004, more than four years after its completion in 2000. The intent was to determine whether there were any medium- to long-term impacts on the overall quality of life of the participating community residents either in terms of poverty reduction and/or the creation of sustainable employment. Further, the study sought to determine whether there were any relationships between the levels of education, gender or ethnicity of the participants and the overall outcomes of using the LBT approach relative to these two objectives.

## **2. Literature review**

Several in-depth studies by the ILO and other agencies such as the World Bank, have suggested that the utilisation of the labour-based approach to design, construct, operate and maintain infrastructure is cost effective particularly when compared to the equipment-based technology approach (Keddeman, 1998; ILO, 1998; ILO, 2003). The experiences of using LBT for infrastructure provision in countries such as Ghana, Lesotho, Madagascar, Rwanda, Zimbabwe, Cambodia, Laos and Thailand, indicate that the approach is generally, in financial terms, about 10 to 30% less costly than the more equipment based option. It potentially reduces foreign exchange requirement by 50% to 60% and creates for the same level of investments two to four times more employment (ILO, 1998; Majeres & Veen, 2001; Islam, 2001; ILO, 2003). In the context of this study this last reported benefit, namely that of employment creation, is of interest.

Other studies have compared labour-based projects with equipment-based projects and found a transfer of knowledge in labour-based road works to local communities - knowledge useful for later maintenance and employment creation. Other benefits of labour-based construction methods include their potential environmental

advantages. These include the use of less fuel, emission of less exhaust fumes, raising of less dust, less serious damage to the terrain bordering a construction site, and requiring less manoeuvring space which in itself is preferable in informal settlements (ILO, 1996; ILO, 1998; Islam, 2001). Further, LBT encourages the development of the local industry for manufacturing hand tools and light road construction equipment. Additional benefits include savings in foreign exchange, injection of cash into the local economy, increasing skills in local people, and the enhancement of future sustainability through a higher sense of local ownership and through familiarising people with the necessary operations for road maintenance (ILO, 1996; Islam, 2001; Majeres & Veen, 2001).

Arguably, poverty is associated with lack of employment opportunity. Employment creation is seen as one of the most effective means of poverty alleviation (Keddeman, 1998). Poverty reduction using labour-based technologies lies in the economic concept known as the 'multiplier' (Hillebrandt, 1999). In effect, this multiplier effect means a boost to the purchasing power of workers created by the injection of cash into the local economy. For instance, when people are employed, they spend portions of their wages or income on goods and services produced in other sectors of the economy which in turn generate employment and spending elsewhere. In this way an upward spiral of increasing employment is created (Keddeman, 1998; Devereux, 2002; Thorndahl, 2003). The theoretical background is based on a wide range of economic theories and the 'circular flow of economy' approach, which uses wages generated from employment gained into propping up the local economy and employment creation for others.

However, the most important determinant of the extent to which earnings from LBT projects generate income multipliers is probably the level or value of income transferred (ILO, 2002). Direct income benefit accrues to the poor through income transfer (ILO, 2002). The income transferred to the participants during construction project attracts business investments around the sites due to the fact that people will spend their wages on goods and services inducing a multiplier effect to the other economic sectors. The study by ILO (2002) in India found that the direct income transferred to the participants in infrastructure provision was high and provided substantial alternative employment opportunities. In another Indian study it was observed that EGS projects generated net income gains to the participants. These direct transfer benefits arguably led to the reduction of poverty (Gaiha, Imai, & Kaushik, 2001).

Although this type of employment paid low wages and was temporary it was possible for workers to derive long-term income benefits (Devereux, 2002). Sustainable poverty reduction and income transfer through LBT can potentially be achieved in several ways. These ways include expanding coverage to increase the number of poor people who benefit, raising the wage rates, and extending the duration of employment to allow participants to accumulate sufficient income to graduate out of poverty with transferable skills (Devereux, 2002). The strategy of targeted wages has been used to provide employment for vulnerable people. A certain amount of income is transferred to each worker during a given period of time. The focus of the wages was to directly alleviate the economic aspects of poverty. At the lowest level, the minimum average employment period was 100 days with an estimated minimum daily wage level of US\$1 (Devereux, 2002; Thorndahl, 2003).

Some critics argue that LBT programmes should be used to enhance the value of labour by improving the human capital of participants through training (Islam & Majeresh, 2001; Watermeyer, 2000). However, Devereux (2002) and Thorndahl (2003) emphasise that the main product component of LBT is the transfer of skills that enhances the potential for workers to find better employment after completion of the particular project than they were able to secure before or to apply their new skill in the informal sector or become self-employed. The study of Teklu (1995) indicated that participants in infrastructure projects in Botswana were given the opportunity to upgrade their skills. For the poor who had previously engaged in low paying marginal wage employment, access to infrastructure projects allowed them to move to better paying jobs. Effectively the projects contributed to moving some households to the middle-income group. A study in South Africa on public work programmes found that there was a superior benefit from employment created particularly through indirect benefits such as training and empowerment compared to cash transfers (Lawrence & Michelle, 2002).

### **3. Research methodology**

Given the investigative nature of the study a case study method seemed appropriate (Yin, 1988). Since the primary objective of the study was to identify the potential for poverty alleviation through the usage of LBT, residents from the community having worked on the infrastructure projects were considered as the most appropriate data source. Semi-structured interviews were held with the residents of the Hanna Nassif settlement who had directly participated in the

provision of infrastructure in their area. This infrastructure included access roads; storm water drains and a tap water system. In order to obtain a representative sample of the participants in the infrastructure provision projects, the list of residents who had participated in the projects was obtained from the community based organisation (CBO) office in Hanna Nassif. A total of 470 participants were on two lists, namely separate male and female lists. The lists formed the population frames from which a sample selection was made. A total of 47 participants were selected on a non-probabilistic basis, thus representing a convenience sample. The instrument used during the interviews contained a total of 52 questions grouped into three sections. Part One of the interview guide was used to gather information about the demographics of respondents including gender, marital status and age, kind of job they were currently involved with, average income earning per month and whether they had construction experience before they participated in the project. Part Two investigated the participation of residents in infrastructure delivery. Questions were designed to determine the basis of their employment on the project, duration of this employment, the amount of money earned on the project, the extent and nature of any training received, duration of this training and how they used the money which they were paid. Part Three of the instrument investigated the benefits of participation of residents in the infrastructure projects especially after these infrastructure projects had been completed. The impacts after completion of the infrastructure projects particularly investigated were their employment status, their average income levels, and their subsequent living conditions or quality of life.

#### **4. Hanna Nassif**

Hanna Nassif is one of the oldest unplanned settlements in Dar es Salaam. It is located in the Kinondoni District - 4 km to the north of the City Centre. The settlement covers an area of 46ha with a population of 32,000 inhabitants with 8,230 households representing an average of 3.9 inhabitants per household (URT, 2002). Before 1994, the settlement had no roads, drainage, tap or water supply system and/or solid waste management system in place. Moreover, the settlement experienced seasonal flooding due to the absence of proper drainage systems. Until 1992 the road network was very poor in the entire area to the extent that a large number of houses lacked vehicular accessibility. The drainage condition in the settlement was very poor. For example, on 10 May 1991 it rained heavily, 72 houses collapsed and the whole of the central depressed area was flooded.

Pit latrines were flooded and human excreta mixed with rainwater. Together with uncollected solid waste, the settlement was reduced to an unhealthy living environment (Kyessi, 2002; Nguluma, 2003).

The settlement was then upgraded with ILO, UNDP and the Ford Foundation support in two phases. The first phase lasted from March 1994 to March 1996 while the second phase lasted from 1996 through 2000. The upgrading programme included the construction of a 2 km access road to a level of murrum, 1,2 km main storm water drains including 150m gabions, 3,7 km side drains, 10 road drifts and 10 vehicular culverts crossing the main drains, two major outlets for drainage discharge into the Msimbazi Creek, 16 road crossings, 128 foot bridges, 2,5 km of water pipes and 7 water kiosks, three of which had a capacity of 10,000 litres each and the other four a capacity of 5,000 litres each- a total of 50,000 litres.



Figure 1: Murrum road with storm water drain (January 2005)  
Source: Authors



Figure 2: Reserve tank at Hanna Nassif (January 2005)  
Source: Authors

The upgrading programme was carried out with the primary intention of not demolishing any houses while creating employment opportunities and alleviating poverty. It involved the community, using a labour-based approach. One critical element was that the community was involved in all phases of planning, designing and implementation. Subsequent to these projects, Hanna Nassif stands as an upgraded informal settlement with a relatively improved and conducive living environment (Nguluma, 2003). The murrum road with storm water drain and one of the reserve tanks for the waste water supply system are visible in Figures 1 and 2 respectively. These installations were constructed by the residents themselves.

## 5. Analysis of findings

### 5.1 Sample Demographics

The sample for the interviews of community participants comprised of 47 community members who had been involved in the infrastructure improvement projects with females representing 32%. Their demographic status at the time of the commencement and subsequent completion of the projects had largely remained unchanged. Half (50%) of the respondents were married suggesting that most of them had family responsibilities. Additionally, less than half (43%) of the respondents were heads of their households. Consequently, they bore the responsibility of providing for the daily needs of their families. Furthermore, 10% of the respondents, while being household heads were the only employed person in their households. The highest level of education of most (66%) of the residents who participated in the infrastructure project was primary or elementary school suggesting that they were most likely to be affected by high levels of unemployment and poverty. Evidently the profile of the sample was such that the purported benefits of using the LBT approach could be optimized with respect to offering employment to poor people who were not in formal employment (Thorndahl, 2003).

### 5.2 Participation in infrastructure project

#### 5.2.1 Type of employment

Of the 47 participants, 49% had been employed during the project as labourers, 30% as 'fundi's' and the remaining 21% in other categories, namely treasurers, storekeepers, foremen and semi-skilled/skilled labourers. The employment profile of the sample is shown in Figure 3.

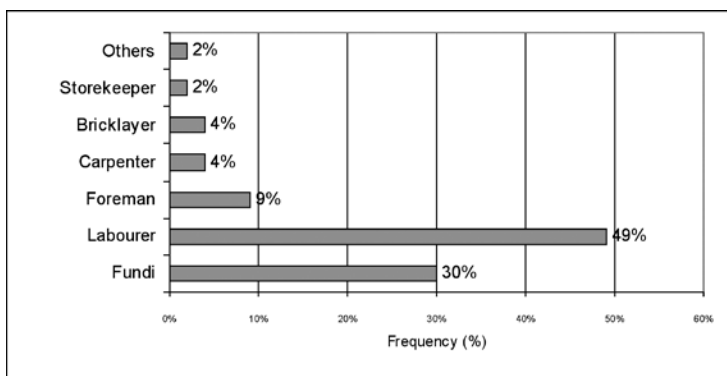


Figure 3: Employment profile of participants in infrastructure project

The LBT literature suggests that this profile is typical for labour force composition in LBT programmes, which require extensive excavation and construction activities that are done by labourers. The Hanna Nassif infrastructure provision project lasted for six years in two phases of three years each. The distribution of the length of employment of residents on the project is presented in Table 1.

Table 1: Length of Employment

<i>No of years</i>	<i>Frequency</i>	<i>Percentage</i>
<1	7	12%
1-5	26	74%
6-10	3	9%
Total	36	100

However, given that most (88%) of the respondents were employed for more than one year the employment period was higher than the 100 days suggested in the literature. Arguably, these findings suggest that most residents had worked sufficiently long enough to accumulate income and work related experiences. They were, therefore, hypothetically positioned to be better able to improve their living standards and benefit positively from the LBT initiative to alleviate poverty in terms of sustained employment and income generation.

### **5.2.2 Skills transferred**

The infrastructure project targeted skill enhancement and transfer as the vehicle for sustainable employment creation and poverty alleviation. This strategy is based on the premise that if existing skills are enhanced and honed and new skills transferred, the beneficiaries would be able to use these to obtain employment after completion of the project and be able from the income subsequently derived to improve their living standards and overall quality of life. Residents were presented with several questions relative to training. More than half (54 %) of the residents had previous construction experience. Both men and women had been taught new skills relative to preparing pre-cast moulds for drains, mixing ratios of materials and other relevant construction skills during the implementation stages of the project. Almost two-thirds (61%) of the residents had received training in the CBO office before the project commenced. Most (85%) had been given on-the-job training in specific construction activities. The duration of training ranged from one week to six months. Each participant had to attend between three and four training sessions



at various intervals throughout the project. The topics addressed in the training sessions included:

- Construction health and safety;
- Handling of equipment;
- Mortar mixing;
- Gabion construction;
- Drain maintenance and plumbing;
- Masonry and carpentry;
- Steel fixing;
- Record and book keeping (treasurer); and
- Issuance of materials and equipment (storekeeper).

For 47% of the participants this was their first opportunity to participate in infrastructure-type projects. The on-the-job training they received would potentially help them to secure better employment after the project was completed.

### 5.2.3 Income earned from the project.

Residents who had been employed as labourers were paid Tsh 900 per day while those employed as 'fundi's' were paid Tsh 1,200 per a day (In 1997, Tsh 900 was equivalent to U.S. \$1) (URT, 2001). Most participants had been employed for more than one year. However, the impact of the income earned on the alleviation of poverty is related to how the earned income was spent. Table 2 provides an indication of the spending patterns of project participants, given that respondents distributed their income across multiple expense categories.

Table 2: Spending pattern of project participants

<i>Expenses</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Ranking</i>
Family expenses	33	70%	1
Investing on business	15	32%	2
Personal savings	12	26%	3
Home improvement	10	21%	4
Insurance policy	1	2%	6
Others	3	6%	5

The findings from Table 2 suggest that expenditure on family expense items such as food, clothes, medical and rent dominated. For many of the respondents, income from the project was their only source of income from which they had to provide for their basic needs. On the other hand, almost one third (32%) of the residents were able to invest in their own businesses such as stalls, hair dressing salons, and small clothing shops. Others (21%) used their income to improve their homes which, arguably, in turn contributed to improving their quality of life.

#### 5.2.4 Impact of level of education and spending patterns during and post project

The findings were cross tabulated to determine whether the level of education of participants affected their spending patterns and, thereby, the overall impacts of the LBT approach to their project. The results are presented in Table 3. These findings suggest correlation between the level of education and spending pattern. Most participants (74%) with primary school level education spent their income on family expenses followed by 23% including spending on business investments and home improvement. On the other hand, most (54%) residents who had high school level education invested their income in businesses followed 46% investing their funds in personal savings. About one-third (38%) spent their income on family expenses and 23% on home improvements. Further, residents who had college level education spent most of their income on insurance cover, while those who had university level education spent their income evenly on personal savings, investing in businesses and family expenses.

Table 3: Cross tabulation of spending patterns and levels of education

Spending pattern	Levels of education							
	PS	Rank	HS	Rank	CL	Rank	UL	Rank
Family Expenses	74%	1	38%	3	0%	2	33%	1
Business Investment	23%	2	54%	1	0%	2	33%	1
Home improvement	23%	2	23%	4	0%	2	33%	1
Personal savings	16%	4	46%	2	0%	2	0%	4
Insurance policy	0%	5	0%	5	100%	1	0%	4

PS: Primary school level, HS: High school level, CL: College level, UL: University level

### 5.2.4.1 Impact of gender on spending pattern

To determine whether there was any correlation between spending patterns and the gender of residents, the data on spending patterns and gender were cross tabulated. The cross tabulation is shown in Table 4.

Table 4: Cross tabulation of spending pattern and gender

Spending pattern	Gender			
	Male	Rank	Female	Rank
Family expenses	37%	1	26%	2
Personal saving	34%	2	-	
Business	31%	3	53%	1
Home improvement	22%	4	-	
Insurance Policy	3%	5	-	

Findings from Table 4 suggest that there is correlation between gender and spending pattern. Males spent most of their income on family expenses, followed by personal savings and business investments. On the other hand, females mostly invested in businesses followed by family expenses. Arguably, males focused on the short-term responsibility of providing for the needs of their families while females took a longer-term view by pursuing sustainable sources of income such as from businesses.

### 5.3 Impacts of participation of residents in infrastructure project

With respect to how they personally benefited from participation in the project, various benefits were highlighted by respondents. These benefits included:

- The acquisition of skills and experience which helped them to secure employment;
- The earning of income used to improve their lifestyles and quality of life;
- The use of funds to start their own businesses;
- Increased knowledge of infrastructure and construction activities;
- Solving community problems of flooding and lack of infrastructure; and
- The procurement of fixed assets such as plots of land and farms.

Relative to how their participation impacted them and their families, respondents reported as shown in Table 5. Several cited multiple impacts. It is evident that the participation of residents in the infrastructure works allowed them to improve somewhat their family's standard of living and to effectively cover their basic needs which could not otherwise have been attained. Moreover, as a result of the project, the skills acquired helped some respondents to secure better employment to better provide for the basic needs of their family. In addition, income earned from the project helped several respondents to invest in new businesses, thereby ensuring sustainability of income to their families.

Table 5: Impact on personal lives of participating residents

<i>Impact</i>	<i>Frequency</i>	<i>Percentage (%)</i>	<i>Ranking</i>
Improve living standard	23	49%	1
Acquire skills to secure more employment	22	47%	2
More income to make investments	14	30%	3
Others	1	2%	4

Comparison of Type of Employment Before and After the Project



Figure 4: Comparison of employment situation before and after the infrastructure project (Note: UE: Unemployed, CA: Construction activities, BS: Business investment, PT: petty trade, and OT: Employed in other sectors as drivers, watchmen, cleaners)

## **6.4 Employment status after infrastructure project had been completed**

Various questions were asked regarding the employment status of participants. They were asked to indicate their employment status before they participated in infrastructure, and whether they had managed to secure employment after the infrastructure project had been completed. Further, they were asked whether they were still employed in jobs they had secured after the infrastructure project was completed some four years previously. These findings are shown in Figure 4.

An examination of Figure 4 reveals that the overall level of unemployment in Hanna Nassif had been reduced after the project was completed. Before the infrastructure project commenced, 47% of respondents reported that they were unemployed. After the completion of the project the unemployment rate had been reduced by almost half to 21% reporting that they were unable to secure a job. Four years later the reported level of unemployment had further reduced to 4%. It could be argued, therefore, that either directly or indirectly, as a result of participation in the infrastructure project, the overall unemployment rate dropped by 43% (from 47% to 4%), creating sustainable employment of the residents. The number of residents who secured employment in construction activities increased by 28% (from 10% to 38%) while the number of residents who were self-employed by investing in their own business increased by 3% (from 17% to 20%). It would also appear that many of those residents (14%) who had invested in businesses either during or immediately after the project had either lost or closed these businesses. On the other hand, residents who secured employment in other sectors as drivers, carpenters, storekeepers increased by 21% (from 17% to 38%).

## **6. Discussion**

### **6.1 Impact of LBT on employment creation opportunities**

Four years after completion of the infrastructure project, more employment opportunities had been created for the residents of the Hanna Nassif settlement due to the skills they acquired and income they derived by participating in the infrastructure project. The level of unemployment had been substantially reduced to almost two-thirds of the previous level. The income earned during the project allowed many residents to make investments and re-investments in small businesses or in farming. Several residents used their income to do home improvements, inducing a multiplier effect for entrepreneurs in the area through increased demand for renovation works. Moreover, a number of residents had as a result of the training they

had received on the project either found permanent jobs or had become self-employed in the construction sector.

The numbers of residents increased almost fourfold who worked on numerous construction sites in different parts of the city or had launched their own independent construction enterprises. The number of residents which invested their funds in business ventures increased by 3%. Other residents secured employment in other industries as drivers, watchmen, storekeepers, and treasurers. These trends highlighted the significant potential of the LBT approach to create sustainable employment opportunities.

## **6.2 Impact of LBT on poverty alleviation**

The essence of poverty relates to deprivation. Put simply - poverty is measured as the shortfall from a minimum acceptable standard of consumption or income. Income level is an indicator of socio-economic status and is, therefore, an important determinant of resources for obtaining access to health care, education, and adequate housing (Murphy, 1998). Evidently, the infrastructure delivery project in Hanna Nassif enabled residents to improve their living standards. The income earned by the workers improved the quality of their family lives by enabling them to improve their homes, and invest part of their savings to start or expand other economic activities. The provision of training and consequent transfer of technical expertise through on-the-job training at the construction site empowered the community to secure better employment and therefore enhancing income. After completion of the infrastructure project, most residents earned between Tsh 50,000 and Tsh 100,000 (equivalent to R333 to R667) per month. This income level is higher than the minimum salary/wage set by the government, which was Tsh 45,000 (R300). Further, the amount earned per day ranged between Tshs 1,533 and Tshs 5,000. This income is higher than expenditure per capita per day for Dar es Salaam, which was about Tshs 1,100 (equivalent to US \$ 1) (URT, 2001). These results suggest that the levels of poverty to most of the residents in the settlement were reduced. Additionally, the income derived from their business activities and the subsequent employment which others secured after the project had improved the situation.

## **7. Conclusions**

This paper employed a case study and interview methodology to investigate whether there was potential for poverty alleviation and employment creation through the use of labour-based technology.

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Analysis of the responses of a sample of 47 residents in an informal settlement, namely Hanna Nassif in Dar es Salaam, suggests that there is some potential. Any impact of LBT on poverty alleviation could appear by two ways:

- (1) Creation of employment opportunities; and
- (2) Use of earned income to improve the quality of life.

The findings of the study suggest that the LBT approach has the potential to create sustainable employment and alleviate poverty. The income earned by the workers in the infrastructure project improved the quality of their family lives by enabling them to improve their homes, and earn returns on their invested savings through expanded economic opportunities. The provision of training and acquisition of technical expertise through on-the-job training at the construction site had empowered community members to secure better employment and consequently, advance their income earning capacity. Unemployment had reduced. The number of residents involved in the construction sector had increased fourfold. There was evidence of the correlation between levels of education and gender on the spending patterns of residents. In this study, it was evident that residents with a primary school level of education spent most of their earned income on basic household expense items such as food and clothing whereas those with secondary level education spent larger portions of their income on business investments and personal savings.

Arguably, employment accompanied by on-the-job training was the catalyst for poverty alleviation. Consequently, it makes good business sense to recognize that in implementing LBT approaches,

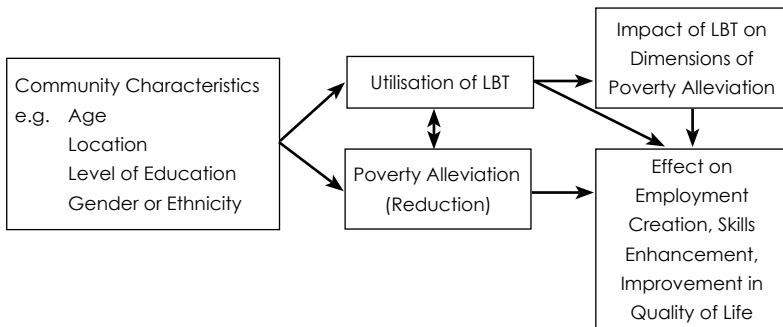


Figure 5: Proposed LBT-Poverty Alleviation framework  
Source: (adapted from Dewhurst *et al.*, 2003)

the levels of education within communities, payment of appropriate wage levels and on-the-job training must be considered.

Clearly, the potential of poverty alleviation by labour based infrastructure delivery will have an effect on employment creation, skills enhancement and improvement of quality of life. However the extent of LBT on alleviating poverty should be of interest to researchers particularly in identifying the direct and indirect effects. This is summarised in the general framework shown in Figure 5.0. Further investigation is also required to identify the extent of the impacts through a refined statistical analysis such as Structural Equation Modelling as it would take into account the moderating effects of time lag.

While this study was limited to the Tanzanian experience it has implications for South Africa and Africa given that the issue of infrastructure delivery in informal settlements is one of the major challenges facing the sub-Saharan region. The lessons learnt from the Dar es Salaam experience could be tested for applicability in the South African context and Africa in general. Furthermore, to explore these issues further a larger survey is required to investigate the extent of the potential and impact of LBT on the alleviation of poverty.

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**Tarina Jordaan, Karen Puren & Vera Roos**

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## **The meaning of place-making in planning: historical overview and implications for urban and regional planning**

*Peer reviewed*

### **Abstract**

In its course of development, urban and regional planning has been greatly influenced by the modernist movement, which left human environments with various problematic ecological and social conditions. In reaction to these conditions, alternative planning approaches branched from the planning profession, one of these being the development approach known as place-making. Place-making is the physical designing of a place based on locational contexts. Place-making is offered as an alternative planning approach to current planning practice to ameliorate and possibly prevent continuation of the problematic ecological and social conditions. However, this implies that there has to come about a shift in the focus and aims of current planning practice. The main implications of place-making are that planning should become more contextually driven, holistic, multidisciplinary, as well as human and quality centred. Also, it is proposed to increase research on place in the South African context.

**Keywords:** Place-making, urban and regional planning, place, contextual design

### **Abstrak**

Die ontwikkeling van stads- en streekbeplanning is grootliks beïnvloed deur die modernistiese beweging, wat menslike omgewings met verskeie ekologiese en sosiale probleme gelaat het. In teenreaksie op hierdie probleme, het verskeie alternatiewe beplanningsbenaderings die lig gesien, waarvan plekskepping een was. Plekskepping is die fisiese ontwerp van 'n plek gebaseer op die plek se *in situ* kontekste. Plekskepping word geopper as 'n alternatiewe beplanningsbenadering tot huidige beplanningspraktyk om sodoende die ekologiese en sosiale probleme te verbeter of te voorkom. Dit impliseer egter dat huidige beplanningspraktyk 'n verskuiwing in fokus en doelwitte moet ondergaan.

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Die hoofimplikasies van plekskepping is dat beplanning meer konteksgedrewe, holisties, multidisziplinêr, asook mens- en kwaliteitgesentreerd moet word. Ook word dit voorgestel dat meer navorsing oor plek in die Suid-Afrikaanse konteks gedoen word.

Slutelwoorde: Plekskepping, stads- en streekbeplanning, plek, kontekstuele ontwerp

## 1. Introduction

Since the 1970s concepts like place, sense of place and place-making received increasing attention in both spatial research and practice (Windsor & McVey, 2005: 147; Cresswell, 2002: 12; Graumann, 2002: 107; Kaltenborn & Williams, 2002: 189; Casey, 1996: 20). This was to a large extent a reaction towards modernism that influenced urban planning practice – a reaction against the destruction of unique local identities that resulted from standardising and sterilising environments, or creating fantastic environments out of tune with their surroundings (Arefi, 1999: 185; Tibbalds, 1992: 9; Relph, 1976). Urban planners kept themselves uninvolved with the context<sup>1</sup> of the locations they designed in order to achieve efficiency or a large profit margin (Madanipour, 1996: 28; Jacobs & Appleyard, 1987: 168). These practices continue today and critique against these approaches has not yet slackened (Carmona, Heath, Oc & Tiesdell, 2003: 12; Arefi, 1999: 184; Dewar & Uytendogaardt, 1995: 4).

In an attempt to understand and perhaps improve the imprints left by modernism on the physical and social realms of humans and environment, there seems to be a great interest in place research. Place research encompasses a wide variety of studies done in various disciplines and paradigms (Patterson & Williams, 2005). Humanistic geography, forestry, resource management, anthropology, sociology, psychology, architecture, landscape architecture, urban design, and urban and regional planning all contributed to place research. Both qualitative studies, as was done by Norberg-Schulz (1980), and quantitative studies, like those of Shamai & Ilatov (2005) have been done in place research. Because of the variety in disciplinary and paradigmatic approaches in place studies, place is considered a complex phenomenon. Therefore, it cannot be classified as a singular research field. Rather, it must be considered as a phenomenon that ought to be studied in an interdisciplinary and encompassing way (Patterson & Williams, 2005).

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1 Contexts in this research refers to the natural, cultural, socio-economic, political, mythical, ethnic, and aesthetic milieus and whichever of these play the strongest role on a location, as identified by Loukaki (1997: 309)

The overall characteristic of place research is the increasing attention given to affective and subjective dimensions of locations. On an international level, place research is fuelled by a spreading belief that a locally responsive approach in management and development of locations increases the quality of life for those inhabitants involved (Williams & Vaske, 2003: 831; Dewar & Uytendogaardt, 1995; 1991; Tibbalds, 1992: 12). On a local level it is fuelled by an increasing need to address the existing shortcomings of modernistic planning – based mostly on economics and functionality – and *apartheid* planning, based on the separateness principle of the *apartheid* regime, in their inability to create locally responsive, unique, and viable settlements (CSIR, 2000; Behrens & Watson, 1997; Dewar & Uytendogaardt, 1995). Despite this, it is disappointing to notice that current South African development law<sup>2</sup> makes precious little mention of place issues within development legislation, giving priority to socio-political, socio-economical, and land and resource issues.

Where humans are actively involved with their environment the landscape plays an active role in everyday life (Hufford, 1992: 241). Human experience and understanding do not exist separately from physical space (Hufford, 1992: 232). Research has shown that places have an enduring effect on the lifespan of an individual on both a physiological and psychological level (Chalwa, 1992; Marcus, 1992; Rubenstein & Parmelee, 1992; Saegert, 1976). This means that people's experiences of a place have spatial implications in the creation of human environments (Thwaites & Simkins, 2005: 11). If urban and regional planners pay more attention to meanings assigned to places by their users, they may possibly achieve a better understanding of development issues (Davenport & Anderson, 2005: 639). This may enable planners to manage and/or create places that are embedded in their context (place-making) rather than to implement homogenising or context-alien designs (space-making) favoured by global development pressures (Hague & Jenkins, 2005).

In the Western World globalisation causes increased international and interregional competitiveness in terms of economic growth (Hague & Jenkins, 2005: 25). A consequence of this competitiveness is physical expansion of cities. Current observers noted that this expansion can influence the rural hinterland around such centres in different ways: either homogenous sprawl creates an expanding semi-suburban rural waste, or local communities insist on contextual development that strengthens the local place identity and can be

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2 For a more complete list of South African development law, see Scheepers, T. 2000. A practical guide to law and development in South Africa. Kenwyn: Juta.

used as a place-marketing tool (McCarthy, 2008; Hague & Jenkins, 2005; Carmona *et al.*, 2003: 101; Raagmaa, 2002; Haartsen, Groote & Huigen, 2000: 148). In South Africa cities also experience these globalisation forces, and together with the high levels of urbanisation, settlements are expanding rapidly. This causes uneven land use management, urban sprawl – notably informal peripheral settlements with insufficient service delivery and government housing projects – and environmental degradation (South Africa. Department of Environmental Affairs and Tourism, 2007; South Africa. Department of Land Affairs, 2007; Pillay, 2004), all of which influence place meanings and identity. In areas that show tourism potential due to their strong sense of place, injudicious development, such as new middle to high income property developments, threatens to change the place identity and meanings that gave rise to its tourism potential in the first place (Ferreira, 2007). The loss of place meanings and identity is therefore very real in South Africa, and though place-making is not the panacea for this problem, it can redress it to some extent.

The question of importance is then why place-making is meaningful for urban and regional planning. To explore the validity of place-making in planning, one has to have an understanding of the historical development of place-making in urban and regional planning, as well as the possible meanings of place and place-making for planners. The aim of this article therefore is firstly, to clarify the concepts of place and place-making in planning by means of an historical overview of the development of place-making, and secondly, to highlight the possible implications of place-making in urban and regional planning.

## **2. Historical overview of place-making**

Interest in place and place-making developed from a variety of disciplines. Of primary importance for this research is how this interest developed in urban and regional planning.

According to Wheeler (2002), the initial phase of the development of urban and regional planning as a profession gained momentum in 1902 with the *Garden Cities of Tomorrow* by Ebenezer Howard (1946) and in 1915 with the work of Patrick Geddes (1968). This phase, which Wheeler calls 'ecological regionalism', is characterised by a relatively encompassing and place-oriented approach (a planning approach embedded in the location's contexts) to urban and regional planning. Therefore planning's origin was considered to be initially a locally responsive spatial discipline.

A typical characteristic of the pre-modern communities was how they adapted to and fashioned their world according to the opportunities and constraints of their environment. Their living places were embedded in the contexts present and suitable for the existing conditions (Williams, 2002). With the advance of the modernistic era, the change in managerial and technical skills since the First World War, and the rising popularity of modernistic principles in the spatial discipline after the Second World War, the focus of urban and regional planning shifted. It changed drastically from its initial holistic place-centred development, to an approach where the physical development of the environment was increasingly determined by economic principles and technology (Wheeler, 2002; Relph, 1981; Porteous, 1977: 316). Interest in fashioning places according to the natural and social contexts in which they were located – as described by Norberg-Schulz (1980) – waned. Gone was the creation of unique and locally responsive places. In its place, human environments were now created to reflect economics and functionality according to modernistic interpretation (Arefi, 1999; McHarg, 1992; Bentley, Alcock, Murrain, McGlynn, & Smith, 1985; Relph, 1981; 1976). This pointed to a shift in planning towards a more abstract and positivistic way of thinking about human and natural environments, one in which the concept of 'space' gained some prominence over 'place'.

For the purpose of this article, 'space' is considered to be as how Relph (1976) described it – sterilised locations that can be anywhere, physical designs that one can duplicate elsewhere so that it is totally unrelated to its context, and what Trancik (1986) coined as lost spaces, no-man's lands that are unformed and under-utilised. Space is perceived through the physical senses and is different from people's mental interpretation of the space (Madanipour, 1996: 12). It carries no human meaning and is regarded as 'objective' (Tuan, 1977: 54). Space is therefore a developed site that stands unrelated to its relevant contexts and the symbolical meaning associated with its location. Space-making is then defined as the process of creating spaces.

This interpretation of space is not the only one that exists. The debate around space and place is particularly visible in the field of geography. Economists and economic geographers see space as a tool to develop scientific generalisations (Cresswell, 2002), especially when referring to the spatial distribution of social and economic activities, factor costs and market price differentials (Hague & Jenkins, 2005; Agnew & Duncan, 1989: 2). This view of space is clearly vis-

ible in regional planning theories, such as those of Christaller (1933), Perroux (1950), Hirschman (1958), Isard (1960) and Alonso (1964).

Human geography was the first academic field to take a step away from the notion of scientific space, to one of 'place' as the setting for everyday routine social interaction (Agnew & Duncan, 1989: 2), as was reflected in the works of authors Lynch (1960), Tuan (1974; 1977) and Rapoport (1977). More recently, cultural geography showed interest in the concept of 'sense of place' or the identification with a place engendered by living in it (Agnew & Duncan, 1989: 2). It is this latter view on 'place' – one in which intangible elements feature – that is the basis for this article, though it is by no means the only one that exists.

'Place' refers to personal, group, or cultural space that has subjective meanings and an emotional tie between humans and their location (Windsor & McVey, 2005: 147; Altman & Low, 1992: 5). It is a space with a specific character or a sense of place (Norberg-Schulz, 1980: 5). This means that it has meaning for the individual or group (Violich, 2000: 113). Sense of place implies that people are satisfied with a place, and appreciate the land in a way that stretches beyond its use value (Stedman, 2002: 563; Eisenhauer *et al.*, 2000: 423). It is the character, the comprehensive atmosphere of a location, as well as the concrete space-defining forms present. It can be described as a place's "fingerprint" (Loukaki, 1997: 308; Rapoport, 1977: 179). It is the perception of what is most salient in a specific location (Cantrell, 1998: 303). Such places are unique and locally embedded, and vibrant with urbanity (if located in an urban setting) (Montgomery, 1998; Behrens & Watson, 1997; Dewar & Uytendogaardt, 1995; Jacobs & Appleyard, 1987; Bentley *et al.*, 1985; Jacobs, 1961). Place is therefore a location that is clearly embedded in (or has drawn inspiration from) its relevant contexts and reflect the symbolic meanings humans associate with it. Place-making would then be defined as the process of creating places, rather than the manifestation of the physical product, which is 'place'.

One of the aspects of modernistic planning that is greatly lamented is the loss of unique places. This was due to partial or complete physical destruction and redevelopment of such places, as well as newly created locations which can be described as mostly mono-functional, monotonous, and sterile (Arefi, 1999; Dewar & Uytendogaardt, 1995; Bentley *et al.*, 1985; Norberg-Schulz, 1980; Relph, 1976; Jacobs, 1961). This is not the only critique against modern planning. Authors (Arefi, 1999; Behrens & Watson, 1997; Jacobs & Appleyard, 1987; Trancik, 1986; Relph, 1976; Jacobs, 1961) site various problems



of modern design, such as large-scale developers creating ever larger-scale developments causing loss of residents' control of their own living places. Also, privatisation of the urban environment leads to loss of vibrancy in public places, while modern designs cause increasing spatial fragmentation between different social groups. Profit-based usage of valued places leads to these places' destruction, which increases placelessness, users' alienation from the urban environment, and inequality between environments of the rich and the poor. Lastly, design professions – influenced by positivism and consumerism – increasingly design for people and locations from a universal viewpoint, applying instant solutions without considering the contexts involved.

The above-mentioned limitations were the impetus for the initial attack on modernistic urban and regional planning. Urban journalist, Jane Jacobs (1961), strongly opposed the theoretical basis on which planning rested on, that was economically driven (for a more detailed discussion, also see Wheeler, 2002). The reality of how cities work – according to Jacobs – differs from the planning theories applied to them. Perhaps this was the spatial disciplines' first inspiration for turning towards a related academic field, humanistic geography, to try to understand the problems of the modern city.

It was during the 1960s and 1970s that the influence of humanistic geography on urban and regional planning became apparent. This contribution in the development of place-making is what can be called the era of environmental understanding<sup>3</sup>.

## 2.1 Environmental understanding

Environmental understanding tries to explain the physiological and psychological processes involved in the way people perceive their natural and built environments. In addition, it tries to explain the way these perceptions influence people's experience of their environment. The way people experience their environment in turn influence how they use it, which also influence how the physical environment is further utilised.

The primary works of environmental understanding came from humanistic geography and urban and regional planning. According to Yi-Fu Tuan (1974; 1977), Downs & Stea (1977), Kevin Lynch (1960), and Amos Rapoport (1977), people gather environmental information in a physiological way through the senses (environmental

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3 Environmental understanding and enabling morphology are the authors' own terms used for classifying relevant literature that reflect similarities in content.

perception), which is then assimilated in a cognitive process, known as environmental cognition (Carmona *et al.*, 2003: 87; Rapoport, 1977: 31).

During environmental cognition people understand, structure, and learn about their environment (Rapoport, 1977: 31). It is an intellectual process and less consistent over cultural boundaries than environmental perception (Rapoport, 1977: 33; Tuan, 1977: 37). Through environmental cognition, people come to understand their environment, connecting it with communal or individual symbolism in the form of cognitive maps (Downs & Stea, 1977: 68; Rapoport, 1977: 31). Meanings are attached to both the physical and the social environment, and are represented as such in their cognitive maps (Rapoport, 1977: 168). The value of these meanings or symbols (whether positive, negative, or neutral) determines attitudes, attachment towards the environment, and usage of the environment. This is very similar to symbolic interactionism, in which people's actions towards things are based on the meanings they ascribe to those things while interacting with them (Blumer, 1969).

Two distinctive parts of environmental understanding is obvious from both the humanistic geographic and planning perspectives. Firstly, environmental input is experienced through the biological senses, as well as on a psychological level. The focus of Tuan's work (1977) overall relates to the way people experience space and place on both a biological and symbolical level. The dimensions of the human body, the cultural and the individual orientations of people holistically influence the way people experience physical places on all spatial levels, which in turn influence the symbols and meanings people assign to these places. Tuan's understanding of the physical environment therefore tries to explain how people assign meaning to the physical environment. Rapoport (1977), writing as an urban and regional planner, illustrates a similar biological and psychological process in the human experience of the environment which eventually leads to the assignation of meaning to physical places. Both studies are useful in terms of place-making, since place-making is the process of actively weaving contextual meaning, whether it is everyday, temporal, or symbolic meaning, into the structure of a place (DeMaria Harney, 2006: 25; Tuan, 1977: 102).

The second part of environmental understanding focuses on how these environmental meanings are spatially represented. Kevin Lynch (1960), as a planner, writes that people's spatial understanding of their environment can be categorised into five spatial elements, namely paths, edges, districts, nodes, and landmarks. These

elements can be superimposed on a physical map of an environment, creating a spatial representation of people's understanding of place. Similarly, though writing from a geographical viewpoint, Downs & Stea (1977) focus specifically on the development of cognitive maps relating to people's spatial experience of an environment. Cognitive maps are abstractions covering cognitive abilities that enable people to collect, organise, store, recall, and manipulate information about the spatial environment (Downs & Stea, 1977: 6). It is therefore the manner in which people organise their representations of some part of the spatial environment, which is obtained through the biological senses, interpreted through the cognitive processes and which are based on a unique personality, cultural, and demographic profile. Understanding the way in which cognitive maps are developed and used offers another way to explore the meaning that users of a specific environment attach to it.

After the spatial sciences' rather short focus on environmental understanding, the 1980s heralded the second contribution in the development of place-making, namely enabling morphology.

## **2.2 Enabling morphology**

Enabling morphology seems to have developed partially due to the continuance of Lynch's initial work in the 1960s, and partially due to the burgeoning urban design movement as critique against the spatial legacy of modernism (Bentley *et al.*, 1985). It pays more attention to the qualities the urban environments must have to allow their inhabitants to fulfil their physical, socio-economic, and mental needs, rather than trying to understand how their inhabitants experience them.

Kevin Lynch in *Good City Form* (1981) did work in which he identified performance qualities that can be used to 'measure' whether an urban environment fulfils the needs of its inhabitants. Performance qualities are identifiable spatial characteristics reflecting on the performance of cities that are also measurable scales (Lynch, 1981: 111).

In *Responsive Environments: A Manual for Designers*, Bentley *et al.* (1985) discussed appropriate qualities for urban environments (from an urban design viewpoint), ranging from permeability on the larger scale of the city, to personalisation of the more personal, small-scale places. Similarly Montgomery (1998) – an urban and regional planner – lay down three principles for creating successful urban places, namely good city form, sensory experience, and human activity. All

of these author's performance qualities and principles are refined into qualities that describe either what the city must allow its citizens to experience, such as vitality and access, or the morphological qualities that must be achieved, like density and scale. Either way, the city is seen as a vessel that can be managed or manipulated to create certain human experiences or enable these experiences, based on the needs of the city's inhabitants.

The essence of enabling morphology is that the physical form of cities is subservient to the needs of its inhabitants. It is however important to create an appropriate physical form in order for the city to serve its inhabitants. This morphology of a city is, therefore, the vehicle for the possible fulfilment of its inhabitants' needs.

The contributions of environmental understanding and enabling morphology are important in urban and regional planning's movement from modernistic planning and towards a more contextually grounded planning of human environments. They both contributed to place-making in planning. However, they truly cannot be considered as place-making, since they do not carry the main elements of place-making, which is 'physical design' within 'locational context' (Behrens & Watson, 1997; Tuan, 1977).

### **2.3 Place-making**

Place-making is considered to be the process through which an environment with a unique sense of place is created (Behrens & Watson, 1997: 10). It is the awareness of weaving contextual meaning – cultural, historical and natural – into physical structure (Trancik, 1986: 97; Tuan, 1977: 102). Built environments based on the principles of place-making reflect the characteristics of their unique natural and cultural settings (Behrens & Watson, 1997: 11). Through place-making, the site's uniqueness is enhanced, instead of standardising its character. Designers working from a place-making viewpoint are against imposing abstract designs unrelated to the contexts present like modernists often do (Trancik, 1986: 98).

Urban and regional planners seem to play an important role in the future application of place-making in the spatial professions. Hague & Jenkins (2005: 8) see planning as "being about place-making; that is to say that a key purpose of planning is to create, reproduce or mould the identities of places through manipulation of the activities, feelings, meanings and fabric that combine into place identity". However, "while place-making is more central to the profession of planners than to most other social groups, the planners do not have

a monopoly on the power to determine a place identity" (Hague & Jenkins, 2005: 8). The making of places, participation from vested individuals and groups, and planning are intimately intertwined.

Internationally, authors who endorsed the place-making viewpoint opposed modernistic planning as early as the 1960s (McHarg, 1969) and 1970s (Relph, 1976). In South Africa a similar reaction occurred in urban and regional planning, where the reaction also included a critique on the spatial legacy of the apartheid era (CSIR, 2000; Behrens & Watson, 1997; Dewar & Uytendogaardt, 1995). Internationally, the past two decades gave rise to a distinctive kind of 'ecological thinking' regarding natural resources, focusing on both tangible objective and intangible subjective environmental properties. It also includes emotional and symbolic meanings people associate with specific places (Williams & Vaske, 2003: 830). Urban and regional planning is seemingly moving into what Wheeler has referred to as the 'new regionalism' era, which is characterised by a concern for the environment, equity, and economic development (Wheeler, 2002). In addition, there is an increasing focus on the developing or managing of human environments in a place-oriented manner. A large body of existing literature in the spatial sciences mirrors this new regionalism of Wheeler. The literature focuses on creating quality places rooted in their local contexts and not just places that purely reflect the principles of economy and efficiency, though not scorning it either (Hague & Jenkins, 2005; Behrens & Watson, 1997; Dewar & Uytendogaardt, 1991, 1995; Mcharg, 1992; Jacobs & Appleyard, 1987; Lynch & Hack, 1984; Norberg-Schulz, 1980; Relph, 1976).

Place-making's history has long been in the making. Starting in the 1960s with Ian Mcharg's *Design with Nature* (1969/1992), environmental design ethics was very much at the forefront. Mcharg believed that a consumerist approach towards development of human environments was leading to destruction of nature, as well as creating meaningless towns and cities without a sense of place. In order to stop environmental degradation and the creation of characterless profit-driven urban environments, Mcharg – and later also Lynch & Hack (1984: 5) – proposed that any site's development must be guided by the inherent possibilities and constraints of that particular site, whether it is historical, physical, or biological. A development ought to adhere to the sense of place, and should therefore be rooted in its contexts. It is here that Lynch & Hack (1984: 5) refers to the skilled site planner as one that "suffers a constant anxiety about the 'spirit of place'".

Hague & Jenkins (2005) have recently illustrated the use of an area's unique character in guiding its development in a contract research project, NoordXXI, which formed part of the European Union's Interreg IIC project, *Quality by Identity: Beyond Traditional Spatial and Economic Development*. The project illustrated how place-making can be integrated into planning practice, which is in line with the increasing interest from professional planners in place constructs (Hague & Jenkins, 2005: 3). The aim of the project was to influence the spatial development of each region based on a stronger local identity (Hague & Jenkins, 2005: xiv). This place identity is more or less based on Norberg-Schulz's sense of place concept (1980), which means that a place has unique natural characteristics that can be strengthened by a sensitive design solution. Also, it is based on the intangible meanings people associate with these characteristics. Planning is, therefore, seen as intimately involved in the processes of creating and disseminating meanings and identities. In addition, it is important for planners to realise that past and present identities cannot be summarily erased in favour of a new identity, but must be used as an important point of reference for the construction of a new place identity (Hague & Jenkins, 2005: 11).

Similarly, South African planners Dewar & Uytendogaardt (1991: 42) view place-making as allowing environments to develop their own 'logic'. A positive environment is one that is sensitive to the social and natural contexts of the place, allowing a fine-grained small-scale structure to exist between larger scale directional-giving structures that are coarser. To create quality places is to make built environments which are not based on ephemeral conditions – like population growth and rapid urbanisation – but places that encapsulate timeless qualities that support human activity, needs and reflect the natural and human contexts, as well as histories present (Dewar & Uytendogaardt, 1991: 13). Place characteristics, human activities and cultural expressions all work together to co-create unique places, which are regarded as the basis of society. Seen from a place-making viewpoint, planning must not be a purely functional, programmatic and technocratic exercise, but rather one that "also calls into play intuition, imagination and insight" (Dewar & Uytendogaardt, 1991: 13).

Championing the creation of unique places, Edward Relph (1976) and Christian Norberg-Schulz (1980) pleaded for the creation of authentic places (spaces with a sense of place) and saw consumeristic rootless development – based on modernism and the International Style – as destroying the meaningful places of peoples' lives by creating standardised places out of context. Jacobs & Appleyard

(1987) also opposed the universally designed developments and 'instant' development solutions. According to them, places must be designed to have a unique accessible character or sense of place in the whole, not as isolated icons unrelated to their contexts.

Overall, place-making can be seen as a complex, interdisciplinary phenomenon that was influenced by various spatial and humanistic paradigms (figure 1).

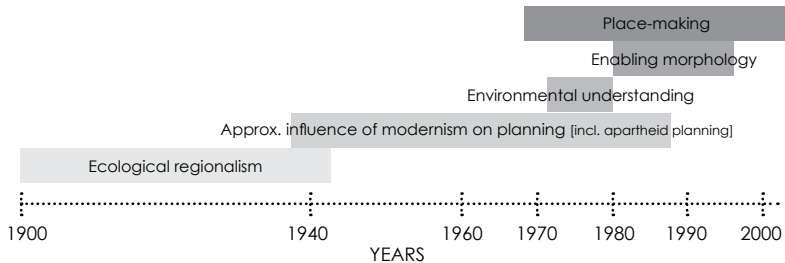


Figure 1: The development of place-making in urban and regional planning (2007)

These influences did not necessarily follow each other chronologically, but rather subtly influenced each other over traditional disciplinary boundaries. Place-making is mostly about creating places that fit the natural contexts, human body, as well as the way the human mind and heart works (Lynch & Hack, 1984: 72). Finally, it is about embracing both tangible and intangible elements of human existence and using these elements to guide physical development in partnership with the meanings that vested individuals and groups associate with a specific environment.

### 3. Discussion

Even though urban and regional planning might initially have been a contextually driven profession, it was drastically influenced by modernism. In fact, it seems as if its largest theoretical basis is still primarily based on the principles of 'objective' functionality and economy in which the end-users have less say in the development of a place than the developers do. These principles are also perpetuated by a profit-oriented approach to what the requirements of a good development are – the largest feasible number of units per area at the lowest cost. Global capitalism creates environments that focus more on quantity than quality. Place is devaluated and turned into a commodity. Numbers, economies, accessibility, and potential for growth change a collective experience and management of the

urban environment into a solitary one. The individual's living experience is not so important anymore as the privatisation and iconification of individual pieces of land. This 'everyone for himself' attitude breeds social incivilities and nuisances, replacing the self-policing nature of premodern neighbourhoods (Arefi, 1999: 182). Additionally, consumeristic development practices increase the potential for environmental degradation and poor quality living environments (McHarg, 1992; Lynch & Hack, 1984: 2; Relph, 1976).

The essence of this planning approach therefore implies that quantity is king over quality. This is not entirely reproachable – making the most of scarce resources cannot be criticised. However, a balance must be achieved. Priming resource use for financial gain over the ecological needs and needs of a place's users is surely to devalue the human experience and the habitat that supports humans.

This 'objective' approach, or space-making, created (and still creates) various problems for the ecology and users of such spaces, mostly because such objective developments go against, or ignore, the very social and natural contexts in which they are located (McHarg, 1992). To rectify these problems the planner has to step away from this singular focused approach towards a more integrated and multi-disciplinary approach. Planners, for example, can draw on the expertise of environmental psychology, which can broaden the list of contexts that can be included in physical designs. Environmental psychology studies tangible and objective properties of the environment that influence humans, as well as the subjective and symbolic meanings attributed to places by people (Williams & Patterson, 1999: 142). This is important, since there are many spatially related meanings and values that cannot be identified through measurable or traceable means like market transactions (Williams & Vaske, 1999: 143). The use of knowledge from environmental psychology is not new – it has proven useful in disciplinary challenges in fields like urban and regional planning (Williams & Vaske 1999: 141; Lynch & Hack, 1984: 68).

In addition to broadening his/her theoretical scope, the planner will have to cultivate a new definition of what urban and regional planning ultimately has to achieve. Whereas 'objective' planning aimed to achieve economy and functionality, contextual planning aims to create places that are meaningful for its users without compromising the natural contexts in which it functions. The essence of contextual planning is therefore place-based design – the use of local knowledge and/or resources available in situ to guide the design.



The argument here is that place-based planning, or place-making, has a greater potential to rectify and prevent the problems associated with 'objective' planning. The motivation behind this reasoning is that place-making aims to understand the contexts in which a place is to be created before a design is created, while letting the physical design be guided by these contexts when the actual planning starts. This implies that the planner has a greater understanding of the history of the place beforehand, enabling him/her to minimise potential negative outcomes, such as anti-social user behaviour like vandalism and crime, which can have financial and security comebacks for the place's users (Bell, Greene, Fisher & Baum, 2001: 286).

Understanding a place also prevents the loss of a location's history – collective and personal – that preserves history for its current and future users. Place-making does not forcibly shear people from their known lived-in world and destroy their place identity. To do so can cause emotional reactions like grief, anxiety, despair, xenophobic reactions towards outsiders, migration, groundlessness, and rootlessness (Holmes, Patterson, & Stalling, 2003: 245; Tibbalds, 1992: 77). In a moving case study about the loss of place and place identity of the Cheslatta T'En Canadian First Nation, Windsor & McVey (2005) wrote about the social ills and the decline of the living standards amongst these people. The Cheslatta community was forced to migrate away from the place they had populated for at least 10 000 years because their valley was flooded for a dam to run a hydroelectric plant (Windsor & McVey, 2005: 154). The loss of place and sense of place created havoc among the traditional lifestyle, effectively destroying the core values and traditions of a whole rural community. This shows that a place's identity can quickly disintegrate when even one of its three formative elements – socio-economic, spatial, and historical-cultural meanings – are threatened, changed, or destroyed (Raagmaa, 2002: 56; Harner, 2001: 675). The influence of loss of place identity can be major because of the role places have in forming and affirming a sense of personal identity (Williams, 2002: 353).

Understanding a place also enables the planner to maximise positive outcomes, such as creating a cherished environment that satisfies human needs such as identity, belonging, groundedness, meaning, growth, and spiritual well-being (Stuart, 2004: 76; Holmes *et al.*, 2003: 241). In addition, when such a cherished environment is under threat from harm or destruction, inhabitants have a greater propensity to rehabilitate it or preserve it (Brehm, Eisenhauer & Krannich, 2006; Brody, Highfield & Alston, 2004; Gifford, 1997: 51) – an element which seemingly lacks in modern landscapes (Relph, 1981: 99).

One way to gain a better understanding of the human contexts of a place under scrutiny is to draw on the knowledge and methods of environmental understanding. Considering environmental understanding, planning opened itself up to the introduction of subjective, less quantifiable elements. Environmental understanding makes it clear that although there is a fundamental difference between the physiological and psychological experience processes, they are ultimately linked to each other (Bell *et al.*, 2001: 95). The human body and mind cannot be treated as separate from its physical environment, since it is environmental input that drives these processes. Also, physiological experiences, such as environmental stress, have distinct physical and psychological effects on humans. This topic has been extensively researched in the field of environmental psychology. The link between environmental stress and psychological disorders shows an increasing occurrence in physical illnesses, mental disorders, performance decrements, aggression, irritation, social withdrawal, and decrease in prosocial behaviour (Bell *et al.*, 2001; Gifford, 1997).

In addition, environmental understanding states that the physical dimensions and qualities of environments have the ability to produce personal and collective symbology for their users. How users perceive their environment has an influence on users' experience of it and on how users will use it (Tuan, 1974). Environmental understanding therefore enables the planner to acknowledge the human meanings attached to a physical location, which in turn gives a probable description of how this place might or ought to be used in the future.

When the planner has a clear understanding of the potential usage of a place, he/she can turn to enabling morphology, which gives guidelines on how to achieve a physical design that enables certain experiences and meanings, as asked for by its users. However, there is the question of relevance of these guidelines. Most of the goals and principles of enabling morphology are generalised, based on goals that are supposed to be representative of all human urban needs. The question arises, for example, on whether these goals and principles are as applicable to a European metropole as to a small village in Sub-Sahara Africa. Identical environmental elements are not necessarily meaningful for different people, as certain elements – like culture – influence people's meanings (Rapoport, 1977; Tuan, 1977: 162). To assume that environmental elements have the same meanings for all people, is to assume that most socio-cultural differences between countries have been eradicated by some global process, such as globalisation. Nevertheless, it still ought to be

possible to apply these principles to a relatively homogenous, localised population.

However, knowing what the end-users' needs are and how to create a place that has the physical dimensions to satisfy these needs, is not what true place-making entails. True place-making also entails, in addition to the formerly mentioned elements, that the place is created according to its location's and users' unique identity. Otherwise, such a place, no matter how successful it is in satisfying its users' basic needs, is just another place that only satisfies basic human needs.

The uniqueness in question can be achieved by letting the design be guided by the inherent (natural or built) potentialities – the sense of place – of such a site. Hague & Jenkins (2005), Ian McHarg (1992), Norberg-Schulz (1980) all give extended descriptions on how to do just so. Ultimately then, it is using a site's character, the sense of place, together with the meeting of ecological and users' needs, for a physical design that crowns long-term quality of place over short-term monetary gain (McHarg, 1992; Norberg-Schulz, 1980).

#### **4. Implications for urban and regional planning**

Place-making has arisen from a human-inhabited landscape that was and still is characterised by definite environmental and social challenges due to certain planning practices. That is not to say that human settlements before the advance of urban and regional planning were free of similar challenges – perhaps these problems were only more in proportion to its inhabitants and more localised than with today's budding global population.

As it is, planning physical environments from a locally responsive way will require some shift in the way planners perceive developments, cities, and regions (Wheeler, 2002). Place-making calls for a more holistic, integrated, and multidisciplinary approach to planning. This means that any form of physical development cannot happen in isolation from the natural, social, and historical contexts that aided in the forming of the site's character; planning must not happen in a way that ignores the site's sense of place. Also, place-making's focus is long term, encompassing a wide range of contexts and meanings.

Every site is unique due to the complexity of its parts and patterns (Lynch & Hack, 1984: 30). It is composed of many factors from various contexts, and to disturb one factor is to create a chain of reaction in others. Disturbance is inevitable in any form of planning – making

places is therefore the creative art of producing a design for a site based on the unique parts and patterns present.

The consequences of planning are therefore greater than might initially be expected. This has several implications for planning practice (table 1).

Table 1: Main implications of place-making for urban and regional planning (2008)

<i>Place-making</i>	<i>Implications for planning</i>
Holistic, integrated, multi-disciplinary	Source information and techniques from related fields, not just those commonly used in planning.
Contextually based	Unique designs, based on <i>in situ</i> contexts and experiences.
Long term focus	Base design on projected long term ecological, social, and financial returns.
Complex approach	Include a wide range of elements in design.
Habitational and end-user oriented	Base design on site's ecological and end-users' needs, not solely on the expectations of developer.
People matter	The human experience <sup>1</sup> must be considered prime over economic or functionality principles.
Quality versus quantity	Quality of places is more important than quantity of spaces.
Accountability	Planner is directly responsible for creating places that meet immediate ecological and user needs; indirectly responsible for long-term quality of environment and life.
Lack of guidance	Increase place-making research on academic level.
Resources	Training personnel can cause short-term temporal and financial difficulties.

Place-making implies that "[r]eal space – seen through direct observation and understood through experience and contextual study – must take precedence over the abstraction of space contained within computer models, which are after all only tools to help planners understand the real world" (Wheeler, 2002: 274). The real world is not only about the level of cost-efficiency per spatial unit. The real world is also about the way the layperson feels about the settlement,

neighbourhood, and erf he or she lives in. If the layperson's lived-in world is characterised by a feeling of loss due to the obliteration of a place's inherent spirit; by spatial monotony that confuses place identity (but is easy to create on the drawing board); by frustration of a spatial design that does not fit or threatens his/her needs, cost-efficiency is the last thing this person thinks about. Ignoring the way people experience place and the meanings that they attach to places; ignoring the character – its inherent opportunities and constraints – of a place in favour of a context-alien design, is to scorn the value of human life and the world that makes life possible. Planning places must therefore ultimately be done from a point of view in which the site's and end-users' needs are prime, not the developer's (although in practice this might be harder to implement than in theory).

At first, including subjective aspects in planning practice may seem daunting, though this is indeed possible. Place-making starts with understanding the place and its various contexts as a whole (Lynch & Hack, 1984: 127). It integrates local knowledge and experience of the environment into the design – it is not a top-down design approach. When designing with the local contexts, the planner's development can perhaps avoid losses due to context-ignoring design of the environment as described by McHarg (one of his own examples refers *inter alia* to flooding). In addition, because place-making is contextually driven, basing designs on users' needs and meanings, it gives users control and choice over their environment. In cases where the planner does not know who the end-users are, design can be based on the locational envelope's natural and social contexts. Producing locally embedded developments might initially seem to be more expensive than the usual space-making, but they tend to have more long term gains – financially, ecologically, and socially – than the former because of the greater level of user responsibility (Brehm *et al.*, 2006; Brody *et al.*, 2004; Gifford, 1997: 51; McHarg, 1992).

However, despite the application value of place-making in urban and regional planning, several difficulties are anticipated. Firstly, there is very little clear guidance on how to proceed when making a place, since appropriate planning sources on this subject are scarce. Also, it is questionable whether the process of place-making should be made according to a 'mould', rather than develop organically from each individual project. Thirdly, there is the question of whose meanings to use to guide place-making. In a place where many cultures, groups with different levels of income, and personal preferences co-exist, it may be difficult to determine which

meanings and symbols to include or exclude in the design. Fourthly, the increased input from vested individuals has cost implications in terms of time and labour. Training personnel to handle qualitative data in the field and processing it afterwards takes time and money, which professionals might not have. It might also be difficult to create a cut-off line, a point to which vested individual participation is confined in the planning process. Lastly, one wonders whether it is possible to create a place with a unique identity that is meaningful over a long period of time when identities are constantly fluctuating in some way or another.

Despite these challenges, the authors still hold that place-making is a worthy design approach when compared to consumeristic or space-making approaches. It is a call for planners to take responsibility for their designs, not only towards those who pay the planner, but also those who have to inhabit or use it once completed, since the making of a place ...

*has a biological, social, and psychological impact that goes far beyond its more obvious influence on cost and technical function. It limits what people can do, and yet also opens new opportunities to them...Its influence outlives that of most buildings, since site organization persists for generations. What we do to our habitat has an enduring effect on our lives (Lynch & Hack, 1984: 2).*

Urban and regional planners may consider place-making as a way to challenge the traditional view of planning. The course of human history is rife with examples of progress that was preceded by challenges in people's beliefs. Place-making holds definite challenges for the understanding and *status quo* of the planning profession. Perhaps planning should move away from its pride in efficiently organising spatial solutions for spatial demands, to a passion for providing spatial a design process that adds value to a place's sense of place and the lives of its users. As Lynch & Hack stated,

*[n]o one should engage in site design who does not have a passion for the land, who is not as fascinated by the variations of site character as a teacher is fascinated by the marvellous variations of the human personality. And so a site of uncertain form should disturb us as much as a person of disordered character (Lynch & Hack, 1984: 30).*

## **5. Conclusion**

The legacy of modernism, apartheid planning and continuing development pressures in South Africa created – and still creates – concerns for the loss of place. Loss of place implies more than

physical loss; also at stake are the intangible elements of place that contribute to the physiological and psychological functioning of the inhabitants in question.

Internationally, concern for place and place-making increases and show some entrance into the spatial disciplines and practice, such as the EU's NoordXXI project. This, however, seems not to be the case for South Africa. Very little emphasis is placed on place-making in development policy and legislation, and planning research and practice, despite the scope for it due to growing levels of urban development in the country. Locations showing relatively high levels of tourism potential can also benefit from place-making to protect and strengthen the place identity for place-marketing reasons. This way these places can achieve capital gain without sacrificing their unique sense of place or way of life.

Understanding how 'place' and 'place-making' developed in the spatial disciplines broadens the South African planner's knowledge base, which currently is – to a large extent – based on positivistic learning. A quantitative approach to development issues cannot capture all of the intangibles of place. In a country such as South Africa, rich in different cultures, histories and place identities, one cannot expect to understand, safe-guard and manage these riches by focusing only on what can be quantified. Planners have to realise that these subjective elements can, to some extent, be used to broaden the economic base of cities, or even those of whole regions (Raagmaa, 2002). This is an important goal for a developing country like South Africa where the number of people living on less than \$1 per day, increased by 122.6% between 1996 and 2005 (South African Institute of Race Relations, 2007).

The inclusion of intangibles in the planning process is not the only implication for planners. Other implications have already been named in table 1. It ought to be of major importance for South Africa to increase research on place and place-making in South African contexts specifically, and to spread the word of place-making to the institutions that influence development policy and legislation in the country. Also, greater effort ought to be made to include place-making in planning practice, which is incidentally one of the foreseeable difficulties, as this would challenge the existing *status quo* of the planning profession.

In the light of this, it is proposed that place research in the South African context ought to be increased. It is recommended that the research focuses firstly, on how places are experienced by different demographic groups (according to age, gender, culture, income,

*etc.*); secondly, on ways to determine the sense of place or place identity of locations in South Africa, as well as how to render them for practical purposes; and lastly, how to integrate and implement the above in the country's planning profession and development policy and legislation.

In conclusion, one has to state that place-making cannot predict the quality of life in a certain environment, though it can provide the positive or negative potential for the interactions and experiences people can have with the environment. Careless planning of the landscape harms humans; skilled organisation enhances them, as Lynch & Hack (1984: 12) wrote. Finally, place-making is not a rigid exercise bound by specific scientific standards. Rather, it is the spatial expression of common sense and a genuine caring attitude towards fellow human beings and the environment without which no living being can truly thrive.

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### **(Footnotes)**

<sup>1</sup> The extent of the 'human experience' for the purpose of place-making is a topic that will have to be researched in the future, as different demographic groups experience the same place in different ways (Williams & Vaske, 2003: 831; Tuan, 1977: 162)

## **The development of location adjustment factors for construction price estimating in Nigeria**

*Peer reviewed*

### **Abstract**

This article explored the use of Location Factors (LFs) as an empirical tool for converting construction price at one location to price at another location. The objective was to generate LFs for selected locations to provoke interest in the concept. Firstly, locational factors influencing construction price were identified from literature. Then, based on a hypothetical project and using Lagos, Ibadan, Port Harcourt and Abuja as pilot locations (with Lagos as the base location), LFs were calculated for the four locations. The LFs obtained were validated using tender prices for the primary school projects of the Universal Basic Education Programme financed by the Federal Government of Nigeria.

The results showed that tender price levels were higher in Abuja and Port Harcourt and lower in Ibadan, compared to Lagos (the base location) on the basis of their location differences. Although the results underestimated the actual values of the LFs by only 8%, which is well within the acceptable level of early price estimating accuracy for quantity surveyors, the insufficient and scanty data used limits their statistical reliability. It is hoped that more detailed studies, based on more locations and using more project samples, would be carried in the near future to further the development of LFs for construction price estimating in Nigeria.

Keywords: Price estimating, project management, location adjustment factors, construction industry, Nigeria

### **Abstrak**

Hierdie artikel ondersoek die gebruik van Plek Faktore (PF) as 'n empiriese hulpmiddel vir die oorskakeling van konstruksiepryse vanaf een plek na prys op 'n ander plek. Die oogmerk was om PF's vir geselekteerde plekke te genereer om sodoende 'n belangstelling in die konsep aan te wakker. Eerstens is plekfaktore wat konstruksiepryse beïnvloed deur middel van 'n literatuurstudie geïdentifiseer. Daarna, gebaseer op 'n hipotetiese projek is Lagos, Ibadan, Port Harcourt en Abuja (met Lagos as die basis plek) as loots plekke gebruik om PF's vir die vier

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plekke te bereken. Die verkrygte PF's is waardes toegevoeg deur tenderpryse te gebruik vir skoolprojekte van die *Universal Basic Education Programme* wat deur die federale regering van Nigerië gefinansier is.

Die resultate het gewys dat tenderprysvlakke hoër was in Abuja en Port Harcourt en laer in Ibadan, vergelykend met Lagos (die basis plek) op die basis van hulle plekverskille. Alhoewel die resultate wys dat die ware waardes van die PF's met slegs 8% onderskat is, wat goed is in vergelyking met die aanvaarbare vlak van voorafpryskattingsakkuraatheid vir bourekenaars, het die onvoldoende en geringe data wat gebruik is die statistiese betroubaarheid daarvan verminder. Daar word gehoop, dat meer uitgebreide studies, gebaseer op meer plekke en deur gebruik van meer projekvoorbeelde, in die toekoms uitgeoefen sal word vir die ontwikkeling van PF's vir konstruksiepryskattings in Nigerië.

Sleutelwoorde: Pryskattings, projekbestuur, plekaanpassingsfaktore, konstruksie-industrie, Nigerië

## 1. Introduction

Estimating, according to the Chartered Institute of Building (1997), is the technical process of predicting the cost of construction. It involves the building up of rates for building elements and components based on the cost of labour, material and plant. The sum of the costs of the various elements and components that make up a project is the cost of the project to the contractor. The addition of the contractor's profit and overhead margins as well as the relevant taxes converts a cost estimate into a tender price (Kwakye, 1994). Thus the cost estimate serves not only as a basis upon which a tender figure is derived for the selection of a suitable contractor (Ashworth, 2002) but also as a basis for a project's ultimate funding by the project owner (Trost & Oberlender, 2003). Early price estimating forecasts a contractor's tender sum (Ashworth, 1994).

A good estimator can readily estimate the cost of a project in his area of operation, but it may not always be so for projects outside his area of operation (Russell, 2002). This is because, according to Humphreys (2005), while cost engineers, quantity surveyors, and project managers are generally very familiar with the major sources of cost data in their areas of operation, they are often unaware of useful sources of cost data and related information in other areas. This problem arises because there is usually lack of time to perform a proper search for information about key factors that can impact the estimate for particular geographic locations. A location adjustment factor enables an estimator to adjust the historical price data for construction in a particular location to estimate the price of a similar project in another location (Yoshihara & Tametoh, 2002)

Location has a significant impact on the major components of construction cost and price, namely materials, labour and plant

(Bilginsoy & Philips, 2000; Pearl *et al.*, 2003; Wilmot & Cheng, 2003). Thus, according to Seeley (1996), material, labour and plant costs in construction projects are dependent not only on the geographical location of the project but also on the site conditions. Construction projects unlike the products of the manufacturing industry are never the same. Each project, according to Peansupap & Walker (2005), is unique in its location. Hence construction projects are exposed to locational variations in addition to a whole range of design factors. This is why project location has been identified by Ahmad & Minkarah (1988), Shash (1998) and Akintoye (2000) as one of the significant factors influencing contractors' tender price levels.

This article is a preliminary investigation to quantify the effect of locational differences on construction prices for some selected cities in Nigeria using Lagos as the base location. The article was aimed at provoking interest in the concept of locational adjustment factors among cost professionals. Lagos was chosen as the base location because of its strategic position not only as Nigeria's major seaport but also as its commercial capital which has the highest concentration of construction firms and professionals in any single city in the country (Dada, 2005).

## **2. An overview of locational factors and their influence on construction price**

Location affects construction price via institutional and market factors, and through geographical realities. The institutional factors include local regulations (Russel, 2002) and the level of taxation (Seeley, 1996) while demand and supply of construction inputs are some of the market factors. Geographical realities include such things as accessibility and topography (Seeley, 1996, Singh, 2007), local climate (Ferry & Brandon, 1991; Parker & Dell'Isola, 1991; Singh, 2007). According to Avery (1982), some of these factors have a bearing on the cost (and hence the price) of executing work and consequently concern tenderers as well as estimators. Also, in a global study of factors affecting contractors' tender margins, Ling (2005) found that project location had a significant impact in many countries.

Generally, the more remote a project location is, the more expensive it will be because of the cost of transporting construction materials and equipment to the site (Avery, 1982, Parker & Dell'Isola, 1991; Akintoye, 2000). Remote locations, according to Mutunga & Talukhaba (2004), are those characterised by low levels of investments in terms of both communication infrastructure and facilities, as is common in a lot of rural set ups of most of the developing world.



In Britain, for example, Anderson (1988) has observed that there are regions within the British Isles where market conditions are so distorted that any interpretation of standard cost data is fraught with difficulty. Within a country there may exist regions exhibiting what Anderson (1988) described as extreme regionality such that economic and social conditions within the areas, regions, states or localities can be isolated from other areas, regions, states or locality to the extent that extrapolation of cost data can be very inaccurate. Avery (1982) identified remoteness from source of materials and plant supply, labour cost and productivity, water and power supply for the works, climate and weather, regional market conditions or tendering climate and local tendering customs as the locational factors that may have an impact on the cost of executing work to any given design. According to Herbsman & Ellis (1991) and Motwani *et al.* (1995), location is one of the critical factors that affect construction productivity. The effect of location also expresses itself in the fact that restricted urban construction sites always pose considerable difficulties for contractors with regard to logistics and planning. These stem from the inherent problems in offloading materials from confined locations, the lack of storage space within which materials can be stockpiled and local traffic and delivery restrictions to protect the city centre environment within office hours (Ison *et al.*, 2004). As a result of these factors, the cost of construction varies from place to place even for projects of similar design, magnitude and size. This variation could increase the total cost of a project by as much as a third from one location to another (Stallworthy & Kharbanda, 1983). It is not surprising therefore that several authors including Akintoye (2000) and An *et al.* (2007) have ranked location among the significant factors that influence construction price estimates.

### **3. The need for locational factors in construction price forecasting in Nigeria**

Nigeria is a vast country occupying a land area of 923768 square kilometres. It is situated between Longitude 3° and 15° East and Latitude 4° and 14° North (Central Bank of Nigeria, 2000). The longest distance from East to West is about 767 kilometres, and from North to South is about 1605 kilometres. The landscape comprises lowlands, plains, highlands and plateaux. The country also exhibits very wide geographical and climatic variations, comprising the mangrove forests at the coast, evergreen rainforests, deciduous forests, Guinea savannah in the middle belt, Sudan savannah in most parts of the north, and the Sahel, semi-arid desert at the extreme northeast

(Central Bank of Nigeria, 2000). It operates a federal system comprising 36 autonomous states and the Federal Capital Territory (Abuja) as well as 774 local government councils. The country has a market economy.

It can be argued that all the locational factors discussed above are relevant in Nigeria due to its large size and geographical diversity. These factors should therefore be of concern to both professional quantity surveyors and contractors' estimators in the construction industry. Indeed in Nigeria, the prices of construction inputs and hence construction prices vary from state to state and local government area to local government area. This is because the country operates a free market economic system and taxation levels differ between the states (Central Bank of Nigeria, 2000). In a developing country like Nigeria where most development projects, such as the construction of schools, health facilities and housing are sponsored by the government, the use of location adjustment factors should be especially useful. The use of location adjustment factors will make it possible for the government (and its project consultants) to estimate the contract price of a prototype design for different parts of the country without going through the lengthy process of collecting cost data for each location. Contractors could also use it to prepare tender estimates for projects all over the country without necessarily visiting every locality to collect estimating data.

#### **4. Conceptual framework and research methodology**

Preliminary price estimating by quantity surveyors predict contractors likely tender sums and enable construction clients to have an idea of their financial commitments early in the project cycle (Ashworth, 1994; Seeley, 1996). The estimates are usually based on historical cost data generated from completed buildings to provide a reasonably accurate prediction of the construction price of a new project (Smith, 1995). These estimates are produced at a specific point in time for a specific location and the prices used therein are (unless other parameters are specifically set) relevant only for that date and location. For this reason, adjustments need to be made to reflect differences in price levels and project characteristics including location (Phaobunjong & Popescu, 2003). Thus estimates based on historical cost data need to be adjusted for inflation or price levels (Chau, 1990; Parker & Dell'Isola, 1991; Singh, 2007), and locational differences (Parker & Dell'Isola, 1991; Elhag & Boussabaine, 1999; Al-Harbi *et al.*, 1994; Singh, 2007), among other factors.

#### 4.1 Adjustment of Estimates Using Tender Price Indices

Price indices are used to update the price of goods and services over time to reflect variations in inflation and price levels (Yu & Ive, 2006). They provide a comparison of price changes from period to period for a fixed quantity of goods or services (Williams, 1994). Beyond tender price inflation, the index should also reflect regional differences, differences in pricing level resulting from size of the contract, site problems (other than those which have design implications) and any other factor which has influenced the price quoted by the accepted tenderer.

According to Yu & Ive (2006), the three common types of price indices are the Laspeyres Price Index, the Paasche Price Index and the Fisher Ideal Index. The Laspeyres price index is a base weight index which uses the relative quantities of the base period to provide the weighting for the respective prices. On the other hand, the Paasche price index is a current weight index. The Laspeyres Price Index has been found to overstate inflation while the Paasche Price Index understates it (Yu & Ive, 2006). The Fisher Price Index takes the average of these indices as a better approximation to the true measure of inflation (Fisher, 1921 cited in Yu & Ive, 2006). Costello & Watkins (2002) and Yu & Ive (2006) give details of the mathematical calculations of the three indices. The BCIS tender price index series which measures the trend of contractors pricing levels in accepted tenders is a commonly used index in the UK construction industry (Yu & Ive, 2006). This index is adjusted for location using the following formula (Elhag & Boussabaine, 1999):

$$C_{\text{adjusted}} = C_{\text{actual}} * \frac{TPI_{\text{base}}}{TPI_{\text{actual}}} * \frac{M.L.F.}{C.L.F.} \quad \text{Equation 1,}$$

Where:

$C_{\text{adjusted}}$  = adjusted lowest tender price

$C_{\text{actual}}$  = actual lowest tender price

$TPI_{\text{base}}$  = average tender price index for the base year

$TPI_{\text{actual}}$  = tender price index at tender date of a specific project

M.L.F. = mean location factor of UK for base year

C.L.F. = county location factor of a specific project

The basis of the adjustment for location in Equation 1 above is yet to be modelled (Yu & Ive (2006).

## 4.2 Adjustment of Estimates for Location

A tender price index is most commonly used to adjust an estimate based on historical data to current price level (Ferry & Brandon, 1991; Yu & Ive, 2006; Singh, 2007). The need to adjust for locational differences has been widely established in literature. A location adjustment factor is an instantaneous, overall, total adjustment factor for converting a base construction estimate from one geographical location to another (Humphreys, 2005). It identifies disparities in construction materials costs, labour hourly rates, productivity, freight rates and taxes, among others, between different project locations (McConville, 1994). However, the cost of land, scope/design differences for local conditions and codes, and differences in operating philosophies are not included in a location factor (Pietlock, 1994). Also, if the designs are not identical for different locations, the cost differences are not generally accounted for by locational factors alone (Humphreys, 2005).

The formula for updating a construction price from a base year ( $Y_b$ ) to a current year ( $Y_c$ ) is generally given as (after Phaobunjong & Popescu, 2003).

$$\text{Price for } Y_c = \text{Price for } Y_b \times \frac{\text{Index for } Y_c}{\text{Index for } Y_b} \quad \text{Equation 2}$$

Based on Equation 1 and Equation 2, the Location Factor (LF) for location A relative to location B is defined for this study as:

$$LF_A = \frac{\text{Price of construction at location A}}{\text{Price of construction at location B}} \quad \text{Equation 3}$$

where B is the base location.

This formula assumes that only locational variations as discussed earlier in the literature account for the differences in price between the two locations (with all other factors already taken into consideration).

Adopting the method used by Olukoju (1995), Proverbs *et al.* (1999) and Xiao & Proverbs (2002a; 2002b), this study used an appropriate hypothetical project (a prototype single-storey block of classrooms) as the basis of a price survey. The unpriced bill of quantities of the prototype project was sent to practising quantity surveyors in the cities of Lagos, Abuja, Ibadan and Port Harcourt to price simultaneously.

The respondents were also asked to list the factors peculiar to their locations which they took into account in pricing the bill.

Using the average costs returned for the cities, and with Lagos as the base city, the Location Factor (LF) for each city relative to Lagos was calculated using the formula in Equation 3. Thus the LF for location X is given by

$$LF_x = \frac{\text{Price of the hypothetical project at location X}}{\text{Price of the hypothetical project at base location (Lagos)}} \quad \text{Equation 4}$$

The predicted LFs were subjected to an empirical validity test using real case study projects in the same selected locations. This was necessary to measure how closely the LFs calculated with the hypothetical project approximated those calculated with the real case study projects (Law & McComas, 1990). The validation serves to show the authenticity and usefulness of the predicted LFs by measuring the extent to which they accord with those for the real projects. The relative measure of accuracy used was the mean variance ratio (after Wilson, 1994 and Odeyinka & Yusif, 2003) between the predicted and the real LFs. The results are shown in Table 4.

For the validation, the tender prices of the Federal Government of Nigeria Universal Basic Education (UBE) primary school projects were obtained for the selected cities. The projects comprised the construction of blocks of classrooms similar in scope and design to the hypothetical project used in this study. Since the pricing of the bills of quantities for the hypothetical project and the construction of the real case study projects were within the same time period, it was not necessary to adjust the project values for time and inflation.

## 5. Results and discussion

The estimated tender prices of the hypothetical projects and the real (Universal Basic Education) projects in the four locations are shown in Table 1.

Table 1: Project costs

Location	Estimated Tender Price of hypothetical project (₦)*	Tender Price of the real project ((₦)*)
Lagos	4,814,520.00	5,019,205.34
Abuja	4,932,310.00	5,019,205.34
Ibadan	4,573,640.00	4,416,900.90
Port Harcourt	6,121,608.00	5,270,165.60

\*₦120 is equivalent to US\$1

In Table 2, some of the peculiar factors the respondents considered in pricing the bill of quantities for the hypothetical projects in their locations are listed. They include, among others, "High level of multiple taxations by the three tiers of government" in Lagos and "High level of insecurity due to political agitations by youths resulting in a very high level of administrative costs" in Port Harcourt in the volatile Niger Delta Region. These factors reflected mostly the differences in the rate of taxation and cost of construction inputs due to different market situations in the four locations.

Table 2: Locational Factors considered by respondents

Location	Factors influencing pricing levels
Lagos	Materials, labour and plant readily available compared to other cities. High level of multiple taxation by the Federal, state and local governments. High cost of living makes administrative cost very high.
Abuja	High cost of living because it is the seat of government Skilled labour is not readily available
Ibadan	No special features, it is just average
Port Harcourt	Construction labour very scarce because of the attraction of the oil industry Prices of goods generally high due to high cost of living High level of insecurity due to political agitations by youths resulting in a very high level of administrative costs (Niger Delta crisis).

Applying the formula in Equation 4 and using the data in Table 1, the predicted and the actual LFs were computed. Table 3 shows the figures obtained.

Table 3: Predicted and Actual Location Adjustment Factors

Location	Predicted Location Factor ( $LF_p$ )	Actual Location Factor ( $LF_A$ )
Lagos (base location)	1.000	1.000
Ibadan	0.950	0.880
Abuja	1.025	1.000
Port Harcourt	1.272	1.050

To validate the results obtained, the two sets of LFs were subjected to variance analysis to measure the accuracy and usefulness of the predicted LFs. The mean variance ratio ( $\bar{V}$ ) is expressed by Wilson (1994) as:

$$\bar{V} = \sum_{i=1}^n \frac{V_i}{n}, \quad \text{Equation 5}$$

where  $V_i = (LF_A)_i / (LF_p)_i$

$V$  = Variance ratio

$LF_A$  = Actual location factor

$LF_p$  = Predicted location factor

$n$  = number of observations

The results of the variance analysis are shown in Table 4.

Table 4: Variance analysis of Actual and Predicted Location Factors (LFs)\*

Location	Actual Location factor ( $LF_A$ )	Predicted Location Factor ( $LF_p$ )	$V_i = LF_A/LF_p$	Accuracy level (%)
Ibadan	0.880	0.950	0.93	7
Abuja	1.000	1.025	0.98	2
Port Harcourt	1.050	1.272	0.83	17

$$\bar{V} = 0.92$$

\* $LF_A = LF_p = 1$  for Lagos (the base location)

According to Wilson (1994), ideally  $\bar{V} = 1$  when the predictions are 100% accurate. As shown in Table 4, the mean variance ratio is 0.92. This means that, on the average, the actual location factors were

underestimated by 8%. This degree of accuracy is within the accuracy range of -5% to +10% for early price estimates (Oberlender, 1993; Harbuck, 2002) and is quite acceptable for an exploratory study of this nature. However, due to the fact that only one project and a few locations were used in this study, the statistical validity of the results may be in doubt.

## **6. Conclusion and recommendation**

This article has examined the concept of location adjustment factors in construction price estimating and demonstrated a very simple and straightforward approach to developing them. The results showed that, compared to Lagos, location factors (and hence tender price levels) were higher in Abuja and Port Harcourt and lower in Ibadan. However, the results obtained in this article are fraught with limitations due to the insufficient and scanty data used. The results are based on only 4 cities and only a sample project was used in generating the factors. This casts some doubts on the statistical reliability of the results as the study violates the requirement for a large volume of data for constructing good and reliable location factors (Stallworthy & Kharbanda, 1983).

It is our belief that in spite of the limitations acknowledged above, the results should explain to some degree the regional differences in the construction prices published by the Nigerian Institute of Quantity Surveyors and other organisations in Nigeria. It is hoped that the study may attract the attention of major stakeholders in the Nigerian construction industry and engender interest in locational factors among academics and practitioners in the field of construction price estimating. It is therefore recommended that more detailed studies should be undertaken to generate more accurate and reliable locational factors. Further studies should model locational factors on such location attributes as ratio of construction inputs obtained in a location, labour productivity rates, taxation levels and freight rates, etc. as suggested by Yoshihara & Tametoh (2002).

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## Dries Hauptfleisch

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# Facilities management: an analysis of evolving educational needs in a developing profession

*Peer reviewed*

### Abstract

Internationally the development of property, being part of the creation of fixed investment and wealth, is taking place unabated. The absence of a universally acknowledged profession, designated to manage and optimise the utilisation of the ever compounding fixed investments in the products of the collective built environment (buildings, engineering structures and infrastructure), is observed. In practice it manifests itself in the attempts, by various professions and others, to cast themselves into the role of facilities managers. The problem at hand is to extract, from the present practice of facilities management, a knowledge profile and secondly to contextualise the results in terms of other applicable managerial concepts. The main objective is to structure a tertiary education programme. There are reasons to believe that facilities management is in the process of becoming a driving force, not only in the scientific management and optimisation of fixed assets, but as an initiator of development in the built environment. A literature study was undertaken to make an overview analysis and a limited statistical sample was made regarding the views of practising delegates attending continuing education short training courses in facilities management. The outcomes indicate some consistent omissions in the literature, while the views of practitioners contribute to form an overview.

Keywords: Facilities management, knowledge profile, managerial concepts, built environment

### Abstrak

Internasionaal vind eiendomsontwikkeling, as voertuig vir die skep van vaste-investering en welvaart, onverpoosd plaas. Die afwesigheid van 'n universele erkende profesie, aangewese om die groeiende vaste-investering produkte van die kollektiewe bou-omgewing (geboue, ingenieurstrukture en infrastruktuur) te bestuur en te optimaliseer, is opvallend. In praktyk word dit gemanifesteer deurdat verskeie profesies en andere, hulself in die rol van fasiliteitbestuurders bevind. Die probleem ter sake is om uit huidige fasiliteitbestuurpraktyke 'n kennisprofiel saam te stel en tweedens, die resultate daarvan binne konteks van ander toepaslike bestuurskonsepte te plaas. Die hoof oogmerk is om struktuur te verleen aan 'n tersiêre onderwysprogram. Daar is rede om te glo dat fasiliteitbestuur in die proses is om 'n dryfveer te word, nie net ten aansien van die wetenskaplike bestuur van, en optimalisering van vaste-investering nie, maar as insieerder van ontwikkeling in die bou-omgewing. 'n Literatuurstudie

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is onderneem om oorkoepelende waarnemings in dié verband te maak en 'n beperkte statistiese opname is gemaak aangaande die sienswyses van praktisyns tydens deelname aan voortgesette onderwys kortkursusse in fasiliteitbestuur. Die uitkoms van voorgaande dui op konsekwente onderbeklemtoning van sekere aspekte in die literatuur, terwyl die sienswyses van praktisyns 'n bydrae lewer om 'n oorsigtelike beeld daar te stel.

Slutelwoorde: Fasiliteitbestuur, kennisprofiel, bestuurskonsepte, bou-omgewing

## **1. Introduction**

Investment in properties, as fixed assets, is growing continuously internationally. These property development activities are served by a multitude of highly skilled professionals such as engineers, architects, quantity surveyors, construction managers, project managers, town planners, land surveyors and others. The absence of a universally acknowledged profession of the same standing, designated to manage and optimise the utilisation of the ever compounding fixed investments in the products of the collective built environment (buildings, engineering structures and infrastructure), is remarkable. This situation may be explained by the fact that, in the present day accepted vocabulary, facilities management as a managerial concept developed in the United States of America only during the 1970's, when a Facilities Management Institute was founded and the first known formal symposium was held in Washington DC in 1989 (Binder, 1989). Though these events started approximately 30 years ago, the development and spread were slow, and in comparison with the other built environment professions, it is still in its infancy. However, although perhaps lacking some of the prestige associated with other professions, there are reasons to believe that facilities management is one of the fastest growing 'new professions' in the built environment. Furthermore, it is becoming evident that facilities management is in the process of becoming a driving force, not only of scientific management and optimisation of fixed assets, but as an initiator of development in the built environment.

## **2. Methodology**

The problem at hand is to extract a body of knowledge from the present practice of facilities management, and secondly, to contextualise the results in terms of other applicable managerial concepts. This was done through literature study and by obtaining feedback from facilities management practitioners attending continuing education short courses (in order to create a limited statistical sample), and from non-quantified observations in practice. Figure 1 shows the generally perceived position of facilities management, in context

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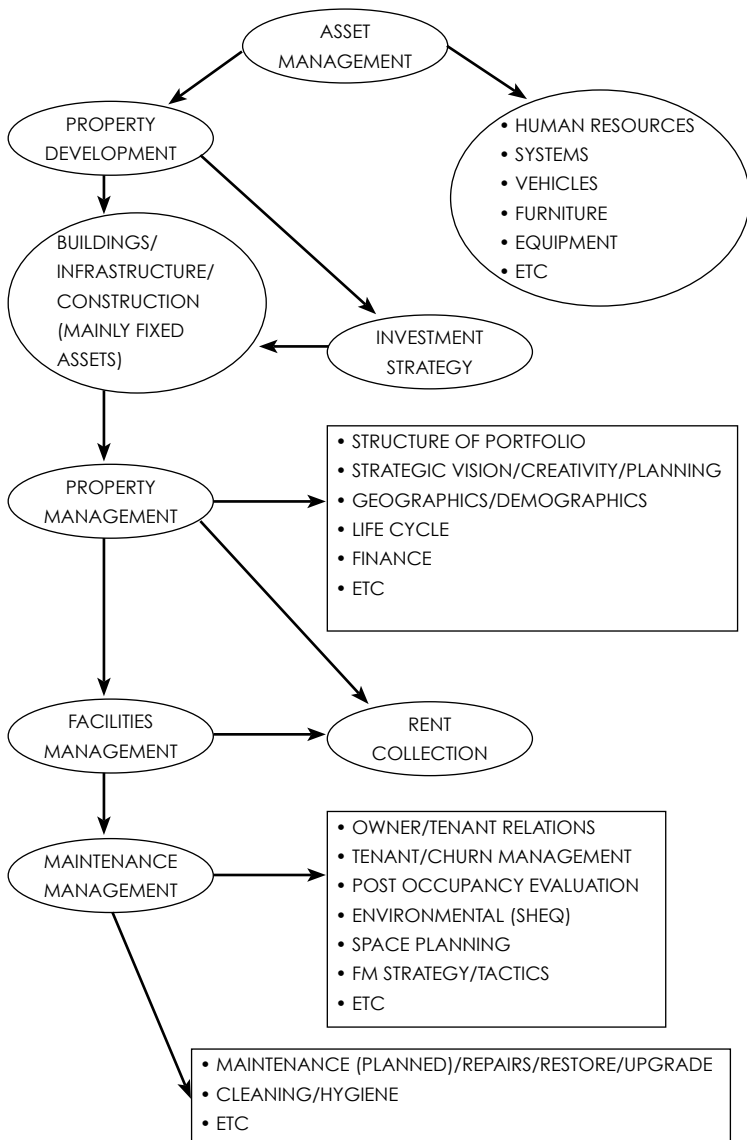


Figure 1: Facilities Management in context of Asset Management

of overall asset management, within an enterprise that holds built environment assets. This diagramme was tested for general correctness by subjecting it to 6 different groups of facility management practitioners taking part in continuing education short courses over a period of four years.

From the above it is clear that the research done was not hypothesis testing. The intention was to establish current thinking regarding facilities management, thus contributing towards the development of academic programmes, pre-empting the needs of industry, resulting in a structured knowledge profile.

### **3. Validation of literature**

Literature was selected by undertaking a web search in order to identify and obtain suitable works regard facilities management and by identifying and utilising known local South African works, commonly used by training and education providers. The contents of the following literature have thus been analysed in order to establish what appears to be representative of a general knowledge profile in literature (see Barret & Baldry, 2006; Bender, 2002; Best, Langston & de Valence, 2003; Cloete, 2001a; Cloete, 2001b, Cloete, 2002a, Cloete, 2002b; Collins & Porras, 2000; Cornwell, 1973; Cotts & Rondeau, 2004; Crocker, 1990; de Vries, 2001; Grulke, 2001; Gross, 2002, Friday & Cotts, 1995; Hauptfleisch, 1999; Hauptfleisch & Sigle, 2007; Magee, 1988; Means Company, 1996; South Africa. Occupational Health and Safety Act, 2004; Owen, 1993; Pearce & Robinson, 2000; Project Management Institute, 2004; Robinson, 1999; Rondeau, Brown & Lapidés, 2006; Seeley, 1987). To this was added those knowledge areas regarded to be of importance in continuing education programmes and in formal academic degree programmes. Table 1 provides an analysis flowing from surveying the sources as described above, divided into three categories: Firstly dealing with the 'contextualising of the managerial challenge', secondly with the 'practice' of facilities management and thirdly with 'property maintenance'. The topics contained in Table 1 are in main heading format, synthesised from comprehensive subdivisions.

It should be noted that the literature survey covers sources from 1973 to 2007 but that the bulk of it has been published since 2000. For this reason no attempt was made to place the development of a knowledge profile on a development time scale over the publications' time span. Table 1 therefore represents an attempt to provide a contemporary 'balance sheet' rather than a 'developmental pathway' over time.



#### 4. Under-emphasised knowledge areas

The knowledge areas that are perceived as important for practicing facilities management and the relevant emphasis of each in the surveyed literature are reflected in Table 1. This analysis is not substantiated by quantitative and triangulated research procedures, but has value as an attempt to observe general tendencies to under-emphasise perceived important knowledge areas, required in a validated knowledge profile for the development and practice of facilities management.

Table 1: Facilities Management Knowledge Profile

KNOWLEDGE AREA		COVERAGE IN LITERATURE			
		OFTEN		SELDOM	
		1	2	3	4
A.	FACILITIES MANAGEMENT: CONTEXTUALISING THE MANAGERIAL CHALLENGE				
1.	INTRODUCTION TO FACILITIES MANAGEMENT	•			
2.	AN OVERVIEW OF FACILITIES MANAGEMENT	•			
3.	DEVELOPMENT OF FACILITIES MANAGEMENT	•			
4.	FACILITIES MANAGEMENT PRACTICE MODELS	•			
5.	GENERAL MANAGEMENT FUNDAMENTALS				•
6.	STRATEGIC MANAGEMENT		•		
7.	PROJECT MANAGEMENT				•
8.	HUMAN RESOURCES	•			
9.	LAW AND CONTRACTUAL ARRANGEMENTS		•		
10.	FINANCE	•			
11.	MARKETING OF SERVICES			•	
12.	TOTAL QUALITY MANAGEMENT				•
13.	SERVICE LEVEL ARRANGEMENTS	•			
14.	INFORMATION TECHNOLOGY	•			
15.	SUCCESSFUL FACILITIES MANAGEMENT		•		
	FACILITIES MANAGEMENT: PRACTICE				
1.	STRUCTURING THE ORGANISATION			•	
2.	CLIENT AND/OR USER NEEDS EVALUATION	•			
3.	DESIGN TO SATISFY CLIENT AND/OR USER NEEDS	•			
4.	SPACE MANAGEMENT	•			
5.	CONSTRUCTION TECHNOLOGY, BUILDING SERVICES AND COMPONENTS		•		
6.	QUANTIFICATION AND TENDERING				•

KNOWLEDGE AREA		COVERAGE IN LITERATURE			
		OFTEN		SELDOM	
		1	2	3	4
7.	PRINCIPLES OF LIFE CYCLE COSTING		•		
8.	GENERAL SERVICES				•
9.	CAPITAL PLANNING		•		
10.	PROCUREMENT & OUTSOURCING			•	
11.	RISK MANAGEMENT		•		
12.	POST OCCUPANCY EVALUATION	•			
13.	BENCHMARKING	•			
14.	THE STRUCTURE OF THE BUILT ENVIRONMENT				•
15.	OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS	•			
C.	FACILITIES MANAGEMENT: PROPERTY MAINTENANCE				
1.	INTRODUCTION TO MAINTENANCE MANAGEMENT	•			
2.	MAINTENANCE CATEGORISATION	•			
3.	PLANNING AND PROGRAMMING OF MAINTENANCE EXECUTION	•			
4.	OPERATIONAL MANAGEMENT		•		
5.	PEST CONTROL IN BUILDINGS			•	
6.	MAINTENANCE FINANCE	•			
7.	CONSTRUCTION, RENOVATION AND MAINTENANCE WORK		•		

## 5. Analysis of continuing education short courses evaluation

Table 2 is based on the results obtained from a limited quantified 100% covered survey, assessing broad disciplines covered during continuing education short courses, soliciting recommendations regarding course content. Delegates are also prompted to make alternative suggestions. This survey has been conducted six times (from 2004 to 2007) amongst delegates, after they have completed a five-day continuing education short course offered to middle (and top) management practitioners of facilities management. Table 2 contains the results that emanated from the last three courses offered during 2006 and 2007. These courses are always well subscribed. Delegates that are required to take part in the above survey are also evaluated by way of assignments, in order to support continuous quality improvement.

Table 2: Recommendations for Programme Content Weighting

KNOWLEDGE AREAS	ACTUAL LECTURE %	RECOMMENDED LECTURE %
Management (assets, property, facility, general)	35	34.1
Client care	6	7.1
Finance	15	13.9
Legal	18	17.2
Quality	13	12.9
Maintenance	13	14.8
Total	100	100

From the results reflected in Table 2 it is concluded that the respondents that have attended continuing education short courses, are satisfied that the course content is on target.

## 6. Conclusions

It may be concluded that the knowledge gained from offering continuing education short courses, expanded with the analysis of a literature survey and non-quantified observations of academia and practice, a first attempt in structuring a knowledge profile of facilities management renders useful information. Being a “new” discipline makes it a moving target that requires continuous evaluation and development, particularly regarding the structuring of a tertiary education programme.

The next step to be taken is the structuring of a three year educational programme on National Qualification Framework (NQF) Level 6, in order to satisfy the perceived needs of industry. The proposed contents of this programme are to be subjected to quantified evaluation by prospective students as well as by organised industry. Once the educational programme has been introduced, continuous evaluation processes will be implemented to further develop evolving educational needs, to be reflected in a facilities management knowledge profile.

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