CRANFIELD UNIVERSITY

ALEXANDER PETER MERCER

FACTORS EFFECTING BASIC NEEDS SERVICE DESIGN AND
INNOVATION AT THE BOTTOM OF THE PYRAMID

SCHOOL OF APPLIED SCIENCES
Master of Science by Research

MSc
Academic Year: 2011 - 2012

Supervisor: Prof. Simon Bolton
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PREFACE

Project Background

The research carried out in thesis is sub-set of a longer on-going project to facilitate a sustainable 'demand driven' approach to water and sanitation product and service development. The project aims to achieve public and private health benefits where urban low-income tenant households, typically living in slums and informal housing areas, cannot access the conventional infrastructure. These families that rent a single room in a slum for $10 per month and who may be earning an uncertain wage of $2 per day. Unable to afford to invest in fixed assets when they might be required to move at very short notice. The project seeks to deliver desirable products to the local market, the one billion growing to two billion slum dwellers, which will be available for years to come. This is irrespective of any on-going donor involvement and possibly in advance of formal recognition and infrastructure investment by conventional service providers.

The project is a collaboration between two departments at Cranfield University, The Centre for Competitive Creative Design (C4D) and The Water Science Institute. The purpose of this was to provide a multi-disciplinary approach to developing solutions for the basic human need of water and sanitation. The university team members consisted of five people, two from C4D, the supervisor Prof.Simon Bolton and the author, a post-graduate student enrolled on a yearlong MSc by Research degree and based at Cranfield Univerity. Three from the Water Science Institute, Jack O'Regan a post-graduate student enrolled on a yearlong MSc by Research degree based in Nairobi for the duration of his research. Also based in Kenya is Yolanda Chakava who will be monitoring and evaluating the project outputs. Finally, the supervisor Dr. Richard Franceys, a senior lecturer in the Water Science Institute. Critical to the project was the partnership with the non-governmental organisation (NGO) Umande Trust. They are an organisation that focuses on delivering water and sanitation projects. The organisation has been instrumental in constructing and implementing over 40 Bio-

Centres[1] in various urban and peri-urban locations throughout Kenya. Their participation in this project enabled the research to be carried out in accordance to ethical guidelines and in a correct manner that was sensitive to the social and cultural customs of the tenants within the locations.

The work described in this thesis set out the research and findings in the format of two papers that are to be submitted for publication. The overall aim and objectives of the authors work were as follows:-

Aim

1. To gain insight into the lifestyles, aspirations and water and sanitation demands of low-income consumers in poor urban areas using a range of research methods.

Objectives

1. Develop a design framework to produce aspirational water and sanitation products and services for the 'bottom of the pyramid' consumers.
2. Deliver a feasible design concept for a water and/or sanitation product-service environment from which a product-service system can be implemented.

Paper 1 *'A Conceptual Framework of Factors that Effect Basic Needs Service Design and Innovation'* assists in meeting Objective 1 and incorporates the output of Objective 2. The paper offers the reader an insight into the process the author took to map and describes a number of interrelated factors that can lead to a successful basic needs service targeted towards the BoP (Bottom of the Pyramid). This was achieved using a combination of literature research, observation and interviews in a number of slums in

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[1] *Bio-Centres are community operated buildings that provide toilets, showers and community space available for use by local tenants in low-income urban areas. They have a unique feature, a dome shaped underground chamber that converts waste from the toilets into bio-gas by an anaerobic digestion process. This is then available for use, allowing people to cook at the premises or have heated water for bathing in return for a small fee*

Nairobi, Kenya and analysis of a water service concept against the framework. The aspiration driven research positions 'aspirations' as a driving factor for success, but acknowledges 10 other factors that impact upon, not only the operational aspects of the service when up and running , but also the service design and development process. The framework outlines a set of boundaries from which to innovate within, mirroring the idea of an 'innovation sandbox' by the late and still leading industry expert C.K.Prahalad. In conclusion the paper encourages the need for deep and thoughtful interactions and paves a way for designers, businesses and development practitioners to validate the framework for innovating through the constraints and barriers inherent to basic needs products and services for bottom of the pyramid.

Paper 2 *'The Role of Aspirations at the Bottom of the Pyramid'* discusses the importance of the BoP market, the importance of understanding aspirations and the need to develop consumer-inspired capability building products. The output of the paper is a conceptual framework for developing a deeper understanding of consumer motivations for innovation opportunities. The author describes the methods used to elicit the aspirational driven empirical research data. The primary research is collected from two African cities, Accra in Ghana (phase 1) and Nairobi in Kenya (phase 2), where a number of consumers and business operators were interviewed in low-income informal settlements, often referred to as slums. Phase 1 of the research informed the development of phase 2 research methods. Using an interview technique originally developed for the fast moving consumer goods sector, the 'ladder up' process of semi-structured questions enabled low-income consumers to articulate their aspirations according to 14 areas of interest. Additional questioning investigated their attitudes, tensions and motivations towards the basic need of water and sanitation and their aspirations surrounding the topic. The author uses the contextually immersive method of investigation to provide insights into the consumer and business bound within an area of interest, in this case water and sanitation. To conclude the author reflects of these methods and offer a conceptual framework to develop aspirational driven innovation opportunities. By utilising the research methods to build insight, develop profiles and understand constraint issues the framework

output focuses of delivering opportunities that capture the functional, emotional and capability building properties of the product and service.

To summarise, these two papers provide an account of the overall project the author undertook. Touched upon in less detail is the design output that meets Objective 2, a feasible water and or sanitation environment where a product-service system can be implemented. This is documented in the appendices (on CD) of this thesis with visuals and 3D renders of the working environment that adopts the Water Choices concept as the service offering driving the design. The authors' intention was to develop more concept ideas for a broader range of products and services that provide solutions to the challenge of water and sanitation for slum settlements. However, through the undetermined journey of carrying out the research project it was found that challenges and obstacles occurred that impeded this. To characterise these author does offer his insights for university based projects that are undertaking the challenge of designing and developing for remotely located low-income markets. It is hope that the insights offered provide future students with a clearer and more defined understanding of what to expect when undertaking such a project.

Keywords:

Subsistence markets, aspirations, new product development, urban informal settlements, slums, water and sanitation, Africa, Low-income

ACKNOWLEDGEMENTS

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LIST OF ACRONYMS & ABBREVIATIONS

BoP	Bottom of the Pyramid
C4D	Centre for Competitive Creative Design
CU	Cranfield Univerisity
DFID	Department for International Development
FMCG	Fast Moving Consumer Goods
HSBC	The Hong Kong and Shanghai Banking Corporation
MDG's	Millennium Development Goals
MSc	Master of Science
NGO	Non-Governmental Organisation
NWC	Nairobi Water Company
PhD	Doctorate of Philosophy
P1-5	Proposition 1-5
PSS	Product-Service System
RQ1	Research Question 1
RQ2	Research Question 2
RQ3	Research Question 3
UN	United Nations
UN-HABITAT	United Nations - Habitat
WEF	Water Environment Foundation
WSUP	Water and Sanitation for the Urban Poor

Conceptual Framework of Principle Success Factors (Paper 1, Figure 4, page 23)

A	Aspirational
BN	Basic Needs
CB	Communal Benefit
CC	Co-Creation
ES	Essential Services
LP	Lifestyle Productivity
P	Partnerships
SD	Supply & Distribution
SM	Social Marketing

Conceptual Framework: Impacting Factors on Basic Needs Service Innovation (Paper 1, Figure 6, page 29)

A	Affordability
AB	Aspirational Benefit
BN	Basic Needs
CB	Community Benefit
CC	Co-Creation
CM	Communal Marketing
ES	Essential Services

L	Location
P	Partnerships
PB	Productivity Benefit
SD	Supply & Distribution

PAPER 1 - ABSTRACT

Factors Effecting Basic Needs Service Design and Innovation at the BoP

Purpose: In the context of poverty and designing for a populace characterised by limitations, the role of design has the ability to bridge the gaps between the 'haves' and 'have not's'. The authors' recognise that design for basic needs requires more than good design, it demands an in-depth understanding of a number of interrelated factors that contribute to its adoption, success and sustainability. This contextual study develops a framework to design and innovate appropriate products and services to meet the needs of the poor.

Design/methodology/approach: This paper adopts an integrative approach to building/understand theory and practice. The combination of a contextual case study, a review of current practice approaches from alternate perspectives in industries and the development sector, and an analysis of products and services operating that societal level, provide an inclusive approach to designing for the underserved.

Findings: A conceptual framework offers a set of interrelated factors that create boundaries for innovation spaces throughout the service design and development process. The authors' outline key drivers for navigating through complex scenarios that are inherent to the world's poor.

Practical Implications: The findings are considered to be theoretical, but its implications are aligned with current thinking and attitudes of the development sector and industry experts. The framework is a tool for assessing current products and services and developing new offerings to meet the needs of the world's poor.

1 A Conceptual Framework of Factors that Effect Basic Needs Service Design and Innovation at the BoP (Paper 1)

1.1 The Challenge

Currently the world is experiencing a surging increase in its population. Statistics from UN estimate a population of 7 billion rising to 9 billion by 2030. Most notably, for the first time in history, is the swell in numbers living in urban areas, which has passed the 50% mark. This phenomenon has resulted in a growing population living in 'slums' or 'informal settlements', which is expected to rise from 1 billion to 2 billion by the year 2030. These overwhelming numbers are greatly emphasised in the developing regions, where an estimated 43% are 'slum dwellers' and, astonishingly, 72% of Africa's urban population live in slums (Cohen, 2006). The UN-Habitat (2006) outlines slum characteristics as having three key elements;

1) Overcrowding
2) Poor housing conditions
3) Inadequate access to improved water and sanitation facilities

And it defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following (UN_Habitat, 2006) Figure 1 supports these points with pictures.

- Durable housing of a permanent nature that protects against extreme climate conditions.

- Sufficient living space, which means not more than three people sharing the same room.

- Easy access to safe water in sufficient amounts at an affordable price.

- Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.

- Security of tenure that prevents forced evictions.

Figure 1: Photo's from Kibera, Nairobi 1. Building materials, 2. Cramped interior of room, 3. Water standpost, 4. Shared toilet structure, 5. Front entrance to a residence (Mercer, 2011)

Described as 'cities within cities' (UN-Habitat, 2003), these settlements are not all the same. They differ in characteristics with layout, density, construction materials, topology, population and social structures, amongst others, defining their individualities. Common issues, such as the lack of ownership of communal space, occur that affects the socio-environmental situation. The unattended spaces between homes become littered and difficult to navigate through; causing unhygienic living environments that can have a serious demotivating social effect. Another challenge is the variable landscapes the different types of settlements have. A combination of poor drainage channels, narrow access between homes, uneven surfaces can determine products and services that can be implemented. Bad weather can multiply these effects of the landscape even more. An accumulation of negative effects, at the micro and macro level results in utilities that fail to adequately connect their services to the populations that reside in these areas. In response to these failures alternative providers dominate the 'water market' that fill the gap to meet the needs of the

3

customer. They can also be referred to as 'informal suppliers' (Gerlach & Franceys, 2010), 'small water enterprises' (Oenga & Kuria, 2006) or second and tertiary suppliers.

The alternative providers' role in the market is considered as an intermediate solution for larger urban planning schemes. When discussed within policy circumstances the alternative providers can be referred to as "empowerment of local people" and "development of local entrepreneurship" (Dagdeviren & Robertson, 2009). This respectful manner in which they are referred is indicative of their presence within the system. They have had to develop to survive and are now a source of income and sustaining a livelihood to many. In Nairobi they are reported to supply up to 60% of the population who are dependent on their services. Their success and growth can be defined by a number of factors (Oenga & Kuria, 2006)

- Failures of the Utility to respond to market demands
- Provide access underserved areas
- Innovative in their approach to problems (financially motivated)
- Respond to the needs of the market
- Operate additional businesses (ability to re-allocate resources)

These success factors are a message to the water utility providers of where their service fails the poor, but counter to this is the negative issues that surround alternative providers. From the perspective of the utility they are losing revenue due to illegal connections and failure to pay. There is also little regulation that governs the alternative providers and including them into the formal service provision can add additional burden and costs (Gerlach & Franceys, 2010). From the perspective of the consumer alternative providers are high in prices determined on societies 'willingness to pay' (Showers, 2002), can provide poor quality water and operate from unhygienic environments, have little emphasis to provide good service. The alternative providers themselves also incur a number of issues. They are reliant on the utility to provide water, lack the finance to develop and improve their business and have no formal training in their operations (Oenga & Kuria, 2006). However, the issues of lack of regulation and governance can result in a corrupt network of providers dominating the

market and controlling the prices that only work in the favour of the business owners, not the consumers (Nickson & Franceys, 2003).

Even though the settlements are clearly visible they are, however, unacknowledged at a macro level due to their informal and illegal status. At the micro level the majority of individuals and families that populate these areas are at the bottom of the economic pyramid (refer to Figure2). Income levels, which differ in range, personify their lives from being vulnerable non-poor down to the destitute or just below the poverty line to living in extreme poverty respectively.

Figure 2 - Levels of poverty at the Bottom of the Pyramid

An historic event for water was the creation of the 4th Dublin Principle, in 1992, that stated:

"Water has an economic value in all its competing uses and should be seen as an economic good"

This statement lead too much misunderstanding on the issue of human rights to water and it was not until the UN Committee of Economic, Social and Cultural Rights met in November 2002 that a documented and universally agreed statement that defined:

"The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses"

And universal access to sanitation as:

"Not only fundamental for human dignity and privacy, but is one of the principle mechanisms for protecting the quality" of water resources.

The Human Rights Council later adopted, in April 2011), the notion that access to safe drinking water and sanitation was a human right - *"A right to life and human dignity"*

The benefits of water and sanitation are well documented in literature and by the bodies that serve these human needs (see below). Water and sanitation are widely thought to provide 'harmonious cities' (Uwejamomere, 2008) and have positive effects on the economy (Dagdeviren & Robertson, 2009). However, the realities of many cities in the developing nations are that there is insufficient access to clean drinking water, inadequate sewerage facilities and insufficient solid waste disposal (Cohen, 2006; UN-Habitat, 2003).

The benefits (to health) of a functioning utility that is able to serve the poor (with piped water) are adapted from (Franceys, 2008)

- Reduction in infant mortality
- Reduction in water expenditure
- More time
- No stress from queuing
- No early morning starts &
- More money in the pocket
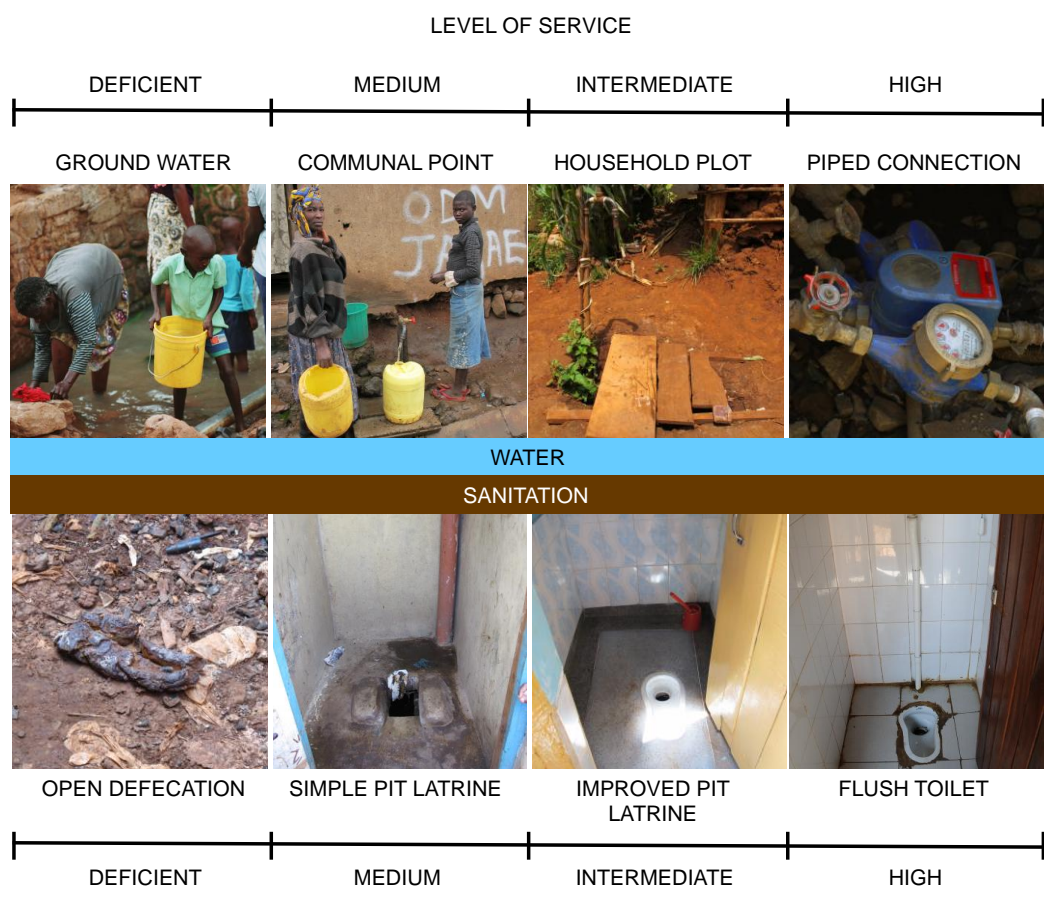
Figure 3 - Typical levels of service providing access to safe water supply and sanitation in urban areas adapted from DFID (1997) by Mercer 2011

There are a few cases where utilities have achieved this (Franceys & Jalakam, 2010). In the majority of cases people have to develop coping strategies (DFID, 1997) to deal with the failures of the utilities provider. On a grander scale it is paramount that to meet the Millennium Development Goals (MDG's) cities need to adopt a pro-poor strategy in order to 'fill the service gap', which involves more than laying pipes and networks (Coates *et al*, 2004). However, they also recognise that it is the last mile of service that needs to be addressed and this involves a different strategy to achieve success (Gerlach & Franceys, 2010).

The issues of sanitation is more severe that its counterpart and its notably far more detrimental for urban dwellers (Cohen, 2006). In Africa specifically, formalised

sewerage systems are rare, only operating in some of the large cities and universal coverage is virtually unheard of. Statistically more than 3 billion people are without access to excreta disposal (DFID, 1997). With only a tiny percentage of aid budgets going to slums, it's the urban poor that suffer the most.

From a national perspective, common problems occur in developing countries on a political, social, technical and institutional level, all usually having adverse effects on the economics of the poor consumer (DFID, 1997). In Africa, where resources are short, debt dependency is a national issue and can "undermine efforts for economic stability" (Nwankwo, 2000). This coupled with the endemic dependency on aid, where decisions are made by aid workers and not the people, means that there is a constant widening of the gap between 'haves; and 'have not's (Nwankwo, 2000). As a strategy for sustainability, charity and aid will not work (Hammond, 2007).

So in markets that are determined by governments and politicians the challenges of corruption and inflation that inflict these countries ultimately punish the poor the hardest (Chikweche & Fletcher, 2010). To exacerbate the situation more is the rising challenge of growing populations and urbanisation, where small cities are more able to manage (Gerlach & Franceys, 2010), but only serve to put extra strain on the resources of governments in a society that is already struggling to cope (Gerlach & Franceys, 2010). Developing strong leadership in government is a necessity to strengthening the weak legal and social mechanisms that try to protect the consumer (Martinez & Carbonell, 2007; Gerlach & Franceys, 2010).

The matter of poverty and meeting basic needs has been approached in different ways from different sectors. All have had varying levels of success over the years; however, it is still a top priority for the international community. Governments have a duty to address the issues, aid agencies and charities support the governments out of a necessity and a desire to do good, but it is now the commercial and industrial sector that has taken a far greater interest in this largely untapped and unaddressed abundance of consumers.

The new interest in the BoP, from predominantly business, marketing and policy sector, has lead to a body of literature that serves to understand the consumers, their lifestyles and demonstrates new strategies to satisfying the markets with products and services that meet their demands. (Fairbourne *et al,* 2007; London & Hart, 2011). Apparent in the literature is the small, but growing number of articles that outline successful design characteristics and the requirements for developing products and services for the BoP (Chikweche & Fletcher, 2009; Ireland, 2008; Sridharan & Viswanathan, 2008; Weidner *et al*, 2010). A key element emerging is the focus on developing aspirational products and services (Subrahmanyan & Gomez-Arias, 2008), one's that meet a basic need and deliver qualities that go beyond enabling survival, but benefit their lives. The author recognises there is a gap in the literature detailing the factors that impact of product and service innovation at the BoP

1.1.1 What is needed?

For design-driven innovation to make a difference and deliver successful solutions, that are respectful to the complexities of this populace and sensitive to the needs of the user, a deep and interconnected understanding is required. As described above, there are a number of issues that are inherent to tackling the needs of the poor. It is the aim of this paper to bring to life those factors that need to be considered when innovating basic needs services for the poor.

1.1.2 What does this paper do?

This paper is the result of a contextual study in the urban 'slums' of an African city. The objective has been to design, develop and deliver a consumer-inspired aspirational basic needs service to the underserved tenants living in these complex environments. Through a journey of exploration, empathy and endeavour the author delivers insight and builds on the understanding of issues that can impact on product and service innovation projects at the Bottom of the Pyramid. The outcome of this study is two-pronged. Firstly, a conceptual framework that demonstrates a number of interrelated factors that are seen to be of critical importance when innovating at the BoP. Secondly

it presents lessons and insights to support the process of university projects focused on BoP basic needs service innovation.

This paper will take you through the journey of its findings and insights into designing, developing and implementing a basic needs service. The aim is to build a holistic understanding of the challenges and requirements to implement a successful innovation project for a complex socio-cultural environment.

To provide validity and minimise misinterpretation the author will guide the reader, in a chronological order, through critical stages of the project that had the greatest influence on the outcome of the framework. The project is considered exploratory, in nature and adopts a case-study methodology to explain the findings and develop theory-building propositions (Yin, 2003). In a domain (the BoP) of innovation that is gaining momentum within industry and academia the paper provides three elements; firstly insights useful for BoP basic needs service innovation projects, secondly a holistic understanding, at a project level and service system level, to assist with BoP focused innovation and lastly, a framework tool to assist in strategic planning for basic needs innovation projects.

1.1.3 Key Questions

The key questions this research aims to answer are as follows:

RQ1. What are the factors that impact on basic needs product and service innovation at the BoP?

RQ2. How do these factors impact on a basic needs product and service design and development process at the BoP?

RQ3. What are the insights and lessons that can be learnt from executing a university-based project on basic needs product and service innovation at the BoP?

To minimise repetition of the term 'product(s) and service(s)' this paper will use the term 'service(s)' to mean both. This is unless the discussion is exclusive to a single object, the product, not part of a service system. This consideration is more suitable to the context of the project as the term 'product' has an isolated meaning that does not consider the system in which it is a part of, whereas the term 'service(s)' is an association of elements (touch-points), interactions (people) and supporting

infrastructures (providers) (Baines *et al,* 2007) . This is deemed more appropriate because it incorporates a system level approach to be able to answer the questions above.

In response to RQ1 the following section will guide the reader through the critical stages that led to the creation of a conceptual framework that details the factors that can impact of basic needs service innovation.

1.2 Critical Stage 1: Identification of principles for success for BoP product and service innovation

A starting point for the project was a review of current literature to better understand the success factors of products and services targeting and operating in the BoP markets. Prominent themes extracted from literature created 8 guiding principles suggesting that a successful BoP service should:

Table 1: Principles for product and service success at the BoP

	Principles for Success	Reference
A	Address a clearly identifiable **basic need**	Fairbourne *et al*, 2007; Guiney *et al,* 2011; Murphy *et al*, 2010; London & Hart, 2011; Whitney & Kelkar, 2004
B	Have **aspirational** benefits	Ireland, 2008; Prahalad & Hart, 2002; Prahalad, 2005; Subrayaman & Gomez-Arias, 2008;
C	Have **lifestyle productivity** benefit	Fairbourne *et al*, 2007; Whitney & Kelkar, 2004
D	Have **co-creation** capabilities	Dos Santos *et al*, 2009; Fairbourne *et al*, 2007, London & Hart, 2011; Sridgaran & Viswanathan, 2008; Takamura, 2011; Weidner *et al*, 2010
E	Provide **community benefits**	Hammond *et* al, 2007; Weidner *et al*, 2010; WEF, 2009
F	Use **social marketing** aspects	Chikweche & Fletcher, 2010; Prahalad & Hart, 2002; Prahalad, 2005; Sethia, 2005; Sridgaran & Viswanathan, 2008; Weidner *et al,* 2010
G	Develop **partnerships** to sustain itself	Fairbourne *et* al, 2007; Murphy *et al*, 2010, Sethia, 2005;
H	Have a **product-service system** approach	Dos Santos *et al*, 2009; Fairbourne *et al*, 2007; Whitney & Kelkar, 2004

A broader justification of the principles is explained below to better

A. Address a clearly identifiable **basic need**

The world is experiencing increasing populations and poverty is showing no signs of reducing its effects. The realities of subsistence living indicate that basic needs are prioritised. Although there are occasions when social norms take precedence and payment is diverted to satisfy other extraneous circumstances, for example weddings, treats for children, or cigarettes and alcohol (Banerjee & Duflo, 2007). A moral embargo, at a policy level, on products and services that do not meet a basic need is a reasonable proposition, but unenforceable. However, in the context of poverty where gender inequalities and socio-cultural-environmental issues impact on the poor the greatest, a focus on basic needs should be a driving principle for service development. The 8 millennium development goals are significant in re-enforcing a global commitment to this.

B. Have an **aspirational** benefit

Described as the 'aspiring poor' (Prahalad, 2002) there is a growing importance for the BoP's aspirations to be met through the delivery of quality services. Although there is a lack of specific data discussing the aspirations of the BoP, there is evidence the poor invest in aspirations. This is recognised through purchasing higher priced quality products aimed at wealthier consumers (Ireland, 2008), or better education for their children (Banerjee & Duflo, 2007). A ubiquitous product that has overwhelming success it the mobile phone. A once aspirational product for the middle classes of the developed nations, it has been able to adapt to become attainable to the BoP. Its success can be attributed to the provision of affordable devices with tariffs that reflect incomes, thereby meeting the needs of this demographic. Delivering an aspirational service one would assume a greater level of user satisfaction and quicker adoption rate of the service.

C. Have **lifestyle productivity** benefit

The notion of lifestyle productivity benefit takes on different forms. From a marketing perspective it is seen as a component of the 'value offering'. From a design perspective it is the functional characteristics of the product that enable one's lifestyle to benefit from improved productivity. An example is the mobile phone that enables ease of communication, therefore increasing one's ability to develop networks and improve the income. Another would be the D-light, a solar powered light, which enables the user to be able to continue doing activities, such as homework, in the evening. Developing a productivity benefit will enable a clearer value offering to be communicated.

D. Have **co-creation** capabilities

The inclusion of the user into the process of the design and development has shown to be a critical aspect at the BoP (Prahalad, 2005), one that encourages participation of the end users, project members and the local community. The strategic purpose of this is to help build empathy towards the project as well as developing a sense of ownership that leads to greater levels of adoption (Fairbourne *et al*, 2007). Case studies show that in a BoP context this can have positive effects on developing successful products and increase rates of adopting.

E. Provide **community benefits**

Targeting the service to benefit communities rather than individuals is shown to increase adoption and bring greater harmony to the social environment (UN-Habitat, 2003). Benefits can vary from the service providing local employment opportunities, to providing access to previously unavailable products or improving the living conditions in an area.

F. Use **social marketing** aspects

A key issue with the BoP is low levels of literacy and numeracy skills. To compensate for this marketing has to be sympathetic to these overcome this challenge (Chikweche

& Fletcher, 2010; Weidner *et al,* 2010). Greater efforts should be made to engage in face-to-face advertising with educational demonstrations to encourage word-of-mouth. Identifying key leaders, elders and influential figures in communities are also important to involve in marketing activities to form trust and acceptance of new services by local tenants (Weidner *et al,* 2010).

G. Develop **partnerships** for scalability

Partnerships are a vital component at different stages of the innovation. At the micro level, developing strong links with community leaders enables better negotiation of social networks (Sridharan & Viswanathan, 2008)). This process can be greatly facilitated by local NGO's who would have knowledge and understanding of social hierarchies, cultural practices one must be sympathetic to and also provide access to areas that are otherwise difficult to enter without local presence. They can also provide knowledge transfer mechanisms and skill sets that may be unavailable within foreign companies trying to access unfamiliar markets. At the macro level, partnerships with organisations can provide strategic alliances for developing supply chain and distribution networks, critical for overcoming the obstacles to access in infrastructure light locations.

H. Develop a **product-service system** strategy

Widely acknowledged is that world resources could not sustain themselves if the BoP consumed in the same way the top 20% did. Solutions to overcome this would suggest that product-service systems (PSS) could ease this potential burden. Baines *et al* (2007) define a PSS as:

"An integrated product and service offering that delivers value in use. A PSS offers the opportunity to decouple economic success from material consumption and hence reduce the environmental impact of economic activity". (p3)

In the context of the BoP a PSS approach would suggest an appropriate strategy to developing basic needs services.

The eight principles developed have been the results of a preliminary investigation into success factors for service innovation at the BoP. At this stage in reading, they should not be considered definitive characteristics, instead serve to initiate further investigation into the factors that impact upon service innovation at the BoP. In the following section the 8 principles are used as factors for analysing products and services targeted or operating at the BoP.

1.3 Critical Stage 2: Analysis of principles against products and services targeted or operating at the BoP

To be considered for selection into the study the limitation criteria specified that it had to be a product and/or service that targeted the BoP consumer or operated in the BOP marketplace. The study was not limited to a particular sector (water and sanitation for example) to allow a broader scope of analysis. It was also not limited by document type (for example case study reports only), so the information available was, at times, limited to the amount available on the product. The study reviews their success factors in relation to the context, products and services operating in the BoP marketplace, being measured against multiple units of analysis, the 8 principles. To add deeper analysis the study assessed the supply and demand aspect to understand the reciprocal interactions that take place between the business and the consumer. This, as will be shown, added greater depth to the findings and meant a revised formation of the 'principles of success' was needed.

Table 2 exhibits which products or services demonstrated characteristics that were considered to meet the criteria of a principle success factor. A general finding was that products that had co-creation characteristics generally displayed characteristics in all the other principle factors. This would suggest that it is an important element to success. However, it is recognised that not all principles have to be met for success to be guaranteed. (Appendix A & B: Comparative analysis of products and services against principles, excel spreadsheet and photos of analysis process)

Table 3 demonstrate how the findings from the study structured the layers of results. Three critical insights were gleaned from this; firstly, a system level of understanding is achieved. One is able to understand which principles have the greatest impact at a

certain societal level, i.e at the micro, meso[2], or macro level. Secondly, a more empathic appreciation of the interactions between consumer and business is developed; gaining knowledge of the benefits each can offer one and other. Lastly, insight into the motivational drivers (both at the societal level and from a business perspective) provides greater awareness to the behavioural factors that are dominant within the principle success factors. Figure 4 demonstrates this stage of findings as a linear conceptual framework. It is organised by structuring the principles' success factors in a central row parallel to the business drivers and the societal level that represent the greatest influence upon them. Additional success factors are the inclusion of essential services (ES). This is recognition of the difference between its neighbour, basic needs (BN). Essential services are seen as separate because they do not satisfy basic needs, but they are vital in supporting human development and are widely adopted by the BoP, especially in urban areas. Supply and distribution (SD) is factored in, and considered a fundamental element to providing access and availability of products. With water and sanitation in low-income urban areas, it is the 'last hundred meters' that is the most difficult to navigate. This is a dominant factor of why utilities fail in their role to provide a universal service. (Franceys, 2008)

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[2] **Meso is a term used in evolutionary economics. It is useful to describe the gap between micro and macro. Please refer to Dopfer *et al*, 2004 for a more detailed understanding.**

Sector	Product	Basic Needs	Aspirational	Lifestyle Productivity	Co-Creation	Community Benefits	Social Marketing	Partnerships	Reference	Reference Type
Agriculture	Rice Crops	•		•	•	•	•	•	Murphy et al, 2010	Journal Paper
Agriculture	ITC Ltd	•	•	•		•	•	•	Vachani & Smith, 2008	Journal Paper
Agriculture	Water Pumps	•	•	•	•	•	•	•	Chesbrough et al, 2006	Journal Paper
Communication	Mobile Phones		•	•					Ireland, 2008	Journal Paper
Communication	Village Phone		•	•		•	•	•	Fairbourne et al, 2007	Book
Communication	Mobile Network		•	•		•	•	•	Anderson et al, 2010	Journal Paper
Communication	Postal Service		•	•				•	Vachani & Smith, 2008	Journal Paper
Communication	Grameen Phone		•	•		•			Seelos & Mair, 2007	Journal Paper
Education	Gyan Shala	•	•	•	•	•	•	•	Vachani & Smith, 2008	Journal Paper
Fashion	Children's Clothes	•	•		•	•	•	•	Nielsen & Samia, 2008	Journal paper
Finance	Microfinance		•	•					Elyadi & Harrison, 2010	Journal Paper
FMCG	P&G Nappies	•	•					•	Ireland, 2008	Journal Paper
FMCG	Coca Cola		•	•				•	Ireland, 2008	Journal Paper

Sector	Product								Reference	Type
FMCG	Food Snacks	•			•		•		Ireland, 2008	Journal Paper
Health	Reading Glasses	•	•		•	•	•	•	Fairbourne et al, 2007	Book
Health	Healthstore	•	•	•	•	•	•	•	Anderson et al, 2010	Journal Paper
Household	Stove	•	•	•	•	•	•	•	Murphy et al, 2010	Journal Paper
Infrastructure	Public Transport	•	•	•	•		•		Fairbourne et al, 2007	Book
Multiple	MNC/NGO Partnerships	•	•		•		•	•	Webb et al, 2010	Journal Paper
Multiple	Multiple	•	•	•	•	•	•	•	Weidner et al, 2010	Journal Paper
Sanitation	Waste Collection	•	•	•	•	•		•	Fairbourne et al, 2007	Book
Sanitation	Waste Concern	•	•	•	•	•		•	Seelos & Mair, 2007	Journal Paper
Service	House Cleaning	•	•		•		•		Fairbourne et al, 2007	Book
Social Enterprise	Shoe Shiners Co-operative		•		•		•		Fairbourne et al, 2007	Book
Social Enterprise	Community Tourism	•	•	•	•	•	•		Fairbourne et al, 2007	Book
Social Enterprise	Retail	•	•	•	•			•	Nielsen & Samia, 2008	Journal paper
Water	Purified Water	•	•	•	•	•	•	•	Fairbourne et al, 2007	Book
Water	Durban Tank	•	•	•	•	•	•	•	Coates et al, 2004	Book

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Water	Water								Allen *et al*, 2006	Journal Paper
Water	Water Kiosks	•	•	•	•	•	•	•	www.globallens.com	Case Study Report
	•		•	•	•	•	•	•	•	

Table 2: Study results: Comparative analysis of principles against products and services targeted or operating at the BoP

KEY BENEFICIARIES: MICRO LEVEL – INDIVIDUALS & FAMILIES					
KEY BUSINESS DRIVER: VALUE OFFERING					
PRINCIPLE SUCCESS FACTOR	INDIVIDUALS & FAMILIES KEY MOTIVATION	BUSINESS OFFERING	BUSINESS INCENTIVE	CONSUMER OFFERING	CONSUMER INCENTIVE
BASIC NEEDS	FOR SURVIVAL	Food, water, sanitation, clothing, shelter, education, energy, health	Business expansion, social good (CSR),	Payment for product or service	Essential for survival, quality of life, human development
ESSENTIAL SERVICES	SUPPORT	ICT, Finance, Transport, (technology focused)	Business expansion, social good (CSR),	Payment for product or service	Enterprise development, formal market entry, diversify options
ASPIRATIONAL	STATUS	Quality, access/ convenience, technology, flexibility, security, trendy/ fashionable, user-centred	Market differentiation	Payment for product or service	Durability, time saving, tangible, customisable, social development, status, pleasure
LIFESTYLE PRODUCTIVITY	INCOME	Employment, Entrepreneurial activity, skills training (human development)	Navigating the last mile	Resources, human capacity	Income (financial), security, control over life, access to formal markets, capability building
KEY BENEFICIARIES: MESO LEVEL – GROUPS & COMMUNITIES					
KEY BUSINESS DRIVER: ADOPTION					
PRINCIPLE SUCCESS FACTOR	GROUPS & COMMUNITIES KEY MOTIVATION	BUSINESS OFFERING	BUSINESS INCENTIVE	CONSUMER OFFERING	CONSUMER INCENTIVE
CO-CREATION	OWNERSHIP	Design and build of products and services	Quicker adoption rates, higher success, access local resources, cost reductions.	Insight and opinion	Inclusivity, personalised to suit needs, employment opportunities, empowerment.
COMMUNITY BENEFITS	IMPROVED LOCAL ECONOMY	Better Facilities, resources,	Navigate social networks, access resources, land access, trust and buy-in	Local resources , land access	Social development, local employment, improved local economy, child's welfare, ownership transfer (possibly), local enterprise opportunities
SOCIAL MARKETING (ACTIVITIES)	AWARENESS (PROMOTION)	Demonstrations, promotional activity, information, education, personal + interactive service	Community integration, brand awareness	Willingness to adopt product or service	Knowledge, benefits, value (to lifestyle)
SOCIAL MARKETING (ACTIVITIES)	INCLUSION (FEEDBACK)	Community involvement	Community integration, understand failures	Insight and opinion	Inclusion, ability to express views and opinions, empowerment
SOCIAL MARKETING (ACTIVITIES)	IMPROVED SERVICE (DEVELOPMENT)	Improvement of product and service	Sustained purchases	Insight and opinion	Better product and services
KEY BENEFICIARIES: MACRO LEVEL – ORGANISATIONS & INSTITUTIONS					
KEY BUSINESS DRIVER: SCALABILITY					
FOCUS AREA	KEY ORGANISATIONAL MOTIVATION	BUSINESS OFFERING	BUSINESS INCENTIVE	CONSUMER OFFERING	CONSUMER INCENTIVE
PARTNERSHIPS	IDEOLOGY & PHILOSOPHY	Quality control, technology resources, finance, human capacity, network access, centralised & collective purchasing, ownership contracts	Access to resources currently unavailable, knowledge transfer, business flexibility, cost reductions, government recognition, security		
SUPPLY CHAIN & DISTRIBUTION	ACCESS AND AVAILABILITY	Bi-directional & shared S+D, network access, formal/informal resource mix	Cost reductions, infrastructure negotiations, network building	Atomised distribution networks	Employment

Table 3: Findings from case study analysis
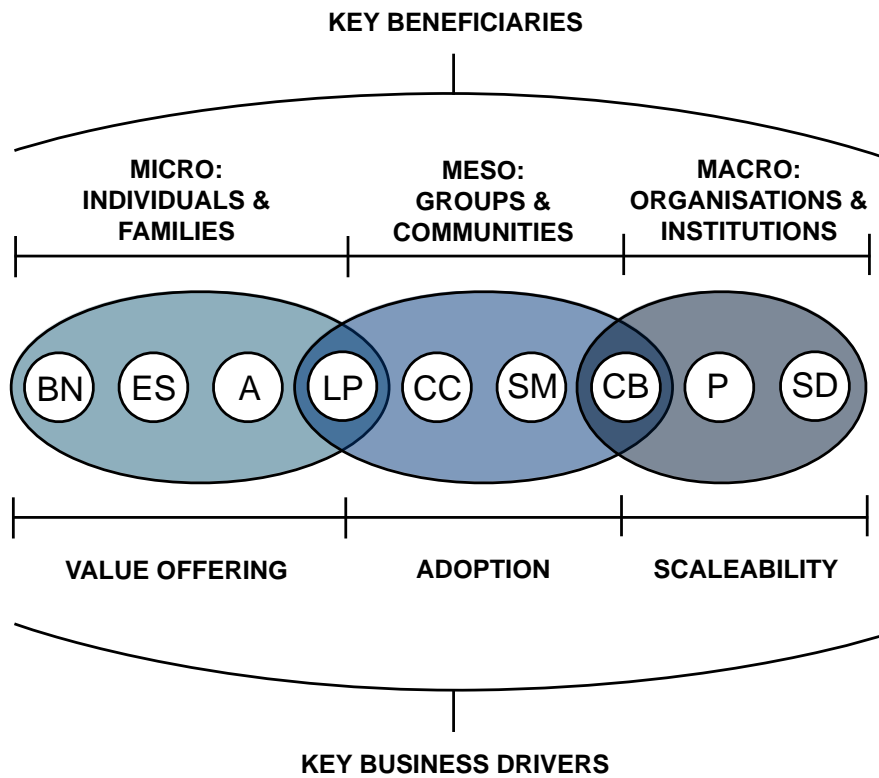
Figure 4: Version 1 - Conceptual framework of principle success factors (KEY) BN: Basic Needs, ES: Essential Services, A: Aspirational, LP: Lifestyle Productivity, CC: Co-Creation, SM: Social Marketing, CB: Community Benefit, P: Partnerships, SD: Supply + Distribution

1.4 Critical Stage 3: Study trip to the cities of Nairobi & Kisumu, Kenya

Immersion in the environment is cited as a vital activity for innovating at the BoP (Prahalad, 2005). The initial trip provided an opportunity for this, and to achieve three objectives. 1) Develop a greater understanding of the complexities of urban 'slum' settlements. This lead to a more empathic understanding of the social, cultural and environmental factors that can have a negative impact on water and sanitation projects. 2) Develop relations with the partnering NGO team members that are facilitating the project and 3) Pilot consumer data collection tools and test their ability to capture the desired information. From this contextual study a number of other factors emerged as being critical to the success of BoP services, Figure 5: Impact factors - study trip findings illustrates these. (Appendix C provides documentation to support the study trip and its findings)

LOCATION + INFRASTRUCTURE   SECURITY   OWNERSHIP & FINANCE   WEATHER & SEASONS

Figure 5: Impact factors - study trip findings

To better illustrate these impact factors; insights are provided from two slums, Kibera in Nairobi and Obunga in Kisumu, piloting the same service concept. The 'value adding' concept used a hosepipe reel, operated by a locally recruited individual, to deliver water to households, filling up jerry cans, buckets or larger water storage vessels. In Kibera it was operated from a Bio-Centre and in Obunga and a private vendor operated

the service from a secure chamber[3]. The idea behind the locally made hose reels was to replicate the service received by wealthier households who can afford individual connections, and therefore benefit from better health and convenience of the service. In both locations the service was well received, with adoption rates high in a relatively short period of time. The lifestyle productivity factor impact was very positive with people. For example, in Kibera, there is a reported element of very welcome child protection in the service. Not having to go to distant water standpost with very young children left alone, one lady reporting that previously her child had followed her once and fallen into a ditch. In Obunga, the private water on-seller was very pleased with the (rather heavy) hose reel sitting in wheelbarrow, stating *'I can get round much faster and sell more - between 100-150shs (25-40 jerrycans) more per day'* – *'I sell more water as I'm quicker'*.

The successful pilot studies also highlighted elements that negatively impacted on overall successful implementation. The following section illustrates these impact factors through pilot studies carried out in Kibera and Obunga. Firstly the impact of *location and infrastructure;* the Obunga pilot suffered from interrupted water supply due to failings by the utility to fix a mains problem. In Kibera, issues of water vendors, often referred to as 'cartels', controlling water supply meant having to challenge social hierarchies in order to resume service. In conjunction with the infrastructure issues, the different locations were observed to affect the product usage scenarios. In Kibera, the carrying of the hose reel through the narrow passageways affected the lifespan of the hosepipe, due to abrasion on the rugged surface and the effects of sunlight. In Obunga, the layout of the settlement meant that the addition of a wheelbarrow to attach the hose reel to became a valid development, where as implementing that in Kibera would be a challenge due to topography issues, poor ground conditions meaning operational control of a wheelbarrow would be difficult. Secondly, *security;*

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[3] **A chamber is a water connection point at ground level made from concrete. In this case it is supplied by a privately owned network who are contracted by the utility to extend networks and increase connections.**

the water on-seller in Obunga removed the meter from the end of the hose as it was felt to be unsafe if left outside and would be a target for theft. However, it was reported that he had connected it to the chamber (the main water supply) to be able to monitor daily sales and consumption. Thirdly, o*wnership and finance;* In Kibera, these factors were highlighted by a scenarios concerning the Bio-Centres. The community managed facilities, with the potential to be community owned, challenged the ownership of the hose reel service because the water connection was actually owned by another vendor, something unknown before. This also challenged the financial aspect of the service and questioned who would pay for someone to operate it. This issue was overcome by using project funds, but the service was later stopped when those funds were no longer available. Lastly, *weather and seasons;* were reported to play a big role in service continuity. The water on-seller in Obunga loses half his business in rainy seasons due to people using rainwater for cleaning and other purposes outside of consumption. This does not apply to Kibera, where rainwater is not used as much due to unsanitary objects on the roofs of homes. However, reports of disruption in water supply occur during the months of September/October when there is a large exhibition happening in Nairobi.

1.5 Critical Stage 4: Aspiration focused empirical research in Nairobi, Kenya

As already mentioned, consumer aspirations are increasingly becoming more important when developing services for the poor. Understanding an aspiration has shown, to some degree, how they manifest themselves at the BoP (Subrayaman & Gomez-Arias, 2008). At present, aspirations of the BoP are used at strategic level to understand the consumer and their behavioural motivations. They do not appear, however, to be used to dictate the functionality, aesthetics, finishes of a product or operations of a service at a system level.

The empirical research in this study used aspirations to focus its data collection methods. Adopting a technique, previously used within the fast moving consumer goods sector, developed by Bolton (2009) to 'unlock' hidden consumer insights and motivations. The findings will be discussed through the analysis of a service concept, developed as part of the project, in relation to the conceptual framework of impact factors on basic needs service innovation (Figure 6)

1.5.1 Conceptual Framework – Impact factors for basic needs service innovation

The final framework (Figure 6) is the result of a combination of activities, 1) a contextualised literature review, 2) an immersive study at the locations of the service environments and 3) the collection of empirical data to gain an in-depth understanding of the circumstances of the users, both consumer and business operator, their lifestyles and aspirations. The framework is made up of three rings. The inner most one is contains 11 elements (primary factors), the middle ring has 5 elements (key business motivations) and the outer ring consists of 3 societal level elements (Micro, Meso and Macro) that impact, although not exclusively, on the middle ring and inner ring elements. The circular formation of the framework is symptomatic of the interrelated nature of the factors' and their impact on BoP service innovation. To better understand the factors, a service design concept will be contrasted against the
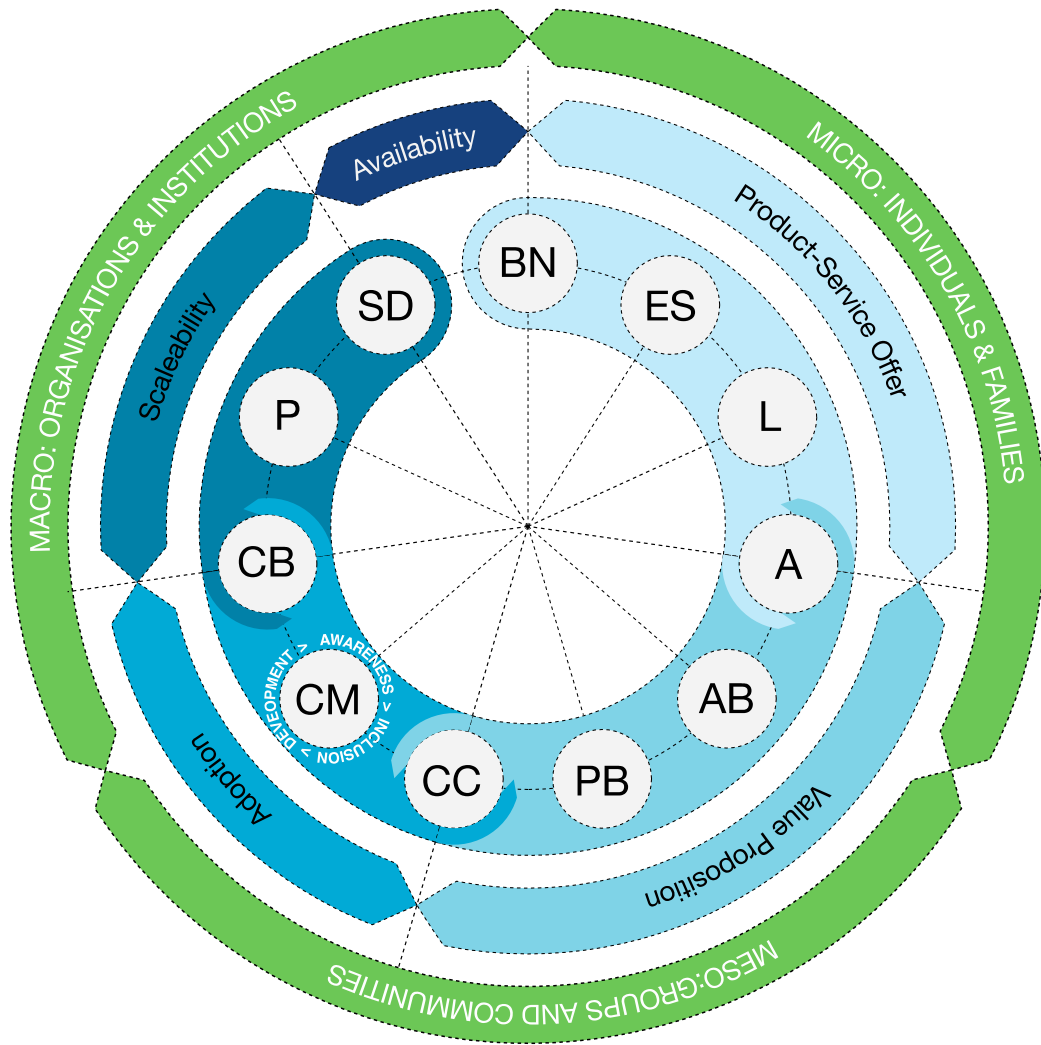
elements of the framework to better explain their impact. Details of the service design concept are below.

1.5.1.1 Water Choices: A Basic Needs Service Design Concept

The *Water Choices* concept is has been conceived to imitate the service of a functioning piped network offered by a utilities water provider. The service concept aims to offer consumers a choice to go up or down the service ladder according to their demands and financial situation. The service ladder has four levels; 1) Collect from service point and pay according to volume, 2) Have it delivered to your home via a hosepipe and pay according to volume, 3) have a daily fill at home by delivery or through an informal (plastic) pipe to a Durban tank[4] and pay according to volume or at a fixed daily rate and 4) a continual supply through an informal pipe and pay according to a meter (located at the service point). The *Water Choices* concept, although not fully operational and considered to be in preliminary concept development and testing stages, will be used as a case study example to develop deeper understanding of the impact factors. The conceptual framework is a strategic tool to be used throughout the design and development process of BoP basic needs service innovation. At different stages of the process some factors show a greater degree of impact than others. This is an important point to reflect on and will be tackled when answering the second research question *'How do these factors impact on a basic needs product and service design and development process at the BoP*?' At this point, however, an analysis of the *Water Choices* concept will be measured against the framework elements. For discussion purposes the impact factors will follow a line of enquiry that asks, for example, 'how does *location* impact on the *Water Choices* service design concept?'

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[4] **A Durban tank is a water tank design that can be filled remotely via a piped network and restricts the flow of water, when it reaches a certain limit, by use of a system similar to those found in toilets.**

MACRO: ORGANISATIONS & INSTITUTIONS

MICRO: INDIVIDUALS & FAMILIES

MESO: GROUPS AND COMMUNITIES

Availability

Scaleability

Adoption

Product-Service Offer

Value Proposition

DEVELOPMENT > INCLUSION > AWARENESS >

BN ES L SD P CB CM CC PB AB A

BN	ES	L	A	AB	PB	CC	CM	CB	P	SD
Basic Needs	Essential Services	Location	Affordability	Aspirational Benefit	Productivity Benefit	Co-Creation	Communal Marketing	Community Benefit	Partnerships	Supply + Distribution

Figure 6 – Conceptual Framework: Factors impacting on BoP Basic Needs Service Innovation

BN - Basic Needs:

The tenants of informal settlements in Nairobi and Kisumu suffer disproportionately compared to their wealthier counterparts. They, the wealthier residents of the city, enjoy the health and convenience benefits of a functioning water utility, receiving water directly to their homes. The slum residents, however, struggle on a daily basis on subsistence living with lives dominated by spending greater time, money and effort to retrieve water, a fundamental basic human need. In response to the failures of the utility and the demands of the BoP consumer, the *Water Choices* concept addresses these issues by offering a transitional solution. Therefore, the factor, basic needs, impacts on the *Water Choices* concept by providing a strategic focus for a service to improve the lives of the underserved.

ES - Essential Services

Within this framework essential service accommodate developed technologies such as transport, financial services and information communication technology. At present, service uptake, at the BoP, of mobile phones has shown that advancements in technology, reductions in manufacturing costs, combined with thoughtful pricing strategies can transform the dynamics of a whole society (Hammond, 2007). The empirical data, from consumer and business interviews across 6 informal settlements in Nairobi, confirmed that ownership of mobiles was high. In one case, a private water seller spoke of paying the water bill via M-Pesa, a mobile phone based banking service. The factor, essential services, does not presently impact on the *Water Choices* concept. However, the use of mobile phones is becoming a very significant domain to add value to the product-service offer. Therefore the factor, essential services, has the *potential* to make an impact on the operational aspects of the *Water Choices* concept.

L - Location

The impact of location on the *Water Choices* concept is extensive. Informal settlements from a global, national and regional perspective vary significantly. Understanding these differences that range from landscape, housing density,

population size, social hierarchies and land ownership are, but a few, considerations that had been factored in when developing the *Water Choices* concept. Stimulated by the factor, location, the design development was encouraged to vary the sizes of the main service delivery 'touch-points'. The outcome was the kiosk, mini-kiosk, and container design options to accommodate the need to diversify retail points to suit location (please refer to Appendix D for design development and final concepts). Another example is the hose-reel, the 'deliver' element of the service. The concept outcome, dictated by the locations layout, ground conditions and user, produced two design routes. In Obunga, developing a wheelbarrow option became more suitable and desirable, whereas in Kibera a handheld version remained more appropriate. Therefore, the factor, location, impacts on the *Water Choices* concept in three ways. Firstly, by challenging the usage scenarios of the service touch-points. Secondly, by challenging the appropriate design of the service touch-points and thirdly, by challenging the feasibility of successful service operation in an area.

A combination of the factors 'Basic Needs', 'Essential Services', 'Location' and 'Affordability' make up the product-service offer. In essence it builds a profile of what service is being offered, in which location, by what means and how much it costs. At a strategic level this combined factor is focused at towards the individual and family, recognising that it will have the most impact upon them.

A – Affordability

The impact of affordability on any product and service at the BoP is critical to its success (Prahalad & Hart, 2002; Prahalad, 2005). The tenants in the informal settlement of Nairobi pay higher prices for their water compared to wealthier residents who can afford a direct connection. An objective of the *Water Choices* concept is to encourage the reduction of water prices, something high on the list of consumer demands. However, in areas of Kibera, for example, reducing the water price created a negative impact on local private water vendors. Confrontational issues arose from this, forcing a compromise to keep water prices at the normal inflated rate in order to retain peaceful relations. So, although price reduction may be achievable in

some areas, the *Water Choices* service concept is sympathetic to this and aims to provide flexibility, in how they receive their water, and choice, in how they pay for their water. Therefore, the factor, affordability, impacts on the *Water Choices* concept by challenging a) the architecture of the product-service offering and b) the payment structure to access the service.

AB - Asprational Benefit:

Meeting the aspirations of the consumer is becoming a key feature for developing products and services at the BoP (Prahalad, 2012; Viswanathan & Sridharan, 2012). Understanding them, as already mentioned, appears to be for strategic purposes. This research led an enquiry of investigation to better understand the aspirations of tenants as well as the water and sanitation businesses in the informal settlements of Nairobi. Using a combination of methods, observation and interviews, the data collected enabled in-depth profiles to be constructed of both consumer and business. The study probed into the consumers aspirations on two themes; firstly, lifestyle according to 14 predetermined topics and secondly, according to water and sanitation, more specifically toilets and showers. Enquiry also revolved around existing water and sanitation services used and how they could be improved from the perspective of the consumer and business operators. The Insights were gleaned by using a 'ladder up' technique of questioning that explored three stages of time: today, tomorrow and dreams. From the viewpoint of the consumer, specifically on water and sanitation, the findings show that receiving water direct at home, having private space to clean oneself and use the toilet are key aspirations for tomorrow. Dream aspirations were more sensual, like being able to have a bath to relax in, or status and income enhancing, like being able to on-sell water. This line of enquiry was unable to significantly influence the physical design of *Water Choices* service touch-points, a point that will be discussed when answering RQ3. However, a focus group discussion about the *Water Choices* service concept (Appendix E for visuals of workshop and responses), with consumers and water vendors, indicated a preference for service level 3, the Durban tank. This met consumer aspirations on several accounts; firstly it provided the benefits of water access at home, secondly it accounted for potential

water shortages in supply (therefore having extra storage), thirdly it was more attainable financially and lastly it was easier to treat with water purifiers. Therefore, the factor, aspirational benefits, impacts on the *Water Choices* by confirming, through ethnographic engagement with users, that the service concept is aligned to consumer aspirations.

PB - Productivity Benefit:

The benefit of a product can take on different forms in different markets. In developed markets access to basic needs is not generally an issue, even for those in relative poverty. This means attention can be placed on attaining other goods to enhance their lives. At the BoP, where absolute poverty is abundant, every purchase counts (Banerjee & Duflo, 2007; Karnani, 2007). So, not only do consumers demand value for money, but they also want quality products that provide them with the capability to live better lives. The *Water Choices* concept has three key aims, 1) to provide health benefits through better service delivery, 2) to provide a more convenient service, especially for women (in line with MDG 3), and 3) increase the accessibility of water. To date these can the first aim cannot be verified in delivering health benefits. However, the 2nd and 3rd aim have had levels of success. As uncovered earlier, the hose-reel element of the service has had a positive impact. One lady revealing that she doesn't go to collect anymore, she keeps enough overnight so she can do her washing etc. in the morning (the vendor previously had an uncertain schedule); At a brewing area, where people normally carried jerry cans and consequently the area got wet and muddy, the improved accessibility of helped keep the environment safer and more habitable, this was appreciated by the local community. As shown the productivity benefits can impact in different forms by committing to different aims, saving time and effort, improving environmental conditions are examples. Therefore, the factor, productivity benefits, can impact of the *Water Choices* concept by aligning the aims of the service with the lifestyle benefits of the users.

A combination of the factors 'Affordability', 'Aspirational Benefit', 'Productivity Benefit' and 'Co-Creation' make up the value proposition. In principle this informs the

user what the product-service can do for them, how it does it and why. Strategically this will focus upon the individual and families to whom it impacts the greatest, displaying how the service speaks in the 'voice of the consumer'.

CC - Co-Creation:

The act of co-creating is an inclusive process that aims to build partnerships, create awareness and develop products and services in the 'voice of the BoP' (London & Hart, 2011; Prahalad, 2005). It is an activity that is requires participation with the critical stakeholders involved in the project as well as those that it effects, the users and the businesses. The co-creation factor in the inner ring, as illustrated in the framework, sits between 'value proposition' and 'adoption' located in the middle ring. The relevance of this is to acknowledge the *Water Choices* concept development utilised the factor on a number of levels. Firstly, at the concept development stage, the building of relationships with the NGO and, consequently, with local community members in the targeted slums, the project team was able to create a network of trusted people to channel ideas, test propositions and gain feedback. Secondly, at a product development stage, extended networks of local manufacturers were created, allowing an understanding of the capabilities and techniques available to produce service elements, such as the hose-reel. Therefore, the factor, co-creation, impacted upon the *Water Choices* concept by creating a network of critical users that enabled the development of elements, from ideas to service 'touch-points', and test their success.

CM - Communal Marketing:

Branding efforts of large multi-national companies surrounds the urban slums in Nairobi. The majority of it is hand painted and consists of clear typography, colours that stand out and images that clearly identify the products use. Inside the settlements, however, the impact of these efforts is much less obvious, with self-imposed branding and the products themselves becoming more dominant forms of visual marketing. Agreed, in literature, is the need to build-in much more localised and personal forms of marketing. Where there is, not only, the visual impact of a brand identity, but also the inclusion of product-service usage demonstrations as well as

some degree of educational information (Ireland, 2008; Sridharan & Viswanathan, 2008). This transfer of knowledge that answers the 'what', 'how' and 'why' questions allow the target users to familiarise themselves with the service, understand how its works and the benefits it offers. To increase trust and adoption rates the use of local community members, to deliver the message and operate the service, is useful to promote this. Benefits of this factor, communal marketing, form part of a cyclic process that helps on three accounts. 1) Through promotion, create awareness, 2) through feedback, create inclusivity and 3) through development, improve the service. The factor, communal marketing, used in this framework can therefore be defined as 'an activity that utilises the local community and integrates them in all stages of the development process to deliver, potentially, better services that meet their needs'. The *Water Choices* concept, in its early stages, has been able to utilise this as an on going process to enable product development. Therefore, the factor, communal marketing, impacts on the *Water Choices* concept by improving the user understanding and assisting in product development.

CB - Community Benefit:

A critical aspect for a BoP basic needs service is for it to benefit a large number of people (Fairbourne *et al*, 2007). In context, a negative community benefit, for example, would be the supply and sale of single serve sachets for cleaning clothes. Although affordable and accessible, it proves overpriced for the amount one receives and can contribute to environmental waste in slums. An alternative business model would be to offer a communal supply of larger amounts, at less cost and with sustainable or re-useable packaging. The *Water Choices* concept offers levels of service to accommodate the different needs of the consumer. Differentiating between access options and payment options. Therefore, the factor, community benefit, impacts of the *Water Choices* concept by challenging the financial and service model to accommodate different demands of the consumer.

A combination of the factors 'Co-Creation', 'Communal Marketing' and 'Communal Benefit' make up the business driver 'Adoption'. In principle the foremost reason to

consider these factors is to increase scope and rates of adoption in the service area. Strategically this will focus on the involvement of groups and communities into the process.

P - Partnerships:

The *Water Choices* concept is absolutely reliant on partnerships for the project to progress. In many phases of developing the service concept, partnerships have proven to be vital in supporting its delivery. At a meso level, initial partnership developments with the NGO contributed to gaining a deeper knowledge of the environments the *Water Choices* service is intended for. In addition, the embedded relationships created by the NGO, in the informal settlements, with tenants and community business teams, meant acceptance of project team members was made easier. This also allowed team members to navigate through the, sometimes, hostile settlements with relative ease. At a micro level, gaining interviews with individuals and using methods of observation was made possible by the partnership with the NGO. Therefore, the factor, partnerships, impacts on the *Water Choices* concept by providing a critical link to access locations and users important to the development of the idea.

SD - Supply & Distribution:

Supply and distribution, of goods and services, is a key factor in assisting poverty alleviation and meeting basic needs (London *et al*, 2010; Hammond, 2007; WEF, 2009; Vachani & Smith, 2008). Essentially providing availability of necessary consumables and services, this factor is essential for many to sustain a quality of life. However, the challenge this factor faces, in urban and rural areas, makes it difficult to achieve continuity or delivery at all (Vachani & Smith, 2008). To compensate, for the lack of effective supply and distribution, companies are developing new strategies to get their products to hard to reach places where the BoP consumer, whose low incomes further challenge the feasibility, reside. Such strategies have challenged traditional business models, like franchising, and adapted them to suit the BoP setting. This reinvented model, micro-franchising (Fairbourne *et al*, 2007), changes the dynamics between the franchisee and franchisor, offering a more attainable solution for perspective BoP

entrepreneurs. Although financially more attainable for the micro-franchisee and suitable from an employment perspective, issues still arise concerning monitoring of operations at an individual level and institutional level (Kistruck *et al*, 2011). Other significant areas to innovate have been to develop better packaging, with reduction in size being able to offer better bulk distribution level through 'atomised' or 'micro' distribution channels (Hammond, 2007; WEF, 2009). Adopting a more general outlook, the supply and distribution of goods and services requires a number of considerations. Firstly, the inclusion of people on the ground level, secondly, a considered review of the difficulties currently faced with infrastructure, thirdly, a reworking of the financial models across the points of payment and, finally, the development of new ways to get the goods to the market, be it through new packaging or modes of delivery. So, whether it is an issue with people, physical access, institutional barriers or financial complications, creative solutions are required to meet demands of the BoP and the difficulties associated with provision of basic needs.

The access of water to urban informal settlements is widely documented as facing many challenges (UN-HABITAT, 2003). But, through necessity and the need to survive, the commodity, water, is always in demand and therefore people find a way to obtain it. The concept, *Water Choices,* recognises the challenges urban water distributions have. These barriers exist at a macro level, the utilities service provider (Table 4, Table 5), and at the micro level (Table 6), decisions making for the consumer. To overcome supply and distribution issues the *Water Choices* concept has created different ways to deliver water to tenants homes using over ground, the hose reel, and underground methods, informal pipe network. At this stage of development major issues surrounding water pressure, a utilities issue, and rival water businesses put strain on the ability to even instigate a *Water Choices* service. Discussions with the Nairobi Water Company (NWC) about the *Water Choices* concept revealed institutional concerns. The main issue being that NWC would not endorse the service concept because it gives too much control over revenue flow to the vendor. A possible solution to this has been piloted successfully in Windhoek, Namibia and Nairobi, where pre-paid systems can provide secure transactions for consumers and operationalise

revenue streams for the utility or community management group in charge. At present the Water Choices concept has not implemented a pre-paid system due to financial issues and economies of scale needed to make it feasible. However, the technology is there to bridge the gap between institutional concerns as well as consumer demands. Therefore, the factor, supply and distribution, impacts upon the *Water Choices* concept by challenging the macro level and micro level issues, failures and capabilities.

Table 4: Water utilities service providers - supply & demand issues

Water Utilities Service Providers	
Aspect	**Issue**
Supply	Historically using supply led engineering approaches
	High operating costs (Allen, 2006)
	Under-utilised investment (Allen, 2006)
	Extending to easy to reach places (Velleman, 2009)
	Only the wealthy populations (certified cost recovery)
	Unaccounted for water (Velleman, 2009) (Franceys R. ,
	Not designed to accommodate the poorest in illegal
	Inadequate human resource capacity (Plummer, 2003)
Demand	Perception towards the poor (Velleman, 2009) (Franceys
	Perceived lack of willingness to pay (Velleman, 2009)
	Block tariffs that penalise reselling (Velleman, 2009)
	Lack of communication between utility and consumer

Table 5: Barriers to success for water utilities

Barriers to success for Utilites (in urban areas)	
Physical	Topological location of settlement (Dagdeviren, 2009)
	Condition of settlement (Dagdeviren, 2009)
	Quality of housing (Dagdeviren, 2009)
Financial	High costs to extend services (Velleman, 2009)
	Poor cost recovery mechanisms (Plummer, 2003)
BOP Customer	Illegal status (UN-HABITAT, 2008)
	Low ability to pay for connections (Franceys R. &., 2007)
	Low ability to pay for volumetric rates (Franceys R. &., 2007)
	Transient nature of residents (Gulyani, 2008)
	Social & community hierarchies (Dagdeviren, 2009)
	Corrupt nature that can occur in community managed projects
Barriers to access formal piped water supply for BOP Consumers	
Issues	Lack of access to finance

	Connections charges + hidden costs (Velleman, 2009) (Gerlach, 2010) (Franceys R., 2005)
	Long administrative procedures (Plummer, 2003)
	Illegal status (UN_HABITAT, 2006)
	Lack of land tenure ship (UN-HABITAT, 2008)
	Inappropriate payment mechanisms (Franceys R. &., 2007)

Table 6: Consumer influences on decision making for selecting a water supplier (Adapted from Coates *et al*, 2004)

Consumer influences of decisions for water supply selection	
Topic	**Issue**
Price and payment aspects	Cost
	Ability to pay, frequency and form of payment
Access aspects	Reliability
	Convenience
	Queuing time & availability
Product aspects	Perceived quality (links to health and well-being)
	Performance
Service aspects	Supplier ability
	Characteristics or features of service area
	Ability to upgrade
Social aspects	Supplier relationship
	Cultural beliefs & practices
	Influence of others

A combination of the factors "Community Benefit', 'Partnerships' and 'Supply and Distribution' make up the business motivation element 'Scalability'. In principle these factors will determine the extent at which the service can grow in a region. Strategically the focus is on developing networks and relationships with organisations and institutions in order to bring the service to market on a larger scale. The remaining business motivation element is 'Availability', a 'make or break' component that determines continuity of a product in a service system. In the urban water market this would, typically, be controlled by the utilities ability to deliver the water to point of service. However, the implementation of the Water Choices service has shown that even if water is available through the utility, challenges can still occur at the meso level

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where water vendors can determine availability. In view of this, 'Availability' is a critical element that carries a set of potential barriers at different societal levels.

In summary, this section has gone through the factors and elements of the framework systematically. In doing so it has shown how each factor impacts upon the *Water Choices* concept, an innovative basic needs service. The findings show that each factor can elicit different requirements needed to either understand a situation in more detail, highlight a particular challenge that needs to be addresses or provide strategic focus at a societal level. Although each impact factor does not prescribe a specific list of characteristics needed for the concept to succeed, it does provide a template from which to investigate a problem scenario. In answering the 2nd research question, this paper will discuss how the framework can be used, more strategically, throughout the service design and development process.

1.6 How do these factors impact on a basic needs product and service design and development process at the BoP?

To answer this question we take a look at an innovation and a design model used within industry to better contextualise the framework. To define innovation we can review a well-known model used to describe the process by Rogers (1995). Goffin & Mitchell (2010) use innovation as strategic activity to generate new ideas for products and services. The process, often defined by funnel shape, is illustrated, at the front-end, by the generation of multiple ideas that gradually filter through stages of refinement or removal, until a viable proposition is decided upon for market entry (Chesborough, 2008). In the context of the BoP, before ideas are generated there is a need to understand the environment for which you are innovating. This stage is described well by a recent article from Prahalad (2012), demonstrating that the process of innovating for the BoP is one that,

"…is not about working without constraints, or adopting a "blue sky" approach. In the BOP, successful innovation is about working within constraints." (p7)

Using ethnographic methods to immerse and understand consumer lifestyles, through to developing insights and building a specification of constraints, Prahalad creates the 'the innovation sandbox', the boundaries to innovate within. The conceptual framework crafted in this paper is supported by this method. Whereby, it provides a set of boundaries from which to start the innovation process. By defining a set of boundaries, using the factors and elements, the front-end research can focus efforts on the constraints that basic need services have to work within. The framework, in this stage of the process, is therefore a tool help develop the innovation boundaries. But how does the framework factors impact upon product and service design and development? To better answer this, a service design process model, developed by a leading service design company in the UK, is used to explain where the factors impact
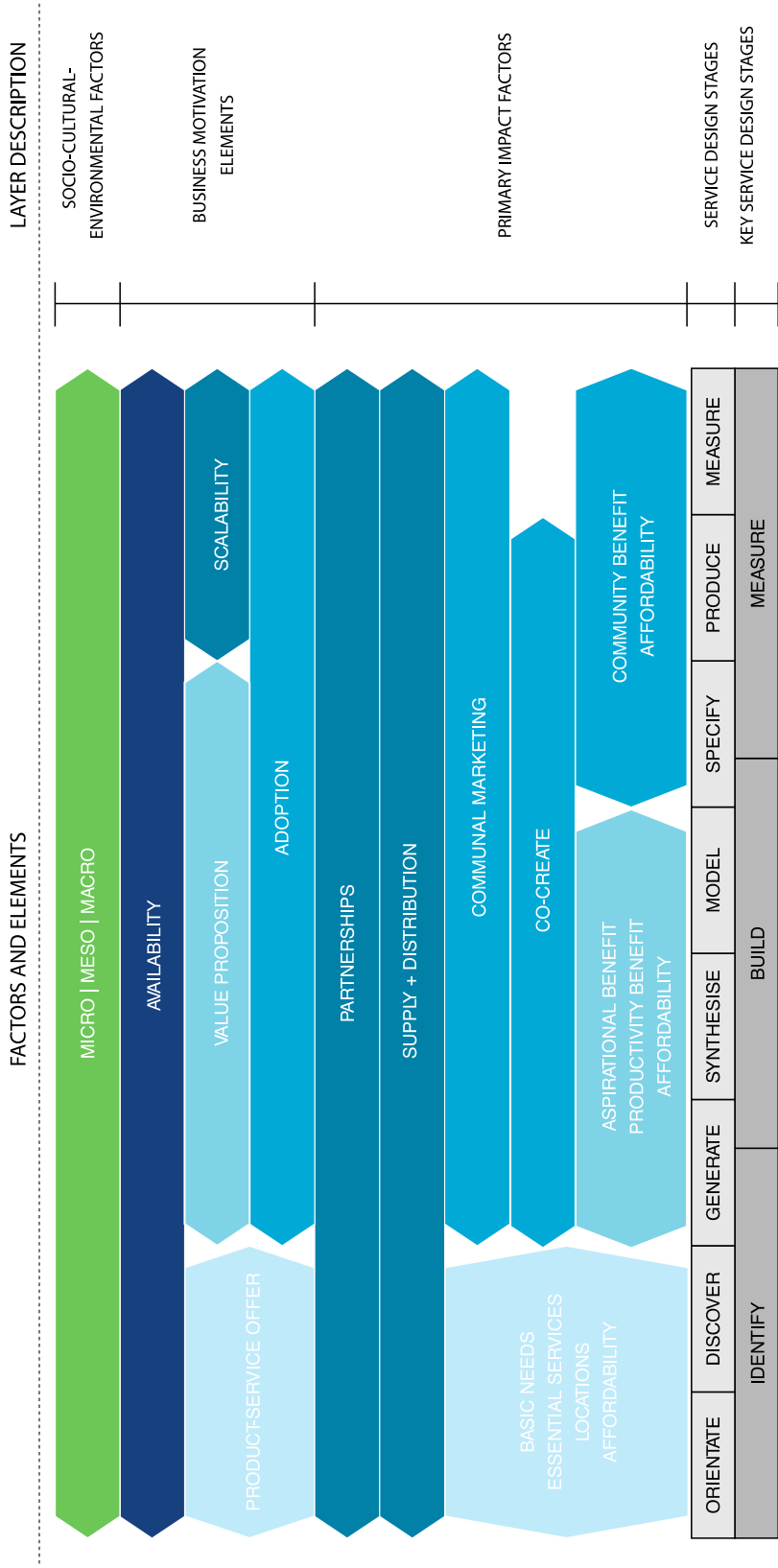
the greatest. The original process model[5] is illustrated as an iterative cycle that goes through a series of stages to bring the service to realisation. An adapted version (Figure 7) is used to show the authors' interpretation of how the framework factors and elements sit within the service design process. The decision to place the factors and elements in these positions is influenced by the requirements of the design and development stages[6]. It also reflects the *Water Choices* concept and, from the authors' perspective, the impact that each has had on its development. For example, basic needs, essential services, locations and affordability are positioned at the start of the process because they are concerned with front-end research to create the product-service offer. However, the factor, partnerships overlap these elements as it is critical to the progression of the process at each key stage. The same applies to the layer with micro, meso and macro, the people aspects; they are continually impacting across the process as their involvement changes according to the design stage. Specifically, at the 'Identify' stage there is a need to understand them, at the 'Build' stage there is a need to include them and at the 'Measure' stage there is a need to observe them to determine success and failure factors. The findings indicate that the factors and their influence change throughout the process and, therefore, create different boundaries at different stages to innovate within. Prahalad's (2012) 'innovation sandbox' is limited to creating boundaries specifically for the product, whereas the framework developed in this research is creating boundaries throughout the service design process and the service itself. To demonstrate this idea better, one can use the framework to combine factors and elements to create *'micro innovation spaces'*. For example, if one takes a combination of factors from each layer in Figure 7 and positions them together (Figure 8), a micro space is created. Within the space issues, constraints and success factors can be generated to determine opportunities for innovations at a particular stage of the design and development process.

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[5] **The illustrated model can be found at http://www.enginegroup.co.uk/service_design/our_process**

[6] **A more detailed review of the stages and the activities is provided at http://www.enginegroup.co.uk/service_design/our_process**

LAYER DESCRIPTION

SOCIO-CULTURAL-ENVIRONMENTAL FACTORS

BUSINESS MOTIVATION ELEMENTS

PRIMARY IMPACT FACTORS

SERVICE DESIGN STAGES

KEY SERVICE DESIGN STAGES

FACTORS AND ELEMENTS

MICRO | MESO | MACRO

AVAILABILITY

PRODUCT-SERVICE OFFER

SCALABILITY

VALUE PROPOSITION

ADOPTION

PARTNERSHIPS

SUPPLY + DISTRIBUTION

COMMUNAL MARKETING

CO-CREATE

COMMUNITY BENEFIT
AFFORDABILITY

ASPIRATIONAL BENEFIT
PRODUCTIVITY BENEFIT
AFFORDABILITY

BASIC NEEDS
ESSENTIAL SERVICES
LOCATIONS
AFFORDABILITY

ORIENTATE	DISCOVER	GENERATE	SYNTHESISE	MODEL	SPECIFY	PRODUCE	MEASURE
IDENTIFY			BUILD			MEASURE	

Figure 7: Impact factors and elements vs. the service design & development process (adapted from engine design group, 2012)
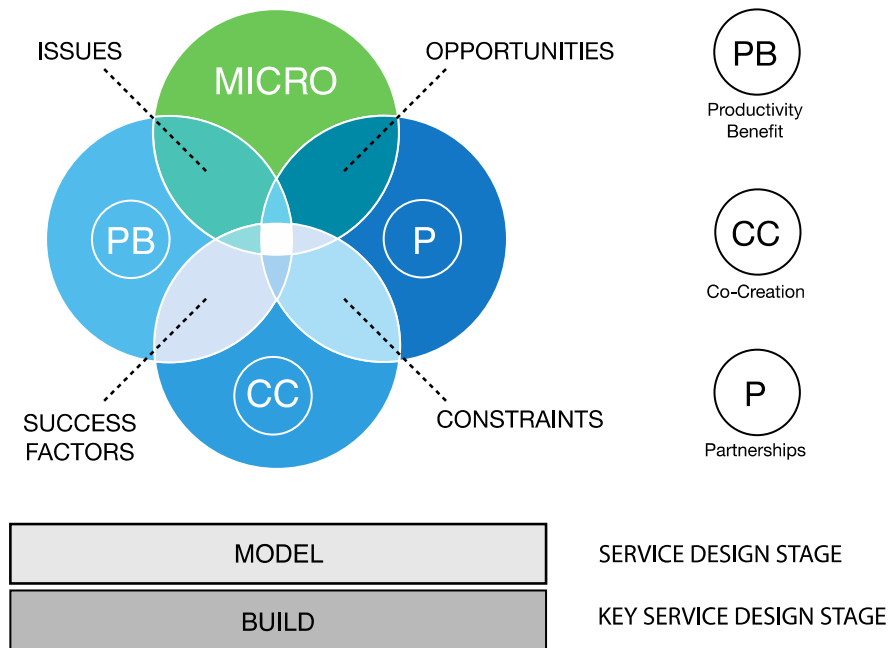
Figure 8 – Micro Innovation Space

This means multiple combinations can be created for the different stages of the design and development process. These micro innovation spaces can be used to stimulate discussion and ideas for innovations. The framework is not a prescriptive one, but an exploratory one that is to be used to spur new thinking and provide an innovation space to support the service design process. Recent articles have been able to provide a more prescriptive conclusion to their research. Using findings from current BoP literature bu Nakata & Weidner (2012), a case study of an individual product development project by Prahalad (2012) and multiple case studies from concept and prototype development projects of university-based student projects in India by Viswanathan & Sridharan (2012), the authors have been able to define propositions of specific characteristics to achieve product success at the BoP. These are important to

incorporate into the service design process as they can potentially lead to improved ideas that are more considerate of the constraints at the BoP.

1.7 What are the insights and lessons that can be learnt from executing a university-based project on basic needs product and service innovation at the BoP?

To answer this question the author will draw from their experience of carrying out a research-based project with the aim of delivering an aspirational basic needs (water supply) service for the tenants of informal settlements in Nairobi, Kenya. The lessons and insights will be used to conceive a number of propositions for projects of a similar disposition, generated from the following themes. 1) 'Alignment' of project objectives, 2) 'Adaptability' to situations, 3) working within a 'decentralised team' and 4) 'Course Characteristics' needed to design for the BoP.

Alignment

A retrospective analysis has enabled a clear understanding and insight to be articulated with regards to 'alignment' of project objectives. The main title for the project was '*Enhanced Demand Driven Water & Sanitation Products and Services for Urban Tenants*'. The aim of the project was to develop a number of product/service solutions that could be implemented in the urban slums of Nairobi. However, the project started at two different stages of the service design process. The Water choices concept, a preconceived idea, was ready to be built and measured. The other, non-conceived ideas, required front-end research to be carried out, so new ideas could be identified, built and then measured. Hence, a miss-alignment in project targets from the outset. This situation, although acknowledged at the beginning, did not have a focussed review of its consequences and, therefore, had a negative impact further through the course of the project development. It should also be reminded that the collaboration of the two university departments was new and could, perceivably, be plague by situations of miss-communication, where struggles to impose ones view upon a situation can over shadow project needs and requirements. Another aspect overlooked was a clear de-briefing of how the two departments function in regards to their project processes. Lastly the factor, that needs to be mentioned, is that the empirical research was predominantly focussed on aspirations at the BoP. A

combination of the two topics, aspirations and the BoP, is new and virtually unexplored, especially in regards to basic needs services design and development. This new area of research, whereby its outcome was undefined at the start, could not be properly communicated and therefore required a much more intense analysis to deliver a better interpretation of how it could benefit the project. Thus, due to the miss-aligned service design and development start points, opportunities to focus on design details of the 'touch-points' were not completely acted upon. This also negatively impacted upon the time available to develop new ideas and solutions for future implementation. This suggests the following proposition.

P1. Clearly defined and agreed objectives can positively impact upon basic needs service design and development and innovation at the BoP in multi-disciplined university-based teams.

P2. Clearly communicated and addressed project issues can positively impact upon basic needs service design and development and innovation at the BoP for multi-disciplined university-based teams.

Adaptability

Working within constraints, as discussed earlier, demands a level of flexibility in project approaches. This is particularly apparent for situations that are unfamiliar to team members. In this case, developing a water service for the tenants of urban informal settlements, core team members are evolving their understanding of scenarios that are new and out of context of their usual life circumstances. This insight places an emphasis on creating an adaptive approach, such as the research methodologies (Robson, 2011) of grounded theory or action research (Robson, 2011), to allow an elastic strategy for project execution. The requirement of having an adaptive strategy also applies to the service design and development stages. Whereby, in this case, different stages of design activities were taking place concurrently and therefore need to be treated separately, rather than trying to force a link between them. It is recognised that an adaptive approach has been more easily managed and adhered to for Jack O'Regan, the researcher based in the location of service

implementation. Key reasons for this are the ability to access necessary resources with greater ease, engage with users in each of the service design stages, test new ideas with the target audience and gain a higher frequency of feedback in a shorter space of time. The author had two trips to Kenya, one being two weeks and the other 3 weeks, that enabled immersion within the environment to take place and empirical research to be carried out. These field trips were fundamental to the front-end 'Identify' stage of the service design process, where orientation and discovery and defining elements. However, later stages that require ideas generations, synthesis and modelling had to be carried out off location. This meant that being able to include the users into the design process was not an option; therefore, limiting the input, ideas and validation one could achieve from lead-users in location. Thus, the design efforts (Appendix D) of the author became superfluous, because of the inability to involve local actors, users and manufacturers to progress the design based on their inputs. The limitation of location affects the speed at which ones design solution can be tested, verified and, therefore, realised. This suggests the following proposition.

P3. Locally based teams can enhance the basic needs service design and development and innovation at the BoP for multi-disciplined university-based teams.

Decentralised Teams

The core project team consisted of two research students, one based at the university and one based in location (Nairobi, Kenya), and two supervisors, both based at the university. The disparity of the team meant that limitations were placed upon the amount of time the group, as a whole, was able to spend together. This, whole group meetings, was an occurrence that happened twice throughout the project duration, once at the university and a more extended period in Nairobi, Kenya, whilst the empirical research was being carried out. Although not critical to the project, it did mean that because of intermittent group discussions, large amounts of knowledge transfer had to takes place, consequently leading to knowledge gaps. It also meant that group dynamics were weakened by under-developed relationships. This point was also apparent with the partnering NGO, who were of critical importance to facilitating

the project development. These insights force the issue of communication being of vital importance to projects with decentralised teams. Therefore, this suggests the following proposition.

P.4 Developing a clear communication strategy for each stage of the process can enhance basic needs service design and development and innovation at the BoP for multi-disciplined university-based teams.

Course Characteristics

This exploratory research has produced the conceptual framework of factors and elements that impact upon basic needs service design and development. The nature of these findings indicates the complex and interrelated issues that are inherent of living, working and operating at the BoP. These insights, gleaned from the 12-month research based project, propose that the university could benefit from a structured course focussed on 'subsistence and sustainability' (Viswanathan *et al*, 2011). The length of time to fully understand the limitations and constraints for service design development at the BoP suggest the following proposition.

P.5 Structured course content from a range of disciplines can enhance basic needs service design and development and innovation at the BoP for multi-disciplined university-based teams.

2 Discussion

The paper used a combination of literature, empirical research and implemented a basic needs service design project in the informal settlements of Nairobi to answer two research questions. 1) What are the factors that impact on BoP basic needs product and service innovation? 2) How do these factors impact upon a basic needs product and service design and development process? A case study approach to the findings revealed a set of interrelated factors and elements; 11 primary impact factors, 5 business motivation elements and 3 societal level factors that can impact on innovation at the BoP. These are illustrated in the conceptual framework (Figure 6). With specific reference to the *Water Choices* concept we find that the factors: 1) 'Basic Needs' provide a strategic focus for services; 2) 'Essential Services' show potential to improve the operational aspects; 3) 'Location' challenges usage scenarios, the appropriate design of the service touch-points and the feasibility of successful service operation in an area; 4) 'Affordability' challenges the architecture of the product-service offering and the payment structure to access the service; 5) 'Aspirational benefits' confirm, through ethnographic engagement with users, that the service concept is aligned to consumer aspirations; 6) 'Productivity Benefits' align the aims of the service with the lifestyle benefits of the users; 7) 'Co-Creation' creates a network of critical users that enable the development of elements, from ideas to service 'touch-points', and test their success; 8) 'Communal Marketing' improves the user understanding and assists in product development; 9) 'Communal Benefit' challenge the financial and service models to accommodate different demands of the consumer; 10) 'Partnerships' provide a critical link to access locations and users, important to the development of the service concept; and 11) 'Supply & Distribution' challenges the macro level and micro level issues, failures and capabilities. The 5 business motivation elements combine the primary factors to: a) provide the profile of the 'Product-Service Offer', b) develop the characteristics of the 'Value Proposition', c) focus efforts to assist with 'Adoption', d) determine 'Scalability' and finally e) define the barriers of 'Availability'. Lastly, the socio-cultural-environmental factors at the micro, meso and macro levels impact upon each stage of the service design process. These extensive

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areas are imperative to factor into the design and development process. They create a human focus for the innovation spaces, allowing differences to be made apparent between the challenges and opportunities that each societal level can offer.

The second research question finds that at each stage of the design and development process, the same factor can impact differently. What this means is that before and during a basic needs service design project, consideration needs to be given to how the factors will impact upon the project and how potential barriers can be overcome to contribute to successful project delivery. Through undertaking the Water Choices project, a number of instances occurred that required this kind of adaptive thinking to enable continuity. For example, major issues with water supply meant that a) new locations had to be sought for product-service testing and b) affordability was challenged due to local water cartel sanctions being applied. Hindsight is certainly a wonderful thing in these circumstances; however, uncertainty can be lessoned through developing deeper understandings of localised constraints. In comparison, it is these constraints that are persistently challenging the service design process. It shows that executing parallel activities, consumer research and understanding locations based issues, for example, at the start is a necessity to ensure project testing is feasible towards the latter development stages.

In summary, what we find is that the factors have a propensity to overlap one another, showing a contrasting bearing of influence upon each design and development stage and the opportunity to innovate. From the perspective of a designer, this knowledge indicates to an integrated and multi-faceted nature of critical elements that are a prerequisite to understanding before designing for the BoP can take place. However, this also shows the close connections of issues and challenges that can be difficult to comprehend unless one has encountered the circumstances for which one is designing. Specifically with basic needs services, designing with the user in mind is of critical importance throughout, not only, the process, but with regards to sustaining the service. In this respect, one can relate to three acts of designing; designing for (imposed), designing with (inclusive) and designing by (user-led), which are aspects of user-centred design. In context of the BoP, the author would suggest that at each

stage of the design and development process all of these, at some point, would be applicable and relevant.

2.1 Conclusions

The conceptual framework in this study is developed from a number of methods to understand the factors that impact upon basic needs service design, development and innovation at the BoP. Its formation offers a starting block for students, enterprises and development practioners to create strategic boundaries for basic needs service innovation. At this stage it has not been tested and validated, but provides a number of directions for future research.

- Validation of the frameworks: Studying its ability to develop innovative ideas and solutions that challenge the issues of BoP basic needs service. This can include seeking expert opinion and using in multi-disciplined teams with and beyond university based projects.

- Further empirical testing: The study uses a single case study from one geographical context and service concept to compare against the framework. Using a range of basic needs services from different locations can improve defining characteristics for each factor, element and design stage.

- The framework could be used to develop pedagogical training platforms for service design and development courses in educational institutions. Engaging students to explore the 'micro innovation' spaces to further develop their meaning and innovation opportunities.

In conclusion, this paper has demonstrated that service design development for unfamiliar contexts can encourage deep and thoughtful interactions. Bringing to life a multitude of constraints, but also opportunities to instigate new meanings and processes for developing services that go beyond the satisfying the user. In an age where design is a differentiator, services are becoming the dominator. The need to provide more than just product satisfaction is critical, ever more so in markets where constraints define one success. Understanding the factors and recognising the boundaries offers designers, businesses and development practitioners the unique

challenge of innovating through these barriers and developing solutions to better serve the growing population of the world's poor.

PAPER 2 – ABSTRACT

The Role of Aspirations at the Bottom of the Pyramid

Purpose: Aspirations are increasingly being seen as drivers for businesses with products and services operating at the bottom of the pyramid (BoP). This paper discusses the development of a framework that aims to study the lifestyles of the BoP, understand what their aspirations are and how organisations can meet the needs, both functional and emotional, of BoP consumers with products and services that fill the gap between current lifestyles and aspirations.

Design/methodology/approach: A case study methodology is used to investigate the context of BoP consumers living in urban informal settlements in Africa. The empirical research adopts a consumer insight approach, used in FMCG marketing research, to understand the BoP consumer aspirations of 14 lifestyle parameters, with a focus on the basic needs of water and sanitation.

Findings: The authors find that consumers are articulate in conveying their aspirations and observe that they (aspirations) manifest themselves in subtle nuances through attainable products and services. They also find that meeting basic needs can become a platform for others (products and services) to succeed. This suggests that aspirationally sensitive value offerings provide an integrated approach to developing appropriate marketing strategies.

Research limitations/implications: The small sample segment used in this empirical research is unable to give a generalist view on the BoP. However, the lifestyle aspirations framework provides a systematic and robust tool for investigating, categorising and mapping the aspirations of the BoP.

Practical Implications: This aspirations-focused approach undertaken to investigate the BoP market offers industry organisations, government, aid agencies and practitioners a means to reposition their current marketing strategies. This provides an insight into developing new products and services that are sympathetic to the emotional and functional needs of the BoP consumer.

Originality/value: The research provides an alternative perspective to the understanding of the BoP and offers insights and suggestions on how to serve them according to their aspirations as opposed to industry led innovations. The acumen offered from this research study is two-pronged. Firstly, it adds to the BoP literature by yielding new insight and perspective into the lifestyles and aspirations of the consumer, an area recognised as becoming more important. Secondly, it offers a conceptual framework to develop this understanding of how aspirations can assist in driving marketing innovation.

3 The Role of Aspirations at the Bottom of the Pyramid: A conceptual framework for developing a deeper understanding of consumer motivations (Paper 2)

3.1 Introduction

The purpose of this paper is to present a conceptual framework for understanding the factors driving the aspirations of consumers living at the bottom of the pyramid (BoP). The study shares lessons and insights from undertaking an empirical study in Ghana and Kenya with the aim of developing aspirational basic needs services.

A number of factors drive the investigation; 1) the growing importance of the BoP market, 2) the relevance of understanding the aspirations of the BoP consumer 3) the need to develop consumer-inspired capability building basic needs services and 4) the need for a demand-driven research approach for the development of aspirational basic needs services. This study builds on a hypothesis: a contextually immersive approach, which explores hidden lifestyle aspirations, provides a more holistic, consumer inspired definition of desires. This should lead to improved insights for effective innovation opportunities to develop demand-driven and aspirational basic needs services.

3.1.1 The growing importance of the BoP market

Before Prahalad (2002, 2005), Harts' (2002) and Prahalad & Harts' (2002) publications the BoP sector was considered in the context of the provision of assistance and support by charities, aid workers and development agencies. Prahalad and Harts' publications alerted multi-national companies to the existence of a potential market where business could be developed and expanded. Not only, they argued, can companies increase market reach, but they can do so in a responsible manner by meeting the needs of the poor and providing social and commercial value simultaneously. This recognition linked to the Millennium Development Goals (MDGs), brought with it a new wave of interest from all sectors of industry, academia, government policy departments and development agencies. Business and marketing

academics have varied in their recognition of the validity of the BoP sector as a market. They have also questioned the ethics of the sector as a 'market' from which profits could be made (Crabtree, 2007; Karnani, 2007, 2009; Landrum, 2007). Alternatively a more positive standpoint sees the increase in interest described above, as a benefit. This has led to a more multi-disciplinary and cross-collaborative approach and new ways of solving issues inherent to this demographic (Fairbourne *et al*, 2007; London *et al*, 2011; Prahalad, 2012). The strategies and techniques for serving the BoP are now considered to be in their second generation (London *et al*, 2011), with a clearer understanding of what it takes to implement successful products and services. With the increase in population, in particular the influx into urban centres, the need to alleviate poverty and better meet the basic needs of the poor has been accentuated. Thus reinforcing the importance of the BoP market.

3.1.2 The relevance of understanding the aspirations of the BoP consumer

We need to know why understanding BoP consumer aspirations is relevant to creating more consumer inspired products and services.

A definition of an aspiration states *"The hope or ambition of achieving something"* (Oxford Dictionary, 2012). In psychology, theories of aspirations are seen as motivational stimulus, whereby its strength is, according to field theory, '*directly proportional to the value the individual places upon the goal and to his or her assessment of the probability of attaining the goal*' (Sherwood, 1989). An aspiration is therefore proportionate to the value placed upon it or one's ability to achieve it. In this context Sherwood (1989), defines an aspiration as one of two types:

1. Long term -future orientated: Something that can only be satisfied at some future time.
2. Short term - a motivator: Goals that individuals are willing to invest time, effort or money to attain.

By applying this definition to the context of the BoP we can examine consumers' aspirations in more depth and so help to understand the meaning and benefits of aspirations which will contribute to a more consumer-inspired development of basic needs products and services. We examine this at the macro and micro levels.

At the macro level both future orientated and motivated global aspirations exist to eradicate poverty. Governments' policy makers united and developed the Millennium Development Goals (MDGs) to achieve these aspirations and so meet human development targets for basic needs' access and other social and environmental agendas. In this context the future orientation is the 8 defined goals and the motivations are the targets within those goals.

Typically, the agents of change who assist in meeting these goals are the development practitioners. Recognising how their role has changed, Simanis & Hart (2006) succinctly portray this, from

'...that of a "development doctor," who diagnoses the poor's problem and prescribes the solution, to that of "enterprise facilitator", who assists the poor in acting on their self-defined aspirations.'

Meeting the aspirations of the MDGs is both imposed and facilitated by an external organisation (e.g WSUP) or body of influence (eg UN-Habitat) It is not the choice of the consumer to invest, time, effort or money in the aspiration. It is the will of a regulated establishment which provides a supportive role in delivering an aspirational goal or a product that is a means of achieving an aspiration. This is not the case when considering the micro level of aspiration where the focus is on the individual's ability to access or obtain their basic needs. Within the literature reference to the micro level of aspirations vary.

Prahalad & Hart's (2002) article refers to the market segment specifically as the *'aspiring poor',* i.e a segment with the potential to do business. A second reference, 'shaping aspirations', suggests that the poor's aspirations are malleable and can be influenced through correct marketing. Although the word 'aspirations' is used as a

strategic focus for incentive rather than addressing in any depth the micro level of BoP consumer aspirations.

In another interpretation of aspirations Hammond's report (2007) discusses the need for 'value creation', say in the form of income generation, affiliating the propensity for achieving or attaining something of aspirational value. This view is also mirrored in Elaydi & Harrison's (2009) comparative case study of two financial institutions targeting BoP markets, one, HSBC that failed, attempts to transfer its' system from a developed market to the BoP market and the other, Grameen Bank, that adopts a consumer-led strategy. Their findings indicate that Grameen Bank's success is down to their commitment to *'invest in the aspirations of the people.'* In this respect Grameen Bank provided a product or service that assisted in attaining an aspiration rather than just being aspirational.

Ireland (2008) gives a useful example of a product which he regards as aspirational. He cites BoP consumers purchasing products aimed at higher income markets, such as expensive television subscriptions to provide entertainment at home where the consumers regard the dangers of leaving home at night as a greater risk than being able to afford the subscriptions. In another example female consumers indulged in the purchase of well-known '*brands of "commodity" products the way wealthy women indulge in extravagant clothes or jewellery*' (p.434). The World Economic Forum (2009) elaborates on this notion of spending aspirationally, stating that:

"They [the BoP consumer] don't necessarily prefer cheaper or stripped down versions of more expensive offerings. They want high-quality products, even if they have to ration their use." (p12)

The notion of aspirations is also significant in the work of Viswanathan and Sridharan (2012) who propose it as a component of 'effective concept and prototype development'. At the same time they acknowledge the lack of literature available that investigates poor peoples' 'values and long-term aspirations'. Prahalad's article (2011) further expands this argument. It specifically links the need to gain deep consumer insights and build what he calls an '*aesthetic and fashionable'* product. He sees this as

a critical ingredient of addressing the BoP's emotional needs, something that is often given little attention.

In these examples at the micro level the theme that drives success is the importance of building in the 'voice of the customer' to understand aspirations. These references to aspirations however do not refer to the basic needs of the BoP consumer. So to link aspiration focused research to basic needs service innovation is new.

3.1.3 The need to develop 'consumer-inspired' capability building products and services

3.1.3.1 Understanding the Consumer

Developing affective strategies that provide low-cost products and services that meet a critical need of the BoP does not necessarily mean success is guaranteed. For example Procter & Gamble's product, PuR, for purifying water, although effective, was not taken up by consumers (London *et al, 2011*). A more sophisticated understanding of the BoP consumer is needed.

For instance the BoP buying mentality runs deeper than costs being the only influence when purchasing a product (Chikweche & Fletcher, 2009; Viswanathan *et al*, 2010; Weidner *et al,* 2009). Income can dictate the extent of how much can be consumed, but not 'what' or 'why' it is consumed. Income data, although frequently used to categorise segments of the BoP, can be misinterpreted (Karnani, 2007) and may not provide the in-depth understanding of the consumption characteristics of the BoP consumer.

Key studies have demonstrated that a more empathic knowledge of the consumers, socially and culturally, highlight other areas that impact on their lifestyle choices (Banerjee & Duflo, 2007). They show that relationships (Chikweche & Fletcher, 2009), accessibility (Prahalad, 2002, 2005), availability (Prahalad, 2012) and status (Ireland, 2008) are also elements that can affect their decision-making.

Having a combined knowledge and understanding of the socio-economic environment, lifestyles and behaviours of, both, the consumer and business is becoming a

prerequisite of developing products and services for the BoP (Subrahmanyan & Gomez-Arias, 2008; Nielsen & Samia, 2008). Contemporary BoP literature (Pralahad, 2012) emphasizes the need for immersing oneself in the context of the daily lives of BoP businesses and consumers.

3.1.3.2 Capability building products

Before Prahalad & Hart's (2002) work on this subject, international development practitioners, such as Schumacher (1973), identified the process of understanding the individual and the environment they operate in as a vital ingredient of the creation of 'capability building' technology for the 'underserved'.
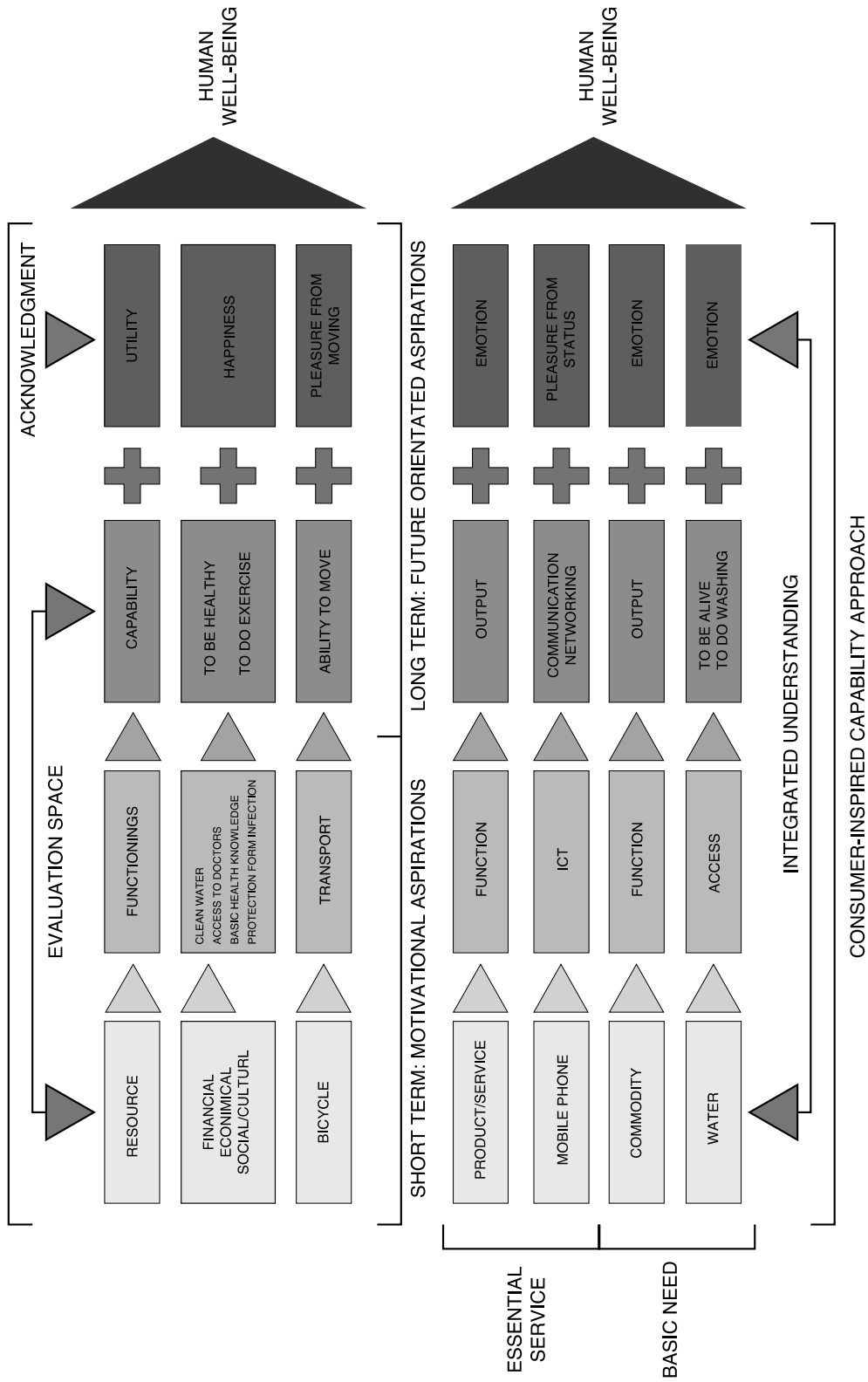
A capability building technology is a means to an end, eg well-being. The 'capability approach' is a method, pioneered by Amartya Sen and Martha Nussbaum, for evaluating peoples' capabilities for human development. A capability is defined as "what people are effectively able to be and do". Interpretations of the capability approach (Alkire, 2002; Robeyns, 2005) focus on evaluating the capability of an individual, group or society to meet the functional requirements of a commodity in order to assess the consumers' well-being. Although acknowledging the 'emotional' outcome, focus on this is largely dismissed as a factor in the capability approach.

Figure 9 demonstrates how the capability approach can combine with aspirations. It would suggest that including a future orientated aspiration of a human capability element into product development strategies is *crucial* to delivering more 'consumer-inspired' and 'emotional' products and services.

The relevance of aligning the capability approach with aspirations lies in their similarities. Firstly, both have short-term attainable targets, functionings and motivations, respectively. Secondly they both have long term targets i.e the ends or the capability and the future orientated that are an aggregate of a number of factors that may need to be achieved in order to meet that capability or aspiration, respectively.

An example of the emotional element is the ubiquitous mobile phone that has penetrated the BoP market with remarkable success. This once aspirational product for the middle classes of the developed nations has been adapted and become attainable to the BoP. Its success can be attributed to the provision of affordable devices with tariffs that reflect incomes, thereby meeting the needs of this demographic. In Venezuela alone, 69% of the population had mobile phones by 2005 (Ireland, 2008). The market in Africa has also grown exponentially in the last few years, with a reported 1 billion mobile subscriptions (http://blogs.informatandm.com, 2011). The telecoms company Celtel has helped lead the way and proven that a 'consumer-inspired' business strategy can create a capability-building product. This swell in market demand is reinforced by Hammond's (2007) findings on Information Communication Technology (ICT) spending patterns in the BoP, where it becomes greater with higher incomes.

ADAPTED CAPABILITY APPROACH
(Alkire, 2005; Robeyns, 2005; Oosterlaken, 2009)

ACKNOWLEDGMENT

EVALUATION SPACE

HUMAN WELL-BEING

RESOURCE

FINANCIAL
ECONIMICAL
SOCIAL/CULTURL

BICYCLE

FUNCTIONINGS

CLEAN WATER
ACCESS TO DOCTORS
BASIC HEALTH KNOWLEDGE
PROTECTION FORM INFECTION

TRANSPORT

CAPABILITY

TO BE HEALTHY
TO DO EXERCISE

ABILITY TO MOVE

UTILITY

HAPPINESS

PLEASURE FROM MOVING

SHORT TERM: MOTIVATIONAL ASPIRATIONS

LONG TERM: FUTURE ORIENTATED ASPIRATIONS

INTEGRATED UNDERSTANDING

CONSUMER-INSPIRED CAPABILITY APPROACH

HUMAN WELL-BEING

PRODUCT/SERVICE

MOBILE PHONE

COMMODITY

WATER

FUNCTION

ICT

FUNCTION

ACCESS

OUTPUT

COMMUNICATION NETWORKING

OUTPUT

TO BE ALIVE
TO DO WASHING

EMOTION

PLEASURE FROM STATUS

EMOTION

EMOTION

ESSENTIAL SERVICE

BASIC NEED

3.1.3.3 Human needs and aspirations

In the context of poverty and BoP markets many studies have recognised it is not just about money, it is a much more complex, multi-dimensional issue (Alkire, 2002; Alkire & Santos, 2010). Robeyns (2005) states:

"While income generally is an important means to well-being and freedom, it can only serve as a rough proxy for what intrinsically matters, namely people's capabilities" (p97)

"Hence, knowing the goods a person owns or can use is not sufficient to know which functionings he/she can achieve; therefore we need to know much more about the person and the circumstances in which he/she is living." (p99)

The economist Manfred Max-Neef stated in an interview (www.you.tube.com, 2010) *"they [global economists] don't understand poverty, that's a big problem, that's why poverty is still there."* His concept of 'barefoot economics', contextually immersing oneself in the lifestyles and environment or the poor, led to the description of nine fundamental human needs which Max-Neef illustrated in an interrelated and interactive framework. Developing from hierarchical motivational theories, such as those proposed by Maslow, Herzberg and Alderfer, Max-Neef demonstrates that decisions and lifestyle choices involve a deeper *emotional* connection, once subsistence needs are met. The studies of Subrahmanyan & Gomez-Arias (2008) use the hierarchical model to better understand consumption patterns and also conclude that, in the context of poverty, an integrated understanding is more suitable. In summary, a bottom-up approach is a central element in developing the right marketing, product development strategy for this segment of society. Therefore there is an urgent need for innovation to deliver 'consumer-inspired' (emotional and functional) capability building products and services.

A valuable aspect of our research has been a greater insight and understanding of the lifestyles and aspirations of the BOP. Both lifestyles and aspirations are important, but studies show that there is little specific data that links the two together. Our research, which we describe below, provided the opportunity to generate data to fill this knowledge gap. Aspirations are certainly a factor for serving the BoP successfully. They are openly cited as a goal for developing products and services, but what role do they play in the BoP? How do they manifest themselves? More specifically, how can we better understand consumer aspirations and how can the knowledge of peoples' aspirations be useful to marketing and product and service innovation?

This paper goes on to discuss a) the development of a framework tool for investigating consumer lifestyles aspirations in the context of the basic need of water and sanitation in urban informal settlements, b) the findings from a case study example of the method in practice and c) managerial insights in the form of a contextual framework to demonstrate this method of investigation as a tool to drive innovation with the BoP.

4 Research context and methodology

Currently the world is experiencing a surge in population. Statistics from UN estimate a population of 7 billion rising to 9 billion by 2030. Most notably, for the first time in history, is the swell in numbers living in urban areas, which has past the 50% mark. This phenomenon has resulted in a growing numbers living in 'slums' or 'informal settlements'. This is expected to rise from 1 billion to 2 billion by the year 2030. These overwhelming numbers are significant in the developing regions, where 43% are 'slum dwellers'. 72% of Africa's urban population is living in slum conditions. (Cohen, 2006)

The UN-Habitat outlines slum characteristics as having three key elements (UN-Habitat, 2003);

1) Overcrowding
2) Poor housing conditions
3) Inadequate access to improved water and sanitation facilities

A slum household is defined as a group of individuals living under the same roof in an urban area who lack one or more of the following: (UN-HABITAT, 2006)

1. Durable housing of a permanent nature that protects against extreme climate conditions.

2. Sufficient living space, which means not more than three people sharing the same room.

3. Easy access to safe water in sufficient amounts at an affordable price.

4. Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.

5. Security of tenure that prevents forced evictions.

Through a different perspective Franceys and Gerlach (2008) apply levels of poverty to their ability to access and be served by the water utilities piped network in urban areas. In this the levels of poverty are defined by the household's collective earnings, house location and living conditions. This is substantiated by the nature of housing settlements and the existing service provision made available to them. The variables from which it views poverty are based on supply and demand

The informal nature of these urban settlements is bound to the informal business sector that many of the tenants operate in (Gulyani & Talukdar, 2010). There is an overlap of factors that affect these consumers on a daily basis (Banerjee & Duflo, 2007; Hammond, 2007; WEF, 2009): their living conditions, low incomes and lack of access to basic need services. This research focuses on water and sanitation services.

The benefits of water and sanitation are well documented in literature and by the bodies that serve these human needs (see below). Effective water supply and sanitation are widely thought to provide 'harmonious cities' (Uwejamomere, 2008) and have positive effects on the economy (Dagdeviren & Robertson, 2009). However, the reality of many cities in the developing nations is that there is insufficient access to clean drinking water, inadequate sewerage facilities and insufficient solid waste disposal (Cohen, 2006).

The issue of sanitation is more severe and is far more detrimental for urban dwellers (Cohen, 2006). In Africa formalised sewerage systems are rare, only operating in some of the large cities. Universal coverage is virtually unheard of. Statistically more than 3 billion people are without access to excreta disposal (DFID, 1997). With only a tiny percentage of aid budgets going to slums, it's the urban poor that suffer the most.

From a national perspective, common problems occur in developing countries on a political, social, technical and institutional level, all usually having adverse effects on the economics of the poor consumer (DFID, 1997). In Africa, where resources are short, debt dependency is a national issue and can "undermine efforts for economic stability". This, coupled with the endemic dependency on aid, where decisions are made by aid workers and not the people, means that there is a constant widening of

the gap between 'haves; and 'have not's (Nwankwo, 2000). As a strategy for sustainability, it is generally acknowledged that charity and aid will not work (Hammond, 2007).

In markets that are determined by governments and politicians, the challenges of corruption and inflation that affect these countries ultimately punish the poor the hardest (Chikweche & Fletcher, 2010). The situation is exacerbated by the challenge of growing populations and urbanisation, where small cities are more able to manage but only serve to put extra strain on the resources of governments in a society that is already struggling to cope (Gerlach & Franceys, 2010). Developing strong leadership in government is a necessity for strengthening the weak legal and social mechanisms that try to protect the consumer (Martinez & Carbonell, 2007; Gerlach & Franceys, 2010).

This research investigated water and sanitation aspects of basic needs services and was conducted in two African countries. Phase 1[7] was carried out in Accra, Ghana in 2010 and Phase 2 in Nairobi, Kenya in 2011. The locations were urban and peri-urban informal settlements, a prerequisite for the projects funding partners Suez Environnement.

Phase 1 comprised interviews with 25 consumers and 11 businesses and focussed on lifestyle aspirations and water and sanitation usage. Some of the tools used were not sufficiently appropriate to the interviewees and in order to build effective profiles we needed to improve the questioning techniques. We applied what we learnt to the methodology for Phase 2.

In Phase 2 consumer lifestyle aspiration and business interviews were carried out in six informal settlements across Nairobi. 30 one-to-one home interviews with consumers and 12 water and sanitation business interviews took place (Please refer to Appendix F for structure and layout of surveys), adhering to ethical guidelines prescribed by the supervising university (Cranfield University, England). The candidates were recruited by

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[7] This part of the empirical research was carried out during the authors individual thesis project for a previous Masters Degree obtained in 2010

the partnering non-governmental organisation Umande Trust. Of the 30 people interviewed, 13 were male (43%) and 17 were female (57%). The average age was 32, ranging from 17 years to 58 years old. Of the 30 consumers 7 were single, 19 were married and 4 were single parents (all female). On average their daily income was 211 Kenyan Shillings (equivalent to approximately £1.60 or $US 2.55 as of 12/03/12)

The whole investigation adopted a framework used to '*unlock hidden innovation opportunities*' for the fast moving consumer goods (FMCG) sector (Bolton, 2009). Modifications were made to the framework to explore lifestyle parameters related to basic needs and essential services, categorised by Hammond's (2007) report and the MDGs. The method used 'rapid' ethnographic techniques, used in eliciting consumer insights, to collect, map and decode the data.

In answering the question 'how can we better understand the role of BoP consumer aspirations?' this paper aims to show the effectiveness of using this interview framework as a tool for collecting, mapping and decoding data for generating insights for innovation.

4.1 Data collection tools

The data collection tools were used in one to one interviews within the consumers' home environment and business operators at their place of work. They comprised four interconnected components that focused on capturing the interviewees': (a) emotional lifestyle aspirations in relation to 14 lifestyle parameters within three time frames; (b) attitudes, tensions and motivations towards a given issue (in this case water and sanitation); (c) functional and emotional aspirations surrounding the issue and (d) current daily lifestyles (please refer to Appendix F for the layout of the survey).

The lifestyle aspirations of the consumers were investigated using semi-structured questions. The 14 parameters were divided into three time related layers, a technique that '*focuses on generating responses that demonstrate progression and advancement*' (Bolton, 2009). The tool has three steps. Step 1 explores "today" – present time

aspirations; Step 2 explores "tomorrow" – next day and/or in the future aspirations; Step 3 focuses on "dreams" - ideal, wished-for aspirations. An additional component to (a) above identified geographical locations, specific products or/and experiences cited in a particular lifestyle parameter. The purpose of this was to capture, not only the aspirations (through keywords and statements), but also first hand experience of the context, characteristics and qualities of the parameter through physical and visual reference points.

This ties in with Sherwood's two types of aspiration where there are long-term 'dreams' or future oriented aspirations and short-term goals ie 'today' and 'tomorrow'. Phase 2 also adapted the twelve lifestyle parameters used in Phase 1, to accommodate two more, health services and financial services.

Based on the Phase 1 outcomes a revised set of data collection tools were developed to address two of the research method issues:

1. *How could we better capture current daily lifestyles?*

Phase 1 relied on observation; a one-dimensional method, to understand consumer lifestyles. In response to this a Cultural Probe tool (Please refer to Appendix G for forms given to participants) was devised to capture 'a day in the life' of a consumer. It involved the consumer taking control of the information captured and at the same time involving them in the process. It also enabled a larger number of studies to be completed in a shorter period of time, over a larger geographical area. There were two elements, 1) a single use camera to photograph the person's lifestyle, desires and activities regarding water and sanitation and 2) a daily routine mapper that consisted of a schedule divided into the morning, afternoon and evening. The consumer was asked to write down what they did at different times of the day in relation to a) daily activities and b) water and sanitation activities.

2. *How could we encourage customers to more clearly communicate their*
    aspirations for water and sanitation?

In response to this question we analysed the effectiveness of our initial interview process. It was established that we needed more focused questioning to align it with the lifestyle aspirations. The parameters of the questioning therefore followed the same format as the lifestyle aspirations data collection tool; Today, Tomorrow and Dreams, probing the issues of water, toilets and showers. Subsequent questioning probed the motivations and tensions surrounding the three issues and was supported by a set of quantitative questions to build robust profiles. The development of the water and sanitation issues resulted in a more synthesized set of data to complement the lifestyle aspirations.

4.1.1 Data Mapping & Decoding

The interviews were transcribed during the interview process and typically comprised of responses, statements and keywords. The data was then documented and a process of condensation, categorisation and interpretation was used to identify themes and emerging issues to arrive at meanings. The photographic evidence was used as supporting data to enable analysis of differentiation between today, tomorrow and dreams. The collation of the data produced the issue cards (Appendix H), tools that synthesised the findings in a visual format. Visualising the data with key words, statements and images allowed their meaning to be explored in an interactive manner. The process of cross-referencing the visual and non-visual data enabled an integrated understanding of the findings that were generated.

In summary the Phase 1 research effectively informed Phase 2 and highlighted the notion of 'water choices' in the context of BoP consumers' aspirations. In Phase 2 interviewees from 3 of the six settlements were brought together in a focus group - the Co-Creation Workshop - where the concept of 'water choice' was specifically

introduced and feedback was elicited. The authors believe this consumer orientated/aspirations approach has enabled a significant leap forward in applying research outcomes to creating more consumer-focused strategies for basic needs services for the poorest communities.

5 Findings

5.1 Emerging lifestyle aspirations

This investigation elicited a number of emerging themes that are worthy of discussion of the role of aspirations in the BoP (Please refer to Appendix I for captured data). This is displayed in the tables below:

Table 7: Consumer Lifestyle Aspirations

Consumer Lifestyle Aspirations			
Demographic	Aspiration - Motivation	Key Observation	Motivational Inight
Family Size	Moderate size (approx. 6 members not including dependents) when based against Kenya statistics	-To have a 'life after children' or to have children for 'security of life' -A clear understanding of the economics of life	Situational Awareness
Education	-Vocationally Driven (predominantly females) -Business Driven -Professionally Driven	Business means Sustainability	Status
Employment	-Business ownership with ability to employ own staff.	-Power and ownership to change their future -Business in the sense of petit trading is an easy concept to understand	Status
Income	Monthly average of 261,810 Ksh per month (equivalent to $US 3,160 or £1,997)	-Provide for children -Better Life -Ranged between	Sustainability
Location of Home	A mix of secure wealthy estates if urban or rural areas close to homelands. With ownership of land a key driver and stress free. 13% saying the would live abroad	-Security -Private -Ownership	Status
Type of Living Environments	Large, permanent, secure and self-contained properties with good recreational facilities	Large & recreational	Private Personal

Food	Traditional balanced diet	Healthy & Nutritional	Freedom of choice
Clothing & Fashion	New, official and smart (reference towards buying suits)	Official	Status
Social activities & Entertainment	Preference for sporting activities and travel	Escapism	Freedom of choice
Technology Use	Desire for modern conveniences and media entertainment	Mod-Cons and Media	Personal services
Transportation	Personal vehicle – Executive 4x4	Executive	Status
Sources of Information	Preference towards internet usage (however little have used it) Awareness of social networking	Mainstream media and social networking	Personal Services
Health Services	Recognised establishments Regular, quality and personal	Personal	Personal Services
Financial Services	Preference for banks to access business loans and create savings	Business Loans	Personal Services

Table 8: Product Aspirations

Product Aspirations		
Water	Aspirations	Key Insights
	Own supply (sell to others)	Resale
	Water at home	Ownership
	Direct access	Time saving
	Own tap	Convenience
	Instant water	
Toilets	Aspirations	Key Insights
	Sit down toilet with flush mechanism	Modern
	Multiple toilets (in case of emergencies)	Accessibility
	Freedom of use	Private
	Well lit	Ease of use
	Hygiene facilities	Cleanliness
	Consideration for all	Inclusive design
Showers	Aspirations	Key Insight
	Room with tiles, shower, basin	Nice environment
	Multiple numbers	Access & availability
	Clean	
	Private/at home	

	Convenient	
	Hot and cold water	
	Bath Tub	Relax + Leisure
Other Facilities	More shops	Access to products & services
	Better use of facilities	Extended service offerings and creation of business opportunities
	Socialising activities	Social integration
	Lighting	Visibility and way finding
	Educational facilities	Learning

5.1.1 Consumer aspirations insights

From the data mapping process and insight development four themes emerged:

1. Situational awareness
2. Status
3. Freedom of choice
4. Personal services

BoP consumers have a 'situational awareness', that is a clear understanding of the situation they find themselves in and this is reflected in their knowledge of what they need and how, if achieved, it will make a positive difference to their lives. Consumers showed themselves to be well aware of their current personal, economic, social position. They recognise that decisions they make now will determine their future. A profile where deciding to have more or less children would have a profound effect on their life, the conflict of having 'life after children' or 'security for life' is stated. What does this consumer awareness mean for marketing a product or service?

The second insight focuses on status. For these BoP consumers 'business means sustainability'. This dominates several of the lifestyle parameters. Business is seen as an aspirational driver, but it is also a necessity for survival. Simple buying and selling or petit trading is abundant and people are in constant contact with this nature of business. For those that do this for a living, the aspiration to expand and develop their

skills and trade are highly apparent. Wanting to be educated in business management, to become an entrepreneur or own a shop are found to be connected to earning a sustainable income that can deliver a quality of life without stress. For those that are not already involved in 'business' it is seen as a way out of their situation and can help enhance their lifestyle. The influence of business migrates into other lifestyle parameters with executive saloons and 4x4 vehicles a reference for aspirations and a preference for smart official clothing being a preference. So driving this segment of society is the aspiration for the opportunity to develop the skills and acumen for making money.

'Recreation time' as a theme is intrinsic to human culture and a necessity. It plays an important role in the lives of the BoP interviewed. For women it was more about socialising and relaxing with friends, for the men it was about being energetic and participating in a sport or activity. It was apparent that there were limited options to become involved in activities, meaning people either have little to do or form groups to provide the option to be able to do extra curricula activities. This insight leads to the main theme of 'freedom of choice', which was also decoded from varied aspirations of home locations, types of living environments and the desire to buy new clothes.

The final insight stems from understanding the aspirations for health services and the case study of water and sanitation in urban informal settlements. People want a 'personal service'. The people interviewed expressed a desire for personal healthcare, having their own physician, having regular and private check-ups to maintain one's health and well being.

5.1.2 Water & sanitation insights

The interviewees show a strong awareness of the facilities they would like to use and the service they desire. Many of them describe the type of toilet they would like, how their bathroom would be, the amenities inside and even the type of materials. As is the case of water and sanitation in the urban slums, lack of income and their lack of legal rights to own their home means whatever they can own become an asset and something that can be sold if in tough financial times. So the products and services

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that fill this gap are, in effect, an extension of their home. Thus, customer satisfaction would ultimately come from the use of the products and services that provide a homely experience and unobtrusive service. Taking this further, three key insights presented themselves throughout the insight development process:

1. Ownership and control
2. Privacy
3. At home accessibility

Ownership was a dominant aspiration, expressing itself through the desire to have ones own tapped water supply, toilet and shower facilities at home. The control aspect links with this desire to manage ones own life and dictate its outcomes. It is also suggestive of the need to not be reliant on others to provide and control these basic services. In this case the ability to manage one's water supply and have the ability to provide it to others as well as be sure that enough is available for emergencies. It also relates to softer issues that became apparent, that of other people that utilise services. Views were articulated that reflected upon the expectations of how one should use a specific service, expressing resentment and disgust at the behaviours of others, as well as the level of service received from the suppliers of the water, shower and toilet providers.

The second insight 'privacy' is a by-product of this central want (ownership and control), expressing itself through the desire to have home access and secluded surroundings. An example of this was also very apparent in people's homes that were visited, people would cover their walls in material to block out the possibility of next door neighbours being able to peep through. This effort to retain one's dignity and privacy while also providing security was important and often overlooked.

The third insight 'accessibility' was a driver for not only choosing to use a service, but also driving the aspiration for ownership and control. It meant that choice did not become an issue and, as a virtue, time and effort were saved in not having to decide where to go to fetch water or which toilets to use. Another aspect for having 'at home access' revealed people's social agendas and status based aspirations. This factor

would allow people to become more socially imbedded with friends and family by allowing them the ease of access to this basic human need.

5.1.3 Products-services systems filling the gap

Keeping in the context of Africa where the research took place there are current examples of new services filling the gap which lay claim to meeting these aspiration insights. An open source initiative, Ghanasan, developed by IDEO and Unilever and tested in the urban settlements in Ghana, provided consumers with the 'privacy' of their own toilet. The service offers customers the use of their own toilet that diverts the urine and excreta and is delivered to use at their home. Collection of the unit is made upon request or on a regular basis.

In the urban slum of Kibera, Nairobi another service being implemented to ease the issues of poor sanitation, meeting the aspiration insight of 'accessibility', is the organisation peepoople. The business sells biodegradable single-use bags that have an inner layer that unfolds to form a wide funnel. The bags are marketed as being easy to use, for one person, whenever and wherever needed. 'The magic' of the bags is that they contain urea within the bag that inactivates harmful pathogens. This means the bags can be stored safely for a short period and then carried to a suitable place to discard or left at one of the drop-off points that have been set up. Both Ghanasan and Peepoo bags are part of a product-service system, whereby the collection and/or delivery is integrated into the service offering. After use the human waste is utilised to create fertiliser that is used for agricultural purposes, meaning that productivity benefits are further implemented into the business model.

An alternative solution, developed by halcrow and partnered with the NGO Umande Trust in Nairobi, is the implementation of Bio-Centres across Kenya. The centres combine the use of toilets, showers and in some cases the provision of water with the use of community space. They are able to meet all three of the aspiration insights, 'ownership and control' by the local community group, 'privacy' offered to the customers for use of facilities and they are strategically placed to offer 'accessibility' to large number of tenants from the urban informal settlements.

5.1.4 The tipping point from functional to emotional

With the examples given their intention is to become embedded into the community as a strategy for sustaining the business. But through extended interviews and site visits to a number of Bio-centres in Nairobi a key insight revealed itself. Social and personal agendas take a priority in situations that are left to their own devices. In this respect, products and services can evolve themselves to please the psychological needs of the people. In the case of the Bio-centre this *tipping point* manifested itself in the social and entertainment needs of the local community. The transformation from its primary function of providing toilets, showers and water into a centre for TV entertainment was due to consumer demand and ultimately became its main source of income. In contrast, its primary functions deteriorated, inhibiting the ability to deliver a better level of service for which it was intended. A case in context of human development needs, whereby once subsistence needs are met other satisfiers are adhered to. Another example, discussed by Max-Neef in an interview (www.youtube.com, 2011) is the case of a machine that could improve the production capabilities of a woman making ponchos and in turn help increase her income. The team returned a few months later to assess her progress and found that she was still producing two ponchos per week. Asked as to why she was not making more she told that them that she did not need to, now she had more time to spend with friends and play with the children. In a reverse scenario of reverting back to satisfying their subsistence needs is that of a pricing strategy offered by Airtel. The low-cost strategy backfired and did not entice users to make more phone calls. Instead findings showed that consumers used the savings to purchase food goods. What these cases show is that unexpected scenarios can occur when the motivations that satisfy human needs are unrecognised. This, however, is an opportunity to innovate and identify where a product fits into meeting the aspirations that drive these needs. These findings are similarity to a 'value open' strategy proposed by Simanis (2011). A proposition that allows the consumer to determine what value they benefit from the product. This gives organisations a platform to understand how a product fits into a consumer's life and also importantly why.

6 Discussion & Conclusion

Knowledge and understanding of BoP markets is now in its second wave (London & Hart, 2011), but success is not guaranteed. However, dealing with its uncertainty has become more manageable with new insights and better-informed strategies. Pivotal to these is understanding the consumer, their lifestyles and decoding their fundamental needs and aspirations. The topic of aspirations has shown itself to be an emerging one, with past practitioners building theories on its motivations (Maslow; Max-Neef,) and current ones developing deeper understanding using these theories (Subrahmanyan & Gomez-Arias, 2008). However, interpretations of aspirations are discussed with different meanings and manifest themselves in alternative nuances in literature. It was the purpose of this study to understand and build insight to this market segment using aspirations as a focus for investigations, testing the hypothesis that an empathic and contextually immersive approach would provide more holistic, consumer inspired desires that can lead to better insight and innovation opportunities. The methods used to test this (the data collection, data mapping and insight development) meant the investigation was structured and focused, providing a rounded approach to this research.

The outcomes of the research fall into three areas:

- Novelty factors
- Lessons learnt
- Practical implications

6.1 Novelty Factors

Four novel aspects emerge from the findings. Firstly the research tools of the investigation use aspirations, as the main driver in order to discover the hidden meanings and emotional needs of the BoP consumer. Historically this has not been a perspective that has received much attention.

Secondly the data collection techniques built a comprehensive picture of the BoP consumers' current lifestyles and future *desires. The findings* better inform the strategic dimension to the development of demand driven basic needs services as well as informing the more operational aspects of innovation. Again not an approach utilised much in the past. Thirdly the Aspiration Ladder Technique has proved transferable - from the FMCG sector to the BoP context - thereby maximising its use. Lastly, the methodology for investigation allowed a large amount of data to be collected in a short period of time over numerous locations. As opposed to an extensive and, typically, time consuming ethnographic study. This was assisted by the 'rapid' ethnographic tools (the cultural probe, consumer lifestyle aspirations interview framework and observation techniques), which successfully captured elements of people's lives that would be inaccessible and difficult to document without spending larger amounts of time with them. Thus a much richer picture is developed of the consumers and their lives.

6.1.1 Lessons learnt

Two issues emerged on reflection of the investigation process and review of the data. Firstly, the constraints of *illiteracy* were apparent in the 'cultural probe' tool. A number of participants, 6 out of 29, did not fill in the prescribed 'daily routine' schedule, marking the relevant areas with and 'X' or nothing at all. The lack of data, although not critical to the investigation, produced gaps in the profile of the consumer. What this highlights is the necessity to develop strategies to deal with issues of minimal literacy. Building this into the research strategy with techniques to minimise data gaps is important to establish.

Secondly, the process of investigating lifestyle aspirations was a *new experience* for the participants. A few consumers questioned the purpose of the questions and others seemed surprised to be asked about their future desires. This tested the interview process and meant that it was important to pursue a line of questioning, building on what consumers said, in order to help the interviewee answer the question. Significantly the questions that inquired into dream aspirations the interviewees had

to think about in more depth because that aspect was not familiar. Consequently all participants were able to express a level of desire and meaning, but were unable to completely disclose 'why' they desired that aspiration. However, they were able to express 'what' they aspired to within each of the 14 parameters.

The question of 'how' they intended to achieve the aspiration was not included in this study, but would warrant further investigation. As would an exploration of the emotional and functional barriers to the actual implementation of any new water or sanitation product or services.

6.2 Practical implications

The practicalities of this research are captured in Figure 10. It shows a linear process beginning with a stage of contextual immersion comprising the relevant business and consumer elements. This leads to a set of insights that inform the functional and emotional drivers for innovation opportunities. This implementation of aspiration-focused research has three particular strengths. Firstly the mix of input methods generates more robust profiles of consumers and businesses. This is an important aspect of any strategy for marketing and human-centred product and service development. Secondly, the insights enable strategies that connect the consumers' emotional desires and functional requirement to create a more meaningful value proposition. Lastly by designing in a productivity benefit, for example time saving, and aspirational benefits, for example a 'status building element, the findings are fed back into the product and service innovation offering.
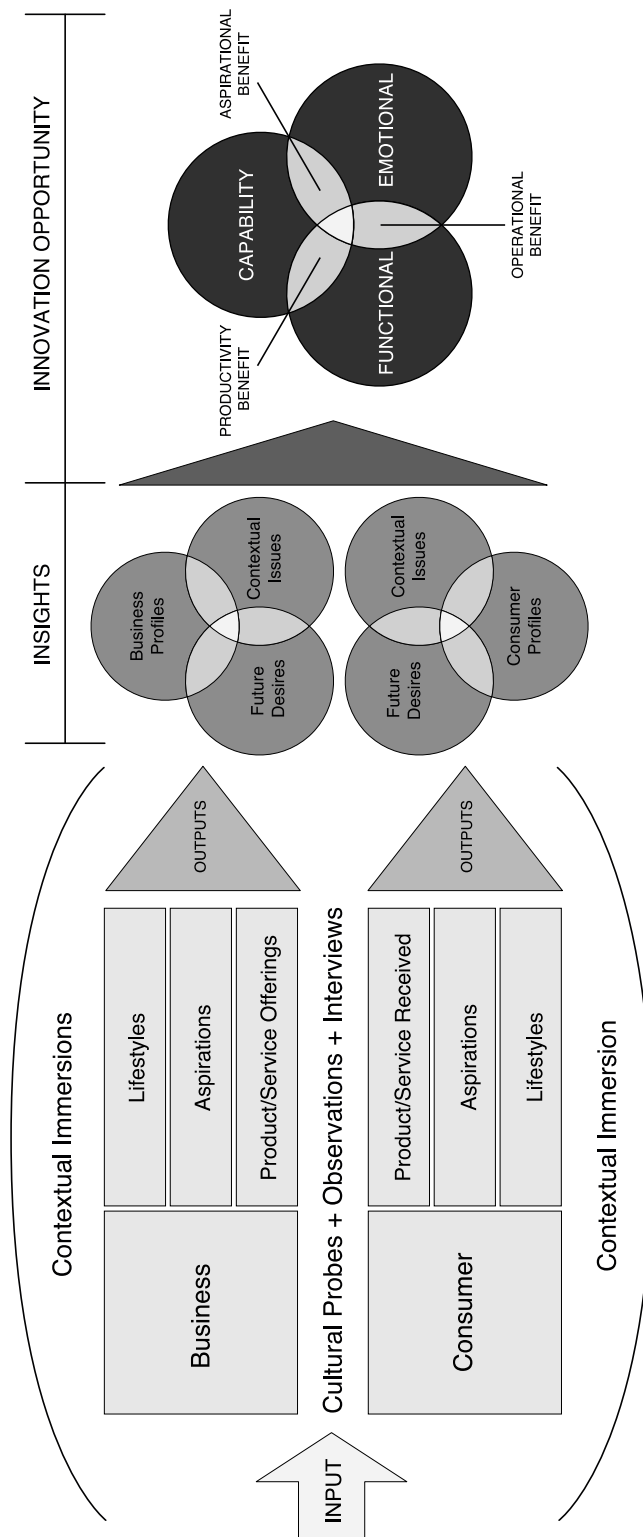
Figure 10: A contextual framework for developing aspiration driven innovation

6.2.1 Implications for Marketing Strategy

For those researching this demographic the contextual framework is an effective tool for generating and documenting data used for developing insights. One admirable quality, which runs counter to many methods of anthropological studies, is the framework's ability to capture data in a short space of time. However, it is important to position this type of research within new product development and marketing strategies. The framework is about capturing insights and not developing an expansive social study into human culture and the way people live and why. So it is best suited to front-end innovation strategies for developing new products and services. The aspirations-focused approach undertaken to investigate the BoP market offers industry organisations, government, aid agencies and practitioners a means to reposition their current marketing strategies. This brings with it innovation opportunities that are sympathetic to the emotional and functional needs of the consumer.

Prahlahad's (2012) proposition offers an alternative to the traditional marketing mix of the 4Ps (product, price, place and promotion), suggesting that efforts be made to focus on the 4As (awareness, access, affordability and availability). It can be argued that a 5th 'A' should be added - Aspirations. The marketing mix is a capacity building process that requires foresight and front-end involvement to develop successful products and services. It is at the front-end of a project where this investigative research can be most beneficial. Investigating aspirations as a means to developing insight has shown deeper hidden meanings of the motivation that drives consumers' behaviour. In markets where subsistence living dominates people's lives, the next level beyond that is meeting fundamental emotional needs which are an integral part of their lives, but not so obvious.

Integrating the 5th 'A' - aspirations - into the framework could minimise failure of adoption of the new product or service and allow a clearer focus on innovations that meet the deeper needs of the consumer.

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APPENDICES

All elements of the Appendices will be made available on a CD.

A.1 Appendix A:

Comparative analysis of principles against products and services operating at the BoP - Excel Spread Sheet

A.2 Appendix B:

Photos of comparative analysis process

A.3 Appendix C:

Documents from field trip to Nairobi, Kenya

A.4 Appendix D:

Water Choices design and development

A.5 Appendix E:

Water Choices workshop photo's and responses

A.6 Appendix F:

Consumer Aspirations Surveys and Business Surveys

A.7 Appendix G:

Cultural Probe form for consumer

Cultural Probe responses – Excel Spread Sheet

Pictures from participants

A.8 Appendix H:

Issue Cards – Photos

A.9 Appendix I:

Recorded Survey Data – Excel Spread Sheets