

Innovating by “making do with what is at hand”: Creating opportunities in low-income markets

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This doctoral dissertation examines how entrepreneurs innovate within resource scarce contexts at the BOP. The more precise research questions are: How does resource-scarcity manifest itself in innovating at and for the BOP? How do innovators create opportunities in resource-scarce context? The theoretical discussion is based on bricolage, creation theory and resource-constrained innovations.

This thesis consists of four articles and an introduction chapter. This thesis is grounded on qualitative research methods and each article is based on an empirical study and presents a distinctive perspective for the aims of this thesis. The first paper (article A, co-authored with Halme and Lindeman) focuses on analyzing the dynamics between the individual innovators and corporate structures within two MNCs. The second paper (article B) focuses on six Kenyan companies operating at the mobile industry sector and discusses how they generate innovations targeting the BOP. The third paper (article C) studies in detail how two Kenyan innovator-entrepreneurs use bricolage as a means of innovating. The fourth paper (article D) considers creation theory as a tool for describing some of the elements of inclusive business development.

The findings of this thesis underline that innovating under resource scarcity can be seen as a unique way of thinking and acting in response to daily problems and an ability to resourcefully create solutions by deploying unconventional means at hand. Innovators may not seek to develop excessively sophisticated solutions, but rather to develop "good enough" solutions. In addition, this study argues that business development at BOP markets is often ridden with uncertainties which make the innovation process risky and unpredictable. Particularly for foreign companies and local ones who are more used to serve the high-income market, the BOP market means having to deal with new markets, possibly new industry and lack of previous experience from which to draw lessons. These uncertainties can affect business development in various ways.

Keywords BOP, inclusive business, resource-scarce environment, resource-constrained innovations, bricolage**ISBN (printed)** 978-952-60-7386-6**ISBN (pdf)** 978-952-60-7385-9**ISSN-L** 1799-4934**ISSN (printed)** 1799-4934**ISSN (pdf)** 1799-4942**Location of publisher** Helsinki**Location of printing** Helsinki**Year** 2017**Pages** 220**urn** <http://urn.fi/URN:ISBN:978-952-60-7385-9>

Tekijä

Paula Linna

Väitöskirjan nimi

Innovoidea "käsillä olevilla resursseilla": Liiketoimintamahdollisuuksien kehittäminen vähävaraisilla markkinoilla

Julkaisija Kauppakorkeakoulu**Yksikkö** Johtamisen laitos**Sarja** Aalto University publication series DOCTORAL DISSERTATIONS 70/2017**Tutkimusala** Organisaariot ja johtaminen**Väitöspäivä** 02.06.2017**Kieli** Englanti **Monografia** **Artikkeliväitöskirja** **Esseeväitöskirja****Tiivistelmä**

Väitöskirjatyö tarkastelee kuinka yrittäjät innovoivat resurssiniukoilla "Base of the Pyramid" (BOP)-markkinoilla. Tarkemmat tutkimuskysymykset ovat: Kuinka resurssiniukkuus ilmenee innovoidessa BOP-markkinoilla ja kuinka innovoijat luovat kehittävät uusia liiketoimintamahdollisuuksia resurssiniukoissa ympäristöissä. Teoreettinen keskustelu pohjautuu käsitteisiin bricolage, yrittäjyyden 'creation theory' ja resurssiniukat innovaatiot.

Väitöskirja koostuu neljästä artikkelista ja johdannosta, joka kokoaa artikkelien tulokset yhteen. Tutkimus pohjautuu laadullisiin tutkimusmenetelmiin ja jokaisessa neljässä artikkelissa on oma empiirinen aineistonsa, jossa tutkimusilmiötä lähestytään hieman eri näkökulmista. Ensimmäinen paperi (artikkeli A, kirjoitettu yhdessä Minna Halmeen ja Sara Lindemanin kanssa) keskittyy analysoimaan dynamiikkaa innovoijien ja yritysten rakenteiden välillä kahdessa eri monikansallisessa yrityksessä. Toinen paperi (artikkeli B) tarkastelee kuinka kuusi mobiilialalla toimivaa kenialaista yritystä kehittää innovaatioita BOP-markkinoille. Kolmas paperi (artikkeli C) selvittää kuinka kaksi kenialaista pienyrittäjää soveltaa bricolage-tyyppistä toimintatapaa innovoidessaan. Neljäs paperi (artikkeli D) fokuoitetu tarkastelemaan kuinka osallistavaa liiketoimintaa on luotu yhdessä paikallisen yhteisön kanssa.

Tutkimus osoittaa, että innovointi resurssiniukoissa olosuhteissa voi olla ratkaisujen kehittämistä päivittäisiin haasteisiin hyödyntäen "käsillä olevia resursseja". Tutkimuksen perusteella voidaan päätellä, että innovoijat eivät välttämättä pyri luomaan sofistikoituja ratkaisuja, vaan enemmänkin "tarpeeksi hyviä" ratkaisuja. Oleellista on luoda innovaatioita, jotka ovat kustannustehokkaita, helppoja käyttää ja hyödyntävät paikallisia resursseja. Lisäksi, tämän tutkimuksen perusteella voidaan todeta, että liiketoiminnan kehittäminen BOP markkinoilla on täynnä epävarmuuksia, joiden takia innovointiprosessia voidaan luonnehtia riskipitoiseksi ja ennalta arvaamattomaksi. Kehittyvien maiden resurssiniukoissa ympäristöissä toimiminen ei välttämättä tarkoita ainoastaan uusien innovaatioiden ja liiketoimintamallien kehittämistä, vaan ylipäättensä kokonaan uusien markkinoiden luomisesta yhdessä paikallisten toimijoiden kanssa.

Avainsanat BOP, osallistava liiketoiminta, resurssiniukkuuympäristö, bricolage, resurssiniukat innovaatiot**ISBN (painettu)** 978-952-60-7386-6**ISBN (pdf)** 978-952-60-7385-9**ISSN-L** 1799-4934**ISSN (painettu)** 1799-4934**ISSN (pdf)** 1799-4942**Julkaisupaikka** Helsinki**Painopaikka** Helsinki**Vuosi** 2017**Sivumäärä** 220**urn** <http://urn.fi/URN:ISBN:978-952-60-7385-9>

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Jyväskylä, 30 March 2017
Paula Linna

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List of Publications

This doctoral dissertation consists of a summary and of the following publications which are referred to in the text by their letter.

A. Halme, M.; Lindeman, S. and Linna, P. 2012. Intrapreneurial Bricolage in Multinational Corporations. *Journal of Management Studies*, 49(4), 43-784.

B. Linna, P. 2012. Base of the pyramid as a source of innovation: Experiences of companies in the Kenyan mobile sector. *International Journal of Technology Management & Sustainable Development*, 11(2), 113-137.

C. Linna, P. 2013. Bricolage as a means of innovating in a resource-scarce environment: a study of innovator-entrepreneurs at the BOP. *Journal of Developmental Entrepreneurship*, 18(3), 1-23.

D. Linna, P. 2016. Creation theory explaining inclusive business development: Case study of a community-operated business venture development in rural Africa. *Conference paper presented at the Africa Academy of Management (AFAM)*, 2016.

Preface

I feel that my interest in this research topic has long roots reaching to my early childhood. I have been privileged to be able to travel across continents from my years since I was a child. One of my early memories is from when I was around 4 years and visiting Mexico City with my family. We were enjoying a dinner in an open-air restaurant. A lady carrying a baby in her bag came to beg for money. My parents gave her some food and she was delighted. A little bit later she came to beg again. This time my parents did not give her anything. She became quite angry and started swearing. Recalling this event later on, I see it as a kick-off for my interest in understanding the complex phenomenon of global poverty. Years went by and my interest in these issues waned somewhat but was occasionally rekindled when I got involved with a few NGOs working on developing country issues, did an internship in India and took developmental studies at university. All the time, I was somehow waiting for something to happen.

At that time, I was working in Vietnam for an UN-led project which aimed to create new measures for tracking urban poverty. As part of the project, we tried to develop tools for including unofficial labor force, such as seasonal workers, housemaids, factory workers as formal poverty indicators. We were visiting informal settlements, factories where we interviewed these people living outside of the formal statistics about how they organized their daily lives concerning food, accommodation and so on. I became more curious and began to study the topic during my spare time as well. With the help of my friend, Mai, we went around suburban areas of Hanoi and interviewed several informal micro-entrepreneurs who repaired and sold used mobile phones. This was very eye-opening and that study became my first official paper on these issues, later on to be presented at the Oikos UNPD academy. Officially, my research started in 2009 when I began my doctoral studies at Aalto University.

Somehow I feel that this dissertation is the culmination of my personal and academic research process. In the end, it is time to ask myself, do I understand global poverty and poverty-related issues better? Yes, I still see poverty as a complex phenomenon with no easy solution. I feel what is positive is to see that companies are showing more interest in it, especially the richness and creativeness of ordinary people is also made visible. This dissertation can also be seen as a collection of stories where individuals innovate solutions to poverty-related problems by “making do with what is at hand”.

1. Introduction

I was facing individuals, small-scale entrepreneurs of all sorts who had a strong can-do attitude, creative thinking as if tilted on a shared vision. Searching and creating solutions for everyday challenges at hand was a worthwhile effort for them. There was an entrepreneur, for example, who was manufacturing wind-turbines made out of car wrecks, 100 percent locally available materials', as he declared himself. Another entrepreneur had developed a portable biogas digester virtually running on flimsy fabricated materials, not to mention the restoring effect of *Jua Kali* sector workers that I saw while crisscrossing the busy Nairobi street and its environs. Someone's waste is someone else's raw material. This was evidently shown through the intricate skills applied on the leftover materials that could end up as an innovative product elsewhere. Or, the more sophisticated young people who had faith that ICT could make an impact. Through hook and crook approaches, their energy and eagerness for innovation at times mirrored that of billionaire IT gurus like Bill Gates. I simply could not help being intrigued by this phenomenon and wondering how I could capture it and make it visible to a broader audience. In this doctoral thesis, therefore, I am trying to capture this emerging phenomenon by examining ways of developing innovations targeting low-income market, called the BOP (Base of the Pyramid) market. More specifically, I will examine how resource-scarcity affects innovation and how entrepreneurs create opportunities in a resource-scarce context. Bricolage and creation theory are used as a theoretical concepts to describe the behavior of these innovators.

This dissertation is composed of two parts: an introduction and four articles. This introductory chapter gives an overview of the research by first outlining the background for the research phenomena and presenting gaps in the current research. After this, the chapter presents the objectives of the dissertation, introduces the research questions and clarifies the focus of the work. Then it moves on to define the key terminology and presents the structure of the thesis.

1.1 Base of the Pyramid (BOP) market

In the management literature the concept of "Base of the Pyramid" (BOP) was originally introduced by Stuart L. Hart and C.K. Prahalad in 2002 in their widely acclaimed article "The Fortune at the Bottom of the Pyramid". BOP

refers to the 4 billion people living with less than 3 000 dollars PPP per year (Hammond et al., 2007). Prahalad and Hart claimed that mature markets in industrialized nations are becoming increasingly saturated; new business opportunities should thus increasingly be sought in BOP markets where there are considerable needs, but which are currently underserved by the global market system because incomes are too low. This line of thinking became known as the BOP approach. The initial argument behind the BOP approach is that there are tremendous benefits for companies if they choose to serve the highly underserved and less competitive markets at the BOP: “[b]y stimulating commerce and development at the bottom of the economic pyramid, MNCs could radically improve the lives of billions of people...”. Prahalad and Hart (2002) argued that by developing a dedicated offer of products and services, multinational and profit-driven corporations can contribute to poverty alleviation by doing business with low-income consumers. They present the argument that achieving this goal does not require multinationals to spearhead global social development initiatives for charitable purposes. According to Prahalad and Hammond (2002) companies act in their own self-interest, as there are enormous business benefits to be gained by entering developing markets. Hence, MNCs seeking new vast markets will benefit the poor by transforming them into customers. To do so, they need to develop a range of products and services dedicated to meeting the needs of low-income consumers, referred to as the “base of the pyramid”. In turn, this market segment could represent a significant growth opportunity for MNCs (Prahalad, 2005).

The early BOP management studies mainly focused on describing how attractive market opportunities these low-income markets particularly for MNCs. Therefore the first documented business cases came from larger corporations, such as Hindustan Lever Ltd. in India, Hewlett-Packard in Africa Kenya (e.g. Anderson and Markides 2007; Prahalad, 2005; Keating and Schmidt 2008). Nevertheless, the more recent studies point out that creating businesses in these markets can be challenging for MNCs (Olsen and Boxenbaum, 2009; Halme et al., 2012) and closer analysis of the BOP initiatives reveals that in fact, MNCs might not be dominant players in the BOP segment. Several BOP initiatives appear to be initiated by small local firms and local entrepreneurs (e.g. Sinkovics et al. 2014; Linna 2012, 2013), or by a joint enterprise created by a for-profit company and a non-profit organization (e.g. Kolk et al., 2014; Webb et al., 2010), by social entrepreneurs (e.g. Seelos and Mair, 2005) or by NGOs (e.g. McKague and Oliver, 2012) rather than multinational. Some scholars have suggested that perhaps BOP innovation is more centrally located in local SMEs than in global TNCs (George et al., 2012). Ray and Ray (2010) and Sinkovics et al. (2014) are suggesting that local companies who are used to operate within BOP can perhaps teach global MNCs valuable lessons in terms of new models of innovation.

To conclude, BOP ventures can come from a variety of sources, including MNCs, domestic firms, and non-profit organizations (London, 2008; Hall et al., 2012) as well as springing from the “grassroots-level” where ordinary people are creating solutions addressing practical problems of daily life and acting

without any support from the formal sector (Seyfang and Haxeltine, 2012; Pansera 2013; Ustyuzhantseva, 2015; Gupta, 2013).

Besides speculation on which entrepreneurial actors are the most suitable players to act at the BOP, the whole concept of BOP itself has generated much debate in the corporate world and in academia; hence the reality of the BOP proposal remains controversial. Some scholars have questioned the presumptions of Prahalad and Hammond (2002) that there is fortune at the BOP and that opportunities are simply waiting to be tapped. For example Karnani (2007) argues that the purchasing power of the poor people has been overestimated, or even exaggerated. According to him BOP markets are quite small and unlikely to be very profitable. Some scholars admit that BOP represents a variety of needs but it cannot be treated as a market in the traditional sense of the term. Instead of tapping into the market, markets need to be created (e.g. Simanis, 2009, 2010). The starting point for market creation is “nonconsumption” as there are no competitors’ products against which to benchmark (Hart and Christensen, 2002; Simanis, 2010). While Simanis (2010) presents more detailed company-specific strategies of consumer market creation, such as ‘value-open proposition’, ‘embedded innovation’, Schuster and Holtbrügge (2014) and Webb et al (2010) have raised concerns about improving the market conditions in a broader sense. This can take various forms, such as making the market more inclusive for poor people for instance by improving their education level, creating employment opportunities and including the poor as producers in various parts of the value chain (Reficco and Márquez, 2012; Schuster and Holtbrügge, 2014; Mair et al., 2012). This kind of inclusive market approach emphasizes the need to create market-based solutions that enable the poor to increase their skills and productivity.

In this dissertation Base of the Pyramid (BOP) market is understood as a socio-economic population segment, in terms of market-size which is counted based on purchasing power. Base-of-the-Pyramid (BOP) consists of approximately four billion low-income consumers, a majority of the world’s population. The 4 billion people at the BOP, all those with incomes below \$3000 per capita per year (in local purchasing power) live in relative poverty. Together they have substantial purchasing power of \$5 trillion a year.

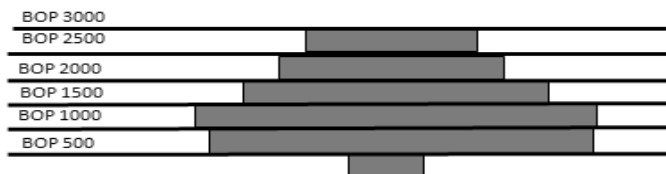


Figure 1. The size of the BOP market (Source: Hammond, et al., 2007) *Explanation BOP500 category represents individuals living with less than \$500 a year, BOP1000 represents individuals earning between \$500 and \$1000, etc*

Within that market there are large variations across regions, countries, and sectors in size and other characteristics. For example Africa has a slightly smaller BOP market, at \$429 billion, but the BOP market is the region's dominant consumer market, with 71% of purchasing power, including around 486 million people (Hammond et al., 2007). It is worth noticing that BOP markets exist within not only the least-developed countries (LDCs) but also countries classified as developed can have BOP market segments. Moreover, these undeveloped segments are often characterized by very different sociocultural elements than the more developing regions within the same country (London, 2008). Thus, the degree to which a market is classified as low-income depends not upon country boundaries, but rather upon market characteristics. BOP markets are also referred as subsistence markets which particularly emphasize how poor people have to deal with uncertainty and lack of control over many aspects of their day-to-day life and typically spend the majority of their income on daily necessities (Viswanathan and Rosa, 2007). These markets are characterized, for instance, by a lack of formal institutions and weak infrastructure; the vast majority of the workforce is uneducated or unskilled and business actions are based on informal institutions and one-to-one interactions between small neighborhood storeowners and local consumers (Rivera-Santos et al., 2012; Viswanathan and Rosa, 2007). The poor also suffer from the so-called poverty penalty; i.e. poor people tend to pay more for basic necessities than the wealthier consumers due to lack of consumer options (see more Prahalad, 2006; Mendoza, 2011). Common examples of poverty penalties are that people living in slums who are not connected to the water distribution network pay much more for water of dubious sanitary quality and buy their drinking water from street vendors with high prices and borrow money from local moneylenders who charge higher rates than commercial banks.

Within the BOP discourse, besides studying BOP as a market, researchers are increasingly interested in understanding BOP as a birth place of and for innovations. Therefore, innovations arising from the bottom-up, either as a grass-root level innovations (see Gupta, 2013) or more as local companies solutions to contextual problems (Sinkovics et al., 2014) have been noticed. In addition, foreign corporations have understood the value of BOP as hotbeds of innovation (Pralhad, 2011). Therefore, the most recent research paradigm has paid attention on how to innovate in resource-scarce settings (e.g. Cunha et al., 2014 Bhatt and Altinay, 2013; Brem and Wolfram, 2014; Sharma and Iyer, 2012; Zeschky et al., 2011; Simula et al., 2015).

1.2 The key definitions

The phenomenon of “innovating under-resource scarcity in low-income market context” is new area of research. The terminology is proliferating and different sets of concepts are used simultaneously and overlapping. The main concepts of this thesis are: base of the pyramid (BOP), inclusive business, innovation, and means of innovating. Below I briefly summarize how these terms are understood in this research.

BOP is understood as a market segment and as a context in which innovations emerge and inclusive business occurs. BOP refers to the parameters set by Hammond et al. (2007), as being formed by individuals earning less than 5€ per day, adjusted for purchasing parity. The BOP market as a business and innovation environment is understood as a “resource-scarce environment” which is discussed in more detailed manner in the chapter 2.2. Scarce resources and institutional voids affect the means of innovating meaning that enterprises are encouraged to create their own paths of innovating under these harsh conditions. BOP market and low-income market are used in this thesis interchangeably referring to the same concept.

For the purpose of this study, terminologies relating to **inclusive business** refer to companies’ wider efforts of building inclusive growth and involving the poor in their business.

Along with BOP studies, the actual term **innovation** has been under discussion as well. For the purpose of this thesis, innovation is defined broadly as encompassing a range of innovations, such as new product or services, new process technology, new organizational structures. In this study the focus is on ideas and opportunities that are turned into commercialized forms of new product, service, process, business model or the modification and recombination of existing ones. The particular context of BOP brings its own elements of defining innovation and particularly its newness. The degree of newness depends on the individual or community that adopts the innovation and proves its worth. **Innovating** is considered as an approach which demands an entrepreneurial mindset to exploit business opportunities by integrating specific needs of the BOP markets as a starting point and working backward to develop appropriate solutions that may be significantly different from existing solutions designed to address needs of upmarket segments.

“Means of innovating” refers to resources and tactics that innovators possess and employ when pursuing their innovation. Resources are classified usually as tangible and intangible assets. While tangible assets are easier to recognize, such financial assets, materials and physical properties, intangible assets are a broader term. In this thesis, I am adopting the approach of Hall (1992) and Galbreath (2005) by dividing intangible resources as assets – something that the firm “has” such as brand, intellectual property rights - and skills – something that the firm “does” . In this study, the focus is on intangible resources that are skills which include capabilities. Resources do not exist in isolation, but their value is influenced by the environments in which the firms operate (e.g. Priem and Butler, 2001). For the purpose of this dissertation, the term **tactics** refers to different ways in which entrepreneurs mobilize resources and interact with the environment and/or within their company.

1.3 Research setting

This dissertation examines how to innovate and create opportunities in the resource-scarce context of BOP market. Due to the richness and variability of the phenomenon, established management theories might not be suitable to explain how innovation occurs under these conditions of scarce resources (George et al., 2012). In this thesis this phenomenon is approached by combining understanding from three emerging concepts: resource-constrained innovations, bricolage and creation theory. These concepts cover several important management subfields, such as opportunity creation, resource configuration, and innovation management.

In terms of the analytical unit of the study, the focus is on “means of innovating” and particularly at the level of individual innovator. Individual innovators can either be small-scale entrepreneurs or intrapreneurs within a bigger company. I am examining how innovators are raising and deploying means of innovating in resource-constrained settings. The contribution of this study is to provide insight and deeper understanding on how these means of innovating occur in the real-life instead of proposing normative suggestions of how companies should innovate at and for the BOP.

Contextually, this research includes different entrepreneurial actors: two MNCs, one Western start-up, two local Kenyan innovators and six Kenyan companies operating at the ICT and mobile sector.

Figure 2 below presents a simplified research setting of this thesis. The figure contains three main building blocks. The block on the left-hand side illustrates BOP as a resource-scarce context. Due to the challenging BOP environment, innovators might face external constraints and organizational limitations which might force them to develop new “means of innovating” such as applying bricolage. The second block, “means of innovating” includes all those resources and tactics that innovators deploy when reaching for the desired outcome; innovation (rectangle on the right side). This whole process is full of dialogue with the environment and conscious construction efforts which the middle arrow illustrates.

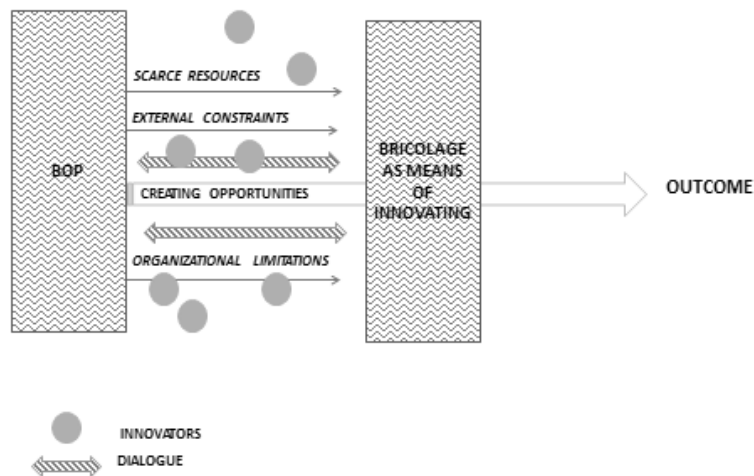


Figure 2. Research setting

1.4 Research gaps and research questions

The driving force of this study is to improve understanding on of what it means to innovate for and at the BOP. This is approached by analyzing how the resource-scarcity environment affects the innovation process; what are the limitations and constraints and how scarce resources appear in reality. It acknowledges that the BOP markets are ridden with high uncertainty due to the subsistence market features such as gaps in value chain (suppliers, distributors not existing) (Anderson and Markides, 2007), business transactions are based on face-to-face interactions among consumers and sellers (Visvanathan et al., 2010) and in general, transactions are governed by relationships and networks rather than by contracts as in the “official” TOP-markets (Rivera-Santos and Rufin, 2011; Wheeler et al., 2005). In this study, the organizational aspects are considered along with external factors.

Although, since Prahalad and Hammond (2002) first introduced the concept, knowledge on BOP has increased, there are still gaps. Whereas the early BOP discourse focused on the BOP as customers, the research has expanded into analyzing the BOP as entrepreneurs (Hall et al. 2012; Sinkovics et al., 2014), the role of partnerships (Rufin and Rivera-Santos, 2013; Rivera-Santos et al. 2012; Seelos and Mair, 2007) and methods of co-creating innovations (Ansari et al., 2012; Nakata, 2012; Simanis and Hart, 2009; Bruggmann and Prahalad, 2007). Additionally, a number of case studies have been documented and different aspects of the business model have been analyzed (e.g. UNDP, 2010; IFC, 2014; WBCSD, 2013). However, scholars have yet to describe theoretically how businesses are developed and what kinds of resources are re-

quired when operating at the BOP (Tashman and Marano, 2010). Further, the lack of empirical studies that apply sound theoretical or analytical frameworks is regularly identified as a major gap in the BOP literature (Schuster and Holtbrügge, 2014).

In addition, perhaps one of the major weaknesses of the previous studies is that the majority have either focused on MNCs (London and Hart, 2004; Prasad and Ganvir, 2005; Schuster and Holtbrügge, 2012) or on social entrepreneurs (Seelos and Mair, 2005; Mair and Marti, 2009; Rivera-Santos et al., 2015). The perspective of local entrepreneurs and SMEs has been under investigation less frequently (see for example Sinkovics et al., 2014; Ray and Ray, 2010 and Linna, 2012, 2013). The empirical evidence shows that although local companies face severe resource constraints, such as lack of skilled labour force, limited access to financial capital, and no proper production facilities, they have created valuable product solutions. They have accomplished this by valuing locally available resources and using them efficiently, for instance instead of conducting market analysis by using their own intimate knowledge on the local conditions and customer needs (Ray and Ray 2010; Dawar and Chattopadhyay 2002; Linna, 2012). Similarly, labour force can be recruited among the idle people and waste material can serve as raw material (Linna, 2013). To improve understanding on innovating within BOP, it is suggested that more research should be conducted on innovation activities among the local players (Brem and Wolfram, 2014) in order to shed light on innovations emerging from these resource constrained environment (von Zedtwitz et al., 2015).

To sum up, this dissertation aims to address the above mentioned research gaps both empirically and theoretically. Each of the thesis articles is based on an empirical study and presents a distinctive perspective for the aims of this thesis. In the papers I discuss how means of innovating can occur in real life within different types of enterprises. In three of the four papers, the level of analysis is on the actual behavior of the innovators. The first paper (article A, co-authored with Halme and Lindeman) focuses on analyzing the dynamics between the individual innovators and corporate structures. By following an inclusive business development process of two MNCs, Nokia and ABB, the findings of the paper reveal that they might be organizational constraints which prevent the innovators from having access to the resources within the organization. In the paper we formulate a concept of intrapreneurial bricolage which is defined as entrepreneurial activity within a large organization characterized by the creative bundling of scarce resources. Second article (article B) discusses how knowledge on the practical every day challenges (at the BOP) can act as a driver for creating business opportunities. The empirical evidence is drawn upon Kenyan mobile industry companies, which are familiar with the needs of the BOP but face difficulties in creating profitable businesses. The third article (article C) is based on two innovators who have both developed an affordable energy solution. In this paper I explore how bricolage was used as means of innovating by compensating for the lack of technical competence of the innovators and mobilizing material resources in the resource-poor setting. Finally, in the fourth paper (article D) inclusive business development process

in analyzed through the theoretical lenses of creation theory. I discuss how elements of high uncertainty have effects on strategic choices and decision-making and how the business venture is socially constructed together with the community members. The paper illustrates how concepts such as “flexible strategy” and “acceptable losses” might be worth considering when developing businesses targeting at the BOP. The empirical case is a small Western start-up which has created a mini-grid based electrification system for rural communities.

Taken together, all the articles tackle the overall research objective of the thesis “How do entrepreneurs innovate within resource scarce contexts at the BOP?”

To contribute to filling above-described research gaps, this thesis asks the following more detailed research questions:

- How does resource-scarcity manifest itself in innovating at and for the BOP?
- How do innovators create opportunities in resource-scarce context?

The field of studying innovation and inclusive business development in the low-income market context is still at its infancy particularly regarding to theory development. It has been explored through established management theories but the richness and variability of the phenomena involved highlight questions that remain unanswered by current organizational and management theory (George et al., 2012). This study is grounded on the theoretical discussion on bricolage (e.g. Lévi-Strauss, 1966; Baker and Nelson, 2005; Dymedjian and Ruling, 2010; Di Domenico et al., 2010), creation theory (Alvarez and Barney, 2005; 2007) and the nascent theorizing on resource-constrained innovation (e.g. Cunha et al., 2014; Bhatt and Altinay, 2013; Brem and Wolfram, 2014; Sharma and Iyer, 2012; Zeschky et al., 2011; Simula et al., 2015). These concepts are appropriate for capturing the rich phenomenon of innovating for and at the BOP by offering one way to describe how innovators are operating under these conditions.

1.5 Structure of the thesis

Overall, this study is organized in two parts. This introduction (part I) gives an overview of the whole research and the second part (part II) presents the four articles that form the empirical basis of the research findings and conclusions.

The purpose of this introduction (part 1) is to discuss the overall research topic and reflect it to my own findings. The theoretical foundations of this study are discussed in the chapters 2 and 3. These chapters are written side by side with my own empirical findings; I will provide concrete illustrative examples based on my own empirical work along with the theoretical discussion. While chapter 2 focuses on presenting the emerging concept of resource-constrained innovation and how to operate under resource constraints, chapter 3 first presents the theoretical concepts of bricolage and creation theory,

and goes on to explain the conceptual framework for the study. Chapter 4 presents the methodology of this study including the used data and methods. Chapter 5 offers a summary of each of the four articles. Finally, in chapter 6 I draw conclusions, discuss implications, and suggest topics for further research.

2. Innovating under resource-scarcity

This chapter discusses how a resource-scarce context affects the innovation process. I will begin by clarifying what the concept of resource-constrained innovations actually mean, how resource-scarcity appears when innovating at and for the BOP (external macro-environmental constraints and organizational factors) and what implications it has on the means of innovating. After this I will briefly discuss the two key resource theories, resource-dependency theory (RDT) and resource-based view (RBV) which are used to explain how organizations' interplay with their environment by applying different strategies to decrease their resource dependency, e.g. by acquiring external resources or increasing their own capabilities. While RDT focuses on explaining what kind of strategies companies apply to cope with environmental constraints, RBV emphasizes how organizations can increase their internal resources and capabilities to innovate. In the resource-poor BOP settings, both of these resource theories are suggested as a solution for companies to increase their ability to innovate for BOP. After the discussion of the two streams of literature, the final section discusses what it takes to innovate within resource constraints.

2.1 Innovating for inclusive growth

As discussed briefly in the first chapter, soon after the launch of the BOP concept, it became evident that in order to succeed, companies cannot only focus on selling affordable products to the poor and getting the distribution channels in place. It is recommended that companies adopt a broader role and take part in market creation e.g. by creating demand for and awareness of the products and services, working with the legislators to create an enabling environment for BOP businesses, and engaging directly with the BOP by leveraging them to be included into companies businesses in various roles (e.g. Simanis, 2010; Anderson et al., 2010; Seelos and Mair, 2007). Chataway et al. (2014) argue that this kind of inclusiveness requires adopting a holistic approach towards innovation. This inclusive approach toward business, including terms such as *inclusive growth*, *inclusive capitalism*, *inclusive business model*, and *inclusive innovation*, refers to attempts to include previously neglected poor people so that they will have the opportunity to enjoy the benefits of the formal market mechanism and global economy and create commercial activities that also pursue broader socially goals (UNDP, 2008; WBCSD, 2013). The significance

of governments and institutions is also highlighted as they have a role to play in creating an enabling environment for inclusive growth. For companies inclusiveness means that they design market-based solutions which improve the quality of livelihoods of the poor. The value proposition is expanded to provide benefits not only to the individual customer, but also to the low-income communities at large by making the value chain more inclusive and just. This facilitates inclusive growth which means improvements in the social and economic wellbeing of communities that have previously structurally been denied access to resources, and opportunities. Inclusive growth can be viewed as a desired outcome of innovative initiatives that target individuals in disenfranchised sectors of society as well as, a characteristic of the processes in which such innovative initiatives occur (George et al., 2012). The concept of *inclusive innovation* refers to an active inclusion of previously marginalized people (Altenburg, 2009; Nijhof et al., 2002). Inclusivity may take different forms, such as ensuring that the problems to be addressed by innovation are relevant to the poor, that the innovations have a beneficial effect on the livelihoods of the poor, and that the poor are involved in the value chain as producers, employees and innovators and they have the capabilities to absorb innovations (e.g. Utz and Dahlman, 2007; Altenburg, 2009; Cozzens and Sutz, 2012). The local context determines the aspects of “newness”: an innovation which may not be new to the world but which reflects local circumstances is an important component of inclusive innovation (Kuznetsov and Sabel, 2011).

To conclude, the notion of inclusive business calls for additional focus on the way companies practice business. Creating affordable products and services is not sufficient; businesses are also expected to create social value.

2.2 BOP as a base for innovations

BOP is not only valued as a source for market opportunities but also as fertile ground for innovations. Prahalad (2006, 2011) in his latest writings, has emphasized the role of BOP as a source of developments. According to him many global firms are increasingly using the BOP markets as a laboratory for innovation. Prahalad believed that the lessons that companies learn in the BOP markets are the qualities that will serve them well in becoming globally competitive. He stated further that understanding and effectively participating in the BOP markets is essential for growth in most sectors. The absence of technological lock-in and the lack of strong legal frameworks to enforce specific socio-technical regimes might potentially lead the way to the development of a huge gamma of alternative technological paths.

In this view, the BOP environment is a fertile ground to test and experiment with new technologies. According to Hart and Christensen (2002) existing mainstream markets are the wrong place to look for the major new waves of growth. Instead BOP should be approached as a fertile ground for innovation and as a testing place. BOP is particularly an ideal learning environment for developing disruptive innovations – initially inferior products that provide a different value proposition over incumbent products. It has been hypothesized

that, once tested and validated, those experiments will be ready to invade developed markets with a disruptive effect (Hart and Christensen, 2002). The idea of reverse innovation is related to the same phenomenon; developing new products in and for emerging markets which can be introduced in developed markets later on (Immelt et al., 2009).

The whole discussion of developing inclusive businesses and innovating under resource-scarcity is still rather novel in the academic discussions and several new terms have been created to describe these innovations. In the previous BOP discourse, scholars and practitioners have made specific criteria that the BOP innovation should fulfill, for instance a “4As framework”; availability, affordability, acceptability and awareness (Anderson and Billou, 2007). In addition, set of basic needs which should guide product developments have been identified, such as the aspirational needs of consumers; envisioning product usage situations; serving multiple usage purposes; highlighting customization at the point of purchase (Viswanathan and Sridharan, 2012). What these have in common is the requirement for affordability and expected user-value. More recently, concepts such as “doing more with less”, “affordability-driven” or “resource-constrained innovations” have dominated the discussion. However, the BOP innovation and resource-constrained innovation cannot be treated as synonymous; the overall difference is that the former focuses mainly on the BOP segment while the latter goes beyond BOP; it is expected that increased environmental concerns, scarcity of resources and continuing financial distress in some developed economics will increase demand for resource-constrained innovations also in the industrialized economies. Table 1 below offers an overview of the varied innovation terms which are used referring to resource-poor BOP environments. In addition, it specifies their distinct characteristics and shows examples that are drawn from my own research.

Table 1. Different approaches to resource-constrained innovation (Source: my own elaboration based on Zeschky et al., 2014; Brem and Wolfram, 2014)

Concept	Definition	Special features	Example from own research	Previous studies
Frugal	A product, service or a solution that emerges despite financial, human, technological and other resource constraints, and where the final outcome is less pricey than competitive offerings (if available) and which meets the needs of those customers who otherwise remain unserved.	Fairly novel from both the technology and market perspectives; disruptive, reaching new customer groups. BOP or first-time consumers in underserved areas are at the center. Originally developed products or services for very specific applications, including entirely new value proposition. Existing technologies are employed.	Safaricom, M-Pesa Kilimo Salama M-Farm Nokia, Village Connection ABB mini-hydro Kudura mini-hydro	Bhatti, 2012 Zeschky, Widenmayer, and Gassmann 2011 Bound and Thornton, 2012 Simula, Hossain and Halme, 2015
Good-enough	Solutions that include functionalities and features designed to meet a range of resource constraints beyond capital constraints.	Adapted or re-engineered to fit the specific use requirements of the low-income market. Targeting BOP. Requires certain level of technological novelty and customer knowhow.	RVE-SOL, a community-operated mini-grid solution Nokia, Village Connection, ABB, mini-hydro	Gadiesh, Leung, and Vestring, 2007 Hang, Cheng, and Subramanian 2010
Reverse	Innovations that are first	Novel market rather than a	M-Pesa	Immelt, Go-

	adopted in emerging markets before being adopted in developed markets.	product concept; can be cost, frugal or good-enough innovations. BOP (or emerging market) as a source of innovation and original target group.	Ushahidi	vindarajan, and Trimble 2009 Govindarajan, and Trimble 2012 Govindarajan and Ramamurti, 2011
Jugaad, jua kali	A unique way of thinking and acting in response to challenges; gutsy art of spotting opportunities in the most adverse circumstances and resourcefully improvising solutions using simple means.	Made by the local people Radical changes in product; Engineering based on a new application of existing solutions.	Flexible, portable biogas digester, small-scale wind-turbine made of scrap	Bhatti, 201 Radjou et al., 2012 Daniels, 2010
Cost	Solutions that offer similar functionalities to Western products at lower costs.	Low technical and market novelty; novelty. Cost reductions are achieved by process innovations. BOP as consumers; expanding companies' market by tapping resource-constrained consumers.	<i>Not in this study, but example elsewhere</i> <i>Nokia- cell phones</i> <i>BYD - batteries</i>	Tiwari and Herstatt, 2012b Williamson, 2010
Grass-root	Innovative product or process created at the BOP (by the local people) usually due to necessity, hardship and challenges.	BOP as source of innovations, created by the BOP, motivation to reduce or eliminate drudgery Novelty for the specific markets; low-tech solutions created with the available resources. Bottom-up process.	<i>Not in this study, but example</i> <i>Load carrier for labourer</i>	Hilmi 2012 Gupta 1997, 2013
Inclusive	Market-driven development of something new in collaboration with low-income groups in order to achieve shared value.	Could be any of the above types of innovations. BOP target group and involved in the business model/value chain.	RVE-SOL, a community-operated mini-grid solution KAZI560, online job service for jobseekers and employers	George et a., 2012

Although, innovations presented in table 1 differ structurally from each other, researchers and practitioners often use these terms interchangeably as there is not yet a common understanding of the terms and the relations between the approaches (Brem and Wolfram, 2014; Zeschky et al., 2014). What all these terms have in common is that they emphasize that innovations spring from resource-limited contexts and that their purpose is to fulfill previously unmet needs. The greatest variation concerns the aspect of market and technological novelty, the sophistication of the development process and their BOP orientation whether BOP is considered a source of innovation or a target market or both. Hence, the BOP can include different types of innovations and some of them can even have market potential in the developed countries.

To summarize, while jugaad and grassroots innovations are accomplished more intuitively (e.g. without structured processes and approaches) giving preferential consideration to problem solutions in the direct environment (Gupta, 2014) frugal innovations have more elements of conscious product development, including the inherent knowledge transfer from developed to emerging markets (Brem and Wolfram, 2014). Their motivation still remains the same: solving local problems and adapting solutions to fit with the constraints. Cost and good-enough innovations have tailored functionality at a

lower-cost, usually by re-adapting or re-engineering existing products to fit the specific user-requirements of the low-income markets, but good-enough innovations are more novel technologies. Inclusive innovation refers to the inclusiveness in a broader sense and the outcome can be any of the above types of innovations.

Frugal innovation is seen as an integrating mechanism that brings these various concepts under one umbrella (Tiwari and Herstatt, 2012a). Simula et al. (2015) define frugal innovation as a product, service or a solution that emerges despite financial, human, technological and other resource constraints, and where the final outcome is less pricey than competitive offerings (if available) and which meets the needs of those customers who otherwise remain unserved. The key characteristic of frugal innovations lies in their value propositions which allow for robust good quality, and their capability to cope with any given infrastructural difficulties while reducing the cost of ownership for the customer (Tiwari and Herstatt, 2012a). Thus, frugal innovations combine low-cost solutions, low-cost manufacturing and low-cost materials with design that focuses on basic functionality and minimal feature sets. In this context, the key words are resource scarcity, simplification, environmental sustainability and lean practices (Simula et al., 2015). “Doing more with less” is not only about lowering the cost of the product, it also need to be designed to operate in resource constrained context with good-enough functionalities. As Bhatti et al. (2013) suggest frugal innovation regardless of costs, aims to create value for underserved markets in a more holistic way. Zeschky et al. (2014) argue that as first-time customers in underserved areas are frequently at the center of innovation efforts, innovating requires firms to adopt new parameters to guide the innovation process.

The empirical cases in this thesis can be characterized as frugal, but including elements of good-enough and jugaad innovations. Cases in A article are frugal when it comes to their expected outcomes - to offer more affordable access to telecom networks and high quality electricity – but both of them are based on good-enough innovations as they employ existing technology for new purposes. In general, mobile innovations (cases in article B) emerge from the low-income market; they are classified as frugal innovations as they offer solutions for the previously unserved population at an affordable cost. In addition, they can be considered as reverse innovations. For example M-PESA and Ushahidi have expanded to developed markets as well. According to latest data, M-PESA is currently used in some East-European countries and Ushahidi has been employed in various natural conflicts as well as in the USA elections.

Cases in article C - biogas solution and small-scale wind-turbine - can be categorized as jugaad innovations: they were designed by ordinary local people. The starting point was the problem that needed to be solved (lack of affordable, clean energy) and the problem was approached in a creative way. The outcome was a simple product at a low-cost with high benefits, targeted at people at the BOP. It is worth mentioning that in the Swahili language the word *jua kali* (meaning hot sun) refers to the dynamic and efficient micro-entrepreneurs in the informal sector and their ‘can-do’-attitude (see for exam-

ple King, 1996; Daniels, 2010). These *jua kali* have similarities to the jugaad kind of behavior (Radjou et al., 2012; Kumar and Bhaduri, 2014). As I see it, these two Kenyan innovators in my study are lively examples of this entrepreneurial and creative “can-do”-attitude.

The empirical case in article D is a good example of inclusive innovation because one of its essential elements is the engagement of BOP to manage the business venture. When it comes to technological solutions, the case has elements of good-enough innovation as it was re-engineered to fit with the specific requirements of the BOP market, such as simple to use, durable in harsh conditions.

2.3 Scarce resources

In this section, I hope to illustrate what a low-income market as a resource-constrained innovation environment mean in practice. I will analyze scarcity of resources both in the external business environment and internally within organizations.

2.3.1 External constraints

Emerging and developing economies are characterized by high levels of uncertainty in the business environment (Choi et al., 2010) which means that business development can include more complexity and surprising factors than in developed markets. BOP is seen as resource constrained environment; an ‘*environment that provides new challenges without providing additional new resources*’ (Baker and Nelson, 2005). BOP markets can even be considered to be an extremely harsh environment due to the lack of basic facilities such as infrastructure, literacy, access to literacy, medical care, retail chains, communication networks, transportation, housing, and sanitation. Further, several important strategic resources may not be available or tradable in markets, such as trained labour force, raw materials or financial capital (Bhatti, 2012). This resource scarcity context makes it difficult if not impossible to acquire relevant and valuable resources.

BOP markets are also described as subsistence marketplaces where both sellers and buyers live in a subsistence environment and produce and buy only little more than what is necessary to survive (Viswanathan et al., 2010). These markets are characterized by having “institutional voids” (i.e. imperfect markets) and institutional uncertainty (i.e. changing rules). By “institutional voids” I refer to imperfections in the market mechanism as a result of which formal institutions do not support economic activity strongly enough, as appropriate market supporting institutions are lacking. In terms of policy and institutional uncertainty, it means that the institutional rules governing businesses may change in ways that businesses themselves cannot predict (Henisz, 2000). Formal institutions have low enforceability of formal laws and regulations and might be lacking critical elements, such as property rights, favorable tax structures, and bankruptcy laws that safeguard investments (Khanna et al., 2005; Viswanathan et al., 2010). Institutional voids also prevent the develop-

ment of supporting industries, such as finance or distribution (Rivera-Santos and Rufin, 2010; Wheeler et al., 2005).

In contrast to the formal market mechanism, values and traditions, societal norms and social relationships are substitute for the lack of formal regulative institutions (e.g. London et al., 2014;) This affects the business operations in various ways. For instance individuals purchase goods and services from subsistence-oriented microenterprises that not formally registered with the government. People are both producers of products and services and consumers of other micro-entrepreneurs (Viswanathan et al., 2010). The scarcity of financial capital means that low-income populations may not have access to credit, neither as consumers or entrepreneurs; instead the poor are forced to rely on informal lenders who charge extremely high interest rates or from their social networks. People are members of densely networked social and kinship communities such as community-organizations, religious groups, tribes or families (Viswanathan et al., 2008). These social networks serve as platforms from which people draw resources. These kind of partnerships are stronger within the community than between communities and compensate for institutional gaps and substitute for missing market actors (Rivera-Santos et al., 2012).

What do these specific subsistence market characteristics mean for companies? In general, foreign companies and those local companies that are only serving high-end markets might not be able to operate due to institutional weaknesses which are de facto in BOP markets. For them, successful business development in low-income markets means dealing with a different sociocultural, ecological and business environment (Prahalad, 2011; Rivera-Santos and Rufin, 2010; London et al., 2010). The absence of many important market players (such as market research agencies, suppliers, lenders of facilities) might require that foreign companies create new markets rather than enter into an existing one and compete against other competitors (Seelos and Mair, 2007). Perhaps business development has to start from zero as Dahan et al. (2010, p. 339) state [companies] “must move beyond their core offering and commit to organizing a wider array of activities if they are to provide an integrated bundle of products and services successfully, either by internalizing these additional activities or by coordinating with external partners such as NGOs”. Due to the harsh environment and other constraints companies might face several failures in their innovation process (Hanson and Powell, 2006) or even decide to retreat from BOP and focus more on the middle and upper income segments of the developing world (Anderson and Billou, 2007).

Nevertheless, local companies serving the BOP are more accustomed to operating under these resource-limited conditions. They are familiar with the local context and adapted to working around institutional voids. They are able to identify customer needs and latent demands and create solutions which fit the local context (Hang et al., 2010). These traits are also illustrated in my own research. For example, all the mobile sector companies admitted that they did not have any difficulties relating to generating new ideas (article B). According to previous studies, local companies are more adept at reaching the “last-mile” in such distinctive operating environments (Chataway et al., 2014). For in-

stance, setting up door-to-door sales agent networks in isolated communities is reported to be a common way to reach those customers who are restricted from travelling to marketplaces (McKague and Tinsley, 2012). This kind of arrangement also generate sustainable sources of income and can have beneficial spillover effects, such as increasing numeracy and business skills, of the uneducated people (ibid). Sincovics et al. (2014) capture this well by saying that for local companies social value creation is an organic part of business formation and business model design, hence they do not need to create any specific “social mission” compared to foreign companies.

Where innovations are concerned, it seems that local entrepreneurs are mainly engaged in minor, incremental innovations with a weak science base (Chataway et al., 2014). This might be a result of the kind of local challenges innovators face. Lim et al. (2013) call this as a deficiency problem: they are lacking ‘in-house’ resources to generate innovation. Hence, they have to seek external resources. My own empirical data backs this claim. For example the biogas innovator (in article C) faced some difficulties developing suitable technology for the digester. To improve his own technical knowledge, he sought information from external sources, e.g. by interviewing people from universities, watching videos on *youtube*. This way he was able to come up with a suitable technical solution. Lim et al. (2013) also state that local innovators may find it difficult to interpret and test the feasibility of product performance. This observation is shared and reinforced by my own empirical findings. The wind-turbine innovator (article C) faced this challenge. He recalled that during the early years, as he did not have any proper production facilities, the first customers served as a test subjects and they reported to him on possible faults of the wind-turbine. Besides, these kinds of BOP context specific challenges, local entrepreneurs also face more common entrepreneurial barriers such as a lack of access to capital and support in business development.

2.3.2 Organizational factors

In the previous subchapter, I discussed the external contextual factors which prevail in BOP markets. When analyzing the BOP market characteristics companies might consider BOP markets to have too many risk factors and elements of uncertainty. The BOP market may be so unfamiliar that companies virtually have no information or knowledge of it beforehand, and consequently no any deep understanding of the possible opportunities it offers and how to exploit them. MNCs in particular often face significant knowledge gaps about BOP markets and lack critical pieces of information about the market as well as cultural norms and values which undermines their operations (e.g. London and Hart, 2004). The standard practice that serves companies well in in relatively stable business environment - to lay out a vision of future events and make cash-flow analysis - is not workable in BOP context. These kinds of approaches do not take into account the type and extent of resources used in business development; their focus is more on the returns from the financial costs of development. Projects are evaluated on the basis of returns on invest-

ments and profit margins and successful projects are those that exceed the firm's expectations.

Business development targeting the BOP differs significantly from these conventional approaches. Market entries at the BOP require long-term commitments to engage in partnerships with local communities (Vanhani and Smith, 2008; Ansari et al., 2012). Previous studies indicate that businesses will be successful only if the needs of the local communities are considered and business initiatives aim to improve the living conditions of the poor (Schuster and Holtbrügge, 2014). Corporations might be skeptical and weigh carefully whether BOP markets are worth of pursuing, especially if it demands creating new technology and business models that have not been tested elsewhere (Halme et al., 2012). In such situations, inclusive business development might depend on individuals who act as intrapreneurs or innovators who are dedicated enough to further the innovation process using only whatever means are at hand and without the support of their organizations (Halme et al., 2012). However, these kinds of innovators in established companies might face difficulties acquiring resources for their early-stage innovations which are yet untested, unproven and lacking a clear business model and have a highly uncertain future cash-flow. Hence, innovators within organization tend to experience considerable constraints in accessing resources inside the organization. In other words, promoters of inclusive innovation may face severe resource scarcity within their own organization: shortage of time to perform the required tasks, lack of adequate financing, lack of access to expertise (Halme et al., 2012). Instead of focusing on the core activity (e.g. developing the solution), innovators in large organizations might need to use their energies to struggle against internal barriers to gain organizational resources for their early-stage, untested, unproven innovations and no certainty about markets (Kannan-Narasimhan, 2014). In other words, innovators are forced to act creatively.

Lombardo and Kvålshaugen (2014) define constraints as “limitations or restrictions for what can or cannot be done in the problem solving, and for what the final solution should fulfill”. Within the organization, constraints can be rules and regulations, standard operating procedures that are structured in the organization. They can become strongly embedded in organizational routines, rituals and practices that define organizational life, irrespective of their efficiency or contribution (Meyer and Rowan, 1977). These constraints can limit what individuals can do in a given situation. In inclusive business development, short-time profit maximization, business unit based incentive structures and uncertainty avoidance, are considered to be major organizational barriers that inclusive business promoters face (Halme et al., 2012; Olsen and Boxenbaum, 2009).

2.4 Theoretical approaches to resource constraints

This chapter discusses the phenomenon of how entrepreneurs innovate within resource scarce contexts at the BOP from the perspective of companies' resources and capabilities. I approach this by discussing what it means to learn to innovate within constraints and develop innovations which are driven by the motivation to use minimal resources and are affordable for broader market. As resources and tactics how entrepreneurs interact with the environment is discussed throughout my thesis, I begin this chapter by briefly presenting resource theories -- Resource dependency theory (RDT) -- which highlights the interaction between companies and their environment - and Resource-based view (RBV) -- which emphasize that companies should develop their internal capabilities and resources. While recognizing the importance of these theories in strategic management literature, in this research they are only used to illustrate how they have been attempted to be used in previous BOP studies

2.4.1 Resource dependency theory

Resource dependency (RDT) was developed to explain how organizations can reduce environmental interdependence and uncertainties (Pfeffer and Salancik, 1978). BOP markets present severe resource constraints and uncertainty factors for companies. For instance, foreign companies might not possess knowledge of local condition, lack previous experience and existence in these specific markets, while local companies struggle with common entrepreneurial barriers, such as lack of financial resources while simultaneously developing solutions to utilize scarce resources efficiently and managing their way without trained labour force, or government support and assistance, despite exploitation by middlemen and lack of access to high quality material (Chowdhury, 2007; London et al., 2010; Dahan et al., 2010).

The basic assumption of RDT is that companies are not autonomous in their actions, but are rather dependent on resources of the external environment. Pfeffer and Salancik (2003) state that companies "are constrained and affected by their environments and that they act to attempt to manage resource dependencies". These environmental constraints are considered the fundamental that drive companies to use different strategies to reduce resource dependencies and thus securing their organizational survival. As companies do not completely control all necessary resources, they must interact with the environment if they aspire to survive (Pfeffer and Salancik, 2003). The dominant strategies of reducing dependency, are acquiring resources from external actors (e.g. by mergers and acquisitions) or increasing the required resources internally (e.g. forward/backward integration and recruiting) (Hillman et al., 2009).

These strategies may not be well-suited in BOP context as the formal market institutions do not function properly and companies find it difficult to find suitable acquisitions. In fact, I also witnessed this in my study. The wind-turbine entrepreneur (case in article C) told me that the American corporation GE had approached him and expressed their interest in buying his company.

This shows that even big MNCs that are interested in BOP markets, realize that market penetration occurs slowly and with small steps.

The imperfect market mechanism in the BOP markets, means that companies, besides taking care of their core activities, need to commit themselves to organizing various kinds of business related activities which have elements of market creation, for instance through creating demand for the services, building infrastructure for distribution, being the pioneers in changing building legislation (see Anderson et al., 2010; Simanis, 2010; Pitta et al., 2008). Companies might not have adequate or appropriate resources to carry out these activities by themselves. Interaction and co-operation between the company and the environment is intensive, profound and takes different forms. Therefore, they need to apply different tactics to deal with resource dependency. Previous BOP studies have highlighted that companies need to engage with BOP and involve them in the business development (London and Hart, 2004, 2011). This engagement takes various forms, such as understanding the value of BOP people as social resources and integrating them into the business activities as co-creators, employees, distributors, entrepreneurs (Vermeulen et al. 2008).

Previous studies emphasize that particularly foreign companies who lack the social capital and trust necessary for operating directly among the BOP people, are encouraged to establish co-operation with local players who operate at the “grass-roots”, such as NGOs, or community co-operatives (e.g. Austin et al., 2007; Rufin and Rivera-Santos, 2011; London et al., 2010; Dahan et al., 2010). Examples of partnership arrangements have been documented in previous BOP studies, for example Hindustan Unilever’s Project Shakti in India (Prahalad, 2005) and Lafarge’s housing project in Sumatra, Indonesia (Perrot, 2013). Companies can also invest in building local capacity and improve the conditions of low-income markets for instance by investing in various points in the value chain (Schuster and Holtbrügge, 2014; Vermeulen et al., 2008; Reficco and Márquez, 2012). This not only increases the resource-scarce consumers’ ability to consume but also make the market mechanism work more efficiently. The above mentioned strategies are aimed to reduce the resource dependency.

2.4.2 Resource-based view

While, RDT focuses on ways of acquiring external resources to reduce resource dependency, the resource-based view (RBV) of firms seeks to explain how organizations develop and maintain competitive advantage using firm-specific resources and capabilities. RBV assumes that performance differences between firms are due to different firm specific resources and capabilities that cannot be easily imitated or substituted (Amit and Schoemaker, 1993; Barney, 1991). According to RBV firms do not compete in developing new products, but rather in the capacity to develop new products (Prahalad and Hamel, 1990). Firms are characterized as a collection of resources and capabilities, rather than a set of product market positions (Wernerfelt, 1984). Also exogenous factors in the business environment, such as market dynamism, have

been noticed to influence on what kind of resources may be valuable (Barney, 2001). Particularly for foreign companies exogenous factors of the BOP markets might mean that they do not possess the appropriate internal resource base to carry out all the necessary business development activities, hence they need to review their current resources and capabilities in order to succeed in this unfamiliar business environment.

Some scholars (for instance Teece et al., 1990; Aragón-Correa and Sharma, 2003) have integrated perspectives of dynamic capabilities and RBV. Dynamic capabilities are understood as companies' ability to create innovative responses to a changing business environment (Teece et al., 1997). These capabilities are reflected in organizational routines, decision-making processes and organizational structures which might hinder creativity or openness for new ideas. Dynamic capabilities can be seen valuable if and when companies are becoming interested in BOP markets. New capabilities are required, for instance, for identifying and absorbing key pieces of nontechnical knowledge, co-operating with informal vendors in the subsistence marketplace, engaging with BOP. For instance, building partnerships can be an integral component of business models which allows resources creation and acquisition (Seelos and Mair, 2007; Schuster and Holtbrügge, 2014; Ruffin and Rivera-Santos, 2013), hence renewing dynamic capabilities also means that companies need to develop their capabilities to interact with various local partners and stakeholders. Tashman and Marano (2010) state that companies should to create routines for successfully identifying and engaging stakeholders by working with them and cultivating new skills among these traditionally overlooked stakeholders and embrace experimentation. However, changing organizational routines, creating structures that would allow more flexibility might be problematic due to prevailing organizational barriers (Olsen and Boxenbaum, 2009; Halme et al., 2012).

In the specific context of BOP Hart and London (2005) introduce the term "native capability" which according to them enable companies to develop fully contextualized solutions to real problems while respecting local culture. Hart and London (2005) see native capability as "the ability to create a web of trusted connections with a diversity of organizations and institutions, generate bottom up development, and understand, leverage, and build on the existing social infrastructure". Companies should learn how to become 'indigenous' to the places in which they operate. According to Hart and London (2005) companies' competitive advantage in BOP is based on deep understanding of and integration with the local environment, developing trust and social capital.

To summarize, according to the findings of previous BOP studies it seems that companies need to question their existing business models, and make managerial and technological innovation paramount (Tashman and Marano, 2010; Anderson et al., 2010). This suggests that companies should rethink their dynamic capabilities and improve their ability to operate under conditions of scarce resources.

2.4.3 Innovate within constraints

In the previous subchapters (2.3.1 and 2.3.2) I briefly presented how resource theories have been applied in the previous BOP studies. In this chapter I return back to discuss how resource scarcity is approached in the recent innovation studies. I begin this by asking can resource-constraints make organizations and individuals more innovative? According to some previous studies innovations can be developed despite or even because of resource constraints (Gibbert and Scranton, 2009; Gibbert et al., 2007). These research findings rely on assumptions that resource scarcity increases organizations entrepreneurial activity (Stevenson and Gumpert, 1985; Stevenson and Jarillo, 1986; Starr and MacMillan, 1990) by forcing them to create novel recombinations of already existing knowledge elements (Keupp and Gasmann, 2013). An entrepreneurial strategic orientation looks beyond the possible limits of currently available resources and assumes that resources can be recombined or found as opportunities develop (Bradley et al., 2010). Entrepreneurially acting individuals discover new knowledge or possibilities to recombine already existing knowledge in novel ways. This means that resource constraints can fuel innovations and lead to entrepreneurial approaches (i.e. Starr and MacMillan, 1990) as the innovators need to look for alternatives beyond "how things are normally done" and adopt a "resource parsimony"; deploying the least resources necessary to achieve the desired results (Gibbert et al., 2007). Individuals can learn to innovate *despite* the lack of "conventional" resources by using social, rather than purely economic transaction strategies (e.g. Starr and MacMillan 1990).

In the emerging low-income market context, constraints and scarce resources are taken as a de facto starting point for the innovation (e.g. Tashman and Marano, 2010; Cunha et al., 2014). By embracing scarcity rather than avoiding it, companies may take advantage of opportunities where competitors mainly see obstacles (Cunha et al., 2014). As the interest towards business opportunities in these markets increases, the concept of resource-constraint innovation has received more attention both in academic research and on the agenda of policy makers and companies (e.g. Pansera and Owen, 2015; Winterhalter et al., 2014; Cunha et al., 2014). Companies are now focusing their attention on creating their own ways to tackle with scarce resources and have high hopes of developing breakthrough innovations and business models (Schuster and Holtbrügge, 2014).

What does innovating "despite resource-constraints" mean in the BOP context? If companies adopt this new innovation paradigm, it would challenge them to rethink their whole process of business development and to apply a holistic model of innovation, not only focusing on technological functionalities but also considering for instance, workflows, delivery systems and business processes (Prahalad, 2011). Companies are recommended to unlearn some of the established business practices that are used in the advanced markets and adapt them to match the external challenges at the BOP market (Puri et al., 2015). Vadakkepat et al. (2015) argue that companies should increase their understanding of the market and the operational environment and identify

contextual constraints. BOP environments are typically resource scarce in terms of formal resources, but they are rich in social ties which are often undervalued from an economic perspective (Sridharan and Viswanathan 2008; Seelos and Mair, 2007). Similarly formal institutions tend to be weak, while informal institutions can be quite strong and relationships are grounded primarily on social, not legal contracts. Hence valuing the strict social and cultural norms also act as deterrents for the successful development of affordable products and services. Therefore, a high degree of embeddedness in the social context is required to understand the needs, wishes, mind-set, cultural preferences and infrastructural shortcomings of the community (Tiwari and Herstatt, 2012a). In addition, rather than looking to overcome limitations in the environment, strategies and tactics should be built on existing conditions and resources (Hart and London, 2005). This means that instead of concentrating on reducing resource dependencies, companies should see the constraints as the focus of the innovation process (Chandra and Neelankavil, 2008).

This actual innovation process occurs differently than the conventional model. Starting from resource-scarcity, the innovation process does not linearly follow the typical three-phases, R&D based, innovation process, i.e. front-end of innovation, new product or process development and commercialization. In principle, BOB innovation includes all these phases, but not in a linear order in which all the separated activities can be monitored and planned one at a time. Besides these activities a range of other duties need to be taken care of. Although the objective is develop solutions based on the (customer) needs, in reality constraints guide the process. Prahalad (2006) illustrates this by using the metaphor of an “*innovation sandbox*”. Prahalad argues that external constraints are utilized to build an innovation sandbox within which new products and business models can be created. Driven primarily by a resource-scarce environment, innovation in low-income markets attempt to cope with resource constraints while meeting the demand for lower priced products (Sharma and Iyer, 2012). The innovation process starts from scratch, from a “clean sheet”. It has elements of so-called frugal or jugaad engineering; its starts with the problem that needs to be solved, not with the product or technologies available to the companies (Brem and Wolfram, 2014; Govindarajan, 2012). Cost discipline is an intrinsic part of the process, but rather than simply cutting existing costs, frugal engineering seeks to avoid needless costs in the first place (Sehgal et al., 2010). This means affordability is a necessary but insufficient condition. The overall value proposition is seen to be the key to success, as Tiwari and Herstatt (2012a) put it the potential customer should not only possess the means to pay for the product, but also the willingness to spend his scarce resources on that particular product.

In the following section I will analyze how elements of scarce resources and a high level of uncertainty in business development are dealt with in creation theory and in bricolage.

3. Creation theory and bricolage in innovating under resource-scarcity

This thesis aims to shed light on means of innovating in conditions where entrepreneurs are operating under resource-scarcity. In the previous section I discussed how the contextual factors matter and the kind of scarcity companies have to deal with; in this section creation theory and bricolage are used as theoretical lenses to analyze the “behavior” of the actual innovators: Creation theory is used as a broader “umbrella” concept to describe the high uncertainty elements of business development and to gain a constructionist perspective on opportunity creation. Bricolage in turn explains the actual means of innovating and shows how innovators creatively bundle different resources and tactics for new purposes when creating inclusive businesses.

3.1 Constructing and creating opportunities

The basic assumption of creation theory is that opportunities do not exist until entrepreneurs act to create them. The same assumption suits the BOP context as well. In the following chapter, I will attempt to justify the use of creation theory to describe some of the processes that innovators undergo when developing inclusive businesses.

3.1.1 Origins of creation theory

Creation theory has not received much attention in the management studies as discovery theory has been the dominant one to explain opportunity formation (i.e. Murphy, 2011; Fiet, 2007). Creation theory can be considered as a theoretical alternative to discovery theory for explaining the actions that entrepreneurs take to form and exploit opportunities. However, unlike discovery theory, creation theory has yet to be articulated as a single coherent theory in the literature. For the time being, it remains a concept rather than a theory. The work of Alvarez and Barney (2007) and Alvarez, Barney and Young (2010) articulated the basic assumptions of creation theory. Creation theory includes aspects of constructionist (i.e. Gartner, 1985), evolutionary realists (i.e. Aldrich and Kenworthy, 1999), effectuation (Sarasvathy, 2001) and decision theories (Runde, 1988; Eisenhardt 1989a). The roots of creation theory can also be seen in the work of Joseph Schumpeter. Schumpeter’s (1934) “innovative” entrepreneurs are those that find new combinations of resources and create products that did not previously exist, rather than business operators that statically

seek rents through ordinary economic activities. This act of developing new combinations can be interpreted as the creation of new opportunities (Buenstorf, 2007). In creation theory, entrepreneurs break away from established forms and face the challenge of creating new knowledge themselves (Aldrich and Ruef, 2006).

Creation theory is applied under conditions of high or “*Knightian uncertainty*”. Knightian uncertainty refers to a situation where decisions are undertaken with an uncertain outcome and without useful preexisting knowledge and information (Sarasvathy, 2001). Creation theory assumes that the end of an evolutionary enactment process cannot be known from the beginning. Seen from this perspective, future opportunities may be unrelated to currently available information (Sine et al., 2005), and extensive new knowledge and information may have to be created, *de novo* (Schoonhoven et al., 1990). In this setting, neither the possible outcomes associated with forming and exploiting an entrepreneurial opportunity, nor the probability of those outcomes, can be known *ex ante*. This informational condition is similar to the definition of uncertainty originally proposed by Frank Knight (1921) who made a distinction between risk and uncertainty; a random variable is risky if its probability distribution is known, uncertain if its distribution is unknown, (see more Nishimura and Ozaki, 2004; Runde, 1988). Practically this means that if a new opportunity is uncertain and hard to evaluate, the decision-maker would unlikely undertake it.

Creation theory is grounded in constructionist approach. Opportunities are understood to be social constructions that do not exist independently of entrepreneur’s perceptions. Basically, the creation theory approach argues that entrepreneurial opportunities are created by the entrepreneurs’ own action (Alvarez and Barney, 2005, 2007). Opportunities are not assumed to be objective phenomena; instead they are created endogenously by the actions, reactions and enactment of entrepreneurs exploring ways to produce new products or services. Instead of “searching” for opportunities, entrepreneurs act (Alvarez and Barney, 2005). Opportunities are not assumed to be objective phenomena; instead, they are created endogenously by the actions, reactions and enactment of entrepreneurs exploring ways to produce new products or services. Instead of ‘searching’ for opportunities, entrepreneurs act (Alvarez and Barney, 2005). Creation-related search appears to be more deliberate, induced, cumulative, and elaborate than discovery-related search. One reason for this is that it is necessary to address a myriad of technological and business issues before opportunities become visible. Since solutions to these problems are of a satisficing nature, search processes are likely to persist and unfold in unforeseen ways (Zahra, 2008). Entrepreneurs’ own action is a key source for opportunities. By acting, they create opportunities that could not have been known without the actions taken by these entrepreneurs. Acting requires sensing, developing, evaluating, and reframing opportunities (O’Connor and Rice, 2001). Idea recognition is simply the beginning of a cycle of activities that gives technological, business, and strategic meaning to the idea. Opportunity creation will often be a messy, non-linear process (Sarasvathy, 2001).

3.1.2 Creation theory in the context of inclusive business development

In this study, creation theory is used as theoretical lens to examine the risky and uncertain factors of inclusive business development. Inclusive business models are still unusual for foreign companies and for those emerging market local companies that serve the top-end markets; the market environment is unfamiliar, target group unknown, knowledge of local needs and resources lacking (i.e. UNDP 2010;). This means that companies cannot succeed by replicating current business models; instead, they need to create new ones that are not too disruptive of the lifestyles of the local people (Prahalad and Hart, 2002; Sánchez and Ricart, 2010). Elements of high uncertainty prevail in the inclusive business development. In this section, I explore in detail how engagement, strategy formation and decision making unfold in contexts riddled with high uncertainty.

Engagement with the environment – dialogue, acting and learning

Creation theory is grounded on the constructionist view that any resources such as information, natural resources, technologies and knowledge are subject to interpretation. Entrepreneurs start “where they are and with what they have” (e.g. Baker and Nelson, 2005) and when acting to exploit opportunities they interact with their environment, which can be the market, consumers, suppliers. Although entrepreneurs might have hypotheses about how the market will react to their efforts, they cannot see or predict the “end from the beginning” (Alvarez and Barney, 2005). The interaction shapes the process and outcome. This interaction allows entrepreneurs to test their perceptions. Based on their observation on how consumers and markets respond to their action, entrepreneurs act: they might learn that their original beliefs about the nature and scope of what they thought were opportunities were not justified (ibid). Entrepreneurs might then be forced to develop new beliefs about opportunities that build on what they have learned. This process of observing, evaluating, learning and reacting can occur several times. It might even lead to a situation in which the entrepreneur abandons the entire process.

In other words, under uncertain conditions where creation theory applies, a key element is the entrepreneur’s own action; this applies to all elements of business development from acquiring knowledge, decision making to strategic choices. Creation theory argues that business developers cannot rely on traditional risk-based data collection and analysis. There might not be any current or historical information that is available or useful in describing the nature of an opportunity. The same conditions apply to the BOP. Previous BOP studies have highlighted that is not enough that companies conduct research to examine local practices when identifying needs: they must engage in close dialogue with BOP communities to gain insights on the culture and to acquire local knowledge (Ansari et al., 2012; Calton et al., 2013). Instead of finding fortune at the BOP, fortune must be created with the BOP (London and Hart, 2011). Co-creation with communities and local partners is seen as imperative part of the inclusive business development process (Schuster and Holtbrügge, 2012; Calton et al., 2013; Reficco and Márquez, 2012). Particularly for foreign com-

panies, partnering with local actors, such as NGOs helps them to acquire localized knowledge, gain expertise in stakeholder management and obtain access to new markets and sources of innovation as they adapt to highly uncertain conditions and resource constraints (Webb et al., 2010; Prahalad and Hart, 2002; Schuster and Holtbrügge, 2014). By forming partnerships, companies can access the resources needed to overcome their own weaknesses and reduce the risks resulting from formal institutional voids.

Similarly, in my own empirical studies, different types of partnerships were created. For example, Kilimo Salama, a weather based insurance mobile application for small-farmers (case in article B) was the outcome of a partnership arrangement between Swiss-based Syngenta Foundation, Kenya UAP Insurance, Kenyan Meteorological Department and Safaricom. Each of the partners had their role to play and could not have created that solution alone. Another example concerns the Kudura entrepreneur (case in article D). Being a foreign entrepreneur, he could not stay in the field constantly. He had found a local expert who became his close partner who helped him to keep in touch with community members and to absorb intimate knowledge of culture-specific issues.

Successful partnerships will arise from interactive processes of emergent, co-creative learning within a shared problem (Calton et al., 2013). Nevertheless, in spite of all efforts of engaging with dialogue, it might be difficult for companies to truly understand the preferences of the BOP people so the actual business development process might go through several iterations before it is deemed fit to be made available in the market (Puri et al., 2015). Creation theory calls this kind of iteration process as an enactment process which is a continuous process of observing, learning and acting.

Decision making and strategy under conditions of uncertainty

Wright et al. (2005) argue that strategy research should consider the extent to which theories and methodologies used to study strategy in mature, developed economies are suited to the context of emerging economies. They encourage researchers to challenge conventional theories and methods. Particularly when business development outcomes are unknown and the environment is uncertain, conventional strategies applying a set of analytic tools to predict the future and then choosing a clear strategic direction may not be applicable (Courtney et al., 1997). Where BOP markets are concerned, Schuster and Holtbrügge (2014) argue that uncertainties are so high that companies need a new way to think about strategy. In this thesis, I propose that creation theory might be worth considering.

Uncertainty demands a more flexible approach to situation analysis (Courtney et al., 1997) and creation theory recommends organizations to adopt a flexible strategy. Flexibility implies that reactions from the environment should be taken into account and that companies should be willing to change their strategical choices on the way. As Alvarez and Barney (2007) say, “the end cannot be known from the beginning”. Too much careful strategic planning might be harmful or even misleading. Rather than based on combining pre-existing information and knowledge, strategy should rely on asking the

right questions, designing new experiments, remaining flexible and learning. This means that companies should observe, learn, act and react, perhaps several times instead of writing specific, time-based strategic plans. Creation theory argues that strategic plans are only suggestive of the general direction to which entrepreneurs are likely to be heading. Reality might offer several unexpected developments for which companies need to be prepared for.

Creation theory points out several issues concerning decision-making strategies. Initially, it is similar to the context of BOP; the conditions can be so uncertain that at the time a decision is being made, decision makers cannot collect the information needed to anticipate either the possible outcomes associated with a decision nor the probability of those outcomes. Companies cannot collect (reliable) data or apply conventional analysis tools to make decisions about whether or not to exploit an opportunity. This means that at the point when the decision is made, the information required to know the possible outcomes associated with this decision, and their probability, does not yet exist. In principle, no matter how hard an entrepreneur works, all the information needed to turn the decision-making setting from uncertainty to risky one - where possible consequences of the decision can be evaluated - cannot be collected (Alvarez and Barney, 2007).

The same elements of uncertainty can be recognized in inclusive business development. Companies face external difficulties, such as lack of market structures and as they don't have previous experience, business development is often a time-consuming process fraught with more costs, risks and unpredictability than normal (Gradl and Knobloch, 2010). It is not enough that companies focus on business development; they also need to be involved in market creation (Simanis, 2010). Creating businesses in a market that does not yet exist involves understanding how to make decisions in the absence of pre-existent goals (Sarasvathy, 2001). These challenges were noted also in my empirical cases. For example, the innovator behind ABB's recalls (in article A) that the business development project was out of the ordinary in terms of the number of unknown variables, e.g. in not having a site or a clearly identified customer, and the necessary legislative changes not having been made yet (in the target country). Due to several high uncertainties, the corporation later decided to terminate the innovation process.

In situations of high uncertainty, conventional risk-based data collection and analysis cannot be applied. Therefore companies must make decisions in other ways, using more context-appropriate tools. As a result, decision making can be heuristic and based on inductive, iterative, incremental processes, with elements of effectuation. According to Sarasvathy (2001) effectuation processes are consistent with emergent strategy and include a selection of alternatives based on loss affordability, flexibility, and experimentation. In practice, it means that the entrepreneur creates the opportunity by experimenting and changing direction as new information becomes available. This kind of business development was also manifested in my empirical cases. In this specific case of Kudura (in article D) the entrepreneur could only make assumptions about how local people would use the mini-grid, for instance, he expected that

they would be willing to pay for having access to clean, purified water. After few months, it became obvious that people were not willing to pay for water (instead they continued to carry water from the nearby river and saved the money for something else). Based on actual user behavior, the entrepreneur was forced to make some changes and find other customers for the purified water.

Under conditions of uncertainty, another challenge is that it is not possible to effectively calculate the opportunity costs associated with actions ex-ante, only to gather data to evaluate the quality of decisions after they have been made. This means that the specific business an entrepreneur plans to pursue may change dramatically over time. Creation theory presents the concept of “acceptable losses”; entrepreneurs should judge the downside associated with engaging in entrepreneurial actions (Sarasvathy, 2001).

3.2 Bricolage as means of tackling resource scarcity

Inclusive business development usually requires that companies either try to increase the efficiency of the use of available resources or expand the resource base employed. In this thesis, bricolage is suggested as a response when operating under resource-scarcity. I argue that engaging in bricolage might be a crucial component in inclusive business development process. Therefore, I suggest that instead of seeing bricolage as an ad-hoc intuitive process it should be understood more as a strategic orientation.

This section provides an overview of previous research on bricolage. First I will introduce the origins of bricolage and illustrate it by contrasting archetypes of bricoleurs’ and engineers’ way of acting. This is followed by a presentation of the different elements of bricolage which are summarized in table 2, together with empirical evidence from my research data.

3.2.1 Origins of bricolage

The etymological foundation of bricolage comes from a traditional French expression which denotes craftspeople who creatively use materials left over from other projects to construct new artifacts. To fashion their bricolage projects, bricoleurs use only the tools and materials “at-hand” (Lévi-Strauss, 1966). Anthropologist Claude Lévi-Strauss used bricolage as a metaphor to contrast two parallel world views, the mythical and the scientific, as distinct but equal modes of thought. He illustrated these two world views by creating archetypes of the bricoleur and the engineer to exemplify the opposing behaviors. The bricoleur is someone who works more with his hands and this mode of construction is in direct contrast to the archetype of engineers who follow set procedures and have a list of specific tools to carry out their work. Lévi-Strauss explains that meaning-making bricoleurs (inversely to engineers) do not approach knowledge-production activities with concrete plans, methods, tools, or checklists of criterion. Rather, their processes are much more flexible, fluid, and open-ended. A meaning-making bricoleur is “adept at performing a large number of diverse tasks; but, unlike the engineer, he does not subordi-

nate each of them to the availability of raw materials and tools conceived and procured for the purpose of the project” (p. 17). For Lévi-Strauss, mythical meaning-making bricoleurs combine in their imagination with whatever knowledge tools they have in their repertoire (e.g. ritual, observation, social practices) and with whatever artifacts are available in their given context (i.e. discourses, institutions, and dominant knowledges) to meet diverse knowledge-production tasks. In contrast with the bricoleur, the ideal-typical ingénieur’s knowledge derives from general and institutionally legitimized laws. The ingénieur and his knowledge are abstract—detached and distant from a concrete problem. He knows the structural characteristics of things to which general rules can be applied, as well as the predetermined ways of using his resources. The ingénieur has received expert education within a well-defined field of knowledge, and, when confronted with a task beyond his expert knowledge, either develops the needed skills through training, or hands the task over to another, better qualified expert. Therefore, because of the differences in the knowledge base, bricoleurs’ and engineers’ way of solving problems differ dramatically; while the bricoleur departs from the situation at hand to build a structure that makes him/her able to solve the problem (how it can be tackled within the current conditions), engineers act as rational resource planners, i.e. they depart from a structure (knowledge of the situation and a diagnosis of necessary resources) and then apply it to the event (the resources necessary to deal with the situation). Naturally, in real life these archetypes are not so clear. Innovators and entrepreneurs can possess elements of both behaviors. In our research (in article A), both innovators were engineers, but partly due to the resource scarcity context, they exhibited bricoleur-type behavior.

Lévi-Strauss does not provide a clear definition of bricolage. Instead, he expresses and illustrates his ideas through frequent changes in perspectives, addressing the process of bricolage as well as the role of the bricoleur, and drawing on multiple comparisons of bricolage, craft, myth, play, and art. Originating in anthropology, the concept of bricolage has later been studied and conceptualized in various disciplines, for instance, in political sciences and decision-making (e.g. Carstensen, 2011), in information sciences (e.g. Ciborra, 1994) and in education (e.g. Hatton, 1988). In the organizational and management field, the concept of bricolage was imported by authors such as Karl Weick, Claudio Ciborra and Giovan Francesco Lanzara. In this field, bricolage has been studied in the context of innovation (e.g. Garud and Karnøe 2003), social psychology (e.g. Weick 1993) entrepreneurship (Baker et al., 2003; Baker and Nelson, 2005). Due to the rise of bricolage research, the concept has been empirically tested and redefined. Different types of bricolage have been recognized, such as social bricolage – *social networking activity and spontaneous collective action* -(Johannisson and Olaison, 2007; Di Domenctio et al. 2010), network bricolage - *pre-existing contact networks as means at hand* - (Baker et al., 2003), institutional bricolage – *actors inside an organization act as bricoleurs*- (Christiansen and Lounsbury, 2013), inventor bricolage - *the reallocation and recombination of existing scientific talent*- (Banerjee and

Campbell, 2009), and in our study (article A) of corporate innovators in resource scarce environments we identified intrapreneurial bricolage - *entrepreneurial activity within a large organization characterized by the creative bundling of scarce resources* (Halme et al., 2012). They all cover the same basic elements of bricolage: resources gathering, assimilation and recombination to produce something new and useful (out of nothing). However, as the research on bricolage has begun to flourish, new types of bricolage activities have been articulated which I discuss in more detailed manner in the following chapter.

Previous research has noted that firms may engage in bricolage out of necessity because they cannot afford the cost of more standard resources. Therefore, the process of “necessity-based” bricolage is satisficing in nature and it focuses on acceptable goals that can be realized with the resources at hand. In this process, the goal of such a firm might be cost minimization and they consequently settle for a satisficing level (Desa and Basu, 2013). Bricolage also tends to be used in critical situations or when individuals or organizations are facing unexpected circumstances or need to overcome a crisis requiring fast action. These situations demand maintaining both a coherence of identity and a capacity to act. In these situations people are compelled to use “the world, obtaining what they need, doing what they have to do” (Cunha et al., 1999; Weick, 1993).

While in some earlier studies bricolage was used with negative connotations (Ciborra, 1996), bricolage connections resulting in pioneering new capabilities are currently understood better. Desa and Basu (2012) call this kind of bricolage ideational since it is driven by the recognition of perceived advantages rather than by necessity. The current use of bricolage in innovation and entrepreneurial contexts refers to the creation of new products and new ventures with limited available resources (Baker and Nelson, 2005; Prahalad and Malshekar, 2010).

3.2.2 Constructs of bricolage

As noted in the previous chapter, since the initial writings of Lévi-Strauss (1966), understanding of bricolage has improved and several elements have been identified. In this chapter, I review certain elements. I will start this review with the work of Baker and Nelson (2005) whose writings are frequently referred to when discussing resource-scarcity environments and whose work is seen as an important step in developing the concept.

Baker et al.’s (2003) note on entrepreneurial firms has improved our understanding of bricolage. Entrepreneurial firms recombine and make creative use of existing resources, and share a capacity to mobilize practical knowledge in a way that challenges general theoretical approaches that specify a priori how resources should be utilized. Under resource-constrained environments, entrepreneurial activity relies on bricolage and on the rejection of institutional constraints (Baker and Nelson, 2005). They (2005) define bricolage as “making do by applying combinations of the resources at hand to new problems and opportunities”. According to them bricolage has three main aspects:

- Making do; a refusal to enact limitations
- Recombining resources for new purposes; using or reusing resources in ways other than those for which they were intended
- Seeking out and collecting resources for future purposes; monitoring constantly resources that can be acquired freely or cheaply

Baker and Nelson (2005) use the concept particularly to refer to entrepreneurs who seemingly create new ventures out of nothing and in so doing defy conventional assumptions about the role of the environment in determining the success or failure of their ventures. They emphasize that companies engaging in bricolage refuse to acknowledge limitations imposed by resource-constraints. Hence, their analysis extended the concept beyond making do to include refusal to enact limitations whereby “actors consciously and consistently tested conventional limitations” (Baker and Nelson, 2005, p. 335). Rather than enactment per se (Weick, 1995), Baker and Nelson (2005) specifically emphasized an entrepreneurial refusal to be constrained by resource limitations imposed by institutional and/or political settings. Thus, rather than refusing to enact, actors resist environmental constraints imposed upon them.

Duymedjian and RÜling (2010) have identified three elements which are paramount to understanding bricolage as presented in the original work of Lévi-Strauss. These elements are i) stock or repertoire: the bricoleur’s view of the resources used; ii) dialogue: the process of bricolage; and iii) outcome: the nature of its results. However, they propose that bricolage involves an ideal-typical configuration of acting (practice), knowing (epistemology) and an underlying world view (metaphysics). Based on the work of Duymedjian and RÜling (2010) and Baker et al. (2003) and the findings of my own empirical work, I have divided elements of bricolage as repertoire, tactics and mindset. These concepts are partly overlapping, but dividing them into different categories illustrates the broad and holistic meaning of the concept – including resources, action and mindset- and what it requires to apply bricolage into problem-solving.

In the following I explain in a more detailed manner how these elements are manifested in bricolage.

Acting - ‘Making do by the repertoire of means at hand’

Bricolage is a local, contextual, and sudden process which, as remarked by Ciborra (2002), cannot be thought of outside the specific situation where it appears. Bricolage can take many forms depending on the resources available at a given moment. These may not be the “optimal” resources. Bricolage starts with the constitution of a repertoire and finishes with the return of resources to the repertoire. Therefore, in practice, bricolage can be manifested in different ways, depending on the innovators’ repertoire of means at hand and the challenge or opportunity that presents itself. Repertoire refers to a “stock of resources” consisting of material and immaterial resources that are collected independently of any particular project or utilization.

For the bricoleur, elements belonging to the repertoire are perceived as independent entities and derive their characteristics from their potential for association: “they each represent a set of actual and possible relations; they are ‘operators’ but they can be used for any operation of the same type” (Lévi-Strauss 1966: 18). Knowing these materials intimately, bricoleurs are able to form the materials or insights into novel combinations (Weick, 1993). Besides possessing intimate knowledge of the elements that belong to their repertoire, bricoleurs must also be familiar with the context (Garud and Karnoe, 2003). Bricolage is about resource invention, requiring a “contingent, inductive and playful” approach to work (Kallinikos, 1998).

Dialogue – *the activity of assembling objects* – is a key part of the process by which the bricoleur utilizes his repertoire. Whenever the bricoleur engages in action, he conducts a “dialogue” with the elements in his repertoire or additional resources in his immediate environment. Dialogue starts from the moment when the bricoleur is confronted with an objective or a practical function to be fulfilled. According to Lévi-Strauss it always begins with an inventory of the repertoire in which the bricoleur turns back to an already existent set made up of tools and materials, to consider or reconsider, thus engaging in a dialogue with the repertoire’s elements. (Duymedjian and Rüling 2010; Lanzara and Patriotta, 2001). Bricoleur is not having a lonely dialogue with his own repertoire and it cannot be manifested in a vacuum. Repertoire and how it has been constituted over time, is closely tied to the bricoleur’s own knowledge. However, interaction with surrounding environment is vital when acquiring more resources. In this interaction, different kind of tactics can be used.

Dialogue also occurs within the organization, taking the form of interplay. While analyzing how bricolage is manifested within MNCs, (in article A) we noticed that the interplay between the organization and the innovator is central to innovation. Although the organization would not actively support the work of the innovators, its intolerance of intrapreneurial bricolage-type activity is likely to negatively affect the progress of innovation for inclusive business.

Tactics for mobilizing resources

In this study “tactics” refers to all those activities that bricoleurs use when interacting with the environment. Bricoleur-innovators are constantly reassessing and correcting their action, based on their observations of the environment. Business development in the BOP market context is not a linear process: scarce resources, institutional voids and other elements of uncertainty mean that outcomes cannot be predicted. In this context it is justifiable to state that tactics replace strategies: tactics are seen as the readiness to take advantage of unpredictable changes and the aspiration to have an impact on the process by trying to influence the key stakeholders. Selecting the right tactics is critical when acquiring external resources.

In previous studies of bricolage, as well as in my own empirical study, it is possible to recognize different tactics that the bricoleurs or so-called innovators are using. The following tactics – *improvisation, stakeholder mobilization, persuasion, social value creation, translation, using and creating new roles* – will be discussed here and concrete examples given from my own data.

The relationship between bricolage and improvisation has been under discussion and occasionally the terms are used as synonyms (Ciborra, 2002). In this thesis, improvisation is understood as one activity within bricolage. Improvisation refers to the ability to perform or provide something on the spur of the moment and to try things out by appealing to the relevant audience at the relevant time. It stresses the personal creativity, flexibility and expertise that are necessary for the improviser (Vera and Crossan, 2005). It allows a rapid degree of adaptation, which makes organizations better equipped to deal with a turbulent environment (Duymedjian and Riling 2010).

Di Domencio et al. (2010) conceptualize the new concept of social bricolage which also includes social value creation, stakeholder participation and persuasion. In general, these elements, particularly value creation and stakeholder participation, are essential in inclusive business development. Previous studies have emphasized how critically important NGOs, local and state governments and communities are to the development process (e.g. Prahalad and Hart, 2002; Ruffin and Rivera-Santos, 2013) while mutual value creation and aiming for a win-win situation is at the heart of inclusive business.

These elements were also witnessed in my study. Stakeholder (and community) participation can be an important part of the social enterprises' strategies and it was used to extend governance structures, to generate new contacts and link with key players. For instance, in article D, stakeholder participation was an essential part of the strategy. Engaging stakeholders extends and strengthens social relations and augments the legitimacy of inclusive business in the communities. The innovator-entrepreneur created community-operated governance around the business venture; he believed that the key to success was to create a sense of ownership among community members. In article C, both innovators engage community members to be part of their business models, for example as sales agents or technicians. In addition, the knowledge of the community elders was used when considering a good place to install the wind-turbine. In article A, the stakeholder mobilization occurred both externally and internally within the corporations. In both cases, the local authorities were included to give feedback to the process and to give the "green-light" to move on with project. Due to the resources constraints inside the corporations, it was also essential to negotiate with the key people in the case if they desired to have access to organizational resources. In article A, we also witness a new tactic for stakeholder mobilization - using and creating new roles. This means that in order to build new networks and influence key stakeholders, it might be beneficial to use roles outside the formal working environment. For instance, in the mini-hydro case, the innovator found the right contacts among his church members.

In addition, persuasive tactics can be used to acquire resources. The purpose is to convince stakeholders of the potential usefulness of resources and assets and of the business case for social value creation. It resembles lobbying and advocacy. In their study of social entrepreneurs Di Domencio et al. (2010) extended persuasion to include the negotiation and re-negotiation of the acquisition of resources.

My research supports this idea of persuasive tactics. In article A, we noticed that the middle-managers acting as innovator-bricoleurs within their corporations needed to persuade their own colleagues that the risk of inclusive business development was worth taking. In order to do so, they attempted to convey their own perception to them and verbally created a hypothetical world in which they highlighted the technical innovation and the societal role of the venture. They constantly promoted their innovation by giving proof of its potential success. The purpose was to persuade people within the organization to get behind the business development, to gain legitimacy and to acquire adequate (organizational) resources. We conceptualized this kind of behavior as translation. It has elements similar to persuasion as described by Di Domenico et al. (2010) and sensemaking (Cornelissen and Clarke, 2010).

In the context of my thesis - inclusive business development in resource poor settings - the element of social value creation (Di Domenico et al., 2010) is an essential part of bricolage. In fact, creating social value was a key motivator for the innovations in different empirical cases in my thesis. Particularly for the local innovators and entrepreneurs in articles B and C, developing a solution for 'everyday' needs was a strong incentive. Similarly, in articles A and D, where the promoters were foreign, the sense of giving back to society, the feeling of developing a solution for a poverty-related problem, was a strong driving force which kept the innovators moving on in spite of constraints and challenges.

Resourcefulness as a mindset

According to Duymedjian and Rüling (2010) Lévi-Strauss's bricoleur sees the world as a complex, interconnected system in which every element may affect all other elements. Ideas, words and living things, as well as inanimate objects, spaces, and places, are seen as belonging to the same world and being related to each other. For the bricoleur, this implies that everything matters and deserves respect and recognition. Individuals can engage in bricolage practices when they hold a particular kind of knowledge developed through a learning process that resonates with a particular world view. Cunha et al. (2003) argues that experienced people are more involved in bricolage than novices. They see the bricoleur as someone who links the past and future through a great awareness of what, when, why and how resources have been used before.

In my thesis, in articles A and C, it is suggested that bricolage requires a certain mindset. This implies that not everybody is capable of practicing bricolage particularly in the context of inclusive business development. In article A we call this a mindset of resourcefulness; the ability and readiness to identify and deploy sometimes unconventional means at hand, to address the problems the person considers relevant. This kind of mindset has similarities with the the "jugaad" attitude which refers to a mentality of resourcefulness, can-do attitude or doing more with less (Radjou et al., 2012). In article C, I extended the concept to "*possessing a social mindset combined with resourcefulness*".

Synopsis - elements of bricolage

Table 2 below summaries identified bricolage elements which are discussed in the chapter. Here, I also offer illustrative examples of bricolage based on my own empirical data.

Table 2. Elements of bricolage (Source: my own elaboration based on the work of Baker and Nelson, 2005; Halme et al.; 2012; Linna, 2013; Di Domencio et al, 2010 and Duymedjian and Ruling, 2010)

Elements of bricolage		Explanation	Illustrative example of bricolage in re-source scarcity in my own data
MINDSET	A refusal to be constrained by limitations	Efforts to test and/or counteract existing or conventional limitations imposed by institutional or political settings and the available resource environment	Organizational constraints of innovation for inclusive business (such as short-time profit maximization, business unit based incentive structures, uncertainty avoidance) (<i>Vilco and mini-hydro cases</i>) Lack of technical skills: no professional education (<i>biogas and wind-turbine cases</i>) Entrepreneurial barriers: lack of access to finance, no business support (<i>biogas and wind-turbine cases</i>)
	Resourcefulness as a mindset	The ability and readiness to identify and deploy sometimes unventional means at hand to address the problems that the person considers relevant	Social mindset: Motivation and willingness to address poverty-related problems through entrepreneurial means Recognizing previously unperceived solutions: using existing technology for new purposes (<i>Vilco case</i>) use of tent material for building light, portable solution, using old used car engines as generators (<i>wind-turbine case</i>) Persistence and determination: hampered few initiatives to terminate the project (<i>Vilco case</i>) Possessing "gadget" knowledge: awareness of the indigenous tacit and ability to utilize it (<i>wind-turbine and biogas cases</i>) Supplementing own technical knowledge when needed (for instance by contacting local universities to ask assistance with technical problems) (<i>wind-turbine and biogas cases</i>) and searching from youtube advice to solve technical issues (<i>case biogas</i>)
REPertoire	Utilizing means at hand and recombining resources for new purposes	Creating something from scratch, such as creating a new market or providing a new service that did not exist beforehand Creative bundling of scarce resources by using discarded, disused or unwanted resources for new purposes; and recognizing and valuing hidden or untapped local resources	Taking into use previously discarded technologies: originally Vilco technology was developed for other purposes and later disregarded Easily available physical materials, such as tent material, biowaste as a source of energy, fiber, used car engines, wind power (<i>wind-turbine and biogas cases</i>) Own private land was used as a "laboratory" and testing place (<i>Kudura case</i>) Non-material resources: use of "idle" labour force as sales-agents, own relatives as "test laboratories" Innovation pair, collective bricolage: complementing knowledge and skills, support (<i>Vilco and mini-hydro cases</i>) Network bricolage: utilizing pre-existing, own personal networks (family, relatives) for bootstrapping (<i>biogas case</i>) Applying existing technology for other uses: to adapt ABB's hydropower technology for a mini-hydro powerplant
	Own knowledge and experiences	Previous knowledge and experiences as a recollection which act as basis for "cobbling" resources together	Interest in science issues since childhood (<i>wind-turbine case</i>) Engineering education, professional expertise (<i>Vilco and mini-hydro cases</i>) Interest in "doing things with own hands" (<i>biogas case</i>) Familiarity with the environment and indigenous intimate knowledge of local cultural issues: e.g. approaching community elders, knowing the needs (<i>biogas and wind-turbine</i>

TACTICS	Intrapreneurship	Entrepreneurial activity within corporation	<i>cases)</i> Resist superior orders Work underground Working own spare time Willingness to risk own career (<i>Vilco and mini-hydro cases</i>)
	Creation of social value	Motivation to develop solutions for societal and poverty related problems	Willingness to develop affordable energy solution for the BOP (<i>mini-hydro, windturbine and biogas cases</i>) Determination to create needed solutions for own home-community (wind-turbine and biogas cases) Feeling of tackling with 'wicked problems' and developing solutions for poverty related problems (<i>Vilco, mini-hydro, Kudura cases</i>)
	Persuasion	Tactic to mobilize resources from external stakeholders	Seeking out for external funding (<i>Kudura, biogas cases</i>) Involving local legislators and governmental bodies to create more legitimacy for the solution (<i>mini-hydro and Vilco cases</i>)
	Translation	Convincing superiors and colleagues of the counter-intuitive inclusive business opportunity into justifications and language accepted in the organization	Having discussions with various levels at the organization and constantly promoting the venture (<i>Vilco case</i>)
	Dialogue	Interplay between the organization and innovator which is affected by how well organization tolerate bricolage types of activities Interaction with the resources in bricoleur's repertoire and in his close environment	Interplay between the organization and the innovator: (<i>mini-hydro and Vilco cases</i>) Interaction with local community and the innovator, such as respecting the role of village elders as gatekeepers, asking early-phase customers feedback for product improvement (<i>wind-turbine, biogas cases</i>)
	Improvisation	"Extemporaneous action" of trying things out by appealing to the relevant audience at the convenient time	"Learning by doing" and technical knowledge improves simultaneously (<i>biogas case</i>) Technical solution is tested by "trial and error" (<i>wind-turbine case</i>) Finding a new 'home' for the venture after strategical changes within the corporation (<i>Vilco case</i>)
	Using and creating new roles	Roles outside of the business sphere are utilized to mobilize resources for the venture creation	Using diverse roles in using private lives roles to influence key stakeholders (<i>mini-hydro case</i>)
	Stakeholder mobilization	Active involvement of stakeholders to generate support for venture	Hiring local researchers to map the needs for electricity and user expectations (<i>mini-hydro case</i>) Hiring local engineering company to find a suitable place for pilot project (<i>mini-hydro case</i>) Operators and telecommunication policy-makers in India, central government, regulators and administrators, members from UN, personnel from the Wireless Research Institute and from the Digital Divide programme (<i>Vilco case</i>) Active involvement in the creation of "BOP business" field in Finland to gain external legitimacy and to seek external funding (<i>Vilco and mini-hydro cases</i>) Involving local people in the business implementation, such as borabora drives as distributors (<i>biogas case</i>)

3.3 Conceptual framework

The above described key aspects of innovating under resource scarcity are summarized in the conceptual framework in Figure 3.

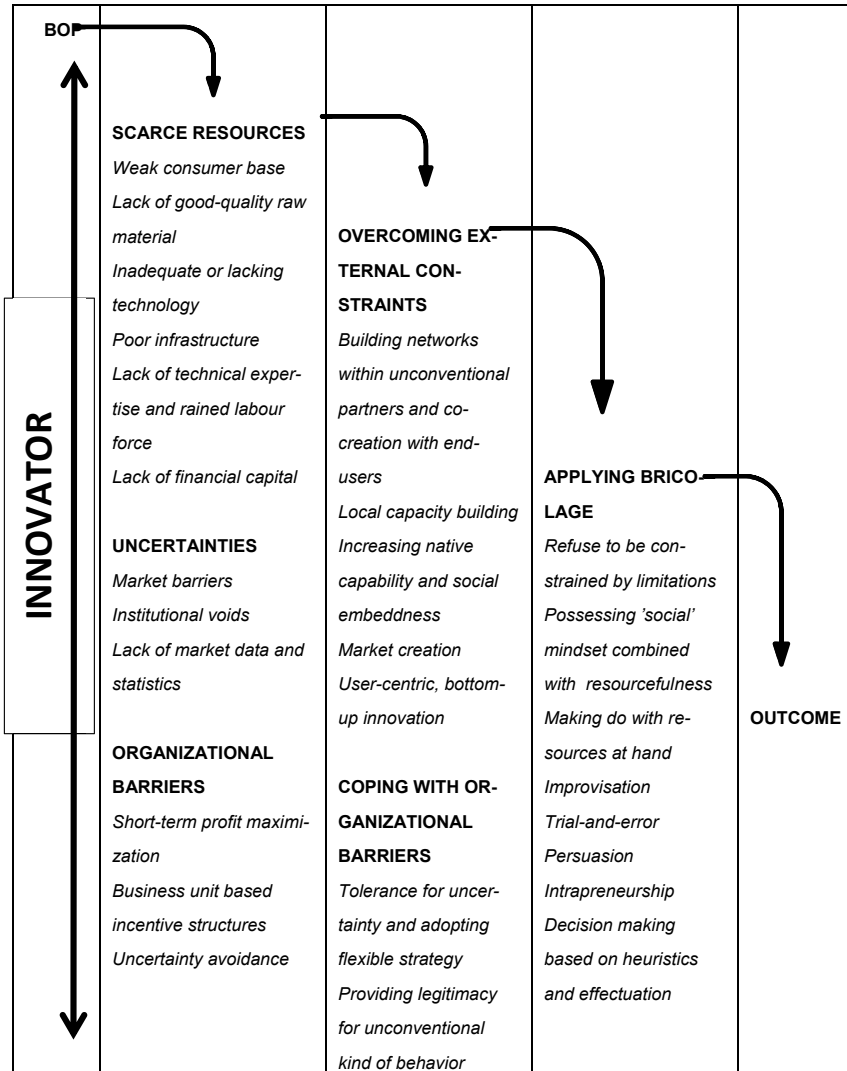


Figure 3. Conceptual framework

The framework above summarizes from the innovator’s perspective what does it take to innovate in and for the BOP and how to create opportunities. Bricolage is presented as a one potential tactic which innovators are applying when coping with scarce resources, uncertainties and confronting possible organizational barriers.

4. Methodological choices

Following the theoretical discussions and review of the previous literature, this chapter discusses my methodological choices. I will explain which methods were used and how empirical data was collected for each article. At the end I will examine the ontological and epistemological foundations of this study. However, in the beginning I want to discuss my own personal research journey because the BOP as a research context presents a number of peculiarities that warrant discussion.

4.1 Conducting research on BOP and inclusive businesses

My interest in the low-income market and societal inequality has a long history, as I stated in the preface. Somehow I feel that those earlier experiences prepared me for this PhD research. Officially, the writing path for the articles included in this dissertation began in October 2009. I started to write the first article together with my co-authors (Minna Halme and Sara Lindeman). I was particularly involved in collecting data from the Nokia case: interviewing employees and people who had been involved with that. Together with the co-authors we analyzed how the inclusive business development process was manifested in two MNCs, Nokia and ABB. Personally I did not spend any time “in the field”, but interpreting the data and listening to the stories of these two innovators gave me a mental image of how complicated inclusive business development can be. In this article A we created the concept of intrapreneurial bricolage to describe the behavior of these innovators.

During the fall of 2010 I had the opportunity to conduct my research in real BOP settings. I had chosen to study how innovating occurred in real-life business cases in Kenya. Kenya was chosen due to my pre-knowledge of that country. The ICT and mobile sector is particularly active there and M-PESA mobile money was presented as an example of so-called leapfrogging technology. So, I was eager to find what was actually happening on the ground and whether ICT was really changing the life of the marginalized people. I started my field research by focusing on how innovations took place in the field of ICT and mobile industry and what the puzzle was all about. The findings of this research are presented in article B. Nevertheless, quite soon, after walking for a few days under the hot sun (“*jua kali*”), I realized that actually there were plenty of interesting businesses and innovations at the grass-root level. I began to search for inclusive businesses and innovations created by local entrepreneurs

more systematically. It was like a snowball sampling; I visited several potential places and met people. I explained what my interest was. I ended up visiting several eye-opening places, such as UNIDO's Community Power Centres (CPCs, also known as energy kiosks'), Nyumba-Kumi (community-operated agri-business)-initiative in Kirinyaga County, Fablabs in Kisumu and Nairobi, innovation exhibitions organized by different players (Ministries and Universities), Center for Appropriate Technologies in Naivasha, solar-cooking initiatives of women's groups in slums. Now, reflecting on it afterwards, all these visits and informal discussions with various people gave me a broader picture of what was going on in the field and helped me obtain a holistic understanding of different kinds of innovations, and how they are adopted by the people and how local resources are used. When I came back to Finland (January 2011), I began to analyze my data and read through my field notes. I actually wrote a few papers on the topic (for example Linna, 2011), but I was not fully satisfied and I decided not to include them in my dissertation. At the time, I was still resubmitting article A together with my co-authors, so my knowledge of bricolage had since increased. I realized that I had met a few entrepreneurs in Kenya whose behavior exhibited entrepreneurial bricolage - making do by applying combinations of the resources at hand to new problems and opportunities" (Baker and Nelson 2005: 333). Hence, the basis for article C was ready and I began a second round of data gathering when I went back to Kenya during August 2011. I also followed up other cases that I had in my mind, for instance, an initiative of a Portuguese business man whom I had met the previous year. This entrepreneur was about to launch his pilot case in Sidonge, which is a small-community near the Ugandan border. He had created a containerized hub that provided potable water and clean energy for lighting, cooking and productive energy. It uses solar photovoltaic. I had the privilege to go and visit the place. I interviewed and talked to the people in the community, including village elders and paying customers. I visited the hut of an 80-year-old lady who had had light installed there. I realized that this business development case would supplement my dissertation so I began to collect data more systematically. The outcome of this data gathering is presented in article D.

Now, looking at my research process in retrospect, I am delighted that I found such suitable, even inspiring empirical cases. As a foreign person, I think it is essential to stay in the field enough long, to approach the general research objective from various angles, to meet as many people as possible and conduct site-visit whenever possible. As business development takes a long time and it is not a linear process, the data collection can be rather time-consuming process.

4.2 Case study as a research method

The empirical data of this thesis is based on eleven cases which are developed within resource scarce contexts at the BOP. Overall, this thesis is grounded on qualitative research methods. Qualitative research aims to gain an in-depth understanding of the studied phenomenon and desires to explain events by

using existing or emerging concepts (Yin, 2011). The aim of this dissertation is to examine the nascent phenomenon of how to innovate for and at the BOP. Terminologies' referring to BOP innovations are not yet coherent, nor is our understanding of how resource-scarcity affects innovation activities.

The research method chosen for this dissertation is case study. It is a research strategy which focuses on understanding the dynamics present within single settings. The case study aims to gain an in-depth understanding of the phenomena in question in a real-life setting. This doctoral thesis is an empirical inquiry that probes the phenomenon within its real-life context, investigating empirical research questions. This dissertation examines (the empirical research phenomenon of) ways of innovating in a resource-constrained environment. As the focus of this research is practical, a contemporary real-life problem, the same level of understanding of the phenomenon would not have been achieved through a purely theoretical approach. The case study methodology is appropriate for 'how' and 'why' types of research questions (Yin, 2003). The more precise research questions of this dissertation are: "How does resource-scarcity manifest itself in innovating at and for the BOP?" and "How do innovators create opportunities in resource-scarce contexts?"

Case study method is flexible, producing diverse research outcomes (Eisenhardt, 1989b), and supporting all types of philosophical paradigms. Case studies can be exploratory, descriptive or explanatory (Yin, 2003). They provide a rich description of social phenomena, generating knowledge of the particular within the interpretivist paradigm. They are also used for theory development purposes (Eisenhardt, 1989b) – in this thesis, the theoretical concepts of bricolage and creation are extended in new organizational context and geographical areas.

Case studies can involve either single or multiple cases, and numerous level of analysis (Yin, 2009). This thesis can be described as a multiple case-study. In multiple case studies each case is considered as a single entity representing the phenomenon but the cases need to have something in common (Stake, 2006). A multiple case-study approach allows for comparisons and a broader exploration of research questions and yields more robust and plausible results when compared to single case studies (Eisenhardt and Graebner, 2007). In this study, the purpose is to gain a deeper understanding of innovation for and at the BOP. This dissertation includes four articles which all are based on different case studies, so various methods of gathering and analyzing empirical data from different sources are used. In total this thesis includes 11 cases representing both foreign and local-based companies. By including several cases with different organizational backgrounds, I was able to recognize a variety of means of innovating that entrepreneurs apply within resource scarce contexts. The overall research process and key methodological choices are presented in table 3.

4.3 Methodologies

This study is based on exploratory research design. Exploratory research design is used when studying emerging topics (Yin, 2003). It offers flexibility when it comes to research design and data collection, yet proving the reliability and validity of the research. Due to the short history of academic research on BOP innovations, explorative research design fits with this dissertation as the aim is to deepen our understanding of the phenomenon.

Table 3 below summarizes the methodologies of each of the articles which are explained in a more detailed manner later in this chapter.

Table 3. Key methodological choices of the articles

Article	Method and choice of cases	Data gathering
Article A.	A comparative case study Industry: energy and mobile industry Entrepreneurial actors: two Western-based MNCs	Primary: Semi-structured and unstructured interviews, observations, e-mail correspondence with key informants, free-form discussions, and telephone conversations. In total 26 informants from both case companies. Secondary: Reviews of internal memos, press releases, articles in customer and in-house magazines and other archival data.
Article B.	Multiple-case study Industry: mobile/ICT Entrepreneurial actors: six Kenyan companies	Primary: sixteen semi-structured interviews Secondary: Organizations' websites, press releases and business publications, attending workshops organized by Kenyan technological and innovation players
Article C.	A comparative case study Industry: energy Entrepreneurial actors: two Kenyan innovator-entrepreneurs operating in the field of wind energy and biogas	Primary: 14 semi-structured interviews, informal discussions, observation Secondary: Companies' websites, press releases, newspaper articles and TV documents.
Article D.	A deep-single case study Industry: energy Entrepreneurial actors: a Western start-up	Primary: 15 semi-structured interviews, observation, and via email correspondence with key informants Secondary: Company's website, forms of social media, newspaper articles, and press releases.

4.3.1 Selecting cases

In qualitative research sample selection has a profound effect on the ultimate quality of the research (Coyne, 1987). For collecting data, I spent lot of time finding the appropriate cases and good informants. Qualitative research allows purpose sampling which was used in this study. Purposive sampling techniques involve selecting certain units or cases “based on a specific purpose rather than randomly” (Tashakkori and Teddlie, 2003.) Further, case studies are selected on the basis of an empirical phenomenon of interest, which is relatively new, interesting and/or unexplored.

In this dissertation, the empirical research phenomenon was the determinant factor and I applied criterion strategy by selecting cases based on their relevance to the research questions instead of their representativeness (Patton, 1990; Flick, 1998). The key criterion was to find suitable so-called “BOP innovation” and/or inclusive business development cases. The purpose was to analyze how different entrepreneurial actors develop these solutions; hence I wanted to have different kinds of market-based actors; from local entrepreneurs to MNCs. My aim in selecting different types of companies was to ac-

quire data of the research phenomenon; innovation to and at BOP. I did not know how many cases would be needed; it was more important to find what Patton (1990) calls “information-rich cases” from which it is possible to learn a great deal about the research phenomenon.

I ended up choosing two different industries; the energy and mobile industry. Having two different kinds of industries allowed me to compare possible similarities but also to learn from the experiences of different sectors. These specific industries were chosen because both industries are crucial to the development of livelihoods. The mobile industry has been the leading sector when it comes to developing BOP solutions (e.g. World Bank, 2010) and energy solutions, particularly solar energy-related products (e.g. Jolly et al., 2012; Palit, 2013) and mini-grid solutions (e.g. Mahama, 2012) have been designed targeting the specific needs of BOP.

The geographical focus was not a key determinant factor at the beginning of this doctoral research process. However, in the end, three articles focused on Africa, particularly in Kenya (due to practical reasons; I ended up spending a longer period of time there). The fourth article, which is co-authored, includes a case from Ethiopia and another one from India. In this research, the geographical area is seen as a resource-constrained environment which demands skills and competencies to overcome obstacles in the external environment but also occasionally within in the organization itself.

Article A contained two inclusive cases from MNCs from the telecom and energy industries: from Nokia and ABB. Both cases involved pioneering technological innovation directed to low-income markets, where no similar services existed previously. The telecom case is Nokia’s network solution for low-income rural markets, and the energy case is ABB’s mini-hydro power concept for low-income rural areas outside the electricity grid. Article B is based on a multiple-case study of six Kenyan telecom industry enterprises that target (also) the low-income sector in their business operations. In article C the two chosen companies represented local (developing country) players who had developed an affordable energy solution. Article D is a single case study of a foreign SME developing a community-based enterprise model around a mini-grid solution. The table below summarizes the research cases in each article.

Table 4. Description of innovations and origin of the ideas

Article	Innovation	Origin of the idea
Article A.	<p>ABB, <i>multinational corporation</i>: mini-hydro power concept for low-income rural areas outside the electricity grid. The technical design was based on standardized containerized (ABB) power plant modules.</p> <p>Nokia, <i>multinational corporation</i>: Village Connection solution which was designed to provide a cost-efficient addition to existing GSM networks (by PC coming a GSM switchboard) effectively extending coverage beyond the point at which a conventional network roll-out would be too expensive. It comprises village-level GSM access points (GAPs) and regional access centers (ACs). The link between the GAP and subscriber terminals is via GSM, while the link between the GAPs and ACs is via IP.</p>	<p>Idea emerged from the informal discussions of ABB sales manager and external consultant. Idea was presented to ABB.</p> <p>Initial idea (of small, simple base station and antenna solution to connect remote areas) came from Nokia’s Innovation Summit and it was selected for further development.</p>

Article B.	<p>Kilimo Salama, <i>a partnership arrangement between Swiss-based Syngenta Foundation, Kenya UAP Insurance, Kenyan Meteorological Department and Safaricom</i>: A weather-based insurance mobile-app for the farmers so that they can insure their farm inputs against drought and excess rain.</p> <p>M-farm, <i>Kenyan start-up</i>: developing mobile applications for farmers, for instance a service where they can check daily prices and an online marketplace for their products.</p> <p>Mobile Planet, <i>Kenyan SME</i>: A company developing mobile applications also for the BOP, for instance Biashara which allows customers to check market prices and sellers to receive orders. KAZI560, a job linking service for job seekers and employers where it is possible to advertise job and look for suitable candidates.</p> <p>Safaricom, <i>Kenyan MNE</i>: Producer of M-Pesa (mobile money) which is a mobile phone-based money transfer, and microfinancing service. It allows users to deposit money into an account stored on their cell phones, to send balances to other users, including sellers of goods and services, and to redeem deposits for regular money. M-PESA has boosted the development of mobile money and related services.</p> <p>Ushahidi, <i>Kenyan NGO</i>: free and open source software for information collection, visualization and interactive mapping (used for example during political attacks) mob application for the BOP.</p> <p>Virtual City, <i>Kenyan SME</i>: developing mobile services for different customer segments for BOP. Their particular customer focus is on small-scale farmers and improving logistics.</p>	<p>The initiative for the solution came from Syngenta Foundation which wanted to reduce the risks that small-scale farmers are having.</p> <p>The company itself was created as a result of a business plan competition as their application won a first prize. The founders were applying their own family-background, supplemented with ethnographic research as basis for innovation.</p> <p>Internal shared innovation process where the employees get together, share their ideas and develop them further together.</p> <p>M-PESA was developed together with Vodafone and Safaricom after they observed how people were sending airtime to their relatives and how this concept could also be used for money transfer.</p> <p>Started as "an ad hoc" process when a group of people started to map online reports of Kenyan post-election violence in 2008.</p> <p>The company was using rather formal ways of generating ideas. They also utilized "indigenous" knowledge.</p>
Article C.	<p>Wind-turbine, <i>local (Kenyan) innovator</i>: a small wind-turbine made out of "scratch" using purely locally available materials, such as fiber glass and old car motors.</p> <p>Biogas, <i>local (Kenyan) innovator</i>: a portable biogas digester which is made of tent material and closed by a zipper. It uses fuel generated from organic waste for cooking and source of electricity.</p>	<p>Based on the entrepreneur's experiences, knowledge of wind-energy, and interest in offering affordable energy for home-community.</p>
Article D.	<p>RVE-SOL, <i>a foreign small-entrepreneur</i>: Kudura, a community-operated mini-grid solution. It is an energy hub which provides solar energy for neighbourhood of 20 rural households, fertilizer plant and water purification system.</p>	<p>Idea came from the founder who felt that lack of access to energy is one of the major causes of poverty.</p>

4.3.2 Data gathering and analysis

All articles in this thesis are based on qualitative research. Interviews and observation were the main sources of data, but I also used various forms of secondary data, such as newspaper articles, writings in social media, press releases. In this thesis, the amount of cases varies in each article. Articles A and C have two empirical cases, article B six and article D one.

Data analysis refers making sense of, or interpreting the data (Miles and Huberman, 1984). It means examining case study data closely in order to find constructs, themes, and patterns that can be used to describe and explain the phenomenon being studied (Miles and Huberman, 1994). As is common in case studies, data analysis commenced already during the data collection

(Merriam, 1998). In the following I will describe in a more detailed manner the data gathering and analysis process of each of the articles.

Article A was co-authored with two other writers. The data gathering process had started before I joined the writing process. Personally I was involved in data collection during the fall of 2009 when we interviewed company representatives from both companies. Otherwise, the data collection had begun in mid-2007 and continued until the autumn of 2009. Data were gathered by means of semi-structured and unstructured interviews and through observation, e-mail correspondence with key informants, free-form discussions, telephone conversations, and reviews of internal memos, press releases, articles in customer and in-house magazines, and other archival data covering the innovation under study. In total 26 interviews were carried out.

In article B the research process was quite structured; it started deductively from pre-set aims and objectives and data collection was a rather linear process. The aim was to gain insight on whether local Kenyan mobile-industry companies considered the BOP a strategically important market segment, how they searched for ideas for innovations and what the biggest obstacles to business development were. The data included sixteen semi-structured interviews: four expert interviews, two with MNC representatives and ten with local company representatives or individual entrepreneurs. The interviews were conducted between November 2010 and January 2011 in Kenya. Secondary data was collected through organizations' websites, press releases and business publications. In addition, I attended several public workshops organized by the local Kenyan technological and innovation players during the last quarter of the year 2010. The analytical process was based on a priori reasoning: first, identifying and listing key themes based on the research objectives and then indexing transcripts with numerical codes, followed by rearranging and charting the data according to the thematic issues and lastly mapping and interpreting and finding associations to provide explanations to the findings.

For article C, primary data were gathered through fourteen semi-structured interviews which were completed with informal discussion with both enterprises' employees and customers. In addition, I did some participatory observation by visiting workshops, exhibitions where the innovators were presenting their products and discussed with potential clients and with other stakeholders. Secondary data were also gathered through documentary analysis (including companies' website, press releases, newspaper articles and TV documents). Data were gathered between autumn 2010 until end of 2011. The research applied an inductive approach: emerging from the raw data, the purpose was to identify themes relating to bricolage, such as how entrepreneurs make do with (scarce) resources at their hand, how they search for new resources, how they utilize networks. While analyzing the data, key themes were identified, a coding frame was developed and the transcripts were coded. During the data analysis, these two empirical cases were compared constantly with each other and against literature. Data were coded and different elements of bricolage were recognized as representing certain meanings. After finishing

the data analysis of both cases, “a cross-case synthesis” (Yin, 2003) was implemented to find similarities.

For article D, the data gathering process began during autumn 2010 and ended during the autumn 2013. During this period, primary data were gathered by interviewing the business founder and his local advisor several times through semi-structured interviews and informal talks. During my stay in Kenya, I visited Sidonge (where Kudura was piloted) quite soon after the launch in November 2011. During the visit participatory observation was done and informal talks held with the first customer, as well as semi-structured interviews with the community members and people selected to be ‘board members’. In total fifteen interviews were carried out. The data gathering was completed through e-mail correspondence with key informants (the founder and his local advisor) and the use of secondary data, such as the company’s website, forms of social media, few newspaper articles, and press releases.

Articles A, C and D applied inductive logic; the research started from an empirical-driven research focus and ended up extending existing theories (bricolage and creation theory). According Eisenhardt (1989b) the process of inductive theory using case studies is especially appropriate in rather new topic areas. The data analysis employed ground-theory approach. The purpose of grounded-theory is theory-building or elaborating existing theories (Strauss and Corbin, 1990). In article C the data collection and analysis phases proceed simultaneously during the three years of research process. The analysis was done by constantly comparing previous inclusive business development studies, evidence from my own data and theoretical concepts to identify common patterns and relationships. I was systematically categorizing the data and limiting theorizing until I recognized similar patterns of creation theory arising from the data, such as business development occurring under conditions of high levels of uncertainty, decision-making having elements of heuristics, and flexibility to make changes based on reactions from the environment being a central part of strategy. In article A data collection took place for two and a half years. In the beginning of the research process, the general focus was on inclusive business model development. However, as the research progressed, the focus was narrowed down to the role of the innovators as drivers of inclusive business development. When analyzing and coding the data, we saw the interplay between the innovators and organization become evident. We went back and forth between the data and the literature until the aggregate code ‘intrapreneurial bricolage’ was formulated. Similarly, in article D, as the research collection process lasted around three years, I was going back and forth between the theories and my empirical data. I was searching for a theoretical framework that would match my own observations in the field and the other documented inclusive business study cases. I recognized similarities with creation theory and therefore I began to analyze the data again. I recognized tentative themes emerging from the fieldwork and compared and contrasted them with the literature of creation theory. Consequently, I was analyzing is it possible to use creation theory theoretically to describe certain aspects of inclusive business development.

4.3.3 Trustworthiness of the study

To evaluate the validity and reliability of this research, I am employing Guba and Lincoln's (1981) model which is based on the identification of four aspects of trustworthiness that are relevant to both quantitative and qualitative studies: credibility, confirmability, dependability, and transferability.

Credibility as a truth value asks how congruent the findings are with reality. Triangulation is a powerful strategy for enhancing the quality of the research, particularly credibility. It is based on the idea of the convergence of multiple perspectives for mutual confirmation of data to ensure that all aspects of a phenomenon have been investigated (Knafl and Breitmayer, 1989). The triangulated data sources are assessed against one another to cross-check data and interpretation. This strategy of providing a number of different slices of data also minimizes distortion from a single data source or from a biased researcher.

In this thesis, to increase credibility, I used triangulation of data methods, by collecting data from various sources and comparing them. Each article is based on different data and, particularly, articles A, C and D are the result of a longer research process which allowed me to observe how the businesses had developed. I have used different sources, interviewed the key innovators a few times, as well as other company representatives (in all articles), clients and community people who are involved and target of the business (in article C and D) and various experts (in all articles). In addition, secondary data have been used, such as media reports, updates in social media. As the research field itself is still in its infancy, during the research process, I have been following closely the latest research findings and utilized them to better understand the research phenomena. In addition, each article was sent to the main respondents during the writing process.

Dependability concerns the consistency of the data; whether the findings would be consistent if the inquiry were replicated with the same subjects or in a similar context. To ensure dependability, all the interviews were recorded and transcribed by a third-party service provider. All articles also included a significant number of field notes which were written systematically during the data collection. In addition, in each article the research process, including data gathering, was described in a detailed manner. I also reflected on the challenges of conducting research at the BOP as a foreign person. The sources of secondary data, such as company websites and their presence in social media, was also made visible in the articles; this allows the readers to double-check how businesses in the selected cases operate.

Transferability refers to the external validity and is concerned with the extent to which the findings of one study can be applied to the other situations (Silverman, 1993). In general, case studies are considered to be rather poor in producing results that could directly be transferred to other contexts (Stake, 1995). This thesis has rich empirical data, but it is not possible to generalize based on these results. BOP-markets are often resource-scarce but it is always necessary to tailor solutions to fit with the specific local context. It is important to be critical when developing innovations for BOP. The attempt of this thesis

is to discuss how the prevalence of scarce resources at the BOP affects innovation and how bricolage-type behavior can be a way to cope with scarce resources. The findings increase understanding of the research phenomenon of innovating to and at the BOP.

Confirmability deals with the objectivity and neutrality of the study and the degree to which the findings are a function solely of the informants and conditions of the research and not of other biases, motivations, and perspectives (Guba and Lincoln, 1981). In this thesis, confirmability was ensured by data triangulation, by acquiring data from multiple sources and by applying more than one method to gathering data.

4.4 Constructivism approach to research

This study adopted a constructivism approach to research. The main theoretical concepts of this thesis - bricolage and creation theory - are rooted in constructivism and this thesis relies on the argument that opportunities at the BOP are created, i.e. constructed by the actions of individual actors. The research interest in this thesis is the analysis of how opportunities are created for and at the BOP, the focus being the actions of the innovators and how they create opportunities. The interaction with the environment is strongly present.

Constructivist epistemology, a theory of what knowledge is, was created as a response to the criticisms that emerged regarding positivist approaches to science and learning (Kukla, 2000). Rejecting the idea that there is one knowable truth, constructivist theorists believe that “knowledge is a process of actively interpreting and constructing individual knowledge representations” (Jonassen, 1991, p. 5). Constructionists argue that reality is a social product based on the social interactions of individuals and does not have an existence independent of individual perception. Individuals create or construct their own new understandings or knowledge through the interaction of what they already believe and the ideas, events, and activities with which they come into contact. Constructivists believe that knowledge is built, or constructed through experiences as opposed to discovered (von Glasersfeld, 1994). In other words, constructivists challenge the idea that knowledge exists freely in the world and can be obtained through objective measures, believing all information is subject to interpretation by the researcher or learner. The relationship between anything known and the mind of the knower are intertwined. Constructivism does not deny reality; rather, it denies that we can rationally know reality outside of our personal perspectives.

Each of the case studies of this thesis can be seen as a representation of individual construction and personal experience influencing innovation activities. In articles A and C, which we based on bricolage, the affiliation with constructivism is strong. As bricoleurs, constructivists are observers and learners observing reality; they are constructing their own knowledge individually and collectively, each learner has his own tool kit of concepts and skills with which he must construct knowledge to solve problems presented by the community (Davis, et al., 1990). Article D was based on creation theory which emphasized

the relationship with the environment: business development is influenced by the reactions of the customers (Alvarez and Barney, 2007). Article B gave evidence how personal experience can affect recognizing business opportunities. In general, based on the findings of these articles, it was possible to argue that learning is a major point of the business development (at the individual level); business developers/innovators make sense of new situations based on their existing understanding. Learning involves an active process in which learners construct meaning by linking new ideas with their existing knowledge (Naylor and Keogh, 1999).

My own research process also includes elements of constructivism, particularly in the aspects of my personal learning and how it reflected the data analysis. Therefore, I feel that these four individual articles in this thesis form a whole that enables the research to advance towards a greater understanding of the phenomenon both in practical terms and in theory building.

I was a co-author in the first article (article A) in which my contribution was more on the theoretical part and interviewing key respondents in Finland. This study increased my knowledge on the challenges that inclusive business developers might face. Bricolage was a suitable concept to explain how the innovators acted when faced with constraints.

Early findings of my own field research are shown in article B. This article is a strongly empirically-oriented paper that aims to deepen our understanding of how opportunities are identified and transformed into actual solutions. Personally, the most significant learning point for me was that these native enterprises are much more familiar with the BOP context and they do not need to put so much weight on identifying the needs or figuring out how to reach the BOP segment. Instead, the focus is more on developing technically and commercially workable solutions.

While collecting data for article B, I began collecting data for articles C and D. The time span of collecting data for these articles was longer, which allowed me to turn back to the literature and go back to data collection. Possessing deeper knowledge both on bricolage and the challenges of operating in a resource-poor environment, I noticed that similarly as in article A, it was justified to use bricolage once again to explain the behavior of the two Kenyan entrepreneur-innovators who had learnt to cope with scarce (external) resources (article C). For article D, although some elements of the business development resembled bricolage, I did not feel entitled to use the concept as part of the business development, particularly the technical solutions, was premeditated. Therefore, I went back to the literature and found the concept of creation theory more applicable.

5. Key findings and contribution of the articles

This dissertation studies innovation within resource scarce contexts. This thesis consists of four articles, which form Part 2. Each of the four articles examines the phenomenon from a different perspective. Article A analyses how innovating for inclusive business occurs within two MNCs. Article B focuses on six Kenyan companies operating at the mobile industry sector and discusses how they generate innovations targeting the BOP. Article C studies in detail how two Kenyan innovator-entrepreneurs use bricolage as a means of innovating. Article D considers creation theory as a tool for describing some of the elements of inclusive business development.

In the following these articles are introduced and their findings and contributions presented.

5.1 Article A.

Article A is a co-authored paper with Minna Halme and Sara Lindeman entitled “Innovation for inclusive business: Intrapreneurial Bricolage in Multinational Corporations”. The paper has been published in *Journal of Management Studies* (2012, 49: 4, p. 743-784).

5.1.1 Research focus

The motivation for this study was to take a closer look at the intra-organizational processes surrounding the innovation of inclusive business models within MNCs. Most BOP studies have concentrated on the external factors, events, and developments that influence the new business model instead of paying attention to intra-organizational events surrounding the development of an inclusive model or to individuals involved in the innovation process. However, the growth of inclusive business out of MNCs may be effectively hampered by obstacles met within the organizations themselves. This article examines these intra-organizational events and takes a closer look at the action of individual innovators included in the innovation processes.

In this study, data were gathered from two inclusive innovation cases from the telecom and energy industries, Nokia and ABB. The telecom case is Nokia’s network solution for low-income rural markets, and the energy case is ABB’s

mini-hydro power concept for low-income rural areas outside the electricity grid. These two cases allowed for a real-time empirical observation of innovation towards novel business models. In both cases we witnessed how dedicated middle-managers acted as innovators to promote their inclusive business development processes. When relating the empirical findings to the literature, the concepts of bricolage and intrapreneurship seemed the most adequate to describe and explain what we observed. In the article we introduced the concept of intrapreneurial bricolage –“*entrepreneurial activity within a large organization characterized by the creative bundling of scarce resources*”.

5.1.2 Findings

We found that MNCs' management frameworks, such as short-term profit maximization, business unit-based incentive structures and uncertainty avoidance, may turn into obstacles to inclusive business since the innovation process does not conform to these frameworks. In such a situation, dedicated middle-manager innovators may engage in bricolage and seek to make use of whatever scarce resources are available (e.g. substantial amounts of their free time, private life roles and networks, previously discarded technologies) in order to further the innovation process. These innovators not only bundle scarce resources; they do so without the support of their organizations, occasionally even working underground or against their superiors' explicit orders in order to push the innovation forward. They act like entrepreneurs within their organization. In an attempt to capture this phenomenon we introduced the concept of intrapreneurial bricolage and showed how it was manifested empirically in the inclusive innovation processes of two MNCs. However, it can be manifested in many different ways depending on the innovators' repertoires and the challenges and opportunities they encounter.

In the article we suggest that while intrapreneurial bricolage may be a fundamental component in the process of inclusive business development, it will not be enough on its own. The success of these efforts is dependent on the ability of the corporation to tolerate these types of out-of-ordinary activities.

5.1.3 Contribution

The theoretical contribution of the article was the introduction of the concept of intrapreneurial bricolage; entrepreneurial activity within a large organization characterized by the creative bundling of scarce resources. One of the key insights of this study was that bricolage is not only about resource integration but rather a particular way of addressing challenges and opportunities. In the article we suggest that bricolage activities might require a mindset of resourcefulness. When this mindset is combined with the innovator's ability to utilize the means at hand for practical solutions in an entrepreneurial fashion, the phenomenon of intrapreneurial bricolage becomes possible.

Another contribution this article makes to organization theory arises from the fact that bricolage was studied in a new organizational context (within large corporations), new bricolage activities were identified (translation and

creation of new roles and using roles), previous theoretical notions were used empirically (on collaborative bricoleurs) and finally, bricolage was linked with the emerging discussions on social intrapreneurship (how social intrapreneurs may act in an organizational environment that constraints their attempts to pursue social goals through business means).

The article has also some practical implications for managers who wish to support developing inclusive innovations. Lastly, our findings on intrapreneurial bricolage are not only restricted to these low-income market contexts, but can probably occur in other settings as well.

5.2 Article B.

Second article entitled “Base of the pyramid as a source of innovation: Experiences of companies in the Kenyan mobile sector” was a single authored paper and was published in *International Journal of Technology Management & Sustainable Development* (2012, 11:2, p. 113-137).

5.2.1 Research focus

The major motivation for this investigation was that little attention has been given to examining alternative models of developing innovations by local players from emerging countries (London, 2008). Although it is greatly emphasized that entrepreneurs may play a significant role in creating solutions for societal problems (Kandachar et al. 2009; Katzenstein and Chrispin 2011), literature offers little theoretical or practical guidelines for innovative product development in the BOP context (Viswanathan and Sridharan 2012). The article focuses on analyzing local (Kenyan) enterprises’ methods of designing socially beneficial market-based solutions for the low-end consumers. The objective was to examine if mobile innovations targeted the BOP are commercially viable. Furthermore, the article discusses how social needs are seen as basis for innovating.

The empirical data of this research is based on six Kenyan mobile industry enterprises which represent a range of start-ups, established and mature organizations.

5.2.2 Findings

The key findings of the paper were divided into three parts: i) alternatives for revenue streams, ii) challenges of serving the BOP, iii) methods of innovating mobile services for social needs.

According to the findings financially sustainable business modelling is seen as a challenge. It was acknowledge that these (socially oriented) mobile applications are not always profitable business for the enterprises. To compensate this companies have created various revenue models.

The nature of technology landscape and the rise of new mobile applications make the low-income market very competitive. For companies this means that they need to follow-up market reactions constantly and develop new services

based on the needs, competitors' offerings and also depending on how technologies are changing. For instance, since I have finished my data collection, M-Farm has expanded their services and are now providing online platform for the farmers to sell their products, Safaricom is considering setting up a proper financial institution around M-PESA, Kilimosalama has evolved from a project to a for profit company (Acre Africa), Ushahidi has expanded its outreach into developed countries as well.

The findings revealed that local enterprises are using various methods to stimulate ideas for innovation. It seems that generating ideas is not a challenge: personal experiences and possessing "grass-root-level knowledge" are significant sources for idea generation. In addition, enterprises are using simultaneously more "traditional" innovation tools, such as benchmarking, ethnographic observation. To develop the ideas further into actual businesses, different kind of social networks, hubs and partnerships between local entrepreneurs and bigger companies have been established. However, the distribution, (acquiring users), was seen time-consuming.

5.2.3 Contribution

The contribution of this study is mainly practical. By shedding light on the process of designing a commercially viable business model around social innovation, the findings of this study are expected to contribute to the ongoing discussion on how to support the development of social innovations. Currently, Kenyan mobile industry has been very vibrant in generating to generate new innovations, creating partnerships and developing tools for promoting technology-based start-ups' businesses. Foreign companies are interested in this ongoing techno-boom in East Africa and also working with local entrepreneurs to learn about the local needs. Although this (mobile) industry has its own characteristics, it is worth of considering how some of the good practices, such as hubs, idea competitions, MNCs and local companies co-operation can be transferred to other industries.

5.3 Article C.

Article C is a single authored paper entitled "Bricolage as a means of innovating in a resource-scarce environment: a study of innovator-entrepreneurs at the BOP". The article was published in *Journal of Developmental Entrepreneurship* (2013, 18:3, p.1-23).

5.3.1 Research focus

At the time, there were three major motivations for writing this article. Firstly, studying how innovating occurs in resource-poor environment was relatively unexplored research field. Secondly, the majority of the previous studies on BOP innovation had mainly concentrated on innovation models of MNCs from developed countries and hardly any light had been shed on alternative models of innovation designed by players from emerging markets (Ray and Ray,

2010). Thirdly, bricolage had not been so much studied in the context of developing country entrepreneurs.

The objective of the study was to gain insights how to design (financially viable) solutions for the low-income market. More particularly the focus was on analyzing the innovation process; how solutions are created from scratch into profitable business; including both the analysis of business model development and technical product development. The means of innovating were analyzed by using the concept of bricolage. Hence, the actual research question itself was how bricolage is used by developing country entrepreneurs to develop market-based innovations for the low-income people.

The study was based on two-Kenyan innovator-entrepreneurs who had developed low-cost renewable energy solutions. One innovator-entrepreneur had developed a flexible biogas digester that can turn waste into energy, and the other had designed small wind-turbines made out of locally available, mainly used materials such as fiber-glass and old car-engines.

5.3.2 Findings

This study identifies the use of three different types of bricolage: i) possessing “social mindset” combined with resourcefulness: *a certain worldview and willingness to tackle societal problems*, ii) making do with resources at hand: *easily available physical materials, non-material resources*, and iii) improvisation as a way of proceeding: *by creatively improving own technical know-how and solving problems as they emerged*.

Social value creation; to fulfill the needs - lack of access to clean and affordable energy - which they have experienced in the communities, was a key driver for these innovators to develop these low-cost energy solutions. Both of these innovators possessed resourcefulness as a mindset which allowed them increase their own technical knowledge, if needed during the technical development process. They also own “gadget knowledge” which I defined in the article as “combination of possessing indigenous knowledge and technical skills without a formal education”. Making do with resources at hand refers to the way how the innovators used locally available materials (e.g. tent material, bio waste, idle labour force, old car-engines) as raw materials for their technical solutions and local people became elements of the business model (e.g. sales agents, technicians). Improvisation as a way of proceeding refers how the product development resembles “trial-and-error” while simultaneously innovators’ own knowledge increased. For instance, the biogas innovator recalls that he needed to add an extra-cover for the digester as kids were otherwise jumping on it.

5.3.3 Contribution

Firstly, the findings of this article contribute to entrepreneurship and innovation management studies by exploring ways of innovating in resource-scarce environment. Entrepreneurial opportunities might not always be sought in a systematic way; rather the process can be about designing the needed solu-

tions for everyday problems that the innovators themselves have faced. Hence, the initial motivation for innovation can arise from own experiences at the communities.

Secondly, in this study, bricolage was empirically studied in a new context; a developing country and African context. This study highlighted that bricolage is not only about resource integration but also a specific mindset of resourcefulness combined with social orientation.

Thirdly, this study shed light on previously neglected area of research by providing insights how local entrepreneurs are innovating for the low-income market. This study is suggesting that local entrepreneurs might have some benefits compared to local companies, due to the fact that they are familiar with the context, responsive to local needs. However, as this study revealed local entrepreneurs might face some other resource-constraints, such as lack of technological expertise, professional skills and financial resources to expand their businesses.

Finally, this study also suggested that low-income economies, in general, should be understood as a “new generation” of innovation systems, which can be based on mobilizing local resources at the community level and trying to solve locally specified problems without outside assistance. Bricolage might offer one explanation how innovating occurs.

5.4 Article D.

Article D is a single authored paper entitled “Creation theory explaining inclusive business development: Case study of a community-operated business venture development in rural Africa. This paper was presented at the Africa Academy of Management (AFAM), 2016.

5.4.1 Research focus

Creation theory is argued to be suitable tool to describe how business development occurs under conditions of high uncertainty (Alvarez and Barney, 2005). Its basic assumptions are that opportunities are created instead of discovered. While creating business opportunities, interaction between the entrepreneur and the environment is crucial: reactions from the environment strongly impact the strategic decisions. In addition, due to highly level of uncertainty, so-called conventional strategic business tools based on might not be possible to use. For instance, the decision-making is more based on heuristics rather than data and statistics.

Previous research on creation theory has mainly been theoretical and focused on concept development. In this article creation theory was empirically used to examine how well it can describe certain elements of the inclusive business development process. Particularly the aspects of business development, strategy and decision making were investigated in more detailed manner. The article was based on an empirical study of a Western entrepreneur who had built a rural-electrification concept called *Kudura*. The entrepreneur himself was responsible of developing the technical solution, designed the

business model and engaging with the local community. In this article I followed the actual concept development from the early idea stage until running the pilot in rural Kenya. The concept of 'community-operated business venture' is used to describe how the business-venture will be (eventually) owned by the community and managed by the community members.

5.4.2 Findings

According to the empirical findings, several assumptions of creation theory fit well to describe certain elements of inclusive business development. Conditions of high uncertainty affect the business development and in practical terms this can mean the following: Business opportunities depend on the entrepreneur's own action; they are not evolving pre-existing industries or previous experience instead they are. Inclusive business development might require creating new markets, new technology which not been tested before and building a new business model. The particular case of Kudura offers an example of this; the entrepreneur was responsible of bunch of activities, beginning from testing the technology in his own land until building up the systems in Sidonge, in the pilot stage. In addition, he was creating general guidelines for the business model. The decision-making relied occasionally on his own inductions, although he had a local co-operation with a local expert. For instance, the entrepreneur could only make calculations what is the expected return-on-investment or will the community be able to run the grid financially self-sustainable way. Further, similarly as creation theory argues, flexible strategy is adopted which means that chances are made based on the market reactions. Lastly, interaction with the environment is a crucial element. In the empirical case of Kudura, community-operated mini-grid, this meant the entrepreneur needed to engage and commit the local community in a way that the community would felt strong sense of ownership.

5.4.3 Contribution

Previous research on creation theory has been dominantly theoretically oriented; the theory has not been tested empirically. In this article, the assumptions of creation theory were compared to an empirical business development case. Despite of the similarities, resource-constrained BOP business environment adds some extra layers for the business development process. For instance, the entrepreneur cannot control the process by himself but must rely on local partners. Due to the unfamiliar context, he (especially if the entrepreneur is a foreign one) needs to build partnerships and rely on the knowledge and experience of these (new) local partners. In addition, the social objectives of the inclusive business mean that the success can not only be judged by financial measurements; improving the livelihoods of the local community is one of the determinants factors of success. It can be concluded that inclusive business serves several stakeholders, hence its success cannot be evaluated strictly based on profits, also other measurements are required.

6. Discussion and conclusion

This section presents the common themes and observations from the four articles presented above. All of the articles share a common underlying theme and contribute to increasing understanding on how entrepreneurs innovate within resource-scarce contexts at the BOP. This section starts by addressing the two specific research questions (6.1) and continues by discussing the theoretical contribution (6.2). Thereafter, I reflect on implications for practice (6.3) and finally, I consider the limitations of this study (6.4) and present some avenues for future research (6.5).

6.1 Research questions

This thesis has two specific research questions: i) How does resource-scarcity manifest itself in innovating at and for the BOP? and ii) How do innovators create opportunities in resource-scarce contexts? In this chapter I will bring these questions together.

6.1.1 Effects of resource-scarcity

In this thesis I have discussed how resource-scarcity appears when innovating at and for the BOP. BOP can be considered an extremely harsh environment as there may often be a lack of basic facilities, such as poor roads or non-existent good-quality local materials. Due to the poor quality of education and training systems, skilled workers can be hard to find, hence firms need to educate the labour force themselves. Market mechanisms are shaped by the weakness of formal institutions, which creates an environment where the boundaries between formal and informal businesses are blurred (Bhatti and Ventresca, 2013); business networks consist of non-market members and may rely on personal networks (Rivera-Santos and Rufin, 2010). This can cause uncertainties for companies who are used to operating under more structured and formalized markets. Hence, the low-income market as a business environment has characteristics which affect the resources that are available and encourage entrepreneurs to employ various tactics to operate under these conditions.

The findings suggest that resource constraints are faced differently depending whether the innovator is a foreign company, a local company or a so-called grass-root level actor. Based on the empirical findings, it seems that Western companies are struggling to adapt to the unfamiliar situation. For them, the

scarcity of resources can mean that the conditions in which their innovation usually takes place are absent. Similarly to previous BOP studies, this dissertation lends support to previous research regarding uncertainties that foreign companies face when developing inclusive business in an unfamiliar environment and lacking previous experience. This can mean, for instance, that to acquire local knowledge, they need to build unconventional partnerships (Webb et al., 2010; Dahan et al., 2010) and adopt a bottom-up innovation process (Brem and Ivens, 2013). This dissertation also showed that besides external constraints, MNCs might have organizational barriers, such as short-term profitability expectations, business unit-based incentive structures (article A) which might hinder innovators to advance their initiatives. In article A, it is suggested that inclusive business efforts might rest on the shoulders of individual innovators who refuse to be constrained by these organizational barriers. They apply intrapreneurial bricolage – entrepreneurial activity within a large organization characterized by creative bundling of scarce resources – to promote these initiatives.

This study implies that local entrepreneurs, in contrast to Western companies, are more used to coping with the conditions of resource-scarcity. As witnessed in my research, particularly in article C, local entrepreneurs value hidden assets, such as respecting the traditional knowledge of community elders and asking for their opinion before beginning business ventures, recognizing and utilizing locally available resources for instance, using old-car motors as generators or turning ‘unskilled labour force’ into social resources and training them to act as sales agents and mechanists. For local entrepreneurs, BOP people are not passive consumers, but rather active value creators and important elements of their business models. Hence, this research gave evidence that BOP can be, as defined by Viswanathan et al. (2010) “*a network-rich environment*” where social ties among people facilitate information sharing.

This thesis also demonstrated that local entrepreneurs have several advantages when applying bricolage. As illustrated in article C, local innovator-entrepreneurs possessed repertoires which were valuable particularly in the BOP context. Furthermore, they were resourceful enough to utilize their repertoire in an appropriate manner. For instance, they were capable of using neglected materials (such as used car engines, tent material for fabrication) for new purposes. In the article I call this ‘possessing gadget knowledge’, referring to a combination of indigenous knowledge and technical skills without a formal education. Familiarity with the context meant that these local innovators obtained local information also due to their own personal experience and they did not need to conduct any systematic market analysis. Instead they relied on their own instincts and previous, albeit informal knowledge. This was particularly evident in the mobile industry sector (article B), where entrepreneurs easily identified opportunities for mobile applications to fulfill gaps, such as developing a platform for small-scale farmers to check market prices and reduce the influence of the middle-man. In addition, being native to the environment, they were capable of embedding their business in the existing social structure of the communities, such as training borabora drivers to be their

sales agents (article C). However, scarce resources caused constraints to local entrepreneurs as well. For instance, lack of technical expertise and proper facilities for product development, such as test laboratories, required creativity. To overcome these kinds of constraints they upgraded their own knowledge by searching for information from multiple sources, e.g. by interviewing employees at the universities, watching videos on *YouTube*. They used family members or early customers as ‘test laboratories’ to receive feedback for improving technical solutions of the products.

The findings of this thesis underline that innovating under resource scarcity can be seen as a unique way of thinking and acting in response to daily problems and resourcefully creating solutions using simple means. My research indicates that reframing challenges as opportunities (e.g. in articles B and C, the everyday challenges that the entrepreneurs themselves have faced were strong motivations for innovating solutions), innovators do not seek to develop excessively sophisticated solutions, but rather to develop ‘*good enough*’ solutions (e.g. small-scale energy solutions demonstrated in article C are easy to use and durable, but do not contain any extra layers). This finding lends support to a number of previous arguments such as those of Cunha et al. (2014), Prahalad (2012), Prahalad and Mashelkar (2010), Radjou et al. (2012) and Prahalad (2006). Cunha et al (2012) suggest that within the resource-scarce context of BOP, companies should make use of scarcity rather than avoid it and take advantage of opportunities where competitors mainly see obstacles. For Prahalad (2012), Prahalad and Mashelkar (2010) and Radjou et al. (2012) this means “doing more with less and for more people” in contrast to a bigger-is-better kind of attitude. To summarize, Prahalad (2006) suggested the “innovation sandbox” metaphor for innovating in resource-scarce context: innovating occurs within extremely fixed specific constraints and it involves free-form exploration and even playful experimentation.

6.1.2 Innovators creating opportunities

This thesis adopted a constructionist approach by showing how opportunities are not objectively ‘there’ to be observed but instead they are socially constructed by the entrepreneur. In this chapter I will discuss what business creation implies in the particular context of BOP.

This research confirms that societal needs are bases for innovation. According to the findings, it seems that local entrepreneurs are rather familiar with these needs, perhaps due to their own personal experiences and knowing the culture and way of life. Familiarity with such everyday challenges appears to be a sound base for designing solutions. For instance, in article B one respondent said that since her childhood she had seen her mother struggle with doing all the bookkeeping manually, so her intention was to create an application which would make this task easier. Another illustrative example of this is the biogas innovator in article C, who explained that he sees needs that he would like to fulfil everywhere. Similarly, Radjou et al. (2012) describe *jugaad* entrepreneurs, termed local entrepreneurs in my data, who had an intuitive sense of latent needs of consumers, driven by a deep passion for making a difference in

their communities. Compared to the foreign entrepreneurs in this study, they also had a broader understanding of the consumers' everyday challenges, e.g. lack of access to clean energy, affordable access to wireless connection'. Nevertheless, possessing convenient technology was also a major driver for the inclusive business development initiative: they had a feeling that the technology could solve some of the so-called "wicked problems".

This thesis lends support to the previous observations that businesses need to start from scratch and build something completely new (e.g. Soni and Krishnan, 2013; Trimble, 2012). This can include creating markets, developing technologies and reinventing business models. Several business development processes were examined in this dissertation and the common issue seems to be that the process resembles "trial and error". Local entrepreneurs might lack technical expertise to develop the solutions (cases in article C) and financial capital or 'business intelligence' to expand their businesses (cases in articles B and C), which delays or even at times hinders the business development. Foreign innovators might be struggling with scarce resources within their organization (cases in article A) and the faulty understanding of community habits complicates developing appropriate services for local needs (case in article D). While the problems vary between the actors, the outcome is the same: business development goes back and forth and innovators are forced to make modifications and to adapt to the prevailing conditions.

This study argues that business development at BOP markets is often ridden with uncertainties which make the innovation process risky and unpredictable. Particularly for foreign companies and local ones who are more used to serve the high-income market, the BOP market means having to deal with new markets, possibly new industry and lack of previous experience from which to draw lessons. Nevertheless, severe resource constraints, exceeding the classical entrepreneurial constraints that most of the entrepreneurs face, are the defining condition of the BOP which perhaps makes business creation even more challenging. These uncertainties can affect business development in various ways. It may not be possible to rely on analytical decision-making tools nor to rationally conceptualize the business planning process. As shown in this research, entrepreneurs might employ bricolage and similar tactics described by creation theory. For example, decision-making can be based on heuristics and effectuation (see Sarasvathy, 2001) as the entrepreneur in article C, who had made preliminary plans for how the business venture would be managed, but allowed the community to make changes). Instances of bricolage came up in the research in various ways: for example, entrepreneurs were recombining resources for new purposes (e.g. biogas innovator in article C using tent material to make a digester), refused to be constrained by limitations (e.g. in article A middle-level managers within the corporation acting like intrapreneurs). It was also used as a tactic to gain legitimacy and support for business ventures (e.g. in article A innovators promoting their ventures to their colleagues). These observations support the arguments of Radjou et al. (2012), who argue that entrepreneurs are required to react to rapid changes while innovating and

practicing business. Hence, Radjou et al. suggest that intuition, empathy and passion, as qualities, should be considered as important as analytical thinking.

This dissertation also reveals that interplay between environment and the innovator - and in the case of intrapreneurial bricolage interplay between the innovator and the corporation - can be an essential part of business development. In this research I use the term interplay to refer to the dialogue between the innovator and the environment and/or organization, i.e. how the innovator engages with the community (and corporation) within which he operates. It largely depends on the innovator's ability to build trust among the communities, and the extent to which he or she is personally involved. Interplay makes it easier for the innovator to respond and react to any unexpected changes. In article A we stated that within the corporation context, interplay between the organization and the innovator is central to innovation, and the corporation's tolerance for intrapreneurial bricolage in particular is likely to facilitate the progress of innovation for inclusive business.

Furthermore, this study underlines that inclusive business development may require more active participation in market creation. This can take various forms, for example as illustrated in the empirical cases, the entrepreneur might find himself involved in framing and legitimizing new activities and norms, such as changing negative attitudes towards using cow's dung for producing electricity (e.g. the biogas innovator in article C) or training farmers to use mobile phones for checking market prices (e.g. M-farm case in article B) or negotiating with ministries to produce required legislative changes (e.g. Mini-hydro innovator in article A).

Finally, as the data of this thesis includes both foreign companies and local companies, the analysis allows for making some remarks about their differences and similarities concerning business development. One of the major differences is evident in how social value creation is integrated into the businesses. For the foreign-led companies (articles A and D) social value creation was a conscious objective. The innovators were thrilled about developing solutions for so-called wicked problems and were motivated to alleviate poverty. For the local companies, social value creation is not a social mission; it is a core part of the business. Hence this thesis supports Sinkovics et al. (2014)'s claim that for local companies, social value creation is more or less an organic part of the business formation and business model design. This social value creation means two things: Firstly, recognizing needs that are crucial for the innovations is not difficult for the local entrepreneurs. Secondly, social value is also created by including community members in the businesses, as innovators, producers and employees, for example.

This study indicates that, for foreign enterprises, it might be beneficial to rely on 'brokers' of some kind, and to use them as interpreters between themselves and the end-users. Previous BOP studies have highlighted that, for Western companies, establishing partnerships with NGOs is vital, for instance to gain in-depth understanding of the market needs - reaching the 'last mile' (e.g. Perez-Aleman et al., 2008; Schuster and Holtbrügge, 2014; Follman, 2012; Gradl et al., 2010; Hahn and Gold, 2014). Perhaps the role of NGOs can be under-

stood more broadly as that interpreters; they are part of the interplay – perhaps even guiding it- between the company and the BOP, assisting companies in the sense-making process while at the same time legitimizing companies' operations among the communities. For local companies, the use of the same kind of interpreter is not necessary. They know the community base and can create value and integrate the local people into their businesses more naturally.

6.2 Theoretical contributions

This thesis used the theoretical lenses of bricolage and creation theory to describe how entrepreneurs innovate within resource scarce contexts at the BOP. These two theories proved useful for the study of innovating in resource-scarce contexts, and they complemented each other in explaining innovation in such settings. Although the etymological foundation of bricolage was originally developed by Lévi-Strauss to demonstrate how crafts-people creatively combine whatever materials are available for new purposes, in entrepreneurship studies, bricolage is applied in similar kinds of conditions as creation theory: to describe entrepreneurial activities either under conditions of resource constraints and/or under high uncertainty. That is why, in the thesis, the use of bricolage and creation theory to describe business development at the BOP was justified.

The main contributions of this study to bricolage are the following: i) a new concept of intrapreneurial bricolage was developed, ii) new elements of bricolage (translation and creation of new roles and using roles for different purposes) were introduced, iii) the concept of bricolage as a mindset of resourcefulness was extended and v) the idea of collective bricoleurs was validated. These multiple contributions to bricolage are discussed below.

Firstly, while studying bricolage in a new organizational context of MNCs, we demonstrated that also large corporations can turn out resource scarce contexts for innovators and resort them to apply unconventional ways of promoting their business development projects. In article A, we introduced notion of intrapreneurial bricolage which we defined as entrepreneurial activity taking place in large organizations in contexts of resource scarcity and characterized by creative bundling of resources at hand.

Secondly, this thesis revealed new bricolage activities that have not been previously documented; translation and creation of new roles and using roles for different purposes. When applying translation the innovator-bricoleur engages in rhetorical activity; he creates a story by using a language accepted within the organization. The purpose is to convince superiors and colleagues and to mobilize internal resources for their own ventures. Creation of new roles and using roles for new purposes refers to how innovators might use their private roles to promote their business ventures. This might even be a necessity in BOP markets as successful business development requires engaging in dialogue with the broader society, from grass-root level users to top-level governmental bodies.

Thirdly, previous empirical studies have not examined the mindset aspect of bricolage, but rather explored bricolage at the level of action. In this thesis, the importance of resourcefulness as mindset was made clear; i.e. the ability and readiness to identify and deploy unconventional means at hand and the motivation to solve wicked problems. Hence, this study strengthens the argument that bricolage is not only about resource integration, but rather a particular way of addressing challenges and opportunities, underpinned by a related knowledge base. In addition, this study is further extending the concept by proposing that particularly among the developing country innovators mindset of resourcefulness is combined with social value creation which can be a key driver when overcoming challenges.

Fourthly, this thesis also contributed to the theoretical notion of collaborative bricoleur (Duymedjian and Ruling, 2010). While, in article C, the innovators fit the description of the Levi-Strauss's solitary figure, in article A the innovator-pair acted as collaborative bricoleurs. We noticed that collaborative bricoleurs can highly creative once they have got to know each other's' repertoires and developed the level of trust necessary to engage in collective bricolage. If bricoleurs have complementary skills and knowledge, collective bricolage can be another "means at hand" when innovating.

Relating to creation theory, the key contribution of this thesis is that it is advancing the creation theory by providing a deeper understanding by expanding the element of social construction. While creation theory highlights the element of social construction, it somehow refers narrowly to the interaction with the market behaviours, i.e. how the customers are reacting. Therefore, based on the findings, I am suggesting that particularly in the context of resource-scarce low-income environment, social construction is much broader concept than merely observing the market responses. It involves learning the needs of the community and social and cultural customs that affect the relationship building between the entrepreneur and community. In some instances the overall market may need to be constructed by the entrepreneur.

6.3 Implications for practice

This study has several practical implications. Most importantly, this dissertation deepens our understanding of how innovation can unfold within the resource-scarce context of BOP and how entrepreneurs actually innovate. This study demonstrated that business initiatives for inclusive growth can spring from various sources; ranging from grass-root level solutions to daily problems to MNCs' strategies for penetrating the market at the BOP. As witnessed in this study, innovations can be promoted by tireless individuals, e.g. middle-managers within MNCs acting as intrapreneurs, local self-taught innovators or foreign start-ups. What these individuals seem to have in common is that they are dedicated individuals possessing a specific worldview which combines resourcefulness and an interest in societal problems. 'Feeling of tackling with wicked problems' or overcoming everyday challenges, such as developing an affordable energy solution for rural people, creating mobile applications allow-

ing farmers to receive better incomes from their cultivations, was a significant incentive for the innovators to keep pushing their ideas further. They strongly believed in their ventures and refused to be limited by constraints, they were using various tactics to persuade other people to believe in their ventures and mobilize stakeholders and engage them. These innovators acknowledge resource limitations and are capable of applying bricolage, ‘making do by whatever resources at hand and turn them into new purposes’.

Furthermore, I argue that in order to innovate within the resource-scarce context of BOP, companies should be able to produce greater value with fewer resources by recombining and readjusting existing resources: as the title of this thesis suggests, innovate by “making do with what is at hand”. To accomplish this, I suggest that companies should tolerate more heuristic behavior, such as bricolage while innovating. However, particularly to MNCs, bricolage-type activities might seem an informal and disorganized way of innovating. Organizational structures, corporate frameworks, moribund routines and processes (as illustrated in article A) are not supporting bricolage. It is worth pondering if it is possible to integrate bricolage into more formal innovation processes, if only as a complementary tool. This might mean for instance, empowering employees to take action, creating possibilities to innovate outside of the labs and, in general, developing a culture of experimenting with new things that may or may not turn out to be valuable. In addition, bricolage might occur naturally when novel and unpredictable situations arise and companies are forced to find expeditious ways of tackling with these situations.

Finally, this thesis contributes to innovation management studies as a whole. Businesses in many sectors are facing the challenge of resource scarcity which forces companies to compete in conditions of scarcity, to use resources more efficiently, explore alternatives and implement new business models. Some of the ways in which they operate in cases documented by this study may actually become more pervasive in the future than they have been in the past. Organizations should not view scarcity as merely a threat. While hardly anyone would consider scarcity a desirable state, it may still trigger innovation. An ability to be innovative in a context of scarcity may be a source of competitive advantage, by allowing a company to respond more quickly, to use resources overlooked by others or to target new markets creatively (Cunha et al., 2014). Moreover, developing solutions for cost-conscious consumers is increasingly becoming a necessity in the matured market (Sharma and Iyer, 2012).

6.4 Limitations

In this chapter I point out some limitations that should be considered when interpreting these findings. The major limitations are: i) several empirical cases studied in this research, ii) the research focus on the front-end stage of the innovation process, iii) plurality of concepts, iv) the main theoretical terms are concepts rather than established theories and v) the geographical focus of the empirical cases.

Several empirical cases studied in this research. The four articles discussed 11 empirical cases in total, covering two MNCs, a Western start-up, eight entrepreneurs and companies representing so-called “local” (developing country) companies. This approach, i.e. including such different entrepreneurial players is both strength and a weakness of this study. The original intention was not to compare how different types of entrepreneurial actors, innovate, hence I did not conduct a systematic comparison. Nevertheless, this introduction chapter allowed me to make comparisons and to raise up a few issues, such as how constraints and scarce resources are faced depending on whether the innovator is a foreign expert working within a MNC or a local, self-taught school drop-out innovator. It might have been interesting to analyze and compare the similarities and differences more thoroughly because this kind of research setting could have given us more insight into how to support the development of innovations targeting the BOP. It is worth asking if the results would have been different if I had had a smaller number of cases and focused on deep-case study analysis. The study of a more homogenous group of enterprises might have allowed me to identify more clearly the critical points of the business development process.

The focus was mainly on the front-stage innovation process. The focus of this study and the empirical cases was more or less on the front-end stage of the innovation process; recognizing opportunities and turning them into actual businesses/innovations. I was analyzing how entrepreneurs are creating opportunities in the context of resource-scarcity. After finishing my articles, I have been following few of the cases and how they businesses have been expanding. It would be highly interesting to conduct follow-up research to evaluate the success of these ventures and what kind of impacts they have had on poverty alleviation. This kind of research would also make visible have entrepreneurs being able to gain more resources for their innovations.

Plurality of concepts. Research on BOP and more broadly on resource-constraints innovations has been mainly empirically driven and lacking coherent theories and frameworks. In different streams of research there are several concepts pertaining to the phenomenon of innovating under resource-scarcity. This plurality of terminologies and the lack of conceptual clarity make it challenging to be exact on the terms and particularly in the four articles, several terms, such as resource-scarcity, inclusive innovation, low-income market, have been used. In addition, this made challenging to formulate the specific research questions of this thesis that would be relevant for the four articles, yet not being too broad. Nevertheless, as I see it, all the concepts that I am using is covered with the research objective of “How do entrepreneurs innovate within resource scarce contexts at the BOP?”

The main theoretical terms are concepts rather than established theories. I used bricolage and creation theory as theoretical concepts to analyze means of innovating within resource-scarce contexts at the BOP. Although both of these concepts were suitable for explaining what I witnessed in the empirical cases, their weakness is that these concepts are (not yet) well-established theories. Bricolage has been linked with improvisation (e.g. Cunha et al., 1999) and or-

ganizational ingenuity (Lampel et al., 2014). Without a proper labeling and framing, the risk is that bricolage ends up becoming an everyday word which is used to describe any innovation process which does not follow the “conventional way”. Creation theory has not gained attention in the mainstream literature. However, I feel that it is useful in describing how business development occurs in highly uncertain conditions. However, more empirical-driven rigorous research is required to construct and frame creation theory.

The geographical focus of the empirical cases. Although the geographical focus is not emphasized in this dissertation, the fact is that the resource-scarcity context of this thesis focuses mainly on Africa, particularly Kenya (three out of four articles). In fact, at some point I was considering should I more emphasize the “Africa aspect” and in that way contribute to the emerging field of Africa-focused management and business studies. However, I felt that this research contributes more to the innovation studies and resource-constrained innovations. Nevertheless, it should be kept in mind that localization and tailoring the solutions to fit to the specific context is essential and it is not possible to offer straight-forwarded advices.

6.5 Avenues for further research

This study constitutes a substantial step forward in understanding how entrepreneurs innovate within resource-scarce contexts at the BOP. Where BOP studies are concerned, there are several avenues for future studies. Firstly, more longitudinal research is required to analyze the success of business ventures. Scaling up has been mentioned as one of the key challenges. Secondly, the analysis of business impacts to societies should be measured. In its current stage, the expected business impacts are rhetorical and hypothetical, lacking deep analysis. Thirdly, with some exceptions (e.g. Sinkovics et al., 2014), BOP studies are still primarily framed from the perspectives of Western companies: i.e. how they can operate successfully, create innovations, build partnerships and so forth. In this study I tried to shape discourse by including both Western/foreign and local companies in my data. I would encourage others to conduct more comparative research because it is likely to add to our knowledge of the innovation capabilities of different actors and make visible some potential obstacles which hinder the creation of an environment favorable to inclusive businesses and resource-constrained innovations. Fourthly, the terminologies relating to BOP and the links between them are still rather varied and mixed. More conceptual research to clarify these terms is required.

I acknowledge that studying bricolage might not be easy as it may be difficult to assess before the completion of a specific concrete arrangement, and is therefore also difficult to generalize about or foresee, or to plan for (Duy-medjian and Ruling, 2010). However, I am raising a few topics as future research suggestions. In general, the topic of organizational bricolage and bricoleurs need further investigation. Is it possible (and how) to cultivate bricolage in organisations? Duy-medjian and Ruling (2010) argue that organizations may eventually seek to manage bricolage. In this thesis, I pointed out that bri-

colage is not only about resource integration, but also a specific mindset of resourcefulness. To what extent does bricolage depend on the personality or can it be learnt? In addition, more focus should be given to collective bricolage.

Finally, it would be interesting to shed light on the interplay between the bricoleur and the organization; as we pointed out in article A, the interplay between the organization and the intrapreneur (e.g. bricoleur) is central to innovation.

Lastly, I would strongly recommend further exploration of the concept of creation theory. So far, the theory has been quite neglected in the mainstream (entrepreneurship) literature, although it might be well suited to explaining entrepreneurial activities not only in the resource-scarce context of BOP markets but also in the behavior of start-up companies.

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This study argues that Base of the Pyramid (BOP) is not only valued as a source for market opportunities but also as fertile ground for innovations. This dissertation focuses on analyzing how innovators are raising and deploying miniature means of innovating in resource-constrained settings. Individual innovators in this study represent both small-scale entrepreneurs and intrapreneurs within a bigger company. The contribution of this study is to provide insights and deeper understanding on how these means of innovation occur in the real-life instead of proposing normative suggestions of how companies should innovate at and for the BOP. Further, this study discusses how resource-scarcity affects the innovation processes. The theoretical discussion is grounded on bricolage, creation theory and the nascent theorizing on resource-constrained innovation. These concepts are appropriate for capturing the rich phenomenon of innovating for and at the BOP by offering one way to describe how innovators are operating under these conditions.



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