

Assessing the Social Sustainability of Frugal Products

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Abstract

Frugal innovations are products, services, processes and business models that target underserved customers of low-mid market segments. Frugal Innovation may be seen as a new way of doing business by conceiving products and services respecting the balance between the triple bottom line pillars: Economic, Environmental and Social. Despite the fact that Frugal Innovation's concept and boundaries often differ when taken from different perspectives, nobody argues against the statement "do more with less", which suggests not only the market volume that Frugal Innovation aims to supply, but also the concerns on minimizing the use of resources. Since its first use in 2010, several authors from different fields have studied Frugal Innovation; however its link with Social Sustainability is still not clear in the literature. Therefore, this work intends to cope with it by presenting the Framework for Frugal Innovations' Social Assessment (FISA). The framework was built with four types of information - which resulted by the application of a multi-methodological strategy: (1) frugal characteristics, (2) Social Value and Social Impact concepts, (3) the most significant stakeholders for Frugal Innovation, (4) the most relevant social areas to assess Frugal Innovation. By applying this framework, the social-related impacts and values are identified and measured and, as a result, the user gets information that supports the decision-making process, as FISA allows to assess the product or service stakeholder-by-stakeholder, in certain social area.

Keywords: Frugal Innovation; Social Sustainability; Sustainability Assessment; Social Assessment; Stakeholders; Framework

Resumo

Inovações frugais são produtos, serviços, processos ou modelos de negócio que se dirigem a consumidores dos segmentos mais baixos do mercado (baixo e médio). Inovação Frugal é por vezes mencionada como uma nova forma de negócio uma vez que pretende conceber produtos e serviços respeitando o equilíbrio das três dimensões da sustentabilidade: económica, ambiental e social. Apesar de o conceito do termo “Inovação Frugal” não ser consensual na literatura – sendo apresentado sob diferentes aspectos e cenários, é unânime a visão de que é uma maneira de “fazer mais com menos” para mais pessoas, sugerindo o volume de mercado que Inovação Frugal pretende servir, mas também o requisito de ser sustentável no que toca à minimização de recursos e seu uso eficiente. Desde que foi referido pela primeira vez em 2010, Inovação Frugal tem sido estudada por diversos autores de diferentes áreas; contudo, a ligação do termo com Sustentabilidade Social não aparece ainda clara na literatura. Assim, este trabalho pretende contribuir para esse estudo apresentado o Modelo de Avaliação Social de inovações frugais (FISA). Modelo este que foi construído usando quatro tipos de informação – que resultaram da aplicação de uma estratégia multi-metodológica: (1) características frugais, (2) conceitos de Valor Social e Impacto Social, (3) os grupos de interesse mais importantes em Inovação Frugal, e (4) as áreas sociais mais relevantes para a avaliação de inovações frugais. Ao usar este modelo, os impactos e valores sociais são identificados e medidos, e como resultado, o utilizador obtém informação que apoia o seu processo de tomada de decisão, uma vez que o FISA permite a avaliação de um produto ou serviço para cada grupo de interesse em cada área social.

Palavras-chave: Inovação Frugal; Sustentabilidade Social; Avaliação da sustentabilidade; Avaliação social; Grupos de interesse; Modelo

Aknowledges

I would like to dedicate my thesis to all young people around the world who do not have access to education due to their family's financial conditions or their country's political situation. Finishing my Master's degree is such an important step in my life that doesn't let forget about the right to education that everybody everywhere should have.

Then I need to thank those persons who supported me. First, Professor Ana Carvalho who guided, advised and inspired me. And Sara Russo Garrido who welcomed me at CIRAIG where I developed the majority of my work. I would also like to thank Vera and Carolina who have been with me in Boston, USA, and Montreal, Canada, and my family and my friends who always support my projects in personal or academic life. And all others with whom I had chance to learn and discuss my work especially those I interviewed in the later stages of this dissertation.

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List of abbreviations

3BL: Triple Bottom Line

BoP: Bottom of the Pyramid

BRIC: Brazil, Russia, India, and China

CSR: Corporate Social Responsibility

E-LCA: Environmental Life Cycle Assessment

EU: European Union

FISA: Frugal Innovations' Social Assessment framework

GDP: Gross Domestic Product

GRI: Global Reporting Initiative

LCA: Life Cycle Assessment

NGOs: Non-governmental organizations

P-I: Power-Interest

S-LCA: Social Life Cycle Assessment

SIA: Social Impact Assessment

SCM: Supply Chain Management

SSCM: Sustainable Supply Chain Management

R&D: Research and Development

RCI: Resource-Constrained Innovation

UNEP: United Nations Environment Program

V-E-W: Value-Expertise-Willingness

1. Introduction

This first chapter includes the introduction and contextualisation of the dissertation. The problem is characterised and the work's objective is presented. Along with the motivations and reasons behind the research, the methodology is also defined.

1.1 Contextualisation

There are three major trends shaping the current global market environment: global competition, natural resources scarcity, and increasing population growth rate. By competing globally, companies find new opportunities in the emerging markets, as there are customers whose purchasing power is increasing so much so that it is even predicted that it can achieve 160 % in 2030 when compared to the one in 2009 (Roland Berger, 2014). The scarcity of resources enhanced the strength of sustainability practices and studies, as people recognized the importance of seeking a balance between economic, environmental and social activities.

The population growth rate is increasing in developing countries. By 2030, 70% of real GDP growth and 70% of western companies' profit will come from emerging markets and by 2025 half of the world's largest companies are expected to come from those countries (McKinsey GI, 2013). Therefore, companies should strive to exploit the potential that emerging markets represent. However, companies need to take into consideration several aspects when shifting from Western markets (Europe and USA) to emerging ones. As the buying patterns are changing and these 80% of the customers will be new and coming from outside USA and Europe, by 2030 (Roland Berger, 2014) the product and service features need to assure a quality equivalent to the one developed countries require today. Also, customers in developed countries are changing their buying patterns as they are more aware of environmental and social issues colliding with the supply chain activities. Hence, business models must adapt to these markets and companies need to be prepared to change the way they are used to deal with the clients and suppliers along the value chain.

The current novelty is serving the overlooked customers in developing countries with disruptive products produced under severe constraints to be able to sell them at an affordable price with a minimized environmental and social negative impacts, maximizing the product value in all three sustainability strands: economic, environmental and social. Hence, frugal innovations exist to meet these purposes and intend to work closely to the end user, so that it will be possible to match their needs in the solution features. Frugal products and services have yet another innovative feature: even if their starting point is a specific market, they can be adapted and distributed worldwide, providing the selling company with a significant profit margin.

Porter and Kramer (2011) point out the society's perception on how companies are making a profit "at the expense of the broader community". The authors state that "business increasingly has been viewed as a major cause of social, environmental, and economic problems". As a result, it is said the work companies need to do on "bringing business and society back together" and 'shared value' is set with this aim. Creating shared value requires the inclusion of social and environmental considerations into companies' economic thinking, and involves "creating economic value in a way that also creates value for society by addressing its needs and challenges". In fact, it is a new way to get economic success without comprising society's interests, as it is "expanding the total pool of economic and

social value". Shared value is pointed out as the main driver of "the next wave of innovation and productivity growth in the global economy". In this sense, like other kinds of innovation, Frugal Innovation corresponds to the three key ways to creating shared value: 1. Reconceiving products and markets; 2. Redefining productivity in the value chain; and 3. Enabling local cluster development.

In this way, as frugal solutions intend to deliver simultaneously economic, environmental and social value, it is pertinent to analyse it through a Social Sustainability standpoint. Frugal Innovation can offer social value in distinct stages of the value chain, as the stakeholders' interests need to be taken into consideration. In this regard, the stakeholder involvement is something that is key while applying Frugal Innovation. Actually, the involvement with local communities is one of the requirements to succeed in frugality, since the end-users' value proposition is the one to be primarily sought.

In this sense, companies lack information on which points they should consider while implementing Frugal Innovation in a socially sustainable manner, as well as on which indicators to use in Social Sustainability assessment of frugal innovations. Therefore, this is the scope in which this work aims to help frugal promoters.

1.2 Problem characterisation

Frugal Innovation requires the integration of a set of constraints, while seeking for frugality and simplification. At the same, Social Sustainability plays a significant role in its implementation, as frugal solutions intend to deliver a maximized social value.

In fact, Social Sustainability has been focused on by literature only in recent years, lately compared with the other pillars of the Triple Bottom Line (3BL) of sustainability – Economic and Environmental. Thus, the social dimension is currently perceived as being not so well defined or developed, as it seems to have a broader scope that emphasises the lack of boundaries of the concept.

Frugal Innovation requires a deep knowledge of the market, its opportunities and threats which is only achieved with a **narrow relationship with the stakeholders**. On the one hand, Frugal Innovation implies a set of changes within the organizations. There is still scepticism about it, especially when proposing a link with Social Sustainability. On the other hand, social aspects are generally seen as subjective, since they are difficult to identify, quantify and measure.

In this sense, there is still a need for an analysis of Frugal Innovation from a Social Sustainability point of view. That is to say that some questions are still to be answered: (1) How both social impact and social value concepts can be integrated and applied to Frugal Innovation Social Sustainability assessment?; (2) What are the measures to assess each of them?. A framework embodying Social Sustainability into frugal innovations' development and implementation is yet to be offered.

1.3 Dissertation objective

The objective of this work is to study the Social Sustainability of frugal innovations; that is to say the link between the two concepts. The dissertation result is an integrative framework FISA – Frugal Innovations' Social Assessment – that supports the decision making process of practitioners: those potential developers or those investing or implementing Frugal Innovation.

1.4 Dissertation methodology

The work hereby presented follows the methodology of Figure 1.

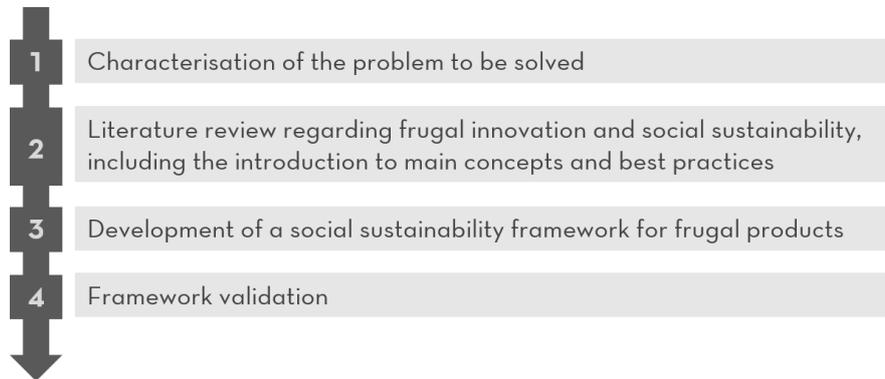


Figure 1 – Methodology.

The first step consists of characterising the problem. It includes an introduction to the main researched topics and the contextualisation of the matter. In the second step, a systematic literature review is performed to gather exhaustive information on the main topics. Hence, the most relevant publications on Frugal Innovation are analysed, just as those on Social Sustainability, to gain a sufficient understanding of the topics and to establish connections. The third step is constituted by two distinct phases, which result in a Social Sustainability framework for frugal solutions. The first phase consists of setting the key aspects one should take into consideration while implementing Frugal Innovation; and in the second phase the indicators, quantifiers, and measures to assess Social Impact and Social Value of a frugal product will be established. The fourth step is related to validation of the framework. It was conducted through semi-structured interviews to a list of people from different fields.

In chapter 3, the research methodology is detailed, as well as the tasks required for each step.

1.5 Dissertation structure

The master dissertation is divided into eight chapters.

In the first chapter the work is introduced, as the theme is contextualised and the problem characterisation suggests the main subjects of the investigation to be performed.

The second chapter is related to the literature review. The two topics (Frugal Innovation and Social Sustainability) are studied separately and jointly. For the former the study on its definitions and its boundaries is presented: market potential, market positioning, and product characteristics. With Social Sustainability scope, its definition is examined, as well as Social Impact and Social Value Assessment methods are approached. This chapter still introduces the joint study of Frugal Innovation and Social Sustainability that is the objective of this dissertation.

The third chapter presents the research methodology and corresponding methods and tasks. The objective of each of these and their outputs are detailed.

The fourth chapter consists of the conceptualisation and definition of Social Value. Social Impact is also addressed, as it is a main concept as well. The comparison between the two concepts is also discussed.

In the fifth chapter the framework constructs are studied. This chapter's results are those which bring the main structure of the framework together and, according to those, the social assessment of a frugal innovation will be conducted.

The sixth chapter consists of building the framework. The structured result is presented and analysed, and each one of the indicators is detailed in terms of context and application. The considerations to take while using FISA are stated, as well as the limitations of its use.

The seventh chapter relates to the validation of FISA. Fourteen semi-structured interviews were conducted on a set of people with different backgrounds and experiences. The interviews are described, as well as the outputs considered to improve FISA, as it is suggested.

The eighth chapter presents the final conclusions of the work, and while identifies its major limitations, it also suggests future works in the field.

2. Literature Review

2.1 Frugal Innovation

This section analyses the literature on Frugal Innovation. On section 2.1.1 the definition to be followed is set and some particulars of Frugal Innovation are pointed out, when comparing it with similar kinds of innovation. Section 2.1.2 unfolds the market of Frugal Innovation by setting the target and the market potential on section 2.1.2.1; and examines the process of positioning on Bottom of the Pyramid (BoP) markets while analysing the global market challenges that frugal innovators face (section 2.1.2.2). The next two sections intend to give an overview of the work done in literature (2.1.3) and in practice (2.1.4). On section 2.1.5 the appropriateness of Frugal Innovation as a mean of Social Sustainability promotion is studied.

2.1.1 Definition

The definition of Frugal Innovation is not consensual among academic or entrepreneurial communities. Since its first reference on the Economist article (Woolridge, 2010a), Frugal Innovation has been defined by many authors, who have developed their own concept emphasizing distinct characteristics of frugal innovations. Woolridge (2010b) describes the frugal process warning to the need of “rethinking everything from products to distribution systems” emphasizing the complexity of Frugal Innovation and its holistic approach.

Bhatti and Ventresca (2013, p.3) claim that “frugal innovation is a label that captures a range of heterogeneous activities which cut across different sectors”. They suggest that the several definitions exist for some specific application.

In fact, some authors state that Frugal Innovation exists within the product concern (Gupta, 2011; Hartigan, 2011; Kingsnorth et al., 2011) as others refer it in the process or even business model extents (Woodward, 2011; Moore, 2011). At the same time, the majority of them emphasize the need of redesigning and adapting the processes in order to successfully implement this kind of innovation.

It would now be relevant to present the different definitions for Frugal Innovation, and also the themes addressed by each of them (Table 1).

The themes are organized in categories. The ‘Economic’ one refers to the affordability of the price, the costs reduction and the financial constraints. ‘Resources’ mentions the importance of a smart use of resources, while ‘Target’ refers to the intention of adapt the product, good or service, to a specific target. The ‘Volume’ consists of referring the large number of people frugal innovations intend to serve, and ‘Quality’ is the attribute that signifies the importance of developing products of ‘good-enough’ quality, in a way that it is equivalent to products designed for developed markets. ‘Sustainability’ is mentioned by fewer authors, but its importance is big, especially as it is a manner of balancing economic and resource constraints, while targeting a certain community and its needs. The ‘Customer Value’ is an attribute that needs more attention, but it is referred by some scholars, while referring the holistic value frugal solutions aim to deliver to their users.

Table 1 – Topics addressed by Frugal Innovation’s definitions.

	Woodridge (2010b)	Prahalad and Mashker (2010)	Zeschky et al. (2011)	Ernst and Young (2011)	Gupta (2011)	George et al. (2012)	Bhatti (2012)	Soni (2013)	Basu et al. (2013)	Bhatti and Ventresca (2013)	Tiwari and Herstatt (2014)	Brem and Wolfram (2014)	Radjou and Prabhu (2015)	Rocca (2016)
Economic	X		X	X		X	X	X	X		X	X	X	X
Resources		X					X			X	X	X	X	X
Target				X	X	X		X	X			X		X
Volume		X				X				X				X
Quality			X			X		X			X		X	X
Sustainability							X		X					X
Customer Value													X	X

As proposed in Table 1, authors approach Frugal Innovation in distinct ways. While the economic constraints on the demand side are something often taken into the definition, other topics are not mentioned very frequently. Therefore, a definition encompassing all Frugal Innovation key attributes was needed, and Rocca (2016) strived to get together the perspectives of other authors.

Hence, Rocca (2016)’s definition will be followed as it embodies different authors and characteristics: “Frugal innovations are products, services, processes and business models that target underserved customers of low-mid market segments with high-quality solutions at affordable prices. They are developed in a sustainable and cost-effective manner that minimises the use of [human] resources, materials and capital in the entire value chain, while enhancing social value”.

Frugal Innovation strives to appeal to billions of people in developing and developed countries, from countryside to urban areas. Woodridge (2010b) looks at this aim of serving so many people as an exercise of learning that all frugal innovators companies shall perform. Having set the definition, it would be interesting to compare it with similar concepts derived from other contemporary theories often associated to Frugal Innovation. Amongst these theories, those pointing the 3BL framework are the ones more relevant to consider for this comparison, such as the ‘Bottom of the Pyramid (BoP)’, ‘Jugaad’, ‘Reverse Innovation’, ‘Inclusive Innovation’ and ‘Resource-Constrained Innovation (RCI) (Govindarajan and Ramamurti, 2011; Radjou, et al., 2012; Ray and Ray, 2010; Prahalad, 2006; Nijhof et al., 2002).

The BoP innovations aim to serve the 4 billion people living with less than 2\$ per day. There are several similarities between BoP and Frugal Innovation on the targeting, product design and Social Sustainability areas. But some authors state that Frugal Innovation is more comprehensive because

the former targets only the Bottom of the Pyramid, while the latter also includes both low- and mid-market segments. (Tiwari and Herstatt, 2014)

Jugaad innovation is seen as a creative mind-set to deal with scarce resources (Prahalad and Mashelkar, 2010) and overcome constraints (Kumar and Puranam, 2011). Its main characteristic is often referred as being an “improvised simple solution”. The main difference between jugaad and frugal innovations is that the latter follow a methodized and analytical implementation model (Hamacher, 2014).

Reverse innovations due to market innovation with respect to both the product flow – which is bottom-up and East-to-West (Bhatti, 2012) –, and the profitability in the developed markets – which requires the offering to be scaled up (Govindarajan, 2009). It differs from Frugal Innovation by letting the bidirectional market growth aside and both the product and process innovation (Zeschky et al., 2014a).

Inclusive Innovation’s major concern is the Social Sustainability of the products/services aiming to reach the underserved customers (Rocca, 2016), while Frugal Innovation goes beyond taking the whole 3BL framework into consideration.

Resource-Constrained Innovation, as its name suggests, deals with the resources scarcity and consequent protection and the derived challenges. Applying RCI, the products are designed to adapt existing technologies (Rocca, 2016). Frugal Innovation differs from this theory by set the societies’ major needs as the basis to the product conception and design.

2.1.2 Frugal Market

According to Rocca (2016)’s definition, frugal products are sustainable by offering an affordable price to a large number of customers - who have a strong influence in the frugal process. Woolridge (2010b) says that this innovation implies “smarter ways of designing products and organising processes to reach the billions of consumers who are just entering the global market”. The market potential and both the targeting and market positioning of Frugal Innovation are studied in the following sections.

2.1.2.1 Targeting and market potential

Frugal Innovation intends to serve both developing and developed markets. As aforementioned, Frugal innovations seek to fit the fundamental and basic needs of a particular market and, at the same time, to be able to market it worldwide, sometimes through applying small adaptations.

While conventional wisdom states that a company can enjoy high market and profits in either emerging or developed market, Mahmood et al. (2013) clarify that some companies have shown that it is possible to exploit advantage in both emerging and developed markets simultaneously, by:

Exploring local innovation by focusing on offering a value proposition to underserved customers and by having present that add value does not mean add features, since the perception of value depends on customer’s location, and - consequently - their needs. **Exploiting** local assets and resources by enjoy from the human resources location, availability and familiarity with local communities. Also, the local means can often represent an opportunity to a better performance.

Mahmood et al. (2013) point out Samsung as an example that defies the conventional wisdom by applying both Exploration and Exploitation as key success drivers across businesses and markets.

Samsung set Speed as its key success factor, and has always preferred to take multiple bets, building an extended product portfolio and diminishing the technological risk and uncertainty. Through its multi-segment approach, Samsung has “encouraging internal competition among product development teams”, which represents an efficient way to assure the continuous improvement of each product. Hence, the ‘Explore and Exploit’ framework mentioned by Mahmood et al. (2013) may be applied to better understand the consumers’ value perception.

Zeschky et al. (2011) also mention the Chinese company Haier as a successful case. ‘Mini Magical Child’ is the Haier’s small washing machine from 1996, which was designed meeting the daily basis needs of Chinese people who cannot afford the price of the ordinary washing machines. After having witnessed Mini Magical immediate success in China, Haier developed a “similar product based on it” which is now being marketed worldwide. (Hang et al., 2010 in Zeschky et al., 2011)

Woolridge (2010b) claims that Western multinationals regard emerging markets as a “source of economic growth and high-quality brainpower”, while at the same time BRIC (Brazil, Russia, India and China) countries are now interested in Frugal Innovation as they are able to innovate cut-price and low energy solutions (Howard, 2011) designed in a sustainable manner while considering hot topics, such as social justice. Thus, BRIC companies are triggering to exploit huge opportunities in their home markets, but also those opportunities in Western markets where people are more and more committed to environmental and social issues, while economy is crossing a post-recession period. As Hossain et al. (2016) say, “frugal innovation is important not only in developing countries, but also and increasingly for developed countries, whose economies are stagnating, while global population growth, the spectre of global warming, and growing demand for sustainability creates pressure for more efficient resource utilisation”.

2.1.2.2 Positioning

Zeschky et al. (2011) describe the customers in the emerging countries as being recent consumers by the shifting from non-served tiers and owners of an increasing purchasing power. They are also mentioned as value conscious consumers derived from the typical resource constraints landscape, while the Western customers are referred to as becoming more and more value-oriented “especially in the wake of the recent economic crises”. Indeed, Benoît and Vickery-Niederman (2010) mention that “shoppers are choosing products and brands based on their moral and ethical understanding of the environmental and social issues related to a product life cycle” (cf. section 2.2.3.1).

In fact, “while the development of such products has largely been the domain of local corporations in emerging countries, Western corporations have recently started to engage in frugal innovation as well” (Zeschky et al., 2011). Not only is the market presence duration an advantage to the local companies, the business model adaptation and the understanding of local communities’ value perception is also easier to achieve than it is for Western corporations that tackle with challenges while aiming to develop Frugal Innovation.

According to Zeschky et al. (2011), “the growing market for frugal innovation brings two main challenges for Western corporations”. The first of which deals with the necessary rethinking of the traditional business model, which must now consider the resource constraints, the price sensitive consumer and the consequent implication of not focusing on the top of the pyramid, but rather taking

into consideration the growing middle class and its great business potential. As Figure 2 suggests, corporations should drop traditional innovation and apply the reverse way instead, due to the consumer characteristics trends. Here, Frugal Innovation takes an integrative role while aiming to serve cross-layer consumers, focusing on those from bottom and middle local markets (Mahmood et al., 2013). The second challenge concerns the re-building of the organizational structures and capabilities. While developing Frugal Innovation, companies should adapt its R&D procedures and frameworks as well as the logistics function, once Frugal Innovation requires the whole integration from design to consumption. “A more prominent local presence and a fundamental new-product development effort may be necessary to develop a truly effective Frugal Innovation process” (Williamson, 2010, in Zeschky et al, 2011).

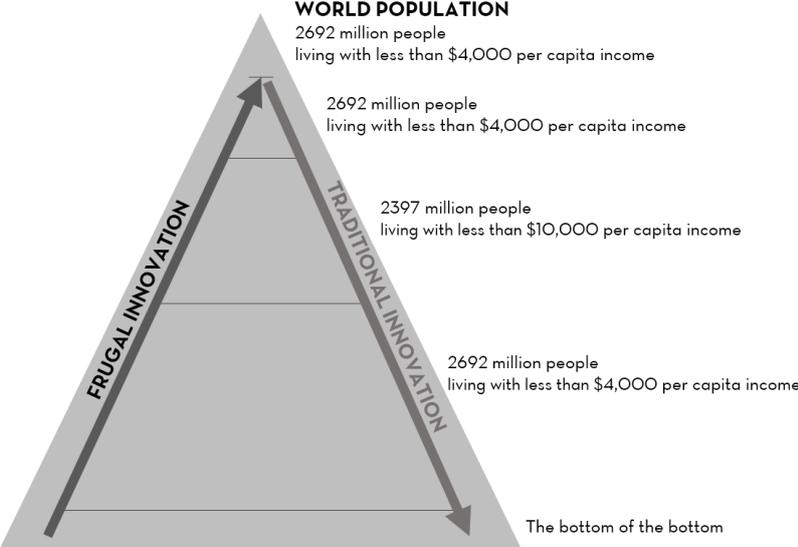


Figure 2 – Target of Frugal Innovation. Bottom-up movement (Adapted from Mahmood et al., 2013).

As mentioned above, emerging countries have been pointed as new business innovators leaders (Woolridge, 2010b). In fact, these countries are able to deliver a product with an equivalent quality of those produced in Western countries. In fact, as Harris et al. (2015) argue in their work ‘They [Western people] hear “Africa” and they think that there can’t be any good services’ – perceived context in cross-national learning: a qualitative study of the barriers to Reverse Innovation, in opposition of negative stereotyping, low-income countries – in that specific case, African ones – may be well prepared to promote Frugal Innovation with products that can satisfy customers also in developed countries – since those products are equivalent in terms of quality and robustness – as Woolridge (2010a) claims that “frugal does not mean second-rate”.

As frugal innovators in BRIC countries aim to adapt its frugal products to West and, as a result, extend their market exposure, Howard (2011) still warns all Western companies to be prepared for what frugal approaches and claims can have in their markets.

In fact, and according to Tiwari et al. (2014), the unsaturated demand arising in the developing countries is the one which frugal innovations intend to satisfy, as it also aims to satisfy the upmarket demand by serving a functional and sustainable product. While integrating both emerging and developed countries markets, Frugal Innovation deals with global market challenges.

On the centre of the Prahalad's BoP framework are both economic development and the social transformation. In fact, the opportunities represented by the markets at the BoP only unfold if multinational corporations, governments and other entities are open to integrate all the potentials of the emerging markets. Amongst which, the one excelled by its comprehensive scope is the "co-creation". It arises from "the importance of collaboration across various groups", these groups being comprised of all the players who should "work together with a shared agenda": large and small firms, governments, civil society organizations, development agencies, and the poor people. The latter act as target groups and value-conscious consumers as well as resilient and creative entrepreneurs and business co-developers. (Prahalad, 2010). EY (2011) publication states the "demographic shifts transform the global workforce" as one of the three drivers which interconnect the six global trends, and in fact Prahalad had already argued that "the poor themselves are willing to experiment, learn, and change". In this context the co-creation arises as the key driver to better exploit all of the potential represented by the BoP tier.

The EY study still reveals that a tight link between governments and private sector is also a way to establish the global power structure, while the private sector set its investments on the country and the "governments balance global cooperation with pursuit of national interests" (EY, 2011). A link is suggested between Frugal Innovation and the fifth EY's global trend. While Frugal Innovation aims to satisfy the underserved markets, the "rapid technology innovation creates a smart, mobile world". Together they can make those products affordable and accessible to a large number of customers.

Following the EY's six global trends, the organizations' transparency about their sustainability practices will contribute to increase pressure from stakeholders to disclose the social and environmental impact of their business activities. Frugal Innovation application benefits from that since it simultaneously increases the global awareness to sustainable development and to the competitive advantage it represents. EY study talks about Cleantech, which encompasses those processes, products, services and methodologies aiming for the reduction of negative environmental impacts, such as: energy efficiency improvements, sustainable resources usage and environmental protection. All three are also required in Frugal Innovation models.

One of the key factors of the increasing global power of emerging markets is the "rising population & prosperity drive new consumer growth and urbanization". EY's study defines that the combined purchasing power of the global middle classes is estimated to more than double by 2030 to US\$56 trillion - over 80% of this demand to come from Asia, while the infrastructure in Asia alone will need estimated US\$7.5 trillion investments by 2020.

In this context, the Mahmood et al. (2013)'s "Explore and Exploit" aforementioned framework is an example, among others, of tackling with and overcoming the challenges a company faces while positioning in a new market.

Hossain et al. (2016) refer some Frugal Innovation's consequences in the global market by mentioning that "frugal innovations increase competition resulting in lower prices, shift a share of R&D sites to developing countries, and engage completely new groups of customers".

In summary, in this section it is perceived that Frugal Innovation intends to serve both low- and mid-market segments simultaneously, in both developing and developed countries, as frugal innovations are low-price but reliable, robust and good quality products.

2.1.3 Aspects addressed on literature

Frugal Innovation has been studied, but a long path is still to be done in order to its practice be accepted and adopted by organizations and governments towards new markets and ways of doing business. Table 2 lists the main work done on this area, and identifies the most emphasized aspects of Frugal Innovation in each article. Although this list is not totally comprehensive of the work done by scholars, it is reliable in a way that it is representative of Frugal Innovation presence in literature.

Table 2 – Frugal Innovation in literature.

Authors	Main issues addressed					
	Social	Environmental	Business Model	Logistics	Market	Product and Product Development
Angot and Plé, 2015			X		X	
Bhatti, 2012				X	X	
Bhatti and Ventresca, 2012	X				X	
Bhatti and Ventresca, 2013					X	
Basu et al., 2013		X		X	X	
Bocken and Short, 2015		X	X			
Bound and Thornton, 2012		X	X		X	
Brem and Wolfram, 2014			X			X
Cameron, 2012			X			
Crisp, 2014						X
Eagar et al., 2011			X			X
Engel and Sebaux, 2014		X	X		X	
Hamacher and Rai, 2015	X				X	X
Herstatt and Tiwari, 2012					X	
Kahle et al., 2013	X					
Lehner and Gausemeier, 2016						X
Mahmood et al., 2013					X	

Cont. Table 2 – Frugal innovation in literature.

Millstone, 2014		X	X	X		
Ostraszewska and Tylec, 2015					X	
Pansera and Owen, 2015				X		X
Pansera and Sarkar, 2016						X
Rao, 2013		X			X	X
Ray and Ray, 2010			X			
Roland Berger, 2013			X		X	X
Roland Berger, 2014			X		X	X
Roland Berger, 2015			X		X	
Rosca et al., 2015	X	X				
Sharma and Iyer, 2012						X
Soni, 2013			X		X	
Soydan, 2012	X				X	
Tavoletti, 2013	X		X			X
Tiwari and Herstatt, 2012a					X	X
Tiwari and Herstatt, 2014			X		X	
Tiwari et al., 2014			X			X
United Nations Development Programme, 2014	X		X		X	X
Winterhalter et al., 2014			X			
Wohlfart et al., 2016						X
Zanandrea et al., 2012						X
Zechky et al., 2011					X	X
Zeschky et al., 2014a			X		X	
Zeschky et al., 2014b			X		X	
Zeschky et al., 2014c					X	

Table 2 shows that the link between Frugal Innovation and Social Sustainability is yet to be further studied, as literature does not present any work with the objectives of this project. Thus, the pertinence of this work is once again highlighted.

2.1.4 Frugal products

Scholars describe frugal innovations as those solutions which meet some specific attributes. Tiwari and Herstatt (2012a) use a list of frugal examples to enumerate their characteristics: low price, sophisticated technology, easy to use, portable, robust, simple, large-scale and economies of scale, low energy consumption and emissions, and adequate quality. In the same vein, Radjou et al. (2012) refer the frugality of jugaad innovations by its mass production, low cost and price, low energy consumption, smart use of resources, simplicity and durability.

In brief, Roland Berger's (2015) publication presents these attributes organized into six according to the acronym FRUGAL. In Table 3, this is presented as an overview of what is mentioned above. Additionally to these six characteristics, Timely-to-market is also referred as the speed and flexibility are requirements in approaching the market with an innovation (Engel and Sabaux, 2014). Also, the Sustainability is a core aspect of frugal innovations in all activities, operations, practices, including material and supplier selection, and product treatment at the end of its life.

Table 3 – Frugal characteristics. Adapted from Roland Berger (2015).

F	Functional	Low-end and Mid-end
R	Robust	Maintenance-friendly and Equivalent quality
U	User-friendly	Simple
G	Growing	High volume
A	Affordable	Low price
L	Local	Emerging markets and Low-end segments in established markets

2.1.5 Frugal Innovation and Social Sustainability

The link between Frugal Innovation and Social Sustainability is yet to be proposed, but some authors have paid some attention to the integration of sustainability into this kind of innovation.

From a holistic point of view, by which the whole supply chain is concerned, sustainability is now seen as a key driver for innovation. Nidumolu et al. (2009) even state that "there's no alternative to sustainable development. Even so, [...] executives behave as though they have to choose between the largely social benefits of developing sustainable products or processes and the financial costs of doing so. But that's simply not true. [...] Our research shows that sustainability is a mother lode of organizational and technological innovations that yields both bottom-line and top-line returns". Thereby, sustainability is perceived as an enhancer of companies' performance, especially while promoting innovation. When applying environmental-friendly practices, companies can optimize resources, and exploiting innovative opportunities while increasing revenues in new businesses.

Regarding Social Sustainability, literature still lacks in analysing what Frugal Innovation benefits from a social sustainable supply chain. Nevertheless, Mani et al. (2016) present a study on the dimensions and measures that provide a better understanding of the supply chain social sustainability within developing countries, where Frugal Innovation intends to be present and developed. In the same way, Rosca et al. (2016) point out that sustainable business models need to be adapted to Frugal Innovation, since the latter encompasses more variables than the ones considered in sustainable

business models, and therefore it has a higher level of complexity. The authors still attempt to compare sustainable innovations with frugal ones, and in this sense claim that “According to Zeschky et al. (2014a), Soni and Krishnan (2014) as well as Brem and Wolfram (2014) innovations in developing countries tend not to involve technological breakthrough which drive innovation in developed countries. However, frugal innovations highlight the social dimension of sustainability and have a high impact on society, especially in health or education” (Rosca et al., 2016).

From the product perspective, authors highlight the role of frugal innovations in helping to solve social problems and in providing customers a solution to a specific need. In fact, Frugal Innovation responds to a complete and stringent demand for sustainable development. Khan (2016) states that “frugal innovation has made a significant impact on society because it has aimed to solve pressing societal problems through ingenuity while simultaneously generating revenue”. In this sense, the author provides a powerful overview on how literature relate Social Sustainability and Frugal Innovation, by organizing into a table (Table 4) the links authors made between frugal characteristics (according to those referred in section 2.1.4) and the implications for society.

Prahalad (2010) emphasizes the fact that people of the BoP who will have access to solutions for their basic needs, in this sense, Tiwari and Herstatt (2012b) also refer the poverty alleviation by looking for the underserved costumers for whom frugal innovations are designed for.

The ability of this kind of solutions in tackling social inclusion, human wellbeing, quality of life, and social justice is referred by some authors (Rajdou et al., 2012; Rao, 2013) as being an important implication of how frugal innovations promote Social Sustainability. These authors also highlight the innovative attribute of frugal products as being a mean of getting higher value proposition.

Table 4 – Characteristics of Frugal Innovation and implications for society (Khan, 2016).

Authors	Characteristics	Implications for society
Prahalad (2010)	Price Performance Innovation: Hybrids Scale of operations Eco-friendly Identifying functionality Process innovation Deskilling of work Education of customers Designing for hostile infrastructure Interfaces Distribution: accessing the customer Unconventional way to deliver products	Making four billion poor people as customers and treating them as self-respecting citizens by understanding the fundamental needs of the BOP population and innovating for them. Building capacity for people to escape poverty and deprivation. Tackles basic needs, social inclusion, human dignity, participation.
Tiwari and Herstatt (2012b)	Affordable Robust User-friendly Easy to use Minimal use of raw materials Acceptable quality standard	Improving the standard of living of individual communities to the next better level. Tackles human wellbeing, quality of life, dealing with poverty.
Basu, Banerjee and Sweeny (2013)	Ruggedisation Light weight Mobile enabled solutions Human centric design Simplification New distribution models Adaptation Use of local resources Green technology Affordability	Needs and context of poor citizens in the developing world are put first in order to develop appropriate, adaptable, affordable and accessible solutions for them. Tackles social coherence, equity, social justice.

Cont. Table 4 – Characteristics of Frugal Innovation and implications for society (Khan, 2016).

Rajdou, Prabhu and Ahuja (2012)	Creative improvisation Innovation based on constraints Unusual skillset and mind-set Flexibility Simplicity Social Inclusion	Innovating for the margins of the society and bringing them into the mainstream. Tackles social inclusion, social justice.
Rao (2013)	No frills, low cost products/services robust, sustainable design, ease of use, Strong tendency to disrupt incumbents.	Innovating to harness frugality and improve profitability in a world conscious of cost and sustainability. Tackles human wellbeing and dealing with poverty.
Govindarajan and Trimble (2012)	Clean-slate innovations (developed from scratch in the developing world)	Closing the wide gaps between the rich and the poor world. Tackles equity and social justice.

Khan (2016) describes an example that supports the link between the two concepts, which is the success of the Narayana Hrudayalaya hospitals in India. This is a striking case of Frugal Innovation due to its ability to keep its economic performance while helping to solve societal problems, with any environmental negative effect as it applies mass production and lean manufacturing. In fact, the Narayana Hrudayalaya group developed an innovative technique to perform world-class heart surgeries at low prices (\$2000 - \$5000 instead of \$20,000 - \$100,000 in the USA). As such, the Narayana Hrudayalaya group can keep a high profit margin and it provides free of charge surgeries to poor people who cannot afford the low price. Moreover, the technique used in these hospitals can be employed in hospitals all over the world.

2.2 Social Sustainability

Through section 2.1.5 one can perceive the scarcity of literature on linking the two topics: Frugal Innovation and Social Sustainability, in the scope of the objectives of this work. In fact, there are not any tools and frameworks to assess and analyse Social Sustainability of frugal innovations. Hence, by the pertinence of Social Sustainability on frugal products conception and development it will be important to prepare the understanding of Social Sustainability (2.2.1), as well as applicability of socially sustainable practices within a company or by that, meaning that Corporate Social Responsibility (CSR) activities can promote and put it into place in a manner that allows a company to exploit the maximum of advantages (2.2.2). Still in this chapter, those key features that are basis for a complete and adequate Social Sustainability assessment (2.2.3) are presented, as well as its application for frugal innovations (2.2.4).

2.2.1 Social Sustainability Definition

Since the Brundtland Report introduced the concept of sustainability in 1987, sustainability has become a major concern in society and in the way of doing business. Sustainability refers to “meeting today’s needs without comprising the future generations’ needs” (Brundtland, 1987).

In 1998, Elkington developed the 3BL framework. It looks at sustainability as the intersection of environmental, social and economic performance. The coexistence of three distinct dimensions, their understanding and influence on each other is key to a good sustainable performance (Elkington, 1998).

The importance of Sustainability is perceived in the literature, an example is Labuschagne et al. (2005) who even use the term ‘Business Sustainability’ and mention the existing

intention on companies to incorporate the 3BL dimensions on their way of doing business, referring that “Business sustainability is becoming a prerequisite for global competitiveness”. Consequently, companies are adopting and adapting “core competencies and business processes”.

Mani et al. (2016) point out to the little attention the literature had paid towards the social dimension, while Holliday et al. (2002), in Labuschagne et al. (2005), state that “In the mid-1990s companies realized that the social side of sustainable development has largely been ignored”. Several authors try to assign reasons to that. Azapagic and Perdan (2000) state that the subjectivity of social indicators and the difficulty of their measurement are the two contributors to the short work on it. Shrivastava (1995), in Shaefer (2004), states that firms contribute to pure social issues in a lower scale than to environmental issues. Schaefer (2004) still points out that there are authors that were not convinced that the social dimension can integrate business strategy. In this sense, Ashby et al. (2012) argue that “the environmental dimension is significantly more defined and developed in the literature” while “the social dimension is recognised, but receives less emphasis than expected”.

Nevertheless, Mani et al. (2016) still claim that it has recently gained importance for both scholars and companies. Vallance et al. (2011) refer a “conceptual chaos” created by the many and varied contributions of social scientists, therefore the authors try to relieve the complexity given by literature to Social Sustainability, as they are concerned with the hypothesis of a consequently compromised importance and utility of the topic. Instead of proposing a single and narrow definition, Vallance et al. (2011) propose a threefold analysis schema that embodies: (1) Development Sustainability: addressing basic needs, the creation of social capital, justice, ...; (2) Bridge Sustainability: concerning changes in behaviour so as to achieve bio-physical environmental goals; and (3) Maintenance Sustainability: preservation of sociocultural characteristics in the face of chance.

The authors still remark that contradictions may occur along the decision-making process since “we cannot assume that the various elements of Social Sustainability are able to be reconciled” (Vallance et al., 2011), suggesting that many trade-offs may arise from the combination of those elements.

While sometimes giving priority to other aspects, the literature does accept the importance of Social Sustainability as it has been gaining a strong role in the way of doing business. An example is the leverage it has in the Supply Chain Management (SCM), this fact is perceived by the shift and change taking place in the SCM practices. Ahsby et al. (2012) intend to contribute to the Sustainable Supply Chain Management (SSCM) field, observing that “Sustainable Supply Chain can invest in human capital e.g. through Human Resources practices which seek to improve employee wellbeing and commitment and build a culture that values people and the environment”. In addition, Carter and Jennings (2002) suggest that the adoption of socially responsible activities on procurement and purchasing function “has a direct and positive impact on supplier performance”, while emphasising the supply chain relationships management as a crucial point when successfully performing a Social Sustainability strategy. The authors still remark the effects of this strategy as an improvement in trust and co-operation. Moreover, business transparency towards all stakeholders is mentioned by Commission (2002) as being a key element that “helps businesses to improve their practices and behaviour”.

Aligned with the Bruntland (1987) definition of sustainability which refers to fulfil the today's needs consisting of "facing the future, and of safeguarding the interests of coming generations", hereby and in the context of this work the following definition will be used: Social Sustainability intends the fulfilment of society and people's needs.

As mentioned before, Frugal Innovation and Social Sustainability are deeply related: frugal innovations trigger to respond to Social Sustainability issues and pressing social needs (Khan, 2016). Governments, companies, and organizations have a strong role when implementing sustainability practices within their mission and vision, and CSR policies are often mentioned as a crucial driver to integrate Economy, Environment and Society in all levels of corporations.

2.2.2 Corporate Social Responsibility and Social Sustainability

Interest in CSR is accelerating rapidly as organizations are increasingly involved (Aguinis and Glavas, 2012). Dupont, Ferauge, and Giuliano (2013) argue that CSR is becoming increasingly crucial for companies' competitiveness. Thus, CSR constitutes an important topic for corporate development and more companies start to engage in CSR behaviours.

However, CSR has been given a lot of definitions by different researchers and organisations; hence there is not consensus on it. One of the most popular definition is given by the European Commission, stating CSR as: "being socially responsible not only means satisfying completely the applicable legal obligations, but also going beyond and investing "more" in human capital, environment and relations with stakeholders" (Commission, 2011). In this sense, the maintenance of a sustainable relationship with all stakeholders is important for companies to be social responsible. The EU states: "To fully meet their corporate social responsibility, enterprises should have in place a process to integrate social, environmental, ethical, human rights and consumer concerns into their business operations and core strategy in close collaboration with their stakeholders."

In this sense, Ashby et al. (2012) highlight the relationship of CSR and Social Sustainability while emphasising the need of an extension of the corporations' responsibility from supply chains into relationships, products and processes. Companies have been aware of the importance of CSR as they adopt and develop programmes and initiatives to achieve Social Sustainability while addressing subjects such as community involvement, supplier relations, ethics, legal issues, human rights, employee health and safety, among others (Wan-Jan, 2006). In this sense, Aguinis and Glavas (2012) point out the improvement of both the company's reputation and customer's loyalty as an outcome of a CSR programme implementation.

Ashby et al. (2012) state that due to CSR's relevance to and overlap with Social Sustainability, the earlier research of CSR makes it out to be a key driver to study and explore the latter. Additionally, the authors depict the strong link between both by referring Bansal (2005) and Davis (1967) when stating that "CSR requires firms to embrace economic, legal, ethical and discretionary expectations of stakeholders, with the understanding that avoidance of a firm's social responsibility will lead to the erosion of social power". While integrating Social Sustainability in a company's CSR strategy, it is crucial to have in mind that the "People" of the "Planet, People and Profit" inserted in the referred 3BL philosophy – can enhance the other Ps by balancing and pulling together resources to achieve major sustainability objectives related to the whole 3BL equilibrium. Even if there could be a difference on

the scale of impact of CSR and Social Sustainability, Sarkis et al. (2010) still remark the relevant link between them.

Moreover, Porter and Kramer (2006) defend that CSR can also be a source of competitive advantage – as ‘business sustainability’ was seen by Labuschagne et al. (2005) and mentioned above. The authors suggest that ‘Corporate Social Responsibility’ should walk to ‘Corporate Social Integration’ as it is much more than hazard management or charity, representing not always an additional cost or a constraint. In fact, “Efforts to find shared value in operating practices and in the social dimensions of competitive context have the potential not only to foster economic and social development but to change the way companies and society think about each other” (Porter and Kramer, 2006). By that it is perceived that CSR – when it is applied according to the frameworks that guide the business choices – represents a source of opportunity, competitive advantage, and a driver of innovation.

As mentioned earlier, CSR product-related activities can lead to distinct types of innovation. In fact, throughout the years processes and business models have been adapted, as products and services have been developed. In this sense, and while encompassing CSR as an enhancer of Social Sustainability in Frugal Innovation, it would be relevant to introduce the role stakeholders can have in CSR strategies.

Stakeholders

The concept of stakeholders takes part in the core of CSR. Moreover, within the CSR implementation frame, it is relevant to define their role and nature in the process. Stakeholders are frequently referred as those who feel the impact or have impact by an organization activity. Freeman (1984) points them as being “groups and individuals who can affect, or are affected by, the achievement of an organization’s mission”. The concern about CSR implies the stakeholder impact management while it is no longer only the shareholders who matter for the company (Clarkson, 1995). Two levels of stakeholders are often mentioned in literature: primary and secondary. Primary stakeholders, also called internal, are those whose direct relationships are essential for the organization to realize its mission in producing goods or services for customers, while secondary (external) stakeholders include social and political actors who support the mission by providing their tacit approval of the organization’s activities, thereby making them acceptable and giving the business credibility, such as local communities, governments, and non-governmental organizations (NGOs) (Maon et al., 2009).

By discovering the role of both primary and secondary stakeholder, literature has witnessed an increasing trend of including stakeholders in sustainability science, especially when Mielki et al. (2016) highlight that “academic literature describes a wide array of opportunities associated with stakeholder involvement”. Maon et al. (2009) point out the significant presence of the subject on CSR research and, as result, the authors propose an integrative framework where continuous stakeholder dialogue has a key position while designing and implementing CSR.

The authors find that “in order to align stakeholders’ interests and create long-term value, organizations must develop, apply, and maintain necessary managerial competences and capabilities to deal with stakeholder concerns”. Moreover, it is said that the engagement with transparent and frequent stakeholder participation can lead to future improvements at corporate level, and also at the managerial or operational level.

Mielki et al. (2016) still argue that distinct ways of participation apply to different situations or procedures, while referring that “the main objective of stakeholder involvement is to tackle the complexity, uncertainty and multiplicity of values and perceptions on controversial issues”.

Regarding the integration of stakeholders on CSR strategies, Pelozo and Shang (2011) have carried out a review on how CSR activities impact the stakeholder response (attitudes and behaviours) and the subsequent creation of value from the perspective of stakeholders, from which the authors concluded that the “marketing researchers can make a meaningful impact in the literature examining the business case for CSR” in a way that the practice claims an “increased focus on the source of stakeholder value provided by CSR activities”.

In the scope of the present work, stakeholders’ participation activities, practices and initiatives will be relevant to apply when looking at the product-related CSR activities directly linked with Social Sustainability, and subsequently with Frugal Innovation implementation. Even if product-related ones are those with the more perceived link with Social Sustainability and Frugal Innovation, the business and philanthropy CSR activities are also related in a more indirect way, therefore even if they are not explicitly mentioned; along the further study they will be considered. It is also essential to highlight the strong importance of stakeholders’ participation involvement along the product development process. In fact, while promoting Frugal Innovation, companies should be always seeking for the accurate adequacy of the product to the specific needs of the target community, and as suggested by this section, a good practice on doing this is to act closer to stakeholders. In Frugal Innovation’s scope, the stakeholders who are more referred are the local communities, including local entrepreneurs, local knowledge and expertise holders, governmental associations, and NGOs – without prejudice to any other entity that has a stake on the value chain. Furthermore, Rosca et al. (2016) state that the two drivers for the business model to be successful is: the more collaborative and inclusive value chains are, and the greater the involvement with local NGOs is.

2.2.3 Social Sustainability Assessment

Sustainability Assessment started to be performed to integrate the social and economic dimensions into environmental assessment methodologies, as it is the example of Life Cycle Assessment (LCA) as it will be discussed on section 2.2.3.1.

Benoît and Vickery-Niederman (2010) identify and list relevant references and instruments, as well as tools and methodologies to perform a Social Sustainability assessment, from which Social Impact Assessment is unfolded – which is described in the following section.

Social Value Assessment can be also used to measure the Social Sustainability of a product, service or process. The measurement of Social Value has been pursued by scholars and practitioners, but its tools are still blurred due to some reasons. On section 2.2.3.2 some points of view are presented as well as its comparison, as an introduction of the further study in chapter 4.

2.2.3.1 Social Impact Assessment

First of all, it would be crucial to define what Social Impact is in the scope of this work. UNEP (2009, p.43) defines social impacts as the *consequences of positive or negative pressures*

induced by social interactions on social endpoints, in which social endpoints mean the wellbeing of stakeholders. This implies a broad scope in which Social Impact Assessment (SIA) operates.

SIA is an interdisciplinary and/or transdisciplinary social science that addresses many core concepts: culture, community, power, human rights, gender, justice, place, resilience and sustainable livelihoods to name a few (Esteves et al., 2012). Summing up, SIA is about the management of the social issues associated with planned interventions (Vanclay, 2003) by analysing and monitoring their social consequences. SIA is defined by Burdge (2004) as being a systematic evaluation of those “impacts on the day-to-day quality of life of persons and communities whose environment is affected by a proposed policy, plan, programme or project”. In this sense, SIA still provides “qualitative and quantitative indicators of social impact that can be understood by decision-makers and citizens alike” (Burdge, 2004). In this sense, Esteves et al. (2012) state that there is a strong consensus on what *good* SIA practice is. The key points of a good practice of SIA are presented in Figure 3.



Figure 3 – Key points of a good practice of SIA. (Adapted from Esteves et al., 2012)

“SIA methods are used to assist decision-making and prioritization of social investments by project proponents. Social investments often form part of the **corporate social responsibility** initiatives of companies and their community development commitments to affected communities” (Esteves et al., 2012). SIA tools allow performing a cost-benefit analysis which is becoming more and more important once companies are seeking to enhance positive outcomes while mitigating negative impacts of their activities (João et al., 2011).

Here, it is important to mention the link that exists between CSR, SIA tools, and the transparency people and companies aspire to, to support the decision-making process in a way that there is more information available to both sides of the trade: customers and companies.

Highlighting the importance of contextualisation while performing SIA, since the social key indicators are dependent on the case itself, Benoît and Vickery-Niederman (2010) claim the relevance of integrating the stakeholders on the assessment process, even when identifying the social indicators.

The fact that SIA is case-dependent is a major reason for the social dimension to often be the one less concerned, aligned with what Khan (2016) stated, “It has been argued that measuring and quantifying Social Sustainability has been quite challenging”. In fact, Benoît and Vickery-Niederman (2010) claim that the SIA should be case- and context-specific, from which arises “no consensus on which indicators to use and how to assess social impacts with SIA”.

Social Life Cycle Assessment

The Social Life Cycle Assessment (S-LCA) is a tool to assess an social performance along a product’s life-cycle, which encompasses resource extraction, processing, manufacturing, assembly, marketing,

sale, use, recycling, and disposal, among others – in order to comprehend all stages from the cradle to the grave. UNEP (2009) state that “S-LCA is not an addition of SIA results because it involves phases of a project’s life cycle (when the product is under production) not generally dealt with in a SIA”. Nevertheless, it is also noticed that SIA may provide useful information for S-LCA.

In fact, S-LCA was conceived to cover the areas the Environmental Life Cycle Assessment (E-LCA) was not approaching. While in E-LCA the “overall social wellbeing of a product or unit process is not assessed” (Benoit-Norris et al., 2012), S-LCA joins key factors such as societal benefits and worker’s rights, among others. UNEP (2009) mentions the complementarity among E-LCA and S-LCA “Environmental LCA, in itself, does not provide all the information to make decisions in a sustainability perspective. An S-LCA provides complementary information, providing a more comprehensive picture of the products’ life cycle impacts.” Hence, S-LCA aspires to add in into the assessment framework those critical indicators of human wellbeing that are influenced by supply chains and their process in a narrower scope (Benoit-Norris et al., 2012; Norris, 2006).

In 2009, UNEP published its guidelines for S-LCA. Until then, the LCA had generally been used to identify and evaluate the effects of a certain product, service or process in terms of environmental impacts. By including the social and socio-economic issue into the LCA framework, S-LCA is nowadays performed as a holistic, systemic and rigorous, being the preferred tool to analyse the impacts of products life cycles which “involve material, energy and economic flows” (UNEP, 2009).

UNEP’s guidelines for S-LCA provide a framework based on two dimensions: stakeholder and impact. The first dimension refers the “cluster of stakeholders that are expected to have shared interests due to their similar relationship to the investigated product systems” and its categories are: Workers; Local community; Society; Consumers; and Value chain actors - without prejudice to other groups that can be added, e.g. NGOs or public authorities (UNEP, 2009). The impact categories are: Human rights; Working conditions; Health and safety; Cultural heritage; Governance; Socio-economic repercussions. From the stakeholders and impact categories, subcategories that represent socially significant themes or attributes are set, as they, together with each corresponding indicator, will be the basis of the whole assessment procedure. These guidelines recommend “the development of methods that prioritize the most important unit processes in supply chains to collect accurate data for” (Benoit-Norris et al., 2012) In this sense, Benoît and Vickery-Niederman (2010) provide an insight on the benefits arise from assess a product life cycle angle of social responsibility. In fact, and as aforementioned, ethical consumerism is a trend, and companies should strive to correspond to the needs arising from that. On the one hand, LCA provides a big-picture perspective of the product life cycle, allowing the promotion of transparency of business activities towards the stakeholders, especially the consumers (or end users). This transparency is deeply related with CSR practices previously mentioned.

Three main benefits are pointed out:

- It provides a comprehensive and targeted analysis of a product’s social footprint.
- The gathered information provides a way to improve the communication with retailers and with the end consumer about the social impacts (positive and negative) of the particular product they sell and buy.

- Having the big picture from cradle to grave prevents the shifting of negative impacts from one life cycle stage to another, or from one social issue to another.

Indicators

Regarding the assessment, it is noted the importance of gathering indicators, which measure the social impacts along the product life-cycle. As social dimension is seen as subjective, literature strove to propose metrics of all three types: quantitative, semi-quantitative, and qualitative – the latter is often less objective, but exists to tackle the difficulty found when trying to assess certain social aspects.

S-LCA guidelines propose a model by which it is possible to be comprehensive while doing the social assessment of the whole life-cycle. There are stakeholder categories, and impact categories, and actually, “one impact category can be related to several stakeholder categories, one stakeholder category can be affected by different impact categories”. Subcategories are the basis to define the inventory indicators, when the former are combined with the impact categories. Inventory indicators “provide the most direct evidence of the condition or result they are measuring” (UNEP, 2009).

Some authors worked about these S-LCA subcategories, and in regard to supply chain Social Sustainability. Simões (2014) used sixteen midpoints that intend to improve upon and systematise “the existing KPIs for conducting a more complete cradle-to-grave SLCA on products and services as well as to provide valuable information on critical criteria for decision-making”. In Table 5, these midpoints are presented, and correlated with the Global Reporting Initiative (GRI) endpoints, and also those related metrics proposed by Ahi and Searcy (2015a) and Ahi and Searcy (2015b) for social SCM performance.

Table 5 – Endpoints, midpoints and metrics for social impact assessment.

Endpoints (GRI)	Midpoints (Simões, 2014)	Metrics for social SCM performance (Ahi and Searcy, 2015a and 2015b)
Labour practices and decent work	Employment Scope; Benefits and Characteristics	Health and Safety incidents Health and Safety practices
	Employment Practices and Relations	Involvement in Health and Safety committees Health and Safety performance measurement systems
	Employee Welfare	Standardized Health and Safety conditions Health status and risks
	H&S Practices and Incidents	Safety of workers Work safety and labour health
	Diversity and Equal Opportunities	Contribution to employment Percent of employment sourced from local communities
	Training: Education and Personal Skills	Human welfare, Social welfare
	Innovation and Competitiveness	

Cont. Table 5 – Endpoints, midpoints and metrics for social impact assessment.

Society	Business Impacts, Community Involvement and Welfare	Improvement in community relations and corporation image Community connection and network Firm's community development effort
	Community Funding and Support	Community impact rate Community engagement
	Fair Business Operations	Significant improvement in relations with community stakeholders
	Corruption in Business	Participation in voluntary programs Number of individual volunteering
	Stakeholder Participation	Economic linkages with communities Corruption risk
Human Rights	Basic Human Rights Practices	Publicly available missions and values statements Value added and community benefits Institutional efficiency
	Human Rights Implementation and Integration	Community ideology Construction of community style and features Supplier and Certifiable Safety Standard
Product Responsibility	Consumer Health and Safety	Contribution to community Product safety
	Product Management and Consumer Satisfaction	Community complaints Community initiatives Improvement of community health and safety Relationship after sales service Complaints from neighbouring communities

2.2.3.2 Social Value Assessment

Social Value is also a concept which is not well defined or whose boundaries are well settled. Scholars have been referring it in the way it is more relevant in their own scope. Yang (2014) refers that the social value of a product depends on whether it is socially desirable. That is to say that the social value mirrors the utility a product or service will have to the community (or society at large), as the value the product has is the one that is perceived by that community. Phills et al. (2008) mention the "social value as the creation of benefits or reductions of costs for society - through efforts to address social needs and problems - in ways that go beyond the private gains and general benefits of market activity". Complementarily to this view, Mulgan (2010) claims that social value emerges from the interaction of supply and demand, so that it is shaped accordingly the situation (people, local, etc) influence the level of social value of a certain product or service. In an attempt to incorporate many points of view, the Social Value International organization defines social value as "the relative importance that people place on the changes they experience in their lives" where, the "changes" are those induced by the product/service utilization.

In spite of the difficulty in defining Social Value, it is possible to notice some trends on the references to the concept. Social Value is certainly something established by the society (as end-user community) and founded upon the contextualization of that society. Social Value is seen from the user point of view, and companies must take it into consideration after ascertaining it by participatory techniques with the stakeholders.

In this sense, Mulgan (2010) presents two reasons for social value assessment to be considered as a challenging task. The first one is related to the nature of the Social Value itself. The author explains that it is not objective, fixed or stable and claims that assuming that can be the main obstacle for those

looking for ways to measure Social Value. In fact, “when people approach social value as subjective, malleable, and variable, they create better metrics to capture it” since people can understand Social Value in a more comprehensive manner as they observe the real behaviour of the action. The second reason the author presents deals with the fact that managerial decisions should be made according to external accounting, internal management and social impacts. These three strands should be taken into consideration simultaneously. Thus, the complexity of the decision-making process unfolds, moreover when each of the strands uses a different tool to perform its assessment.

The author claims that, while measuring Social Value, there is an important aspect to consider: effectiveness. Mulgan differentiates supply and demand from effective supply and effective demand. Effective demand means that someone is willing to pay for a product, service, or outcome; and effective supply means that the product, service, or outcome works, is affordable and implementable.

By the definition proposed by Mulgan (2010), the interaction of effective supply and effective demand



Figure 4 – Social value emerges from interactions between demand, supply and resources. Adapted from Mulgan (2010).

is the core of the topic. And as it is, the link between three things seems to be unfolded. As it is suggested in Figure 4, while assessing Social Value the balance between demand, supply and resources should be procured. On the demand side, there are people and organizations with needs; while on the supply side there are people and organizations with solutions and services; and on the resources level there are people and organizations with funds.

For example, the link occurs when a need (demand) is recognized by a local charity who develops a solution (supply) to cover that need, and at its time, a funding entity (resources) allocate s its money in that solution. But links like this one are not always visible as sometimes a need (demand) is not

perceived as it is by funding entities (resources) for example. Mulgan (2010) proposes to use social value assessment to turn visible what wasn't to both sides of the trade. It is also relevant to point out some methods that are being used to perform social value assessment. Most of them are unreliable and have limitations while being applied. Table 6 is adapted from the one presented by Mulgan (2010) and it comprehends eight of these methods. In addition to these eight, one may include the government accounting measures as the metrics to assign the governments' spending but, in this scope, there is no agreement about which indicators to include. Also other field-specific assessments could be applied to social value measurement, but the “diversity of these measures means that they are little used for public decision making” (Mulgan, 2010).

Table 6 – Eight ways that can be applied to social value assessment. Adapted from Mulgan (2010).

Method	Description	Limitations
Cost-Benefit Analysis/ Cost-Effectiveness Analysis	It is the most widely used family of tools and often used for large public programs. It counts up costs and benefits, and then applies discount rates.	Disagreements about the actual numbers and weightings in the calculation, and conclusions.
Stated Preferences	It is based in what people say they would pay for a service or outcome.	Stated preferences often do not correlate with actual behaviours, as they set off the emotional side of the purchasing.

Cont. Table 6 – Eight ways that can be applied to social value assessment. Adapted from Mulgan (2010).

Revealed Preferences	Examines the choices that people have actually made to infer the relative worth of different options.	There is no enough data available for most of the fields.
Social Impact Assessment/ Social Return on Investment Assessment (SROI)	Estimates the direct costs of an action, the probability of it working and the likely change in future outcomes, sometimes with discount rates.	There are disagreements about numbers, weightings, and conclusions; values; how to handle time and discount rates; and intended audience of the calculation.
Public Value Assessment	It is based in judgements on how much the public values a service.	It is not rigorous or accurate enough.
Value-Added Assessment	It is used in education area and assesses how much a school adds to the quality of its students.	It is complex and sometimes it is not understandable for parents.
Quality-Adjusted / Disability-Adjusted Life Years Assessment	It is used in health care policy and research, and it accounts for patients' objective health and patients' subjective experiences.	This method can be controversial when a particular treatment is not cost-effective.
Life Satisfaction Assessment	It is based on judging social projects and programs by how much extra income people would need to achieve an equivalent gain in life satisfaction.	It is a new approach that remains unproven and it is not reliable for the practitioners. At the same, as it is based on judgements, it is highly sensitive to input assumptions.

2.2.4 Social Sustainability Assessment for frugal innovations

The objective of this work being to link Social Sustainability and Frugal Innovation, it is relevant to look at what literature presents about the assessment. Thus, it is important to consider that Khan (2016), when proposing the role of frugal innovations promoting Social Sustainability, presents a set of themes of Social Sustainability derived from the literature that will be also used as basis for setting the indicators and quantifiers. In Table 7, the list of social themes is presented. The author is the one giving the first step towards linking Social Sustainability and Frugal Innovation, but still doesn't give any tip for its assessment indicators.

Table 7 – List of themes of Social Sustainability derived from Social Sustainability literature (Khan, 2016).

Themes of Social Sustainability	
Human health and wellbeing/ wellbeing of generations	Preservation of socio-cultural patterns and practices
Basic needs and quality of life	Participation (including stakeholder participation)
Social coherence	Human dignity
Social justice and equity	Safety and security
Democratic/engaged government and democratic society	Sense of place and belonging
Human rights	Education and training
Social inclusion	Employment
Diversity	Community involvement and development, community resilience
Decline of poverty	Fair operating practices
Social infrastructure	Capacity for learning
Social capital	No structural obstacles (to health, influence, competence, impartiality, and meaning-making)
Behavioural changes	

Even when a product, service, or procedure, is considered as frugal, it typically does not address all the themes. Depending on the market and also on the business sector, the solutions are more linked with some social issues than others; while governance, for example, is something that is cross-sector due to the importance of regulation and commonly the status of adequacy of the law system leverage the way Frugal Innovation promoters can operate in and influence the market.

In this way, the social impact assessment of frugal innovations needs to be systematic and integrative of all stages along the value chain. The indicators and metrics suggested by literature are still broad when applying to Frugal Innovation, as – and in the scope of what was presented in section 2.2.3.1 –

indicators and metrics “may vary depending of the context of the study” and “stakeholders can vary not only from one study to the other but also within each step of the supply chain”. This means that several efforts will have to be made in order to find and define the appropriate indicators for a specific case (UNEP, 2009). With Khan (2016) being the only contribution to the social sustainability themes to be eventually assessed for Frugal Innovation, the practical and scientific relevance of the actual work is once again highlighted.

2.3 Conclusions

Frugal Innovation exists as a response to the global market trends: increasing population, scarcity of resources and global competition – that result into a new set of customers coming from the emerging markets with new buying patterns. The purpose of Frugal Innovation consists in answering these challenges with products, services and procedures that represent simultaneously economic, environmental and social value to both consumers and firms, as the latter can still be benefiting from a high profit margin - by serving a large volume of customers - when developing frugal innovations that should be functional, robust, user-friendly, growing, affordable, sustainable, and thought to be local, but able to be adapted globally. As such, Frugal Innovation itself also represents many challenges. One of the more severe and less studied is its integration with Social Sustainability in two distinct ways: on the one hand, how to assure the link between the two concepts and, on the other hand, how to assess it in the long haul along the value chain until the end of the product or service life cycle.

The literature review shows the relevancy of looking for to bridge the gap between Frugal Innovation and Social Sustainability. While some scholars are already positioning their researches from a product value delivery perspective, the link between Social Sustainability and Frugal Innovation is yet to be offered. Opening doors to be integrated into the framework, the appropriateness of this work is also seen through the urgency there is to show companies how to put Frugal Innovation into practice.

Despite not being consensual, many authors suggest a definition to Frugal Innovation and none of them exclude the perfect adequacy and the requirement that emerges out of that to the product or service features to match and fulfil the society's needs. There is still some way to go in alerting companies to all the variables of Frugal Innovation, and this study intends to close the gap between the theoretical researches that literature has been proposing with the actual practical side of Frugal Innovation implementation.

Although frugal innovations deliver many advantages to both promoters and consumers, it faces a period of definition. That, together with the subjectivity assigned to Social Sustainability (especially Social Impact and Social Value concepts), represent a high barrier for companies – which are often not prepared to overcome it, as the information about the practical side of Frugal Innovation. Social Impact and Social Value are here studied as two complimentary parts of Social Sustainability, so that the assessment tools literature suggests for the former concepts were reviewed. The stakeholders are key actors in both strands of evaluation; therefore their involvement and participation should take part in the whole process. In addition, CSR is perceived as necessary for Frugal Innovation.

The assessment of Social Impact and Social Value integrated simultaneously seem to provide an integrative view of how social sustainable is the frugal process and product from the cradle to the grave, or even cradle-to-cradle.

3. Research Methodology

The research methodology employed in this work is detailed in this chapter. It encapsulates several methodologies, building a multi-methodology approach. Figure 5 shows the flow diagram of the work and the corresponding methodologies used.

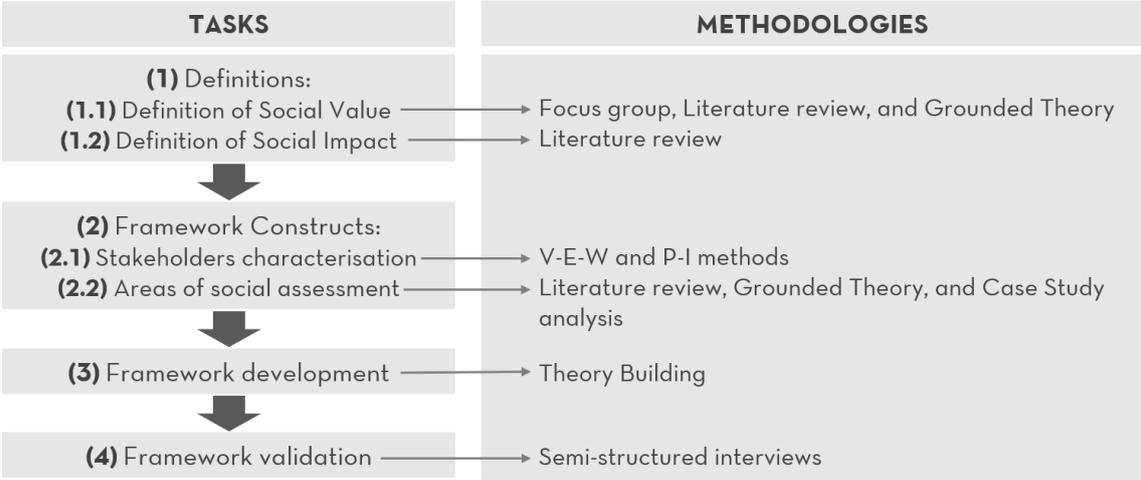


Figure 5 – Tasks and methodologies.

3.1 Definitions

3.1.1. Literature review

The literature review is a research strategy applied with the main objective of contextualising and familiarising the author with the literature in the field of the work, in order to get to know about which are the theories and concepts used in that field, and also about the theoretical and methodological debates and the questions to be answered (Flick, 2009). Hence, the first literature review encapsulates two different areas: Frugal Innovation and Social Sustainability, as described in chapter 2. While comprehensive, this review would be crucial to allow the author to further develop concepts that in the literature are often misunderstood or not clear. In this way, an intermediate goal is to find the link between the two mentioned research areas. Then, the establishment of the definition and comparison of Social Value and Social Impact is the next intermediate goal, with these concepts as the basis for the further work.

The keywords used in the literature review from online publishers and libraries, such as Google scholar, Science Direct, and Springer, were: ‘frugal innovation’, ‘frugal products’, ‘social sustainability’, ‘social sustainability assessment’, ‘social impact’, ‘social impact assessment’, ‘social value’, ‘social value assessment’.

Firstly, literature review allowed identifying the stakeholders as a key link between Frugal Innovation and Social Sustainability. Thus, the stakeholder characterisation appears in the work as a main task (section 3.2.1). Then, to define Social Impact, the literature has contributed with the boundaries and the scope – according to Table 11 presented in chapter 4 – so that, it was possible to define it directly from the scholars’ inputs.

3.1.2. Grounded Theory

Then, the task of defining Social Value required two additional methodologies. First, Grounded Theory which was done by simultaneously collecting and analysing data, which allowed to conceptualise and define the term. It was achieved by the comparison of empirical evidence and theoretical frameworks (Eisenhardt, 1989), specifically the comparison between Social Value and Social Impact – presented in chapter 4. In fact, different fields offer an insight on what Social Value is, but literature was missing a clear and comprehensive conceptualisation. Thus, Grounded Theory was used as a general inductive research methodology to identify the boundaries of Social Value, alongside with those main concepts to be considered that are suggested by several fields such as Marketing, Sociology, Social Economy, among others.

The procedure used was based on three main processes: open coding, axial coding and selective coding – which allowed to move from the practical and literature contents to the conceptualization on how each input contributes to the definition. First, the Open Coding: the data collection from the literature was made exhaustively since many fields were considered; these inputs had to be analysed and organised in order to be able to take out of them the ones which give the right set of actions to follow to build theory. Then the Axial Coding: the identified categories were decomposed into narrower topics, therefore it was possible to explore correlations among them; then, they were rearranged in order to obtain results by exploiting those relationships. Thirdly, the Selective Coding: as the categories were integrated, as it is detailed in chapter 4, the core concepts of this exercise arise and were then embodied into the definitions that followed.

3.1.3. Focus Groups

Focus Group methodology was crucial to achieve a wider insight and further discussion about the novelty that Social Value concept would bring. Therewith, multidisciplinary groups met several times (Annex I) to discuss it and to unfold the applicability of the concept. The Focus Groups included researchers on Social Sustainability, Social Impact and Social Life Cycle Assessment, Frugal Innovation, Social Entrepreneurship, and Marketing.

In addition, for the application of the Grounded Theory after the literature review, a confidential report on products' Social Value was a valuable input due to its comprehensive scope and its application to companies' reality. It also provided orientation to the analysis that allowed the consequent conceptualisation presented in chapter 4. This confidential report was provided by a research group with whom the author had taken part in the meetings and discussions which also valued the analysis.

3.2. Framework constructs

The framework was developed taking four types of information as basis, named the framework constructs:

- the frugal characteristics;
- the definitions of Social Value and Social Impact;
- the most significant stakeholders; and
- the most relevant areas of social assessment for the context of Frugal Innovation.

The latter two required a further analysis through some research methodologies, so that it is detailed in chapter 5, according to the methods introduced in this section.

3.2.1 Stakeholder characterisation

To consequently contribute for the framework development, the stakeholder characterisation has the aim of identifying and prioritizing the stakeholders with more relevance and significance in Frugal Innovation. This characterisation, which was based on the literature review and grounded theory, required two methods described below: Value-Expertise-Willingness (V-E-W) method, and Power-Interest (P-I) method.

3.2.1.1 V-E-W method

The objective of this method is to prioritize the stakeholders in terms of their Value, Expertise, and Willingness. The V-E-W method is based on the Business for Social Responsibility (BSR) method (BSR, 2011), but includes some adjustments to better adapt it to the Frugal Innovation. To employ this method four steps should be followed: 1. identify, 2. analyse, 3. map, and 4. prioritize.

1. Identify | The aim is to list the whole set of stakeholders, and this identification needs to be comprehensive. Thus, several techniques are used to gather information, being some of them: interviews, questionnaires, observation, study of existing documents and reports, multi-disciplinary groups brainstorming, among others. In this work the identification was conducted having the multiple discussions and meetings of focus groups and the information taken directly from the literature. Thus, the identified stakeholders were listed according to what literature refers as being the actual actors in business activities, and pursuant in Frugal Innovation practice and study.

2. Analyse | The analysis is carried out according to three categories: Value, Expertise, and Willingness – as the method's name suggests. Table 8 schematizes the method's categories and subcategories.

Value: both subcategories Influence and Necessity of involvement give the information needed to get the Value of a stakeholder. In this sense, 'Influence' seeks to answer to "How much influence does the stakeholder have towards the frugal performance or the frugality of a product or service?". And 'Necessity of involvement' strives to respond to "Is this someone who could derail or delegitimize the process if they were not included in the engagement?". (BSR, 2011)

Expertise: This category is also divided into two subcategories: Contribution and Legitimacy. These two help in evaluating the level of knowledge or skills a stakeholder have in a specific context. While 'Contribution' intends to answer the question "Does the stakeholder have information, counsel, or expertise on the issue that could be helpful to the company to implement Frugal Innovation?", the 'Legitimacy' answers to "How legitimate is the stakeholder's claim for engagement?". (BSR, 2011)

Willingness: This category, through its own subcategory Willingness to engage, intends to answer the question "How willing is the stakeholder to engage?" (BSR, 2011). A low score in this category would require a higher level of effort by the company when it is justified by the values in the other two categories. For Frugal Innovation, this will be a minor criterion to perform the prioritization, nevertheless, this kind of information on the willingness of the stakeholders to collaborate is very important for the company and should not be undervalued.

As the objective of the method is to prioritize the stakeholders by ranking them according to their importance to the Frugal Innovation process, the scale used to quantify each of the subcategories for each stakeholder has three levels: Low, Medium, and High. It is a “scale of comparison” or a relative scale since it shall be used by comparing one stakeholder relevance with each other, in each subcategory. It is important to mention that this scale differs from the BSR method one as there are not meanings for each level of the scale Nevertheless, subjectivity is still present in this analysis method. However its effect can be weakened by using multidisciplinary expertise judgements – in this work those from Frugal Innovation and Marketing.

Table 8 – Stakeholder analysis categories and subcategories.

Categories			
Value		Expertise	Willingness
Subcategories	Influence	Contribution	Willingness to Engage
	Necessity of Involvement	Legitimacy	

The usage of three levels for general cases, does not ignore that in some cases the levels could be subdivided when a more accurate ranking is required. Hence, the author ended up in using a numeric scale with correspondence to the 3-level scale, where: 1, 2, and 3 correspond to Low; 4, 5, and 6 correspond to Medium; and 7, 8, and 9 correspond to High.

3. Map | Mapping stakeholders is a visual tool which is done by using a 3-variable graphic where Value is on the vertical axis and Expertise on the horizontal one. The third variable, Willingness, is represented by the circle size of the corresponding stakeholder.

The graphic is represented by four quadrants whose boundaries are three lines of the scale: low, mid and high, and the upper quadrant at right, where the Value and the Expertise are higher corresponds to the cluster of more significant stakeholders for Frugal Innovation, according to the definitions of Value, Expertise, and Willingness mentioned above.

4. Prioritize | The prioritization gives the results of the method by ordering the stakeholders according to the relevance in terms of the three variables. This order is important to companies implementing Frugal Innovation who need to allocate resources and systematize the stakeholder participation. In the scope of the present work, the same order will also be useful to develop the framework, assigning more significance and attention to those stakeholders with higher priority. From the map, it is possible to recognize more priority to those stakeholders in the upper-right-hand quadrant, i.e. that for which the value and the expertise are the higher, as the willingness is and indicative variable whose propose is to identify the predisposition each stakeholder has to participate.

3.2.1.2 P-I method

The objective of this method is to identify the possible synergies between stakeholders in terms of Power and Interest they have towards the company activity, business, or their participation.

The P-I method was proposed by Ackerman and Eden (2011). Prior to that, Freeman (1984) had designated ‘Power’ as the strength a stakeholder has to affect the achievement of the organization’s

objectives, and 'Interest' can be regarded as the concern, advantage or benefit a stakeholder can have in the organization's strategy, according to Ackerman and Eden (2011). In this work's scope, both Power and Interest are related to the Frugal Innovation implementation or frugal performance or strategy of a company:

Power refers to the material strengths (economic, political, knowledge, ...) a stakeholder has to implement, develop, and collaborate to the success of a certain frugal innovation.

Interest is different from the Willingness of V-E-W because it does not involve the occasional intention a stakeholder has in participating in the Frugal Innovation implementation or development, but it has to do with the greater interest they have regarding the development of a certain frugal innovation.

Like the V-E-W method, the P-I has the same four steps, for which the analysis is made in terms of Power and Interest. The relative scale used is numeric from 1 to 9 for the two axis: Power (vertical axis) and Interest (horizontal axis).

The main difference is about the application used hereby: instead of prioritize the stakeholders, the results will be analysed in terms of the synergies between stakeholders suggested by their mapping. Visualizing these synergies, or relationships, between different actors of the value chain is important, especially within the context of Frugal Innovation, as by exploiting them, the minimization of resources used and the sustainability of the value chain can be more easily achieved. For the scope of this work, the author considers the greater synergy the one that involves the higher power and interest.

3.2.2 Areas of social assessment: Literature Review, Case-study analysis, and Grounded Theory

The objective of this task is to identify the main areas of social assessment of frugal innovations, that is to say those more relevant for the Frugal Innovation context. This was possible through the organization of literature review and case-study inputs into a 2-input data table (stakeholders, and social areas). The result of this task will enclose the scope of assessment of the final framework.

The scope used in here was the GRI categories or endpoints, proposed in the 3.0 GRI guidelines (GRI, 2006) and followed by the 4.0 GRI guidelines (GRI, 2013):

- **Labour Practices and Decent Work**, where the following aspects are included: employment, occupational health and safety, training and education, diversity and equal opportunity, equal remuneration for women and men, supplier assessment for labour practices, and labour practices grievance mechanism. For this category, GRI 4.0 has 16 indicators.
- **Human Rights**, whose aspects are: investment, non-discrimination, freedom of association and collective bargaining, child labour, forced or compulsory labour, security practices, indigenous rights, assessment, supplier human rights assessment, and human rights grievance mechanism, which englobes 12 indicators.
- **Society**, which has 11 indicators and encapsulates the following aspects: local communities, anti-corruption, public policy, anti-competitive behaviour, compliance, supplier assessment for impacts on society, and grievance mechanisms for impacts on society.
- **Product Responsibility**, in which are included the aspects: consumer health and safety, product and service labelling, marketing communications, customer privacy, and compliance, and for which there are 9 indicators.

Lately, as Simões (2014) suggests, each of these endpoints was translated and divided into midpoints, according to Figure 6.

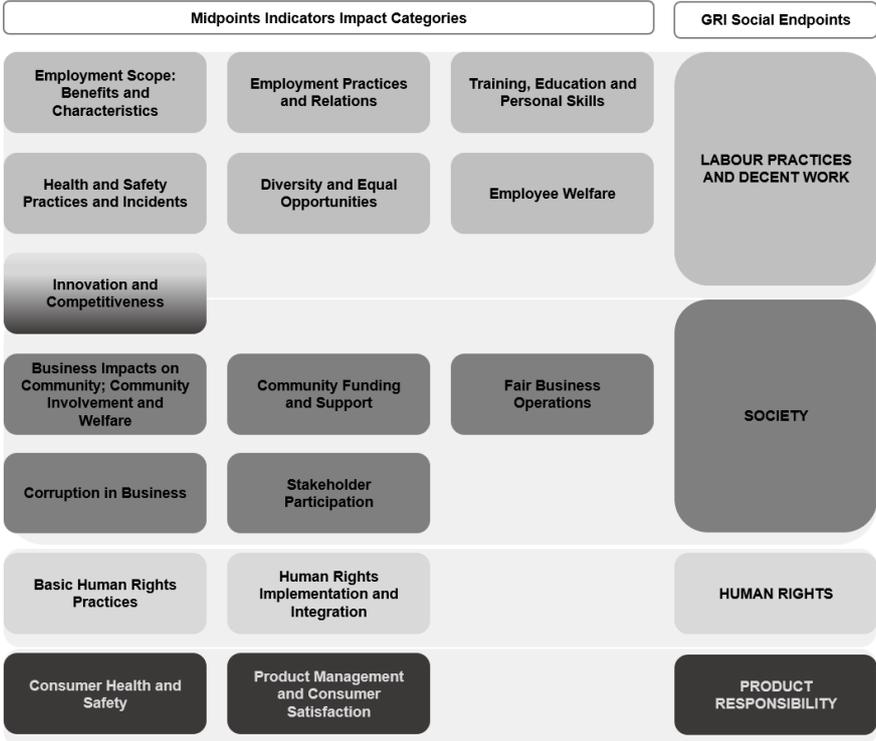


Figure 6 – Midpoints Indicators Impact Categories and GRI Social Endpoints. (Simões, 2014)

To do that, three sources of information were considered: (1) books, papers, journal articles; (2) websites of relevant entities: regulators, governments, funding entities; (3) companies best-in-class in CSR and Frugal Innovation developers.

Regarding the companies' information, an analysis of what businesses put into place was conducted. In this sense, it was important to select a collection of practices from different types of companies:

- those best-in-class in CSR strategies and results which can either have implemented frugal innovation or not, and
- those Frugal Innovation developers who are in place already working with communities all over the world.

This collection allowed to have a big picture of how comprehensive the practices are in terms of stakeholders, and endpoints and midpoints of social assessment. The three types of sources hereby referred (literature, entities and organizations, and companies) are described in Annex II.

In this sense, the main research strategies used were literature review and case-study analysis. In fact, to do the assignment of a practice to a specific midpoint and stakeholder, grounded theory was employed as a methodology of data analysis, so that literature review were conducted simultaneously as the data was organized into tables (Annex III) applying the grounded theory - in the same terms as referred above. The coding process was necessary here to move from the empirical material to the organization of the collected data according to a solid logic and meaningful criteria.

3.3 Framework development: theory building

According to Corley and Gioia (2011), theory building exists to bring novelty by working the existing theory in a practice-oriented way. The authors claim that two aspects are crucial while building theory: utility and originality. Additionally to these two, there is also what they call the “maintenance role” which is the ability of looking to what exists and giving it new approaches and new applications. In this work, the maintenance role appears as the basis of the research strategy is the joint study of the two main fields: Frugal Innovation and Social Sustainability.

The practical relevance is noticed by the general objective of this work: to provide practitioners an integrative framework to assess the Social Sustainability of frugal solutions. By using it, practitioners would see their decision making process supported throughout the value chain (from design to end-customer communication) towards all of their stakeholders, in the most relevant social areas.

The target of this work is not only those implementing or willing to develop Frugal Innovation, but also the academic and scientific community since this is an exploratory and primordial study. Thus, academics may find here a basis for future work within the Social Sustainability and Frugal Innovation areas.

According to Corley and Gioia (2011)’s requirements of theory building, the author strove to meet some general requests of a practice-oriented theoretical contribution: easiness of measuring each indicator, easiness to get the information needed, exploit the maximum of information typically available and monitored, to name a few. As such, the relevance and pertinence of the result and its applicability could be achieved.

3.4 Framework Validation: semi-structured interviews

Interviews were conducted to perform the framework validation. The author opted by semi-structured interviews as the analysis of the fourteen collected testimonies benefits from “the consistent use of an interview guide” (Flick, 2009, p.172) which, as result, increases the easiness to compare and gather data. Flick (2009) still mentions how to prepare, perform and analyse these interviews. In semi-structured interviews “more or less open-ended questions are brought to the interview situation in the form of an interview guide” (Flick, 2009, p. 94). Hence, to prepare the interview is important to build an interview guide which should follow the Flick (2009)’s key points (p.173):

A semi-structured interview should be prepared to allow:

- The interview to be conducted with flexibility, but without missing the point. This is reached by structuring the interview guide consistently.
- The interviewees to reveal their views about the whole scope, which is done by giving them as much scope as possible.
- The interview guide should provide an orientation on the themes to be addressed, and not necessarily applied as a formal questionnaire.
- The interview guide should include questions to help to take the interviewee to specific answers, and not only general ones.
- A kind of communicative validation may be done after the interview, or in a second meeting, with the aims of (1) checking the adequacy of the main statements, or (2) to develop the structure of the results with the interviewee.

In this manner, and using the semi-structured interviewees to validate the framework, the intermediate goals of conducting them were: (1) the validation of the first framework construct: the more significant stakeholders for Frugal Innovation; (2) the validation of the second framework construct: the more relevant areas of social assessment for Frugal Innovation; (3) the validation of each Social Value and/or Social Impact indicator; (4) the validation of the framework as a whole.

The interview guide is presented in Annex IV, where the description of the scope given to interviewees is summarized as the content is part of this work. Each interview was organized into six points: 1. Frugal Innovation definition, scope, and examples; 2. Social value and Social Impact concepts; 3. Areas of social assessment; 4. Stakeholders characterisation; 5. Indicators; 6. FISA. The first three points (1-3) are part of the presentation stage of the interview and the following three (4-6) deal with the discussion itself. As the objective of these semi-structured interviews was to validate the logic followed in the present work, the author (and interviewer) strove to give a complete scope of the subject, and then to put the interviewee at ease during the discussion.

Then, the analysis of the answers required two steps: (1) structure the main statements according to the objectives of the interview; (2) explore similarities and differences across interviewees' answers. As stated before, this analysis is obviously eased by the existence of an interview guide, while the results are enriched by the privileged flexibility while performing the interview.

The set of interviewees is intended to be multidisciplinary and comprehensive in terms of specific contributions to the work's final result – the framework itself. Thus, out of the fourteen people interviewed, one may find Frugal Innovation researchers, private equity funds managers, social entrepreneurs, social innovation consultants, social strategy managers, social economy project managers, management consulting associates, amongst others.

4. Conceptualisation and Definitions

According to the literature review previously presented, it is possible to verify that Social Impact is more often mentioned than Social Value. Moreover it was possible to verify that Social Value is not clearly defined. Despite the suggestions on how to define it, there is still a lack of conceptualisation on what is involved in this concept. Therefore, the objective of this chapter is to provide a conceptualisation of Social Value, aiming to define it and relate it with Frugal Innovation, and presenting the comparison of this concept with the Social Impact one.

4.1. Social Value Definitions

Several research areas may contribute to the definition of Social Value. Therewith, the literature review presented in chapter 2 provides some hints on which aspects should be taken into consideration in order to define Social Value. In Table 9 there are ten definitions, which contribute to the understanding of what the Social Value of a product is and what it intends to encapsulate.

The Marketing area strongly relates social value with the customers' perceived value of a product (Lin and Huang, 2012). Roig et al. (2013) link this perceived value with the social practices of the company suggesting the connection between Social Value and the brand and not only with the product (cf. Bourdieu, 1984; Veblen, 2001 in Boztepe, 2007). Social Entrepreneurship turns it more specific by mentioning Social Value as the summation of the positive effects that a product might have (Ács, 2015) when promoting the "core values of development" (Todaro and Smith, 2011), overcoming social problems (Felício et al., 2013), and enhancing human capabilities (Sinkovics et al., 2014). Social Economy claims that the Social Value's *who* is related to the "concerned public" (Caillé and Wéber, 2015). Also, social economists include a dimension of Social Value, which is the product's contribution to the society's wellbeing (Euillet, 2002). In this sense Phills et al. (2008), in Social Innovation, also refer the "general benefits" as an objective in Social Value scope. These authors especially go beyond the individual or private gains, since products can address and cover social needs and problems. In addition, Sociology still introduces the idea of valuing also the experience with the product and the consequent social benefits (Bourdieu, 1984; Veblen, 2001 in Boztepe, 2007).

There is an overlapping in what Marketing refers as the perceived value and what Social Entrepreneurship claims as the "positive effects" valued by "a person".

While Social Economy mentions the "concerned public, groups and people", Roig et al. (2013), from Marketing area, present a narrower scope referring the "customer" as the only concerned subject. Nevertheless, while writing about the target of those positive effects, social economists refer two dimensions of wellbeing: that of society as a whole and that of a group in particular; even Ács (2015) from Social Entrepreneurship refer three levels of target: individuals, communities, and society.

Table 9 – Social Value definitions.

Discipline	Authors	Definition
Marketing	Lin and Huang (2012)	Social value is the perceived utility derived from an alternative association with one or more specific social groups. The subjective norm construct refers to perceived social pressure to approve and adopt a style of behaviour. Although subjective norms reflect external social pressure (personal perceptions of what peers think an individual should do) personal norms and moral attitudes constitute rules or values that inform motivation because of anticipated self-administered rewards or punishments.
	Roig et al. (2013, p.356)	The social image that customer's perceive from the social practices carried out by the company.
Social Entrepreneurship	Ács (2015)	What a person values more than the money paid (...) Positive effects for individuals, for communities, and for society.
	Felício et al. (2013)	Refers to the necessary goods and services provided by organizations with social purposes such as promoting community development, advocating for more inclusive and fairer policies, or dealing with a variety of other social problems.
	Todaro and Smith (2011)	Social value creation as an activity that leads to the realisation of any of the three core values of development, i.e. sustenance, self-esteem, and freedom from servitude.
	Sinkovics et al. (2014)	Financial, reputational, ethical value, consumer surplus, positive externalities, and the enhancement of human capabilities as dimensions of social value creation. Consumer surplus and the enhancement of human capabilities are more direct forms of social value creation.
Social Economy	Caillé and Wéber (2015)	Social value is what is perceived as such by the concerned public , groups and people.
	Euillet (2002) in Rodet (2008)	Social utility is derived from the public good. (...) While the objective of an activity for the public good is the wellbeing of society as a whole, the objective of an activity with social utility is the wellbeing of a group in particular and, as corollary, the wellbeing of society as a whole.
Sociology	Bourdieu (1984) and Veblen (2001), in Boztepe (2007)	Social significance value refers to the socially oriented benefits attained through ownership of and experience with a product . These include attainment of social prestige and construction and maintenance of one's identity.
Social Innovation	Phills et al. (2008)	We define social value as the creation of benefits or reductions of costs for society - through efforts to address social needs and problems - in ways that go beyond the private gains and general benefits of market activity.

4.2 Conceptualisation of Social Value

The objective of this section is to conceptualise and better understand the main concepts related to Social Value. In fact, from the definitions presented in Table 9, it was possible to decompose those definitions into three levels: 1) who; 2) what, and 3) for whom. These means that Social Value is

perceived by those from the *who*, Social Value intends to comply the *what*, and its effects have a direct *for whom*.

4.2.1 Who

Some authors (Roig et al., 2013; Caillé and Wéber, 2015; Euillet, 2002) agree that Social Value is perceived and “set” by the concerned public, being it the customers and the groups and people who are close to the product utilization of influence area. In Frugal Innovation context, and according to chapter 2, the customers to whom the product is designed have a major importance in this *who* level since they are the first ones who need to recognize the social value of the product being sold. Nevertheless, as some authors suggest, society in general might even be “far from the product” always influence the *who*, because it contributes with standards and patterns for the evaluation of a product, with objectivity or subjectivity.

Consequently, being “concerned public” the main concept related with Social Value, here it was possible to translate it into the **concerned stakeholders**: Local communities, Consumers, users, customers, and Neighbouring communities – when applying to Frugal Innovation (chapter 5).

4.2.2 What

The Social Value’s *what* is presented in the literature within a wide scope: it can encapsulate the social practices performed by the company, or brand, and also the positive effects the product has in core social subjects, needs and problems.

Some authors even mention both individual and collective wellbeing as main objectives of Social Value’s *what*. Some authors list some practices which promote wellbeing (Todaro and Smith, 2011; Sinkovics et al., 2014), despite those practices not being very specific, they are clear about wellbeing’s two dimensions: individual and collective.

Therefore, wellbeing is a core concept to include in this conceptualisation. Moreover, when contextualising it with Frugal Innovation, it is important to look at it from the developed countries’ point of view, and also from the emerging countries’ one.

On the one hand, with regards to the concept of wellbeing for developed countries, it has been seen as very close to the concept of happiness. The book Wellbeing - The Five Essential Elements (Rath and Harter, 2010) contributes to get to know the dimensions included in it. **Career wellbeing** is related to the pleasure that a person has in doing what she does every day. It is related to the occupational wellbeing, which is referred by other authors. **Social wellbeing** is related to the relationships and the social connections a person has throughout her life. **Financial wellbeing** exists when a person has financial security. **Physical wellbeing** is related to the health and energy a people have to do what they want and need every day. **Community wellbeing** deals with the pride a person takes in her community. It is broader than social relationships because it involves the connection to the culture, and not only people.

On the other hand, the document Voices of the Poor: Crying Out For Change (Narayan et al., 2000) presents a research work conducted by The International Bank for Reconstruction and Development of The World Bank, together with western governments and NGOs, whose content includes the definition of wellbeing for emerging countries. This study - which involved “over 20,000 poor women

and men from 23 countries” (p.2) – intends to look to the poor people’s perspectives and consider them while talking about quality of life, *illbeing*, and powerlessness – among other subjects arising in the study. Table 10 presents a summary of the dimension of wellbeing coming from the poor people perspective, as stated in the mentioned work.

Table 10 – Wellbeing’s dimensions (Narayan et al., 2000).

	Ghana	Malawi	Bangladesh	Indonesia	Nigeria	Bulgaria	Kyrgyz Republic	Bolivia
Health and medical care		X					X	
Security	X		X	X	X	X		
Employment		X	X		X	X		X
Housing and land		X	X		X			
Family			X	X	X		X	
Food		X	X					X
Water supply		X						
Sanitation and Hygiene		X						
Clothes		X	X		X			
Helping other people, good relationships, and protection and support				X	X			X
God-fearing (spirituality)	X	X					X	
Tolerance							X	
Patience	X							X
Peace (of mind)	X	X					X	
Harmony with oneself								X
Respect		X				X		
Education					X			
Wealth					X	X	X	

In fact, for both developed and emerging markets, the individual wellbeing has several dimensions where the collective wellbeing is included. For emerging countries it is seen by being included in the “helping other people, good relationships, and protection and support”, and for the developed countries by its “Community wellbeing” element. Despite their strong relationship, collective wellbeing (or common good) cannot be seen as the sum of individual wellbeing. In fact, the common good goes beyond that by including wide number of conditions that enable the flourishing of human life (Clarke et al., 2006; OECD, 2011a): healthy environment, functional infrastructures, and human networks to name a few. Consequently, it is considered that the *what* of Social Value addresses not only the individual (or personal) wellbeing, but also the collective one.

4.2.3 For whom

As consequence of its *what*, Social Value targets not only individuals, but also communities (in a direct way), and the society at large more indirectly. In fact, those products or companies' influences mentioned above are measured depending on the effect they have on the stakeholders. Effects on individuals come into Social Value scope in the same way the ones on the local community and in a secondary line on the society at large – depending on the available information, and its quality, as mentioned in the previous section.

In fact, and within Frugal Innovation's scope, the effects that a product has on the local community will tell a lot about its social value. The main reason for that lies in the fact the major objective of a frugal solution is to meet local community's necessities and to help in overcoming its social problems.

In chapter 5, the stakeholders' characterisation will detail the importance of each stakeholder within the scope of Frugal Innovation, and there the Social Value's *for whom* unfolds once again.

4.3 Comparison of Social Impact and Social Value

Encompassing those main definitions from section 4.1 and the conceptualisation presented in section 4.2 it was possible to determine the Social Value's boundaries to then suggest a clear definition. Nevertheless, as already mentioned, the concept of Social Impact is also relevant to take into consideration, as its concept intersects partially with Social Value – as will be referred below.

In Table 11, some concepts related to Social Impact are presented as they can serve as hints for a clear conceptualisation. In this table, the more significant terms and expressions are highlighted as they were used to build the definition that will be followed for this comparison: **Social Impact is how the company activities, or the product itself, change or influence each stakeholder in a period of time.**

Table 11 – Social Impact related-concepts' definitions.

Author	Definition
Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1994, p. 108)	By social impacts we mean the consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs, and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize people's cognition of themselves and their society.
UNEP (2009, p.43)	Social impacts are consequences of positive or negative pressures on social endpoints (i.e. wellbeing of stakeholders)
Vanclay (2011)	Social impact assessment (SIA) is the process of managing the social issues associated with development.
Vanclay (2003)	SIA includes the processes of analysing monitoring and managing the intended and unintended social consequences , both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions.
Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1994)	In this monograph, however, we define social impact assessment in terms of efforts to assess or estimate, in advance, the social consequences that are likely to follow from specific policy actions (including programs and the adoption of new policies), and specific government actions (including buildings, large projects, and leasing large tracts of land for resource extraction), particularly in the context of the U.S. <i>National Environmental Policy Act of 1969</i> or NEPA (PL 91-190, 42 USC 4371 <i>et seq.</i>).

Cont. Table 11 – Social Impact related-concepts' definitions.

<p>Burdge and Vanclay (1995, p.32) from Interorganizational Committee (1994)</p>	<p>Social impact assessment can be defined as the process of assessing or estimating, in advance, the social consequences that are likely to follow from specific policy actions or project development, particularly in the context of appropriate national, state or provincial environmental policy legislation. Social impacts includes all social and cultural consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organise to meet their needs, and generally cope as members of society. Cultural impacts involves changes to the norms, values, and beliefs of individuals that guide and rationalise their cognition of themselves and their society.</p>
<p>Goodland (2000, p. 12)</p>	<p>SIA used to be the identification, prevention, minimization, and mitigation of potentially adverse impacts of a proposed project on human society, carried out as part of project design, as is Environmental Impact Assessment. Now, Social Assessment is becoming extended as a tool of monitor social development impacts of projects during implementation.</p>
<p>Vanclay (2002, p. 388)</p>	<p>Social impact assessment is the process of analysing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment.</p>
<p>Gentile (2002)</p>	<p>Social impact management is the field of inquiry at the intersection of business practice and wider societal concerns that reflects and respects the complex interdependency between these two realities.</p>

Both Social Impact and Social Value are fundamental to evaluate frugal innovations due to the fact that one complements the other, and together they allow the assessment of Social Sustainability in services and products. Moreover, both concepts are strongly related to each other and help to emphasize the important goal of Frugal Innovation: to cover needs and social problems, while targeting underserved people in developing and developed countries.

To decompose and understand Social Impact, the same three levels of the Social Value's conceptualisation were used: 1) who, 2) what, 3) for whom. Social Impact's *who* refers to the company and its operation, activities, products and services it offers. Then, its *what* is the influences and changes the *who* (company activities or the product or service) induces. Then, Social Impact's *for whom* refers to those will feel the *what* (influences or changes), who are the stakeholders in general, and the concerned stakeholders in particular.

In fact, Social Impact deals with the effects the product and the company activities have in stakeholders. It overlaps with Social Value in this sense, but it is not redundant due to the other levels – *who* and *for whom*. Social Value appears as subjective since its perception (*who*) remains attached to the concerned stakeholders, who are always different and new in each circumstance. Actually, even if the same person is evaluating a product in different times, she has not the same perception since the information and experience she has strongly influences it. In every occasion, the quantity and quality of information influences the subject perception, so that the Social Value he assigns to a product. Therewith, Social Impact and Social Value overlap and the former influence the latter where

the Social Value subject (*who*) has information about the effects/influences (*what*) which influence the stakeholders (*for whom*).

In conclusion, and by the presented conceptualisation and including the main terms identified from the literature review presented earlier, Social Value is defined as follows: **Social Value is the perception that the concerned stakeholders have about the products' influence in their individual and collective wellbeing.**

4.4 Conclusions

According to the literature review it is possible to identify the main concepts to be considered in Social Value's definition. These concepts were organized into three dimensions, which were called the "three levels of Social Value": *who* (concerned stakeholders), *what* (company's or product's positive effects; individual and collective wellbeing), and *for whom* (individuals, communities, and society). From that, it was possible to define Social Value, and to understand the existing overlap of Social Value and Social Impact – which lies in the effects and influences the product or the company activities have on the stakeholders, whose endpoint tells a lot about Social Impact's definition also suggested.

5. Framework constructs

To frame FISA two types of information were then important: one about the stakeholders, and the other about which areas are of concern to socially assess frugal innovations. Both are explored and studied from a frugal viewpoint. The first intends to further the characterisation of the several value chain actors, or stakeholders, and to get which of them have a higher priority than the others in Frugal Innovation. The second intends to look for those areas more relevant to be studied while performing the social sustainability assessment of frugal innovations. In consequence, the results will be direct inputs of the framework. This chapter presents the procedure used to get both the constructs according the methods described in chapter 3.

5.1. Stakeholder characterisation

After having the main concepts defined, it was relevant to conduct the stakeholder characterisation – which was based on the literature review, and grounded theory, and required two methods described in chapter 3, V-E-W and P-I methods. To consequently contribute for the framework development, this stakeholder characterisation has the aim of identifying the stakeholders with more relevance and significance in Frugal Innovation.

5.1.1. Application of the methods

The application of both methods has the same first step, which consists of identifying the stakeholders involved in the Frugal Innovation value chain. As stated, the several discussions and meetings taken with focus groups contributed to the exhaustiveness of the list as it was intended. As such, Figure 7 shows the structure internal vs external of the identified stakeholders who are described below.



Figure 7 – Stakeholders.

1 - Top Management Employees | These are those employees in the administration and direction of the company, therewith their responsibilities are higher, and they are the ones who hold the decision making power. Hence, top management employees perform an important role in the economic sustainability of the product or service, and it is important for the frugal performance to have them involved in the process of design and development.

2 – Employees | Employees' stakes are strongly presented in the literature, and companies' CSR practices often promote employee welfare in areas like health and safety, and freedom of association to name a few. Employees' participation is crucial to a company, since the employees have know-how and daily experiences that company's managers do not deal with, and their participation and interaction can mean cost savings, for example, which in the end can represent a benefit for the consumer who will have the product at a cheaper price.

3 - **Shareholders/Investors** | This stakeholder is the first one who can turn the frugal implementation possible or impossible. If an investor looks firstly to the profitability and cost-effectiveness of the product, service, or business, he will also look to the social effects it will have in each stakeholder.

4 - **Suppliers** | On the one hand, the selection of suppliers should follow a set of criteria according to which, the company assures the achievement of its social goals. On the other hand, the company should take on obligations towards the suppliers, and maintain a narrow relationship with them in terms of exploring new opportunities and sharing information.

5 – **Distributors** | Distribution is frequently a challenging task for the logistics planning. Distributors' participation is important for the product, service, or business especially when they are local actors and the company is entering a new market. In Frugal Innovation context, the distributors often assume an important role in the marketing of the product, since they are the traditional sales points, or individuals, in contact with the potential consumer.

6 - **Post-sales technicians** | Post-sales services are very important in Frugal Innovation since people with low income are risk averse and do not rely or trust easily in a new product or service. So, the existence of post-sales assistance – who, in Frugal Innovation, should even be well-known in the targeted community, is a good indicator of security for local people.

7 - **Society at large** | Within this stakeholder are included all people not referred in local or neighbouring communities. These people and communities might be influenced by or influence the product, service, or business, by impacts on sustainability, or macroeconomy, for example. Nevertheless society at large includes both developed and developing countries, the developed countries will have a stronger influence on Frugal Innovation implementation since they have more information, and consequently a bigger contribution.

8 - **Governments and Regulators** | The stake a government has can be very strong in a way it can facilitate, and even to become a highway to get the market, or the opposite if the regulations are not reflecting the needs companies and entrepreneurs have. Here it is important to mention the reality in many developing countries, where corruption strongly exists.

9 – **NGOs, Non-governmental organizations** | NGOs have a strong and important insight of the market. Many times, they already work with the local community and people rely on them. This type of organizations can contribute with valuable information about the social environment of a community.

10 - **Competitors** | This stakeholder is here mentioned because the company together with a competitor can exploit opportunities which benefit the business in terms of cost reduction, and consequently the other stakeholders. And competitors are also the ones who establish the benchmark.

11 - **Neighbouring communities** | Besides looking to how the company operations, and the product itself can have effects on the local community, it is also important to look to communities in its surroundings regarding the possibility that a benefit to a certain community could mean a prejudice to its neighbouring communities, whose stake can be related to both environmental and economic facts, which will influence the social wellbeing of those communities. As non-users are included within the local community, in neighbouring communities there are also non-users who will affect and be affected by the product or service itself, or company operations. Neighbouring communities are not only those geographically close to the target community, but also those close in terms of necessities. That is to

say local and neighbouring communities have similar needs, so that the latter are the future markets for frugal innovations designed for the former community.

12 - Local Community | It is the target market of the whole frugal implementation process. In fact, a frugal solution intends to correspond and respond to a specific need, which can be identified through an effective participation process and a site-specific study in the targeted community.

13 - Consumers, users, customers | The author did not differentiate between consumers and customers because it would not represent a significant importance in this scope of work. For example, the customer and the consumer (or user) are not the same subject while talking about cars' spare parts commercialization, where typically, the customer is the repair workshop, and the consumer is the car driver. This stakeholder is different from local community, since consumers/users/customers are the ones who already use the product, and local community are the whole set of people for whom the product is designed.

5.1.1.1. V-E-W analysis, mapping, and prioritization

Having identified the aforementioned thirteen stakeholders, the next step in the V-E-W is to analyse each of them in terms of: **Value**, which is decomposed into the Influence a stakeholder has towards the frugal performance of the company or the frugality of a product, and then into his Necessity of Involvement into the Frugal Innovation process of implementation development, or improvement; **Expertise**, whose subcategories are Contribution and Legitimacy. Both intend to reflect the skills and knowledge a stakeholder has, which serve as input to the company's frugal performance or frugality of the product or service, and the meaning and legitimacy of a stakeholder's claim to engage with the Frugal Innovation implementation, development, or improvement within the company; and **Willingness** (to engage) translates the predisposition a stakeholder has to participate with the Frugal Innovation implementation, development, or improvement.

Table 12 shows the levels assigned to each stakeholder in each subcategory, as explained below.

Table 12 – Frugal Innovation stakeholder analysis: Value, Expertise, and Willingness.

Stakeholder		Value		Expertise		Willingness
		Influence	Necessity of Involvement	Contribution	Legitimacy	Willingness to Engage
1	Top Management Employees	MEDIUM 4	HIGH 9	LOW 3	MEDIUM 4	MEDIUM 6
2	Employees	MEDIUM 6	HIGH 8	MEDIUM 4	MEDIUM 5	MEDIUM 6
3	Shareholders/Investors	LOW 3	LOW 3	MEDIUM 4	LOW 2	MEDIUM 6
4	Suppliers	MEDIUM 5	MEDIUM 5	MEDIUM 5	MEDIUM 4	MEDIUM 5
5	Distributors	MEDIUM 5	LOW 2	MEDIUM 6	MEDIUM 4	MEDIUM 5
6	Post-sales technicians	LOW 2	MEDIUM 6	MEDIUM 5	MEDIUM 4	MEDIUM 5
7	Society at large	MEDIUM 4	MEDIUM 4	LOW 3	LOW 3	LOW 3
8	Governments and Regulators	LOW 3	MEDIUM 5	MEDIUM 5	MEDIUM 6	HIGH 8
9	NGOs	MEDIUM 5	HIGH 7	MEDIUM 5	MEDIUM 3	HIGH 8
10	Competitors	HIGH 7	LOW 1	LOW 1	LOW 1	LOW 1
11	Neighbouring communities	HIGH 8	MEDIUM 6	MEDIUM 6	HIGH 8	LOW 3
12	Local Community	HIGH 9	HIGH 9	HIGH 9	HIGH 9	LOW 2
13	Consumers, users, customers	HIGH 9	HIGH 8	HIGH 8	HIGH 8	MEDIUM 6

1. Value

i. Influence

The stakeholders with higher influence for the frugality of the product, service, or process, are the **(12)** Local community alongside with the **(13)** Consumers, users, customers, because they are those for whom the innovation is conceived, and thus will influence it since the very first phase of conception. The **(11)** Neighbouring communities have also a high influence as they represent a market very close to the target and probably with similar needs and requirements, who in turn can influence the frugality when considering their resources and conditions.

The **(10)** Competitors can also highly influence by introducing competition in the market and making frugality a requirement and benchmark.

The **(2)** Employees have medium influence as they live among the local community and so they can contribute for the frugality of the product or service. In a way they can bring the knowledge directly to the company, therewith the employees are a valuable “communication channel” between the community and the company; while **(1)** Top management employees have the opportunity of taking the stakes to **(3)** Shareholders/ investors – who have stronger power of decision.

The **(4)** Suppliers and **(5)** Distributors have leverage in the way that their good practices can influence the sustainability and cost savings.

(3) Shareholders/investors, **(8)** Governments and regulators, and **(6)** Post-sales technicians have a low influence since, despite the former two having a lot of power for the realisation and completion of putting the product in the market, they are not particularly interested in frugality as first objective. For example, for shareholders the profitability is a major goal. It is important to mention that the feedback of post-sales workmen enhance the frugality of a product in a way improvements can be introduced.

ii. Necessity of Involvement

The stakeholder whose involvement is absolutely necessary is the **(12)** Local community. In fact, the first statement of Frugal Innovation is to respond to a specific need of a community, and cover it with a solution which meets some requirements and characteristics. Hence, a development process without studying the local community – as the potential consumers – is not frugal. The **(2)** Employees and **(1)** Top management employees, and the **(13)** Consumers, users, customers are also very important to the process since they bring together a lot of information and experiences which truly contribute to the frugality implemented. In this sense, the stakeholders whose involvement is less required are **(3)** Shareholders/investors, **(10)** Competitors, and **(5)** Distributors.

Although the **(7)** Society at large is not the closest stakeholder to the scope of the frugal innovation, its involvement is necessary due to its contribution with standards and quality patterns, and can even contribute to the spread the product at the global area: towards new regions and markets.

2. Expertise

i. Contribution

The **(12)** Local Community is the target and so it will provide information on the requirements and specificities the frugal innovation should have, as the **(13)** Consumers, users, customers are those who enjoy and use the product, so that they contribute with knowledge and experience through a feedback, or participation, mechanism. Also enjoying this mechanism, the **(6)** Post-sales technicians can also contribute to the reliability and trust people have on the product or service, as aforementioned. The **(5)** Distributors, while commercialising the product, will have to explain its utilisation and so, their expertise can contribute to the achievement of mass markets, especially when the distributors are the salesmen themselves, as in the majority of the cases of Frugal Innovation in emerging countries. **(7)** Society at large brings its expertise since people can work close to the local community for example in volunteering programmes, when there are people who care about social causes. Despite this contribution being valuable, this is assigned as *low* since it is generally temporary. **(9)** NGOs contribute with the knowledge they have from their work close to the local community.

ii. Legitimacy

As aforementioned, the process of Frugal Innovation implementation and development would be regarded as invalid if the **(12)** Local Community would not be studied, consulted, engaged and involved in the process. Thus, this is the stakeholder with the highest legitimacy, alongside the **(13)** Consumers, users, customers and **(11)** Neighbouring communities.

In the same logic presented above about the distance to the product scope or about the first interest, the **(3)** Shareholders/investors, **(7)** Society at large, and **(10)** Competitors have the lower legitimacy to claim.

The **(1)** Top management employees, **(2)** Employees, **(4)** Suppliers, **(5)** Distributors, and **(6)** Post-sales technicians and **(9)** NGOs have legitimacy as market experts. **(8)** Governments and regulators have a medium legitimacy as the readiness the developer company can have towards them can turn an unviable product, a viable and adequate one.

3. Willingness

i. Willingness to Engage

The predisposition to engage with a Frugal Innovation developer depends on several factors and on the type of information each stakeholder has.

For example, the **(3)** Shareholders/investors will have a higher willingness to participate – even if their value is not that high – than the **(10)** Competitors who do not want to share expertise with other company. Also the **(7)** Society at large often does not want to engage, since it does not feel any relationship or linkage with the objectives of a certain frugal innovation.

The **(12)** Local Community, and in the same sense the **(11)** Neighbouring communities, do not rely on the frugal innovation process enough to show willingness in cooperating with it. Moreover, for communities in emerging countries whose frugal implementation often requires

visits of foreign people, there is a set of barriers to be surpassed such as the language, the manners, the habits, etc.

The **(8)** Governments want to engage with a frugal developer in a way a Government in its true nature wants to collaborate, contribute, and participate in every action whose propose is to benefit the people; for the same reason, **(9)** NGOs engage with Frugal Innovation intentions.

The stakeholders **(4)** Suppliers, **(5)** Distributors, and **(6)** Post-sales technicians want to engage in a way the achievement of big markets is part of their interest.

As indicated in Table 12, the author assigned a numeric reference to the levels Low, Medium, and High. It was important to have a clearer comparison between the eleven stakeholders in the five subcategories. The numeric scale corresponds to the levels as follows: Low: from 1 up to 3; Medium: from 4 up to 6; and High: from 7 up to 9. Having Table 12 completed, it was possible to build the V-E-W map, presented in Figure 8.

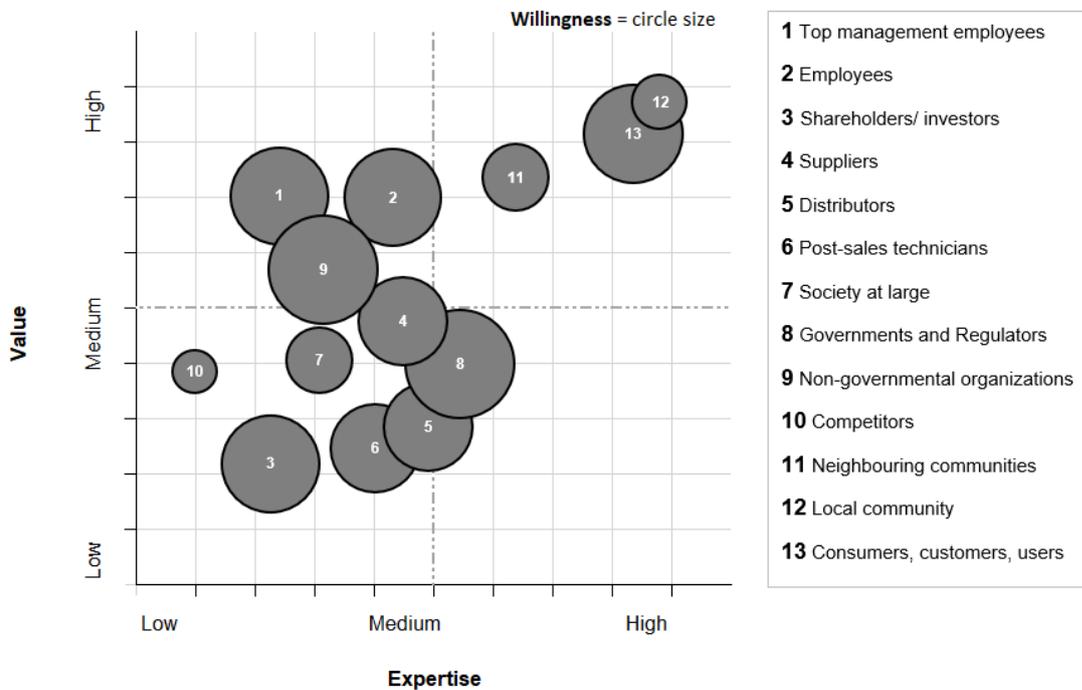


Figure 8 – Value - Expertise - Willingness map.

Finally, it is possible to provide the prioritization of the stakeholders for Frugal Innovation, according to what is given by the map of Figure 8. As such, the prioritization is given in two groups:

- the first one, referred to as *concerned stakeholders* conceptualised in chapter 4, includes the **(12)** Local community, **(13)** Consumers, users, customers, and **(11)** Neighbouring communities;
- the second group encompasses **(2)** Employees, **(9)** NGOs, **(1)** Top management employees, **(8)** Governments and regulators, **(4)** Suppliers, **(5)** Distributors, **(6)** Post-sales technicians, **(3)** Shareholders/investors, and **(10)** Competitors.

5.1.1.2. P-I analysis, mapping, and prioritization

As referred, the objective in applying this P-I method is to identify the possible synergies between stakeholders in terms of the Power and Interest they have towards the company activity, its business or their participation. Table 13 shows the analysis performed regarding the ten identified stakeholders in terms of power and interest. Once more, the scores were attributed considering the expertise given by the literature and by the multiple discussions and meetings with focus groups. As defined in chapter 3, **Power** means the strength a stakeholder has to affect the achievement of the organization's *frugal objectives*; and **Interest** relates to the concern, advantage or benefit a stakeholder can have from the organization's frugal strategy.

Table 13 – Frugal Innovation stakeholder analysis: Power and Interest.

	Stakeholder	Power	Interest
1	Top management employees	7	7
2	Employees	2	2
3	Shareholders/Investors	9	5
4	Suppliers	3	3
5	Distributors	2	2
6	Post-sales technicians	2	2
7	Society at large	5	5
8	Governments and Regulators	8	8
9	NGOs	6	8
10	Competitors	5	2
11	Neighbouring communities	1	5
12	Local Community	1	9
13	Consumers, users, customers	1	9

The **(3)** Shareholders/Investors and **(8)** Governments and Regulators are the ones with the most power since they are the ones who almost exclusively own the monetary and legal resources. That is to say both of these stakeholders have the power to stop the development of a frugal innovation at any point, according to objective reasons: money or legal dispositions. The ones with less power are those, contrarily, who do not have monetary or a “voice” in legal matters: **(12)** Local community, **(11)** Neighbouring communities, **(13)** Consumers, users, and customers, alongside with those who do not contribute directly for the decision of develop a solution or not: **(2)** Employees, **(4)** Suppliers, **(5)** Distributors, and **(6)** Post-sales assistance technicians. Both **(7)** Society at large and **(10)** Competitors have power in a way the former can contribute with standards and quality patterns, and also can pressure the public entities – such as governments – to respond to the needs of low income and bottom-of-the-pyramid people. In this sense, **(9)** NGOs have a stronger power than **(7)** Society at large since the former are an organized group whose power to get the attention of the most powerful (the Governments, for example) is higher. Moreover, **(1)** Top management employees have high power since they have better chances of being heard by the **(3)** Shareholders/investors, and the **(8)** Governments and Regulators.

Alongside with the **(12)** Local community and **(13)** Consumers, users and customers who are the ones with higher interest as is their need being targeted and covered, the **(8)** Governments and **(9)** NGOs have also high interest, as mentioned, in the way they intend to collaborate, participate and engage with any initiative whose propose benefits the people. The ones with less interest at the first sight are those whose activity contributes for the frugality of the product, service, process or business model, but are not engaged with the goal after being introduced to the whole scope of Frugal Innovation, especially because in many times the fact of being contributing with Frugal Innovation represents less profit margin for them: **(6)** Post-sales assistance technicians, **(5)** Distributors, **(4)** Suppliers, **(2)** Employees. In opposition, **(1)** Top Management employees have a high interest in developing Frugal Innovation since that represents new challenges while entering new and demanding markets. Finally, it is possible to provide the list of interesting relationships, or synergies, between stakeholders within the Frugal Innovation scope, according to what is given by the map of Figure 9.

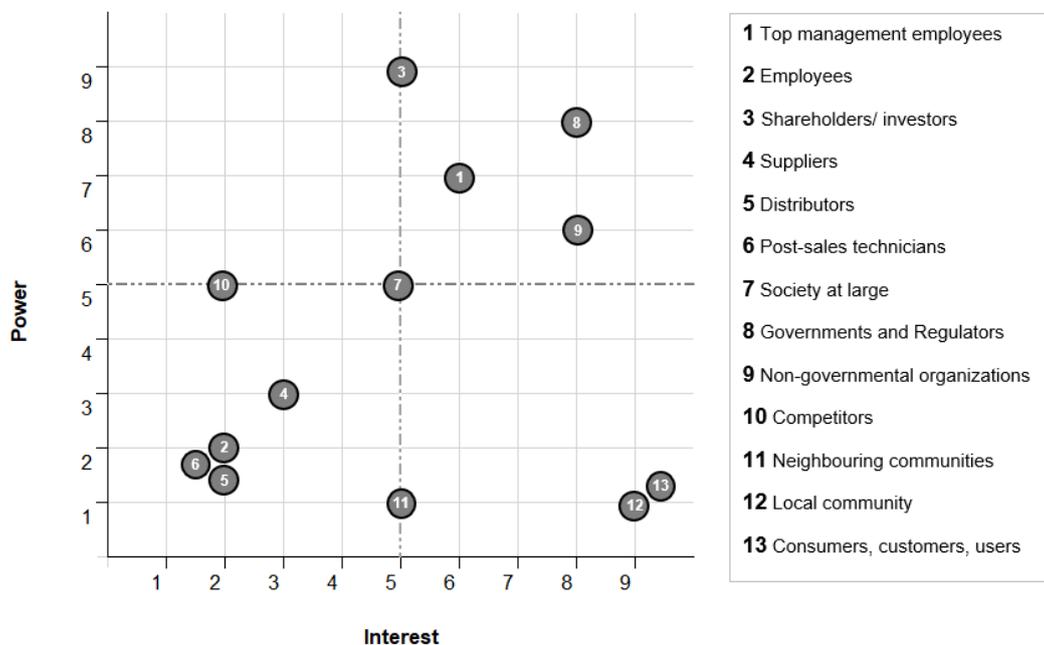


Figure 9 – Power-Interest map.

The map suggests some linkages that can benefit the Frugal Innovation implementation:

- **(1)** Top Management employees, and **(8)** Governments and regulators;
- **(1)** Top Management employees, and **(12)** Local community;
- **(1)** Top Management employees, and **(13)** Consumers, users, customers;
- **(3)** Shareholders/ investors, and **(8)** Governments and regulators;
- **(3)** Shareholders/ investors, and **(12)** Local community;
- **(8)** Governments and regulators, and **(12)** Local community;
- **(8)** Governments and regulators, and **(13)** Consumers, users, customers;
- **(9)** NGOs, and **(12)** Local community.

5.1.2. Results and discussion

The results show that, when striving to implement, develop, or improve Frugal Innovation, there is a priority group of stakeholders to whom companies and developers should look at in order to get and access to their value and contribution to their performance. The stakeholders belonging to this priority group are Local Community, Consumers, users, customers, and Neighbouring Communities, who are here called *concerned stakeholders*, which were conceptualised in chapter 4.

The V-E-W method's results are direct inputs of FISA in chapter 6, as it will be organized into two level of assessment as the results are organized into two groups. These concerned stakeholders come from the application of the V-E-W method, in which stakeholders were identified, analysed, mapped and prioritized according to the three categories suggested by the method's name: Value, Expertise, and Willingness to engage. The concerned stakeholders are those with higher Value and higher Expertise, since Willingness takes a minor weight to the prioritization in this method as explained before. Out of V-E-W method results, the author highlights the redundancy of (11) Neighbouring Communities, since they are looked at as a (12) Local Community when the frugal innovation is being adapted to it, and as (13) Consumers, user, customers when they are already using the solution. Notwithstanding the implications of this redundancy in FISA itself, as already stated, the understanding of the neighbouring communities is a relevant part when developing Frugal Innovation. In fact, the first level of assessment includes the three stakeholders in the first group on V-E-W method results, as the adequacy of the frugal innovation to the target and the importance of having a scalable solution are major requirements of Frugal Innovation, as the literature review pointed out.

In addition, in this characterisation scope, the P-I method provided the identification of the possible synergies between stakeholders in terms of the Power to and Interest in implementing, developing, or improving Frugal Innovation. The results show that the most powerful stakeholders (Shareholders/Investors, and Governments and Regulators) can work together, or in partnership with the Local Community, and Consumers, users and customers who are the stakeholders with higher interest, but lower power to implement, develop, or improve Frugal Innovation. These synergies are important to be considered due to the existent difficulty in putting Frugal Innovation into place, especially in developing countries where the infrastructures and resources are short, and in developed countries where the minorities can be easily forgotten or hardly identified.

5.2. Areas of Social Assessment

Alongside with the stakeholder characterisation, it was also necessary to identify which are the more relevant areas of social assessment of frugal innovations. Two methodologies were employed: Grounded Theory and case-study analysis – as described in chapter 3. The first has two sources of information: the literature review, and the information obtained from governments, NGOs, funding entities, and other organizations. Both methodologies were employed in order to get the relevant areas of social assessment of frugal innovations, and both methodologies were important to assure the consideration of: **1)** What literature and theory propose as valid and applicable to perform the social assessment, whether being indicators, measures, aspects, or areas. The references used were: Ahi and Searcy (2015a), Ahi and Searcy (2015b), and Khan (2016) which were first presented on chapter 2, and then summarily described in chapter 3 (Annex II) alongside with Searcy et al. (2007),

and Vachon and Mao (2008). As mentioned, the former authors suggest a set of assessment metrics of social supply chain management performance that were decomposed in the several midpoints and presented in Table A of Annex III, together with the social areas Khan proposes as important to be studied and evaluated. **2)** Which practices organizations and entities suggest carrying out the social assessment in general, since there is any work proposing areas or indicators for the frugal innovations' social assessment. Six different entities – which are described in Annex II were also input of Table A of Annex III: B Impact Assessment, BAEM, European System of Social Indicators, IRIS 4.0, Millennium Alliance, and Social Value International. **3)** In which social areas companies of three types are acting – described in Annex II: **a)** Those already working on frugal innovation services, products or business models: General Electric Healthcare, Danone, Johnson & Johnson, and Solar Cookers International. These examples were chosen since they are representative of what and how it is being implemented. **b)** Those “best-in-class” on Corporate Social Responsibility (CSR) strategies, even if they're not implementing frugal innovation: Danone, Toyota Material Handling Europe, Sustainable Harvest, and Oxfam International. **c)** In addition, there are some cases that are mentioned as they represent some aspects which are often relevant to frugal innovation: for example, Girl MOVE which values local partnerships, CDC Group which works together with the local communities, Nike who shifted from bad labour practices to promoting business transparency and Mumm whose business model intends to incorporate cultural beliefs.

In Annex III, Table A shows the grounded theory results, and Table B the company cases' ones. The construction of each table required a systematic procedure of assigning all information, from a specific source, to a cell (i.e. intersection between of a stakeholder with a social midpoint. This procedure required consistency and adequacy to the context of Frugal Innovation. For example, in Table B, the example of Mumm is assigned to the cell which cross 'Employees' with 'Business Impact, Community Involvement and Welfare' since the company business model is designed to promote community welfare through the women they employ.

From Table A, we can see that the more relevant endpoint is Society, whose “Business Impacts, Community Involvement and Welfare” midpoint has more emphasis. This result was expected since the literature review, in chapter 2, already suggested the importance of the stakeholder involvement as well as the relevance of paying attention to the specificities of each target community when contextualizing with the frugal innovation scope.

From Table B, two endpoints stand out: Society and Product Responsibility. In fact, the second one was not expected, but since it is an area the companies are minding, the contextualization came to clarify the relevance of this endpoint. In fact, while implementing Frugal Innovation, and even commercializing a frugal product, the developer intends to deliver the user a product with specific characteristics and adapted to his specific needs. Thus, the Product Responsibility endpoint is relevant since it represents - alongside with its midpoints: Consumer Health and Safety, and Product Management and Consumer Satisfaction – the aspects that directly affect the stakeholders. Moreover, since what matters here is the product, or service, or even more generally the frugal solution being delivered, the Product Responsibility endpoint objectivises the relationship between the company or the product itself, and the consumer (or customer, or user).

In conclusion, the two areas emerging from this analysis are: Society and Product Responsibility. These two areas will frame FISA's development in chapter 6, as they are the more relevant areas of social assessment of frugal innovations.

6. Framework for Frugal Innovations' Social Assessment (FISA)

This chapter presents FISA, as it is the target result of this work combining Frugal Innovation's integration with Social Sustainability. This combination is done in two different ways; on the one hand, how to assure the link between the two concepts and, on the other hand, how to assess it in the long haul along the value chain until the end of the product or service life cycle.

FISA is then a tool to help decision makers in the assessment of social sustainability of frugal innovations. Using FISA, the decision-maker can assess a product or service, considering a holistic perspective that covers the different stakeholders, in certain social area. The indicators proposed in the matrix assess the different stakeholders regarding different social endpoints and corresponding midpoints. Each indicator is still related to a frugal characteristic, assessing it.

To build FISA, four types of information were necessary: 1. the stakeholder characterisation from the Frugal Innovation point of view, 2. the areas of social assessment more relevant for frugal innovations, 3. the definitions of Social Value and Social Impact, and 4. the frugal innovations' characteristics. These constructs were studied and conceptualised before in this document, and their finding are here summarised:

Stakeholder characterisation

Through the application of the V-E-W Method, the stakeholders were mapped and prioritized – as presented in chapter 5. The results are organized into two groups - which then structure Level 1 and Level 2 of assessment in FISA, respectively:

- The first one - which includes the *concerned stakeholders*: Local community; Consumers, users, customer; and Neighbouring communities – has the higher priority and relevance for Frugal Innovation. These *concerned stakeholders* are the ones in FISA's assessment level 1, as Figure 10 shows.
- The second group includes: Top management employees; Employees; Shareholders/ investors; Suppliers; Distributors; Post-sales technicians; Society at large; Governments and regulators; NGOs; and Competitors. Consequently, this group's stakeholders frame FISA's second level of assessment (Figure 11).

Areas of Social Assessment

According to the methodology applied in chapter 5, out of GRI 4.0 social endpoints the most relevant social areas are: **Society** and **Product Responsibility**. These are relevant since they are the ones in which Frugal Innovation brings novelty comparing with other types of innovation. In this sense, FISA includes only these two areas, since for the other two (Labour Practices and Decent Work, and Human Rights) there already are tools and indicators proposed in literature – such as SCLA, OECD guidelines, amongst others. The endpoints are subdivided into midpoints, according to what literature review already mentioned in chapter 2. Therewith, FISA's indicators are connected to one or more midpoints within an endpoint.

Definitions of Social Value and Social Impact

The conceptualisation of Social Value and Social Impact (chapter 4) frames Social Sustainability in the context of the present work:

- **Social Value** is the perception that the concerned stakeholders have about the product's influence in their individual and collective wellbeing.
- **Social Impact** is how the company activities, or the product itself, changes or influences each stakeholder in a period of time.

FISA's indicators refer to each of the concepts or to both of them when their intersection remains over each of them individually.

Frugal characteristics

FISA includes information on frugal characteristics as they are requirements of such solutions. These characteristics are presented and described in chapter 2, and they are here summarized. Frugal innovations are **functional** since they should be designed to be practical and useful. In this sense, simplicity is crucial in meeting core social needs. The **robustness** of a product is evidenced by its lasting materials and maintenance-friendly components. Frugal Innovation requires easiness-to-use and fault-resistance, which contribute to the product **user-friendliness**. "**Growing**" refers to the volume of people and the target mass markets Frugal Innovation intends to serve. Alongside it, the characteristic **timely-to-market** was here included as speed and flexibility are requirements in approaching the market with an innovation. Frugal innovations are still meant to be **affordable** - as they should have cheap price, and low costs of operation and maintenance along the entire product's life cycle -, and **local** – as frugal operations should always prefer local collaborations to better fit in a budget. In addition, Frugal Innovation is economically and environmentally **sustainable** in all activities, operations, practices, including material and supplier selection, and product treatment at the end of its life.

Therewith it was possible to build the framework as it is presented in Figure 10 and Figure 11, as FISA has two levels of assessment, representing the stakeholders' priority.

Using FISA, the decision-maker can assess the product or service stakeholder-by-stakeholder (columns), in a social area (row). As FISA is organized into two assessment levels, the user shall dedicate more resources (workers, time, money) to the stakeholders in Level 1, but without great prejudice to the ones in Level 2, as all of them shall see dedicated attention and resources. For each intersection of stakeholder-area (column-row) there are indicators measuring the frugal innovation's Social Sustainability (colour), which is decomposed by Social Value (BLUE), Social Impact (ORANGE), or both of them (GREEN). Each indicator also refers to one or more frugal characteristics (symbols): functional (STAR), robust (TRIANGLE), growing/ timely-to-market (RECTANGLE), affordable (CIRCLE), local (PENTAGON), and sustainable (CROSS). Within this scope, each indicator is then described in the next section.

Framework FISA - Frugal Innovations' Social Assessment			
Level 1			
	LOCAL COMMUNITY	CONSUMERS, USERS, CUSTOMERS	NEIGHBOURING COMMUNITIES
SOCIETY	Market share (1) ★■ Price per average income (2 and 3) ● Site-specific studies (1, 5 and 6) ♠	Product lifetime (1 and 3) + Direct impact on users (2) ★■♠+ Feedback contacts (5) ★■♠	Contracts with neighbouring suppliers (1) ■■+ Impact on the delocalisation of neighbouring people (1) ■■+ Involvement of neighbouring people (5) ★■+
	Value chain entities audited (4) + Local partnerships (1, 2 and 3) ●♠+		
PRODUCT RESPONSIBILITY	Covered needs ratio (1) ♠+ Substitute products ratio (2) ★ Price comparison (2) ● Initiatives to raise awareness (2) ■■ Local maintenance technicians (2) ▲ Financial purchasing alternatives (2) ●	Product lifetime (1 and 2) ▲ Educational actions (1 and 2) ■ Product adoption curve (2) ■■ Distribution channels (2) ■■ User per product (2) ●	
	Environmental impact (2) +		

Legend:

Colours:
Blue = Social Value Indicator;
Orange = Social Impact Indicator;
Green = Social Value and Social Impact Indicator

Symbols:
 Functional = ★
 Robust = ▲
 User-friendly = ■
 Growing/Timely-to-Market = ■■
 Affordable = ●
 Local = ♠
 Sustainable = +

Society midpoints:
(1) Business Impacts, Community Involvement and Welfare;
(2) Community Funding and Support;
(3) Fair Business Operations;
(4) Corruption in Business;
(5) Stakeholder Participation;
(6) Innovation and Competitiveness

Product Responsibility midpoints:
(1) Consumer Health and Safety;
(2) Product Management and Consumer Satisfaction

Figure 10 – Framework for Frugal Innovations' Social Assessment (FISA) – Level 1.

Framework FISA - Frugal Innovations' Social Assessment										
Level 2										
	TOP MANAGEMENT EMPLOYEES	EMPLOYEES	SHAREHOLDERS/ INVESTORS	SUPPLIERS	DISTRIBUTORS	POST-SALES TECHNICIANS	SOCIETY AT LARGE	GOVERNMENTS AND REGULATORS	NGOs	COMPETITORS
SOCIETY	R&D expense (6) ■■	Variation of employees (1, 2 and 3) ■■+ Local employees (1 and 2) ● Participation in local volunteering programs (2) ● Individual hours of volunteering (2) ● Impact of volunteering programs (2) ●		Contracts with local suppliers (1 and 2) ● Equality in suppliers selection (3 and 4) ■■+	Contracts with local distributors (1 and 2) ● Feedback contacts (5) ★■ +	Contracts with local people (1 and 2) ● Feedback contacts (5) ★▲■ ■	Impact on production capacity (1) ★ ■■ Indirect impact (1) ★ Impact of initiatives beyond business area (1 and 2) ■■●	Social and political participation and integration (1, 2, 3, 4 and 5) ■■●	Support local NGOs (1 and 2) ●+	Job shift from an industry or company to another (1) + Number of substitute products (1 and 2) ■■
	Value chain entities audited (4) + Opportunities to cooperate locally (1, 2 and 3) ●●+									
PRODUCT RESPONSIBILITY	Feedback management system quality (2) ■■● Changes and improvements embodied (1 and 2) ★ ■■●		Future markets (2) ■■ Customer retention rate (2) ★▲■●		Educational actions (1 and 2) ■■ Distributors per targeted people (2) ■■● Distributors per targeted area (2) ■■●	Educational actions (1 and 2) ■■ Technicians per sold product (1) ▲ ■■		Social and political participation and integration (1 and 2) ■■● Timely-to-market (1 and 2) ■■ Compliance with regulation (1 and 2) ■■	Joint specific-studies (1 and 2) ★●●	Substitute products ratio (2) ★▲■●●+ Price comparison (2) ■■●
	Environmental impact (2) +									

Figure 11 – Framework for Frugal Innovations' Social Assessment (FISA) – Level 2.

6.1. Indicators

In this section, the social indicators are described aligned to what ISO22400 suggests (ISO, 2014). Each indicator is identified by its name and ID, and described by its formula and units, as well as its range and trend. The meetings and discussions with focus groups (Annex I) served as basis for the indicators' conception and/or selection - alongside with literature works, especially those referred in Annex II. The indicators of the first level of assessment are presented in this section, and the second assessment level indicators can be found in Annex V. In the tables, it is often used the word "product", which shall encapsulate both goods and services.

Table 14 – Indicator: Market share, MS.

Market share		
ID	MS	
Description	This indicator assesses the level of product's market success. The product is considered better, when covering the market needs, which means a higher Market share (MS). It measures on how well the product is responding to the market, and vice-versa.	
Formula	$MS = \frac{nAC}{nTC} \quad (eq.1)$ nAC - number of actual consumers; nTC - number of targeted consumers	
Unit of measure	%	
Range	[0, 100%]	
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare
	Stakeholder	Local Community
	Frugal Characteristics	Functional; Growing/Timely-to-Market
	Measurement of	Social value

Table 15 – Indicator: Price per Average income, rPI.

Price per Average Income		
ID	rPI	
Description	This indicator assesses the affordability of the product by the ratio between the price and the average income of the local community. It will provide information on how adapted the price is to the economic context. A lower value means a higher affordability and adequacy of the product, as lower is the financial effort the household has to do into order to access the product as lower is the budget percentage expended.	
Formula	$rPI = \frac{ProdP}{HAvgInc} \quad (eq.2)$ ProdP - product price; HAvgInc - Household average income	
Unit of measure	n.a.	
Range]0, ∞[
Trend	The lower the better	
Scope	Endpoint	Society
	Midpoints	Community Funding and Support Fair Business Operations
	Stakeholder	Local Community
	Frugal Characteristics	Affordable
	Measurement of	Social value

Table 16 – Indicator: Site-specific studies, nSS.

Site-specific studies		
ID	nSS	
Description	This indicator counts the number of initiatives and programs promoted by the developer company among the local community. These initiatives are essential to a correct adequacy of the product to the targeted community, in terms of product design and business development. (Source: Searcy et al., 2007)	
Formula	$nSS = \sum InDevProd$ (eq.3) InDevProd – initiatives promoted while developing the product	
Unit of measure	n.a.	
Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare
	Stakeholder	Stakeholder Participation; Innovation and Competitiveness.
	Frugal Characteristics	Local Community
	Measurement of	Local
		Social value and Social impact

Table 17 – Indicator: Covered needs ratio, CNr.

Covered needs ratio		
ID	CNr	
Description	As the objective of Frugal Innovation is to serve people whose needs are yet to be covered, this indicator measures the ratio of needs (identified by site-specific studies or stakeholder participation) being covered by the product. A product can simultaneously cover more than one need by e.g. providing a quicker way of doing the laundries, and saving water comparing with the actual procedure of washing clothes.	
Formula	$CNr = \frac{Ncov}{TotalN}$ (eq.4) Ncov - needs covered by the product; TotalN - total uncovered needs identified in specific studies	
Unit of measure	n.a.	
Range	0 – 1	
Trend	The higher the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Consumer Health and Safety
	Stakeholder	Local Community
	Frugal Characteristics	Local and Sustainable
	Measurement of	Social value and Social impact

Table 18 – Indicator: Substitute products ratio, SPr.

Substitute Products ratio	
ID	SPr
Description	Substitute products are the products available for and in the local community that can act as substitutes towards the assessed products as they cover the same community's needs. This indicator is then the ratio of substitute products used by the local community per total number of products used to cover a specific need or function. This indicator is only applied if there is one or more products that can be considered substitutes, or functionally comparable, to the frugal product being assessed. This indicator is relevant since it provides information on how well a product is covering the need, or needs, it is designed to cover, and achieving its market goals, as it highlights the importance of benchmarking – and that's why the indicator is also related to the stakeholder Competitors. Despite their overlap in certain cases, it differs from Market Share indicator since this one compares the use of the product with the use of substitute products, while MS concerned the potential market even if it is, or is not, covered by competitors.

Cont. **Table 18** – Indicator: Substitute products ratio, SP_r.

Formula		$SP_r = \frac{SP}{TotalP}$ (eq.5) SP - number of substitute products being used by local community; TotalP - total number of products being consumed to cover that specific need (i.e. SP + products assessed)	
Unit of measure		n.a.	
Range		[0, 1]	
Trend		The lower the better	
Scope	Endpoint	Product Responsibility	
	Midpoints	Product Management and Consumer Satisfaction	
	Stakeholder	Local Community	Competitors
	Frugal Characteristics	Functional	Functional, Robust, User-friendly, Affordable, Local, and Sustainable
	Measurement of	Social value and Social impact	

Table 19 – Indicator: Price comparison, PC.

Price comparison			
ID		PC	
Description		This indicator quantifies the difference between the product price and the cheapest substitute product. It is an important measure to take into consideration when looking to the affordability of the assessed product. In this case, the product social value is higher if the product presents similar features of high class substitute product but it has a lower price.	
Formula		$PC = Prod_p - \min\{v SP_p\}$ (eq. 6) Prod _p - product price ; SP _p - price of substitutes products	
Unit of measure		Monetary unit.	
Range]-∞, +∞[
Trend		The more negative the better.	
Scope	Endpoint	Product Responsibility	
	Midpoints	Product Management and Consumer Satisfaction	
	Stakeholder	Local Community	Competitors
	Frugal Characteristics	Affordable	Growing/Timely-to-market; Affordable
	Measurement of	Social value and Social impact	

Table 20 – Indicator: Initiatives to raise awareness, nIRA.

Initiatives to raise awareness			
ID		nIRA	
Description		This indicator counts the number of initiatives and programs promoted by the company in order to raise the awareness of the product. As a company wants to sell more, and a community has high necessity of covering its requirements in a frugal manner, the company also needs to meet the “timely-to-market” characteristic and to increase awareness of its product whose marketing communication is often difficult to conduct, especially in developing markets. (Source: adapted from Labuschagne et al., 2005)	
Formula		$nIRA = \sum InAw$ (eq.7) InAw - initiatives or programs promoted to raise awareness	
Unit of measure		n.a.	
Range		[0, ∞[
Trend		The higher the better.	
Scope	Endpoint	Product Responsibility	
	Midpoints	Product Management and Consumer Satisfaction	
	Stakeholder	Local Community	
	Frugal Characteristics	Growing/Timely-to-Market	
	Measurement of	Social value and Social impact	

Table 21 – Indicator: Local maintenance technicians, nLMT.

Local maintenance technicians		
ID	nLMT	
Description	This indicator counts the number of local people who are trained to perform the product maintenance. It is a quantitative indicator of how easily Local Community will trust in the product. While trying to sell a new product, companies or salesmen have to overcome several obstacles. One of them, and very important when taking place in new markets in developing countries with recent new consumers, is trust: trusting in the product in order to invest, trusting in the product characteristics, etc. Alongside with having local salesmen, it is also important to train local people to perform the maintenance of the product. Having maintenance assured is one important step towards trust. (Source: adapted from Searcy et al., 2007)	
Formula	$nLMT = \sum LocPeMnt$ (eq.8) LocPeMnt - local people trained to perform maintenance	
Unit of measure	people	
Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Local Community
	Frugal Characteristics	Robust
	Measurement of	Social value

Table 22 – Indicator: Financial purchasing alternatives, nFPA.

Financial purchasing alternatives		
ID	nFPA	
Description	This indicator measures the number and nature of financial alternatives a potential buyer has to purchase the product. It is indicative of how the product price is contextualized towards the market. As the BoP customers are typically risk averse, an alternative which allows to rent the product instead of only buying it can mean a lot to them. It is important to mention that (*) the trend is not direct since a lower nPA does not mean the product is not adequate to the economic environment.	
Formula	$nFPA = \sum FPAIt$ (eq.9) FPAIt - alternatives to purchase the product	
Unit of measure	n.a.	
Range	[0, ∞[
Trend	(*)	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Local Community
	Frugal Characteristics	Affordable
	Measurement of	Social value

Table 23 – Indicator: Product lifetime, PL.

Product lifetime			
ID	PL		
Description	This indicator gives the time interval from when a product is sold until it is discarded. This number is relevant for customers since the investment lasts more, and it is important in assuring fair business operations and a positive impact for community welfare as it is promoting sustainability as the meeting point of economic and environmental issues. From a product perspective, and by the impact it has for society, the social value increases if the product has a longer lifespan. (Source: adapted from Searcy et al., 2007)		
Formula	$PL = \sum Y_{Prod} \quad (eq.10)$ YProd - years during which the product is working at its best or normal conditions		
Unit of measure	Years		
Range	[0, ∞[
Trend	The higher the better (in general)		
Scope	Endpoint	Society	
	Midpoints	Business Impacts, Community Involvement and Welfare Fair business operations	
	Stakeholder	Consumers, users, customers	
	Frugal Characteristics	Sustainable	Robust
	Measurement of	Social impact	Social value and Social impact

Table 24 – Indicator: Direct impact on users, DI.

Direct impact on users		
ID	DI	
Description	This indicator measures the direct impacts the product has on its users. The product direct impact is relevant to measure since a holistic and integrative indicator shall encapsulate what SLCA measures as a whole. Despite being also embodying social impacts, this indicator intends to evaluate the social value as a consequence of having information about the product potential impacts. SLCA's stakeholder and impact categories are all at stake, but the ones related to the Local Community and Consumers, and Health and Safety and Socio-economic repercussions have a higher relevance according to the findings of the present work. Therewith, subcategories and indicators (depending on the product or service being assessed) will be just as Safe and healthy living conditions; Health, safety and transparency; Consumer choice: availability, accessibility; Resource management: type of materials used; Infrastructure, health, education, housing. e.g. a gain of time by using the product can be applied into education, or into helping other people, etc.	
Formula	<i>By using SCLA single score, guidelines and standards</i>	
Unit of measure	Score (depends on the used indicators)	
Range	[0, ∞[
Trend	The lower the better.	
Scope	Endpoint	Society
	Midpoints	Community Funding and Support
	Stakeholder	Consumers, users, customers
	Frugal Characteristics	Functional, User-friendly, Local, Sustainable
	Measurement of	Social value and Social impact

Table 25 – Indicator: Feedback contacts, FC.

Feedback contacts				
ID	FC			
Description	<p>This indicator counts the number of communications (personal, standard forms of contact, amongst others) the company has with its stakeholders. The users are the ones who can provide the more complete feedback to the company. From them, the developer gets information on the product, distribution, and utilisation characteristics. Incentives to promote these feedback contacts are very valuable for the company sustainability. In developing countries, this feedback can be gathered by different participatory methods beyond the verbal tools, such as visual, drawing, interactive or role-playing tools for scoring, mapping, and ranking. The distributors' feedback is important in a way that they gave a direct contact with potential buyers, so that their contribution provides the company with new and important information. The post-sales technicians' feedback is valuable for the company because they have information from the user, after having (a supposedly lasting) experience of the product, so that they can report back to the company for improvements. Also, the post-sales technicians' feedback is important in terms of frequency and time between interventions, and the one between the purchase and the first assistance. (Source: inspired in GRI 4.0's Grievance Mechanisms for Impacts on Society: G4-DMA and G4 SO11)</p>			
Formula	$FC = \sum nFbCont \quad (eq.11)$ <p>nFbCont - feedback contacts</p>			
Unit of measure	number			
Range	[0, ∞[
Trend	The higher the better			
Scope	Endpoint	Society		
	Midpoints	Stakeholder Participation		
	Stakeholder	Consumers, users, customers	Distributors	Post-sales technicians
	Frugal Characteristics	Functional, User-friendly, Local	Functional, User-friendly	Functional, Robust, User-friendly
	Measurement of	Social value and Social impact		

Table 26 – Indicator: Educational actions, nEA.

Educational actions				
ID	nEA			
Description	<p>This indicator measures the number of actions (communications, incidences, visits, ...) necessary to inform the stakeholders about the product utilization. It is related to the user-friendliness of the product. If one goal of frugality is the simplicity – not only of the product but also the process – the easiness to explain how to use and maintain is an aspect which can be measured by the number of times it is necessary to give explanation to the targeted market. The trend (*) is not direct since a higher number of actions can mean the stakeholders are well informed about the product, but simplicity means a lack of necessity to explain how to use the product.</p>			
Formula	$nEA = \sum nEA \quad (eq.12)$ <p>nEA - necessary explanations/actions about the product utilization</p>			
Unit of measure	Number			
Range	[0, ∞[
Trend	(*)			
Scope	Endpoint	Product Responsibility		
	Midpoints	Consumer Health and Safety; Product Management and Consumer Satisfaction		
	Stakeholder	Consumers, users, customers	Distributors	Post-sales technicians
	Frugal Characteristics	User-friendly		
	Measurement of	Social value and Social impact		

Table 27 – Indicator: Product adoption curve, PAC_t.

Product adoption curve		
ID	PAC _t	
Description	This indicator measures the variation over time of the number of sold products per period of time. The Product adoption curve will provide information in two areas: the first one, on how fast the product is being adopted, and the second one on how effective and efficient are the initiatives and programs. Since this period depends on the type of analysis the company is willing to perform, in the formula it is not specified. In this way, this indicator is more complete when the PAC _t is compared with the PAC for previous periods (t-1, t-2, ...). This number given by PAC _t should be read alongside with the Market Share (MS) indicator. (Source: adapted from Searcy et al., 2007)	
Formula	$PAC_t = \frac{nSoldProd}{t} \quad (eq.13)$ nSoldProd - number of sold products; t - period of time t.	
Unit of measure	Products/period of time	
Range	[0, ∞[
Trend	The higher the better; the bigger the variation between period t and period t-1 the better.	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Consumers, users, customers
	Frugal Characteristics	Growing/Timely-to-Market
	Measurement of	Social value

Table 28 – Indicator: Distribution channels, nDC.

Distribution channels		
ID	nDC	
Description	This indicator measures the number of distribution channels. It gives information on how close to the market the product is. Alongside with other indicators for distributors, in the second level of assessment, this indicator measures the flexibility the business model has to approach the market efficiently. In developing countries, distribution channels include sales points (such as local grocery stores) and individual salesmen (door-to-door).	
Formula	$nDC = \sum DC \quad (eq.14)$ DC - existing distribution channels	
Unit of measure	number	
Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Consumers, users, customers
	Frugal Characteristics	Growing/Timely-to-Market
	Measurement of	Social value

Table 29 – Indicator: Users per product, nUPP.

Users per product		
ID	nUPP	
Description	This indicator counts the number of users per product unit. It is relevant when one is assessing the affordability of the product, as using other indicators such as Financial purchasing alternatives (nFPA), and Price per average income (rPI). The number of users, or households, per unit can reveal the adequacy of the price to the market context, when nUPP is read alongside with an indicator such as the referred. e.g. even if the rPI seems to be high, the nUPP gives complimentary information: since a washing machine can be bought and used by two or more households simultaneously.	
Formula	$nUPP = \frac{nUH}{nSoldProd} \quad (eq. 15)$ <i>nUH</i> - number of users; <i>nSoldProd</i> - number of sold products	
Unit of measure	Users/product	
Range	[0, ∞[
Trend	There is not a right value.	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Consumers, users, customers
	Frugal Characteristics	Affordable
	Measurement of	Social value

Table 30 – Indicator: Formal or informal contracts with neighbouring suppliers, CNS.

Formal or informal contracts with neighbouring suppliers		
ID	CNS	
Description	This indicator gives the percentage of formal or informal contracts celebrated with suppliers from neighbouring communities. It intends to evaluate the impact the product has on the neighbouring communities' development (geographically or in terms of needs – as described earlier). The percentage of contracts with neighbouring (geographically) suppliers provides information on how the product can contribute to the economy of those communities.	
Formula	$CNS = \frac{nCNS}{TotalS} \quad (eq. 16)$ <i>nCNS</i> – number of suppliers from neighbouring communities; <i>TotalS</i> – total number of suppliers	
Unit of measure	n.a.	
Range	[0, 1]	
Trend	The higher the better. (when in conflict with CLS, then CLS is preferred)	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare
	Stakeholder	Neighbouring communities
	Frugal Characteristics	Growing/ Timely-to-market, Sustainable
	Measurement of	Social impact

Table 31 – Indicator: Impact on the delocalisation of neighbouring people, DNPe.

Impact on the delocalisation of neighbouring people		
ID	DNPe	
Description	This indicator measures the number of people from their city, or village, to the local community due to business activities related to the product development. It is relevant in evaluating the impact on the development of neighbouring communities (geographically), since the delocalisation of people from a place to another might represent disadvantages to the former community, such as a lack of workforce or soil management, amongst others.	
Formula	$DNPe = \sum PeMov$ (eq. 17) PeMov - number of people who moved from their city (or village) to the <i>local community</i> due to business activities related to the product.	
Unit of measure	Number of people	
Range	[0, ∞[
Trend	Despite there not being a right value, the lower may be better.	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare
	Stakeholder	Neighbouring communities
	Frugal Characteristics	Growing/ Timely-to-market, Sustainable
	Measurement of	Social impact

Table 32 – Indicator: Involvement of neighbouring people, iNPe.

Involvement of neighbouring people		
ID	iNPe	
Description	This indicator measures the initiatives carried out to get information from neighbouring communities. The neighbouring communities (both geographically, or in terms of needs and characteristics) can contribute with valuable information for the product design and development process as they can be future markets.	
Formula	$iNPe = \sum InDevProdNC$ (eq. 18) InDevProdNC - number of initiatives and programs carried out to get information from neighbouring communities	
Unit of measure	Number	
Range	[0, ∞[
Trend	The higher the better.	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare
	Stakeholder	Neighbouring communities
	Frugal Characteristics	Functional, Growing/ Timely-to-market, Sustainable
	Measurement of	Social impact

Table 33 – Indicator: Value chain entities audited, pVCEA

Value chain entities audited		
ID	pVCEA	
Description	This indicator measures the ratio of value chain entities who are audited. This indicator is important due to the insight it provides about the entire value chain. Unfortunately, corruption is a reality and internal audits, alongside with external ones can be a way of keeping the company operating fairly in all its sectors, departments and activities.	
Formula	$pVCEA = \frac{nVCEA}{nVCE} \quad (eq.19)$ nVCEA – total number of audited value chain entities; nVCE – total number of value chain entities	
Unit of measure	percentage	
Range	0 – 100%	
Trend	The higher the better.	
Scope	Endpoint	Society
	Midpoints	Corruption in Business
	Stakeholder	Multistakeholder
	Frugal Characteristics	Sustainable
	Measurement of	Social value and Social impact

Table 34 – Indicator: Local Partnerships, nLP.

Local Partnerships		
ID	nLP	
Description	This indicator counts the local partnerships held by the company to cooperate with its stakeholders. As affordability is one of the characteristics of Frugal Innovation, the partnerships are opportunities to minimizing resource usage or to better operate in auxiliary tasks (such as transportation among others). Cooperating can contribute to the minimization of costs, environmental impact and even to get a better integration in the local market.	
Formula	$nLP = \sum LP \quad (eq.20)$ LP – partnerships of cooperation among stakeholders	
Unit of measure	number	
Range	$[0, \infty[$	
Trend	The higher the better.	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding ad Support; Fait Business Operations
	Stakeholder	Multistakeholder
	Frugal Characteristics	Affordable, Local, Sustainable
	Measurement of	Social value and Social impact

Table 35 – Indicator: Environmental impact, EI.

Environmental impact		
ID	EI	
Description	This indicator intends to measure the aggregated impact the product has for the environment.	
Formula	By using LCA single score	
Unit of measure	Single-score	
Range	$[0, \infty[$	
Trend	The lower the better.	
Scope	Endpoint	Product Responsibility
	Midpoints	Consumer Health and Safety; Product Management and Consumer Satisfaction
	Stakeholder	Multistakeholder
	Frugal Characteristics	Sustainable
	Measurement of	Social value and Social impact

6.2. FISA's use considerations and limitations

By using FISA, a company benefits from a large number of aspects.

1. The decision-maker can assess the product or service considering a holistic perspective that covers the different stakeholders, in a certain social area.
2. FISA's users benefit from a clearer and easier way of getting informed about the Frugal Innovation implementation and development requirements.
3. It allows its users to identify who are the main stakeholders and so - by having two levels of assessment - companies can better manage the resources they dedicate to each stakeholder.
4. Regarding the areas it encompasses, FISA allows the assessment of the two main endpoints of Social Sustainability: Society and Product Responsibility.
5. The information FISA's indicators give enriches the design process of a new frugal solution, or provides content to consistent improvements of an existing solution. The product design and development phases are complex as many requirements and constraints are at stake. FISA is also a supporting tool at these times as it includes information about the realisation of frugal characteristics in each stakeholder. This can facilitate both design and development phases which typically take a very long time.
6. As reflected in FISA's indicators, a company largely benefits from partnerships with its stakeholders. Through them, accessing and gathering information can be easily done. As studied in chapter 5, Power-Interest method's results show some interactions which benefits Frugal Innovation implementation and development, which can be useful if promoted by the company.
7. FISA is easily used alongside with other tools that analyse other Frugal Innovation dimensions, just as environmental assessment, or logistics and operations models.
8. FISA's use enlightens some market approaches necessary to adequately implement and develop Frugal Innovation: a deep knowledge about the market's environment (political, social and economic contextualisation, amongst others).
9. In regard to the business model, the indicators still provide hints for human resource management and also for procurement department as local resources are preferred over relocated ones.

The company takes advantage out of the mentioned FISA applications, especially when it takes into account managerial implications just as:

- Whenever possible, FISA should be studied before designing the research schedule or the product development phase, since it gives hints on which parameters to consider in approaching the several stakeholders. In addition, FISA requires information whose collection can be considered since the very first stages of the process.
- When designing its Frugal Innovation business model, the company should frame it according to the stakeholder characterisation presented in chapter 5. The business model should also include the information collection as a very important activity along the entire value chain towards each stakeholder.

FISA's user should take into consideration that its indicators are prone to be customized to a specific product or service. Regarding the required information, and despite its indicators being suggested as easy-to-measure, FISA's use could require efforts to get information which is not typically monitored. In fact, the quantity of available information and also its quality will obviously influence the accuracy of the FISA's general output.

Moreover, FISA's output comes in the global report of all indicators for all stakeholders in both areas of assessment. In this sense, the use of an individual indicator alone can mean a poorer analysis and it can lead to less accurate results. As such, FISA's indicators are made to be used altogether in a generic approach to the overall social propose of frugal innovations.

As Frugal Innovation assumes a socially responsible company, FISA is not entirely complete since it only includes two out of the four social areas GRI 4.0 uses. That is to say that, for the remaining two (Labour Practices and Decent Work, and Human Rights) companies should use the tools already available, such as GRI 4.0 guidelines, S-LCA (UNEP, 2009), and OECD guidelines for multinational enterprises (OECD, 2011b).

6.3 Conclusions

FISA is a tool to help decision makers in the assessment of social sustainability of frugal innovations. Using it, the decision-maker can assess the product or service considering a holistic perspective that covers the different stakeholders, in certain social area. FISA is intended to be generic for all industries, in all countries, for all products and services, so that it presents a useful tool for companies who are willing to implement Frugal Innovation, or for those who are already developing them. Nevertheless, there are disadvantages in trying to use something so generic: some indicators are only adequate to certain types of products.

7. Validation

The framework validation was conducted through semi-structured interviews whose intermediate goals were: (1) the validation of the first framework construct: the most significant stakeholders for Frugal Innovation; (2) the validation of each indicator; (3) the validation of the framework as a whole. To this end, the interview guide was drawn up with two main parts. Firstly, the work's scope presentation (1. Frugal Innovation; 2. FISA; 3. Social Value and Social Impact concepts; 4. Areas of social assessment) and then the discussion itself (5. Stakeholders characterisation; 6. Indicators; and the framework as a whole). The interview guide may be found in Annex IV.

The group of fourteen interviewees is a multidisciplinary group. Since the design of the validation method (chapter 3), the group was intended to comprehend different expertise, so, it was important to include: social entrepreneurs, social sustainability consultants, social innovation researchers, Frugal Innovation researchers, funding entities, project managers in developing countries (Burkina Faso, São Tomé and Príncipe, Mozambique, Brazil, Angola, Nicaragua), and project managers in developed countries (Portugal and Germany).

7.1 Stakeholders validation

Within the discussion, the interviewees were asked to organize the stakeholders (Figure 12) into groups according to the relevancy each stakeholder has over the others within the scope of Frugal

STAKEHOLDERS:

- 1 - Top Management Employees
- 2 - Employees
- 3 - Shareholders/Investors
- 4 - Suppliers
- 5 - Distributors
- 6 - Post-sales technicians
- 7 - Society at large
- 8 - Governments and Regulators
- 9 - Non-governmental organizations
- 10 - Competitors
- 11 - Neighbouring communities
- 12 - Local Community
- 13 - Consumers, users, customers

Figure 12 – List of stakeholders

Innovation. Table 36 shows the absolute frequency, as it aggregates the results of the interviewees' stakeholders' prioritisation. These numbers allowed the comparison with the stakeholder characterisation presented in chapter 5, as the organization into groups and the consequent discussion were material to validate both V-E-W and P-I methods' results. In fact, the majority of the interviewees pointed out as the most relevant (12) Local Community and (13) Consumers, users, customers – as the former is the “starting point” [interviewee E], and the latter as “the one who gives the more complete feedback and from which, the company can make the product more adequate to the community” [interviewee F] and “able to be scaled” [interviewee J]. Comparing results in Table 36, with FISA's first assessment level, the (11)

Neighbouring communities are referred as giving redundant information comparing with the one given by local community or consumer [interviewee C], since Frugal Innovation “rather than look to neighbouring communities, look at each of them as a local one, individually. It will allow to escalate the product, with key adjustments” [interviewee B]. Even so, interviewee I recalls the importance of knowing which and how many the neighbouring communities are to inform, and prove workability to investors.

Table 36 – Interviews' results – stakeholders: absolute frequency.

	(12) Local community	(13) Consumers, users, customers	(1) Top Management Employees	(8) Governments and Regulators	(3) Shareholders/ Investors	(2) Employees	(6) Post-sales technicians	(7) Society at large	(9) NGOs	(10) Competitors	(4) Suppliers	(5) Distributors	(11) Neighbouring communities
Frequency	12	10	7	7	6	2	2	2	2	2	1	1	1

Three other stakeholders often appear in the most relevant group: (1) Top Management Employees; (8) Governments and Regulators; and (3) Shareholders/ Investors. The discussion about them it is here summarized:

- Interviewee A mentions as being “strange not finding any internal stakeholders among the first level of assessment”, also other interviewees refer the (1) Top Management Employees as a key stakeholder, as the company needs to be aligned with the nature of Frugal Innovation, and “If we don’t have the Top Management Employees engaged, we have nothing. They are simultaneously the best enabler and the highest barrier.” [Interviewee L]. Hence, (1) Top Management Employees engagement is key as they have power to “share the purpose, vision and mission, shaping the company culture” [interviewee B]. In addition, (1) Top Management Employees are still key for (3) Shareholders/ Investors as the latter relies on the former.
- Interviewee J states that “while looking to my stakeholders, I should be able to identify those who will make my path easy of difficult”, and due to that, (8) Governments and Regulators appears as a player with a greater power over the company, and being one towards which the company typically have less control – so that also acting as a major barrier or an enabler – and also a major impact on product’s frugal characteristics such as its affordability (since a stronger governmental support may represent a lower price), or its functionality and correct adequacy to the market by facilitating the communication with the community and transferring the knowledge governments have. Interviewee H and K set out the importance of local governments (such as municipalities) as they are entities committed to the territory and, particularly in developed countries, they are a great source of means necessary to the success of the product, as “It is important to alert people to the benefits the local power can give beyond the economic dimension. The contribution with transportation, human resources, volunteering work, infrastructure, ..., is often overlooked, and there’s a lot to gain with it” [interviewee K].

In addition, the discussions on (9) NGOs revealed that they can assume different roles within the frugal process. They are valuable during the research phase since, as referred earlier, when they are already working in a territory, they have a strong and important insight of the market and of the social environment of a community. Interviewee N still highlights that “a significant amount of existing frugal innovation products appears as a result of the progress and work performed by non-governmental organizations together with local communities”. Then, the people working in a NGO can act as lead-users, or beta-testers, since they are open to contribute with their experience and being educated, they can give a consistent and well-structured feedback. Frugal developers can even look at NGOs as a valuable partner in distributing the product – taking advantage of the reliability people can find in these organizations.

So, in regards to stakeholders' characterisation, the interviews validate the first level of assessment's stakeholders as the more relevant: (12) Local community and (13) Consumers, user, customers; and still validate the logic, understanding and pertinence of taking (11) Neighbouring communities as priority. These evidences are supported by the frequency of results, and by the discussion as stated that highlighted the general understanding that Frugal Innovation is the answer to a large amount of new buyers requests, so that there is urgency in knowing them and adequate the solution to their specific contexts.

Moreover, the interviews seem to suggest the possibility of using an intermediary assessment level between FISA's level 1 and level 2, using therefore three levels of assessment. This new level would include the (1) Top Management Employees and (8) Government and regulators. This is an adjustment that FISA as it is would easy incorporate as it would make sense to organizing its Level 2 into smaller groups, as it would decrease overall entropy of the analysis.

Annex IV includes additional and detailed information about the stakeholders validation.

7.2 Indicators validation

The indicators' validation was conducted by asking the interviewees to point out the social issues to be assessed for the more relevant stakeholders according to their logic, and then with this scope each of the corresponding indicators was discussed.

In this sense, some interviewees point out what literature review already referred by Mulgan (2010) “when people approach social value as subjective, malleable, and variable, they create better metrics to capture it”, the subjectivity of social assessment should always be considered. So that, as interviewee A states, FISA's scope “is a subjective area, and it is key to be looked at as being subjective and as an objective matter, because it isn't”, in fact interviewee L highlights the importance of not losing the focus on the subjective part of social assessment “even using quantitative indicators, the key-stakeholders' judgements are valuable for the findings' validation”. During interview G, the indicator ‘Direct Impact on Users’ was discussed, as the comparison of one social impact with another is a very difficult task – that SLCA cope with, but about which there is still room for developments. In addition, interviewee F suggested the study of stakeholders trade-offs within the same assessment level.

Regarding what a frugal innovation should be, during interview M self-maintenance was pointed out as an aspect to consider. Thus, (6) Post-sales technicians would have a lower importance than others,

and the indicators for both social areas would also differ. Self-maintenance can be something that is not contemplated in a first version of a product, but since it promotes independence and sustainability it is something that should be addressed.

Therefore, the indicators were validated for those more relevant stakeholders in both areas of assessment.

7.3. FISA's validation

All the interviewees noticed the relevancy and pertinence of FISA: not only as encapsulating valuable information to aware companies of the importance of Social Sustainability and presenting Frugal Innovation as one of the more complete ways of putting it into practice, but also as being a tool that can easily be made available for companies by the way it is organized and presented.

In interview G the grounded theory results were discussed, as two assessment areas were discarded. Despite understanding the logic and even these results, interviewee G highlighted the importance of presenting or suggesting the assessment methods of Labour Practices and Decent Work, and Human Rights alongside with FISA, as one complete the other and companies should be aware of the wholeness of the social assessment.

Due to the importance of taking social assessment as a not entirely objective task, interviewee L suggested to add a stakeholder interaction exercise (as a validation of what FISA informs the decision-maker) at the end of FISA assessment, as a complement to it.

7.4. Conclusions

This chapter presented the work validation that consisted of fourteen semi-structured interviews conducted with the main objective of confirming the results of FISA as a whole. That allowed guaranteeing the practical and theoretical relevancy and pertinence of the work, as interviewees had different backgrounds and past experiences in academic or business fields.

To achieve the main objective, the interview guide included two prior tasks: the stakeholders' and the indicators' validation. Through it, FISA's stakeholders in assessment level 1 were validated according to the frequency of mentions and the overall understanding that Frugal Innovation responds to a large amount of new buyers' requests, so that there is urgency in contextualising the solution and the business model according to the customers.

8. Final Conclusions and Future Work

Frugal Innovation exists as a response to the global market trends: increasing population, scarcity of resources and global competition – that result into a new set of customers coming from the emerging markets, with new buying patterns. This new business environment brings new challenges, hence Frugal Innovation's proposition consists of answering to them with products, services and procedures that represent simultaneously economic, environmental and social value to both consumers and companies, as the latter can still benefit from a high profit margin when developing frugal innovations that should be functional, robust, user-friendly, growing, affordable, and thought to be local, but able to be adapted globally. Therefore, Frugal Innovation itself also represents many challenges. One of the more severe and less studied is its integration with Social Sustainability in two distinct ways: on the one hand, how to assure the link between the two concepts and, on the other hand, how to assess it in the long haul, along the value chain until the end of the product or service's life cycle.

In this sense, the literature review shows the relevance in bridging the gap between Frugal Innovation and Social Sustainability. Despite the attention scholars are dedicating to Social Sustainability in the recent years, literature still lacks an approach of Frugal Innovation from this perspective.

In fact, although frugal innovations deliver many advantages to both promoters and consumers, it faces a period of definition. That, together with the subjectivity assigned to Social Sustainability, represents a high barrier for companies – which are often not prepared to overcome it, as there is a lack of information about the Frugal Innovation applicability. In this sense, the goal of the present work is to enable companies to implement Frugal Innovation especially regarding the main aspects to take into consideration while assuring Social Sustainability. This was achieved by building an integrative and generic framework of Frugal Innovations' Social Assessment, FISA.

As a first step, a comprehensive and exhaustive literature review was performed. It dwelled on the two main concepts: Frugal Innovation and Social Sustainability. Then, the conceptualisation of Social Value and Social Impact was conducted. The two elements that frame FISA were then studied. Firstly, the stakeholder characterisation, which followed two different methods, that looked for the prioritization of stakeholders, from the Frugal Innovation perspective, and also the identification of synergies among them. Secondly, the social areas of assessment more relevant in the context were established through the application of different methodologies: literature review, grounded theory, and case study analysis. With the four elements: 1) the stakeholders characterisation, 2) the relevant areas of assessment, 3) the concepts of Social Value and Social Impact, and 4) the frugal characteristics, it was possible to build the framework-FISA.

FISA is a tool to help decision makers in the assessment of social sustainability of frugal innovations. Using it, the decision-maker can assess the product or service considering a holistic perspective that covers the different stakeholders, in certain social area. Therewith, FISA helps companies in dealing with the social challenges Frugal Innovation brings and in evaluating its social value and social impacts. Beyond providing indicators that quantify company's action, FISA still encapsulates evidences of how approaching the targeted markets, as well as other valuable managerial implications for the frugal process and success.

FISA's validation was conducted through semi-structured interviews. Fourteen interviewees contributed with their experience and expertise in several fields: entrepreneurship, social entrepreneurship, social innovation, frugal innovation, funding, amongst others. Their contribution enriched FISA by confirming the results, but also by identifying room for future works.

Four main areas for future research are suggested. First, as FISA is generic to all industries in all countries, it could serve as basis for specification to a certain company operating in a specific sector of a certain country. This could support companies in better understanding Frugal Innovation's opportunities, requirements, and challenges. Secondly, FISA should be integrated with other models that address Frugal Innovation as a whole, just as business model, product design and development, supply chain and logistics, and environmental sustainability. It would support companies in creating roadmaps of implementation, which could be eased by a computer-based decision support tool. Third, it would be enlightening to study the more efficient mechanisms of value chain monitoring with special focus on accessing to the information needed to use FISA, as well as the more appropriate participatory methods to get information out of more relevant stakeholders. Fourth, FISA could be extended if the two remain social endpoints (Labour practices and decent work, and Human rights) would be included, as they are necessary requirement for the implementation of Frugal Innovation. As literature already suggested tools to assess those areas, FISA is susceptible to be easily incorporated by them.

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Annexes

Annex I – Focus groups: meetings description

Annex II – Sources of areas of social assessment: literature, entities and companies

Annex III – Tables of social areas of assessment

Annex IV – Validation: Semi-structured interviews. Interview guide; details; and results

Annex V – FISA's Assessment Level 2: indicators

Annex I

Focus groups: meetings description

Date	Participants	Contents
2016.10.10	Research Group IST	<ul style="list-style-type: none"> ▪ Presentation of Rocca (2016) that was basis for further work and discussions
2016.10.17		<ul style="list-style-type: none"> ▪ Discussion on the criteria of Frugal Innovation (what are the characteristics of frugal solutions)
2016.11.28		<ul style="list-style-type: none"> ▪ Workshop on Sustainable Function Deployment (SFD). Speaker: Jose Manuel Garcia
2016.11.07		<ul style="list-style-type: none"> ▪ Discussion on the methodologies to be applied ▪ Collection of Frugal Innovation literature references ▪ Organization of the database of articles and other references
2017.05.08	Catherine Benoit Norris, Harvard Extension School	<ul style="list-style-type: none"> ▪ Presentation of the work ▪ Presentation of Social Hotspots Database (SHDB)
2017.05.16		<ul style="list-style-type: none"> ▪ Analysis of Social Life Cycle Assessment (SLCA) themes and measures ▪ Discussion on how they can be applied and bring novelty in Frugal Innovation's scope
2017.05.30		<ul style="list-style-type: none"> ▪ Future work
2017.05.15	Angeliki Diane Rigos, Tata Center, MIT, Boston	<ul style="list-style-type: none"> ▪ Presentation of the work ▪ Discussion on Frugal Innovation definition and intersection with Social Entrepreneurship ▪ Possible links and contacts with companies in Boston
2017.05.18	D-LAB, MIT, Boston	<ul style="list-style-type: none"> ▪ Presentation of the work developed by D-LAB in terms of products. Collection of information on how the specific studies are conducted, and then what are the main features of the products.
2017.06.07	Sara Russo Garrido, CIRAIG-UQAM	<ul style="list-style-type: none"> ▪ Presentation of the work ▪ Discussion on the methodologies to be applied in approaching Social Value
2017.06.14		<ul style="list-style-type: none"> ▪ Presentation of "Defining Product Social Value" study
2017.06.22		<ul style="list-style-type: none"> ▪ Stakeholders analysis ▪ Discussion on the definition on Social Value: from what the referred study suggests to what it means in Frugal Innovation context
2017.06.27		<ul style="list-style-type: none"> ▪ Framework organization ▪ Future work
2017.06.06	Breno Barros Telles do Carmo, PhD, CIRAIG	<ul style="list-style-type: none"> ▪ Introduction to multicriteria decision analysis approach tools and applications
2017.06.22		<ul style="list-style-type: none"> ▪ Presentation of "Making decisions based on life cycle sustainability assessment performances: a stochastic multiple criteria decision analysis approach"

Annex II

Sources of information to ascertain the more relevant areas of social assessment for Frugal Innovation

LITERATURE

Ahi and Searcy (2015a, 2015b) | The authors present a review on metrics on safety, welfare and community issues that are translated into metrics for social Supply Chain Management performance.

Khan (2016) | The author presents a set of social themes while approaching the promotion of social sustainability through frugal innovations.

ENTITIES AND ORGANIZATIONS

European System of Social Indicators | “The European System of Social Indicators is an instrument to be used to continuously monitor and analyse the individual and societal well-being of European citizens in terms of their quality of life, social cohesion and sustainability, as well as changes in the social structure of European societies.” (www.geis.org)

Millennium Alliance | Millennium Alliance is an inclusive platform to leverage Indian creativity, expertise, and resources to identify and scale innovative solutions being developed and tested in India to address development challenges that will benefit base of the pyramid populations across India and the world. It proposes a list of “kinds of development impacts” which includes Education, Water and Sanitation, and Health, among others. (www.millenniumalliance.in)

BAEM | BAEM – Business with Impact is a Finnish programme conducted by the Ministry of Foreign Affairs together with Tekes (the most important publicly funded expert organisation for financing research, development and innovation in Finland). BAEM’s aim is “is to generate new, sustainable business in developing countries. BEAM assists Finnish enterprises and other actors in using innovations to address global development challenges, by converting such innovations into successful and sustainable business in both Finland and developing countries”. Its criteria contributed for the comprehensiveness of the review. (www.tekes.fi/en/programmes-and-services/tekes-programmes/beam--business-with-impact/)

B Impact Assessment | The B Impact Assessment is a platform developed by B Analytics (www.b-analytics.net) that “makes it easy for you to collect information from the companies and funds in your portfolio, supply chain, or association.” The platform has an impact evaluation method with three steps: 1. Assess, 2. Compare, and 3. Improve, which helps companies in assessing and comparing their performance with other ones. The criteria used in this method contributed to this work. (www.bimpactassessment.net)

Iris 4.0 | IRIS presents the collection of the “generally-accepted performance metrics”. IRIS 4.0 metrics are designed to measure the social, environmental and financial performance of an investment. And its social impact objectives have contributed in general to this work. (www.iris.thegiin.org)

Social Value International | It is “the global network focused on social impact and social value”, whose “members share a common goal: to change the way society accounts for value”. Social Value International present a tool called Social Value Self Assessment Tool whose scope contributed to this review. (www.socialvalueint.org)

COMPANIES

General Electric (GE) Healthcare | GE already operates in the field of frugal innovations. MAC 400 is one product developed by GE to meet the needs identified in India, but then applied to other markets in developed countries. MAC 400 is an electrocardiogram device which is affordable: costing one third of the conventional devices, of good-quality: it has the same accuracy of those equipment produced for developed countries. It is also portable in a backpack which allows doctors to travel to far villages and examine the patients with the same service as they would have in a hospital. All of these assign to the product a high social value as it meets an actual need of Indian society.

In order to be able to produce the well successful MAC 400, GE Healthcare has come a long path whose result is now perceived as a striking case.

GE was already operating in India when realized “We were selling what we were making [rather than] making what the customers here needed”. According to a former leader at GE Healthcare, realising that was the cornerstone towards changing to a “**in country, for country**” strategy for India. By which the country became to be seen as an independent region and treated as GE India itself. “Managing the entire local value chain from India itself was expected to improve local adaptation and speed up decision-making”, while the **R&D teams in the field** were entirely responsible for the developing and commercializing the solutions.

Danone | Danone is a European company of dairy products operating worldwide with a strong presence in emerging countries where establishes local partnerships to develop social businesses.

In Bangladesh, Danone operates in partnership with Grameen. Grameen-Danone offers nourishing dairy products to a poor population with a high infant mortality due to the malnutrition result of the low access to food. Grameen-Danone delivers social value not only the products itself, but also by the operational activities: it created jobs not only on the production, but also distribution and salesforce. The supply of milk is done by local producers who sell their cows' milk to Grameen-Danone. Moreover, being a social business, all the profit is reinvested in the business or in other infrastructures in the local community.

As aforementioned, Danone operates all over the world, and in Moscow, Russia, the company conducted recently an initiative aiming better knowing the markets where it is operating. Danone noticed that it would need to do something new if it wanted to grow the business in large cities. So that, this project was created aiming to get in touch with Moscow's residents and develop with them a "city purpose" aligned with Danone's mission by identifying needs and trends of these people. **Listening to the people and get them involved** in the process were key to be successful in 'doing something new', and the collaboration between Danone's Moscow divisions it is also pointed as a key point to be exhaustive in responding to the identified needs. In fact, the company's growth in Moscow is three times faster than for Russia overall. This was just a pilot project, being Danone's objective to work to better "understanding cities and their people" worldwide.

Girl MOVE | Girl MOVE is an NGO which targets young women in Nampula, Mozambique. Girl MOVE's aim is to empower Mozambican girls and women to become the main development agents, through servant leadership. By providing women the opportunity to study included in the Mwarusi Project, and then in the Leadership Academy, Girl MOVE intends to alleviate poverty in Mozambique because, as stated by Nicholas D. Kristof & Sheryl Wudunn, from Half the Sky, "When you educate a girl there's a ripple effect that goes beyond the girl itself. When you educate a girl, she tends to get married later, she takes better care of her kids, she has greater economic opportunities, she might create a business so she can contribute to the local economy. When you educate a girl you educate a village, you give power to the country". (girlmove.org)

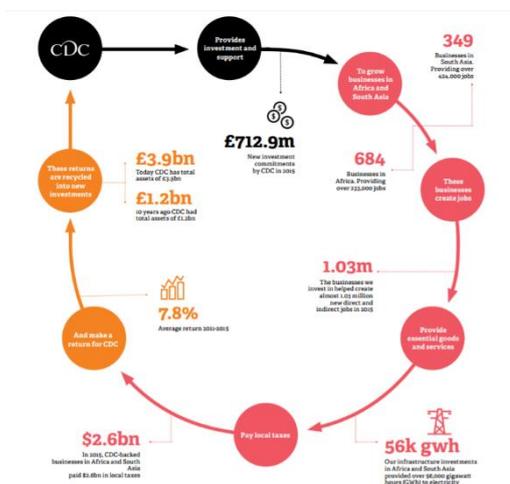
What is interesting to point about Girl MOVE approach is that the NGO looked for local partnerships instead of working *per se* in the field. The organization was founded by a Portuguese businesswoman who worked for more than ten years in a multinational company. She wanted to do something to change what she has seen in Nampula during some business travels; she wanted to understand how to change the way young people put their objective into place; she wanted to promote change. After a deep research on the cultural and social beliefs, trends and convictions, she aimed to start the change from the girls' education, by perceiving the stated above by Nicholas D. Kristof & Sheryl Wudunn.

Nowadays, after five years in the field, the executive director and founder points that the success would not be achieved as it was without counting on the experience and knowledge of the local partners who transmitted trust and reliability to the young girls to integrate the project. The social value of the organization's work is perceived by the results is getting, and the impacts it will have in the future generations.

This is a case which highlights the importance of site-specific visits, local partnerships and the necessity of looking for the trust and confidence of the communities/ consumers.

CDC Group | CDC Group is an English private equity company operating in many sectors with the primary mission of supporting "the building of businesses throughout Africa and South Asia". (cdcgroup.com/What-we-do/). CDC Group acts as a business partner of local, and small businesses, to promote job creation as a very first step to make a lasting difference to people's lives in some of the world's poorest places.

The relevant aspect to point about CDC Group is that, despite having tight financial criteria while choosing the businesses the group is investing in, the company looks simultaneously to the social value delivered, being the job creation the first impact the group looks for, as it believes that "having a job is one of the first steps out of poverty". One example is Chai Bora, in Tanzania, where CDC Group is investing since 2012. Until there, Chai Bora was just a small tea producer of Tanzania, with any skills, resources or prospects. "Since the investment, Chai Bora has increased its annual turnover from 17 billion Tanzanian shillings to more than 20 billion (around US\$ 11 million), meaning it's now classified in Tanzania as a large firm, rather than medium-sized" and it employs



now almost 300 people in a permanent basis. CDC Group has a business model that strongly supports social entrepreneurs, without not taking its eye of the economic sustainability.

Toyota Material Handling Europe (TMHE) | TMHE belongs to the Japanese Toyota group. It commercializes forklifts and equipment for industries, being them its consumer. TMHE defines its business strategy as “to become first in customer satisfaction, by bringing exceptional efficiency to material handling operations”, relying on its foundations: safety, quality, compliance and sustainability.

TMHE is a company known for its strong engagement with stakeholders, especially regulators and employees, and for its initiatives on Health and Safety awareness and education. The company reports yearly its corporate social performance, in accordance with GRI guidelines.

In its 2015 sustainability report, TMHE details the ‘stakeholder input’ put into place since 2013 in the company. The stakeholder input is considered a key aspect on defining which are the material issues to the company.

TMHE distinguishes internal and external stakeholders. On the one hand, internal stakeholders are those who have a stake from within the organization, such as employees, service technicians, to the company’s president. On the other hand, external are customers, suppliers, authorities, industry bodies, charities, pressure groups and academics. Both contribute with inputs to the Materiality Matrix, which intends to map the principal issues TMHE should look at. As stated by TMHE’s Director Sustainable Development, Tom Schalenbourg, “The true value of this exercise is that it creates an ongoing dialogue. If our stakeholders tell us we have missed any significant issues, we will respond in future reports. In line with the Toyota philosophy, we strive to continuously improve this process”. (toyota-forklifts.eu/globalassets/downloads2/sustainability-report-2013.pdf)

From this case, it is relevant to point the attention paid towards stakeholders since the very beginning of the process, being the sustainability report the mean of communicate the programmes and initiatives TMHE promotes along its activities and operations.

Johnson & Johnson | The American company Johnson & Johnson states that “our over 125,000 employees in 60 countries are united in a common mission: To help people everywhere live longer, healthier, happier lives”. In this sense, the company has engaged with many CSR practices included in its “Citizenship & Sustainability” department.

For the company, it is important to keep employees engaged with the (local) communities where they live and work, by taking part in initiatives and programs outside the company, but aligned with its mission, vision and values. Moreover, it is stated in Johnson & Johnson’s 2015 Citizenship & Sustainability report that “We believe it’s important to recognize employees who are passionate and highly engaged within their communities. Some of our business segments and regions formally acknowledge employees’ volunteerism with recognition grants that can be applied to non-profit organizations of their choice”. (jnj.com/_document?id=00000159-6a1e-dba3-afdb-7aff1b270000)

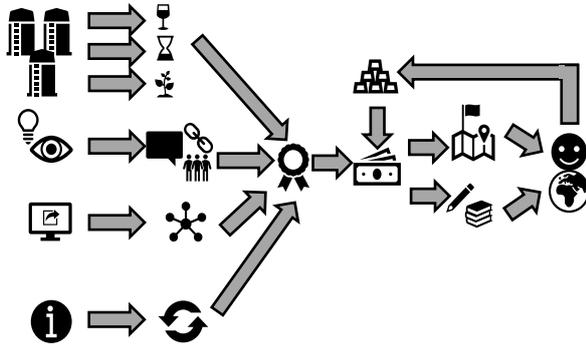
Johnson & Johnson has a strong commitment with innovation. As stated in its Citizenship & Sustainability 2015 report, the company considers innovation as “critical to the success and future of Johnson & Johnson. It is critical to the entire healthcare industry and central to the success and well-being of society as a whole.” In the company, innovation is seen as the first step to understand the social and cultural environment of a specific location. Also, both the accessible opportunities and existing challenges, internal or external, are something taken into consideration while analysing the “innovation landscape” to a certain acting area for Johnson & Johnson. (jnj.com/caring/citizenship-sustainability/our-stakeholders)

Within the Philanthropy acting area, Johnson & Johnson has developed the mMitra program in India, whose slogan is “Connecting more moms via mobile”. The project aims to give access to basic health information to new and expectant mothers about prevention of diseases, birth preparation and other motherhood issues. The information and support are given by phone, as the medical technicians sent mothers voice calls in a twice-a-week basis. The phone is a way to keep in touch with a large number of users spread in Indian territory. This service is coping with actual issues in India, where nearly 150 mothers and thousands of children die each day by complications incurred by the pregnancy or the delivering. This service could be considered frugal as it is tackling a social issue, but the information available suggests that it is not-paid, which takes out the economic sustainability of the service providence. Nevertheless, the business model is considered frugal.

These Johnson & Johnson’s examples suggest the strong engagement multinational companies are expressing towards social issues especially in their acting areas, but not only. The examples also show that companies can have different approaches to the market, and that sometimes - even without using the term “frugal innovation” - they tackle the frugal challenges and respond to them in a way that literature could call a frugal solution.

Sustainable Harvest | Sustainable Harvest (SH) has journeyed a long way in involving stakeholders into business changes and adjustments. Actually, it pioneered the Relationship Coffee Model “to create a closer connection between farmers and consumers, and have built their business on inclusivity, connection, and

transparency” (bcorporation.net/community/sustainable-harvest) In this scope, SH promotes an annual event called Let’s Talk Coffee, which “brings supply chain partners together in coffee producing countries to discuss pressing issues in the industry, strengthen business relationships, and participate in training workshops and cuppings” (sustainableharvest.com/lets-talk-coffee/).



SH has also a strong commitment in collaborating with other industry players to “establish a system that ensures farmers are able to make a reasonable profit on the sale of their coffee”. The SH’s project in Kigoma, Tanzania is one example on how SH shares its knowledge and know-how and, by investing in supply chain, it helps enhancing businesses. SH introduced change in Kigoma’s coffee production in different areas of influence. In the figure, the scheme shows how SH operates in Kigoma.

a) SH invested in partnership with other entities in water supply infrastructure, which allows Kigoma’s people: (1) having water to drink, (2) saving time – because they don’t need to walk long distances to pick water, (3) to efficiently supply the coffee processing, which consequently implies a better-quality coffee; b) By promoting transparency in the business operations, the local enterprise could develop and strengthen relationships with stakeholders along the supply chain, which not only brought some costs savings, but also a better-quality coffee by making more efficient certain processes; c) SH enabled the coffee production control by introducing monitorization and online information management features. It allowed a better connectivity with suppliers and distributors, and consequently a better-quality coffee; d) In addition, SH provided access to new sustainable techniques for coffee plantation, harvesting and production. Which is environmentally friendly because these techniques use less water and less electricity.

With these four influence areas conducting to a better-quality, Kigoma’s coffee price doubled. Higher profit means access to more land (to increase the production capacity), and allows people to send their children to school. All of this promotes the overall well-being. In addition, both sustainable practices and business transparency can easily increase the sales volume, and consequently Kigoma’s economy.

SH’s example brings not only a successful case of social business development, but also of a stakeholder involvement because for making change and induce transformation a narrow relationship and engagement is required in order to be exhaustive in a complete changeover.

Solar Cookers International | Solar Cookers International (SCI) is an organization whose aim is to build the large solar cooker knowledge base. The information the organization intends to provide is related to solar cookers, solar ovens, and solar grills. These devices not only allow to cook hot meals in a sustainable and affordable manner, but also to pasteurize water making it safe to drink.

These appliances have a strong value in all three sustainable strands:

Economic: a solar cookers costs \$39.00 which is approximately ten times cheaper than an equivalent appliance.

Environmental: the device only requires solar energy (irradiation), and it is zero-emissions.

Social: by having water safe to drink and a hot meal, people’s health is already being addressed. But by that, solar cookers have more impacts: using it, the danger about using fire is avoided, as well as there are savings in terms of money and time about gathering the wood (which also implies danger and drudgery).

SCI’s target are not only those non-profit groups (communities in developing countries), but also the fuel-stressed communities in developed markets. Thus, SCI sells not only frugal products, as it has a frugal business model.

Out of this example, the collaboration and partnerships made with NGOs and governments to enrich SCI’s programme is also a case of success, as the organization relies on a threefold philosophy: knowledge, networking, and funding.

Nike | Nike is one of the most known sports brands in the world. Its good image is given by the amazing advertisements and by the perceived-quality costumers see on its products. But Nike was not always a striking example. In the early 1990s, the international company was indicated for subcontracting local companies which had children working for them under “horrible conditions”. The case onset with an article of Life Magazine, in 1996, with a picture of a twelve-year-old boy working on a Nike soccer ball, for which he would be paid only sixty cents.

Until nowadays, the company has done a lot of efforts to re-build the relationship it had with the consumers, and the society at large. The good thing is that currently Nike is best known for its transparency, rather than for past scandals. In 2005, Nike was the first in the sports industry publishing a complete report on its local partnerships, and on the conditions and impact its business has. Already in 1999, the company had created the Fair Labor

Association “a non-profit group that combines companies, and human rights and labor representatives to establish independent monitoring and a code of conduct, including a minimum age and a 60-hour work week, and pushes other brands to join”. (<http://www.businessinsider.com/how-nike-solved-its-sweatshop-problem-2013-5>)

Related to child labour’s scandals in multinationals companies, there are some organisations that respond directly to employment issues like these, with norms, rules and standards. Two examples are: International Labour Organisation (ILO), and Social Accountability International (SAI) – whose scope is larger than the labour concerns. There is a powerful document, named SA8000 standard, which was published by SAI according to ILO recommendations. About child labour, the rules are clear about the prohibition of supporting or employing children under 16 years old (or 15 years old in some specific cases, according to ILO recommendation 146). Nevertheless, SA8000 provides some measures for young workers (between 16 and 18 years old): “The organisation may employ young workers, but where such young workers are subject to compulsory education laws, they shall work only outside of school hours. Under no circumstances shall any young worker’s school, work and transportation time exceed a combined total of 10 hours per day, and in no case, shall young workers work more than 8 hours a day. Young workers may not work during night hours” (reference: SA8000 e ILO146).

Out of this Nike’s example, the business transparency is also something to be highlighted. The company reports yearly its activity, according to GRI’s standards and guidelines.

Aligned with its acting area, Nike promotes the “Design to Move” program which promote physical activity among young people. This program is put into place in partnership with other seventy organizations - ‘sport-expert’ or not, as Nike believes “in the power of sport to change the world” (sustainability report, p.73, FY14-15).

Oxfam International | Operating in more than ninety countries in developing areas, Oxfam International intends to fight poverty implementing a “six-sided” strategy: (1) Power to claim; (2) Human development; (3) Primary care; (4) Environmental protection; (5) Fighting hunger; (6) Basic services access.

The first two areas are the ones to be highlighted in this work’s scope. In fact, Oxfam believes that giving poor people power to claim will allow them to escape poverty permanently. In this sense, Oxfam refers the existing partnerships and relationships with and within local communities, facilitating not only the access to, but also the understanding of people’s needs.

The human development is conducted by concerning the women empowering, as the aforementioned case of Girl MOVE. Women’s role in the society is very strong when talking about their influence to change, but they are “still massively under represented and often oppressed” thus, Oxfam “works to help them speak out and demand justice, and to assert their leadership”. (<https://www.oxfam.org/en/explore/how-oxfam-fights-poverty>)

Mumm | Mumm is a “new app which is helping Egyptian women cook their way to financial independence” (<https://www.weforum.org/agenda/2017/05/egyptian-women-homecooking-mumm/>). This app was conceived by an Egyptian start-up whose work is recognized as being “embracing the challenges by digital technologies” and also dealing with cultural beliefs and social challenges. In this case, being Middle East and North Africa is a region where the women’s role is seen as restricted to domestic tasks, in fact “only 11% of men believe women should be able to work outside the house” (<https://youtu.be/2xvOq5uzhdQ>).

Mumm’s scheme consists of women cook the food – that customers ordered through the app – in their own kitchens, without leaving their houses, according to their culture and believes.

While women do what they know and like (cooking), Mumm is responsible for what know to do: marketing and delivery. In addition, Mumm also help Syrian, Iraqi, and Sudanese refugees integrating them into the delivery staff team.

Mumm started in November 2015 and has created more than 120 jobs with minimal investment, allowing these women to get financial independence. As the company’s CEO, Waleed Abd El Rahman, stated: to have their own money, brought women happiness. This example also brings the importance of the respect for cultures.

Annex III

Tables of Social Areas of Assessment – referred in chapter 5.

Table A – Grounded theory results: social areas of assessment.

This table is divided into five tables A-1, A-2, A-3, A-4, and A-5.

Table B – Case study analysis results: social areas of assessment.

This table is divided into two tables B-1 and B-2.

Table B-1

		Stakeholders												
GRI Endpoints	Midpoints (Simões, 2014)	Top Management Employees	Employees	Shareholders/ Investors	Suppliers	Distributors	Post-sales technicians	Society at large	Governments and Regulators	Non-Governmental Organizations	Competitors	Neighbouring communities	Local Community	Consumers, users, customers
Product Responsibility	Consumer Health and Safety	Grameen-Danone										Johnson & Johnson (mMitra)	Johnson & Johnson (mMitra)	Johnson & Johnson (mMitra), Solar Cookers International
	Product Management and Consumer Satisfaction							GE Healthcare						Sustainable Harvest
Labour practices and decent work	Employment Scope; Benefits and Characteristics							CDC Group					Mumm	
	Employment Practices and Relations		Nike											
	Employee Welfare													
	H&S Practices and Incidents		TMH Europe						TMH Europe					
	Diversity and Equal Opportunities									Girl Move				
	Training: Education and Personal Skills													
	Innovation and Competitiveness							Sustainable Harvest					Johnson & Johnson	

Social Areas

Table B-2

		Stakeholders													
GRI Endpoints	Midpoints (Simões, 2014)	Top Management Employees	Employees	Shareholders/ Investors	Suppliers	Distributors	Post-sales technicians	Society at large	Governments and Regulators	Non-Governmental Organizations	Competitors	Neighbouring communities	Local Community	Consumers, users, customers	
Social Areas	Society	Business Impacts, Community Involvement and Welfare		Mumm	CDC Group	Grameen-Danone	Grameen-Danone		Sustainable Harvest, Nike					Girl MOVE, Grameen-Danone, Johnson & Johnson (mMitra), GE Healthcare, Sustainable Harvest, Nike, Mumm	Social Co-operators International
		Community Funding and Support			CDC Group									CDC Group, GE Healthcare, Sustainable Harvest	
		Fair Business Operations		Nike					Oxfam						
		Corruption in Business													
		Stakeholder Participation	TMH Europe; Nike	TMH Europe		Sustainable Harvest				TMH Europe				Girl MOVE, Sustainable Harvest	Sustainable Harvest
	Human Rights	Basic Human Rights Practices	Nike; Oxfam						Oxfam						
		Human Rights Implementation and Integration							Oxfam						

Table A-1

		Stakeholders													
GRI Endpoints	Midpoints (Simões, 2014)	Top Management Employees	Employees	Shareholders/ Investors	Suppliers	Distributors	Post-sales technicians	Society at large	Governments and Regulators	Non-Governmental Organizations	Competitors	Neighbouring communities	Local Community	Consumers, users, customers	
Social Areas	Product Responsibility													<p>(Ahi and Searcy, 2015a and 2015b) Product Safety</p> <p>(IRIS 4.0) Health improvement Disease-specific prevention Affordable housing Food security Access to clean water Access to education Access to energy Access to information Access to financial services</p>	
	Product Management and Consumer Satisfaction													<p>(Searcy et al, 2007) Benefits to customers and stakeholders</p>	

Table A-2

		Stakeholders													
GRI Endpoints	Midpoints (Simões, 2014)	Top Management Employees	Employees	Shareholders/ Investors	Suppliers	Distributors	Post-sales technicians	Society at large	Governments and Regulators	Non-Governmental Organizations	Competitors	Neighbouring communities	Local Community	Consumers, users, customers	
Social Areas	Labour practices and decent work	Employment Scope; Benefits and Characteristics	(ESofSI) Labour Market and Working Conditions					(Ahi and Searcy, 2015a and 2015b) Contribution to employment					(Ahi and Searcy, 2015a and 2015b) Contribution to employment	(Ahi and Searcy, 2015a and 2015b) Percentage of employment sourced from local communities	
		Employment Practices and Relations	(Ahi and Searcy, 2015a and 2015b) Participation in voluntary programs Number of individual volunteering (Vachon and Mao, 2008) Fair labour practices												
		Employee Welfare	(ESofSI) Individual well-being and Societal/ Collective well-being											(BAEM) Impact in developing countries (working conditions)	
		H&S Practices and Incidents	(Ahi and Searcy, 2015a and 2015b) Health and Safety incidents Health and safety practices Safety of workers Work safety and labour health Health and Safety performance measurement systems												
		Diversity and Equal Opportunities	(Khan, 2016) Social inclusion Diversity (ESofSI) Social cohesion (B Impact Assessment, CM4.5) Percentage of populations in the management employees (women, minorities populations excluded, handicapped people, low-income individuals) (Vachon and Mao, 2008) Gini index											(IRIS 4.0) Equality and empowerment	
		Training: Education and Personal Skills												(Khan, 2016) Education and training Capacity for learning (IRIS 4.0) Income/productivity growth	
		Innovation and Competitiveness												(BAEM) Impact in developing countries	

Table A-3

		Stakeholders													
GRI Endpoints	Midpoints (Simões, 2014)	Top Management Employees	Employees	Shareholders/ Investors	Suppliers	Distributors	Post-sales technicians	Society at large	Governments and Regulators	Non-Governmental Organizations	Competitors	Neighbouring communities	Local Community	Consumers, users, customers	
Social Areas	Business Impacts, Community Involvement and Welfare							<p>(ESofSI) Environment Leisure, Media, and Culture Publicly available missions and values statements</p> <p>(Khan, 2016) Well-being of future generations Decline of poverty</p>				<p>(Ahi and Searcy, 2015a and 2015b) Complaints from neighbouring communities Contribution to community</p> <p>(Khan, 2016) Employment</p>	<p>(Ahi and Searcy, 2015a and 2015b) Value added and community benefits Community impact rate Community connection and network Community engagement Contribution to community Community complaints Construction of community style and features Community ideology</p> <p>(Khan, 2016) Social coherence Social justice and equity Sense of place and belonging Employment Community involvement and development, community resilience Perservation of socio-cultural patterns and practices Behavioural changes</p> <p>(BAEM) Impact in developing countries (capacity development, economy, environment, governance, participation and security)</p> <p>(IRIS 4.0) Employment generation Community development</p>	<p>(ESofSI) Income, Standard of Living, and Consumption Patterns</p>	
	Society	Community Funding and Support		<p>(Ahi and Searcy, 2015a and 2015b) Participation in voluntary programs Number of individual hours on volunteering</p>				<p>(ESofSI) Crime and Public Safety Social Security</p> <p>(Khan, 2016) No structural obstacles (to health, influence, competence, impartiality, and meaning-making)</p>	<p>(ESofSI) Social and Political Participation and Integration</p> <p>(Khan, 2016) Democratic/engaged government and democratic society</p>			<p>(ESofSI) Population, Households and Families Housing; Transport and Mobility (Ahi and Searcy, 2015a and 2015b) Firm's community development effort Community initiatives</p> <p>(Khan, 2016) Social infrastructure Social capital Community involvement and development, community resilience</p> <p>(B Impact Assessment, CM6.5) Free hours to community service</p> <p>(IRIS 4.0) Health improvement Affordable housing Food security Access to clean water Access to education Access to energy Access to information</p> <p>(Vachon and Mao, 2008) Corporate social involvement</p>			
	Fair Business Operations			<p>(B Impact Assessment, CM2.1) Suppliers' social performance assessment</p>				<p>(Ahi and Searcy, 2015a and 2015b) Economic linkages with communities</p> <p>(Khan, 2016) Fair operating practices</p>				<p>(Ahi and Searcy, 2015a and 2015b) Economic linkages with communities</p>	<p>(Ahi and Searcy, 2015a and 2015b) Institutional efficiency Economic linkages with communities</p> <p>(Khan, 2016) Fair trade practices</p>	<p>(Searcy et al, 2007) Governance and management issues</p>	
	Corruption in Business			<p>(Ahi and Searcy, 2015a and 2015b) Supplier and Certifiable Safety Standard</p>				<p>(Ahi and Searcy, 2015a and 2015b) Corruption risk</p>						<p>(Searcy et al, 2007) Governance and management issues</p>	

Table A-4

		Stakeholders													
	GRI Endpoints	Midpoints (Simões, 2014)	Top Management Employees	Employees	Shareholders/ Investors	Suppliers	Distributors	Post-sales technicians	Society at large	Governments and Regulators	Non-Governmental Organizations	Competitors	Neighbouring communities	Local Community	Consumers, users, customers
Social Areas	Society	Stakeholder Participation	(Khan, 2016) Participation (Social Value International) Involve stakeholders	(Khan, 2016) Participation (Social Value International) Involve stakeholders (Searcy et al, 2007) Staff relations	(Khan, 2016) Participation (Social Value International) Involve stakeholders	(Khan, 2016) Participation (Social Value International) Involve s takeholders	(Khan, 2016) Participation (Social Value International) Involve s takeholders	(Khan, 2016) Participation (Social Value International) Involve stakeholders	(Khan, 2016) Participation (Social Value International) Involve stakeholders (Searcy et al, 2007) Public involvement	(Khan, 2016) Participation (Social Value International) Involve stakeholders (Searcy et al, 2007) Public involvement	(Khan, 2016) Participation	(Khan, 2016) Participation	(Khan, 2016) Participation (Social Value International) Involve stakeholders	(Ahi and Searcy, 2015a and 2015b) Significant improvement in relations with community stakeholders Improvement in community relations and corportation image (Khan, 2016) Community involvement and development, community resilience Participation (Social Value International) Involve stakeholders (Searcy et al, 2007) Community relations	(Khan, 2016) Participation (Social Value International) Involve stakeholders

Annex IV

Validation: Semi-structured interviews

Interview guide

Objective

The goal of this interview is to get information of what practitioners think about the developed framework, getting into its general lines: stakeholders and areas of assessment more relevant for Frugal Innovation, and into each of the suggested indicators in particular.

I. Frugal Innovation

So that it will be firstly important to introduce what Frugal Innovation is to the interviewee by referring its:

a. Definition

“Frugal innovations are products, services, processes and business models that target underserved customers of low-mid market segments with high-quality solutions at **affordable** prices. They are developed in a **sustainable** and **cost-effective** manner that minimises the use of [human] resources, materials and capital in the entire value chain, while enhancing **social value**” (Rocca, 2016)

b. Characteristics [Adapted from Rocca (2016)]: Functional, Robust, User-friendly, Growing/ Timely-to-market, Affordable, Local – and Sustainable.

c. Examples: GE MAC400; M-Pesa; M-KOPA IV Solar Home System

II. FISA

III. Social Value and Social Impact concepts

Social Value is the perception the **concerned subjects** have about a product **influence** in their individual and collective **wellbeing**.

Social Impact is **how** the company activities, or the product itself, **change or influence** each **stakeholder** in a period of **time**.

IV. Areas of social assessment

a. Why those are the options (mention GRI as a reference for sustainability assessment, and Simões (2014)'s work a useful and practical conceptualization on GRI's endpoints)

b. Ask to develop the interconnection between each GRI endpoint and Frugal Innovation scope, in light of the findings

V. Stakeholders characterisation

a. Organising the identified stakeholders into groups (from two to as many as the interviewee needs) according to Frugal Innovation and its relevance within the scope.

b. Explore the difference between those groups (point-of-view, ...) and the justify relevance of each of them over the others

c. Develop the importance of each stakeholder of the group with higher relevance

VI. Indicators

Interviews' details

	Interviewee	Date	Duration
Interview A	Lourenço Pinto Leite, MSc in Entrepreneurial Strategy	2018.03.10	1h40
Interview B	Francesco Rocca, Impact Hub Lisbon, Frugal Innovation researcher	2018.03.12	2h10
Interview C	Vera Rosete, Analyst at Deloitte Lisboa, previous work on Frugal Innovation's Market Analysis	2018.03.12	1h00
Interview D	Francisca Empis, Junior project manager at CESO	2018.03.21	1h15
Interview E	Maria Esperança, Senior project manager at CESO	2018.03.21	00h45
Interview F	Miguel Simões, Senior Consultant at Deloitte Lisboa,	2018.03.23	1h10
Interview G	Margarida Anselmo, Impact Investing Analyst at Maze	2018.03.28	1h15
Interview H	João Santos, Impact Investing Associate at Maze	2018.03.28	00h50
Interview I	Carlos Pais, Manager at Bem Comum Fund (investment fund for social impact)	2018.04.03	1h10
Interview J	Francisca Pereira de Almeida, Master in Social Entrepreneurship, Hult International Business School, former IES-Business School Portugal collaborator	2018.04.08	1h00
Interview K	Hugo Martinez de Seabra, Cohesion and Social Integration program and project manager at Calouste Gulbenkian Foundation, Portugal	2018.04.12	1h00
Interview L	Catarina Neves, Consultant at Sair da Casca, Portugal	2018.04.18	1h15
Interview M	Margarida Montanha Rebelo, Master in Management at NOVA SBE, Lisboa, Portugal. Collaborator in several social initiatives.	2018.04.18	1h10
Interview N	Carolina Leite Analyst at Deloitte Lisboa, previous work on Frugal Innovation's Environmental Sustainability	2018.04.20	

Interviews' results: stakeholders

Interviewee	Stakeholders – Level 1
Interview A	13 6 5 1 and 3
Interview B	12 8
Interview C	1 8 13 4 7
Interview D	3 8 12
Interview E	12 13
Interview F	13 1/2 3 11/12 8
Interview G	6 13 12 1
Interview H	1 3 8
Interview I	13 12 1 and 3
Interview J	12 13 10 8
Interview K	12 8 7/10
Interview L	1 13 12
Interview M	1/3/2 12/9
Interview N	12 13 9

Annex V

FISA's Assessment Level 2: indicators.

1 – TOP MANAGEMENT EMPLOYEES

Table V.1 – Indicator: R&D expense, pRD.

R&D expense		
ID	pRD	
Description	The percentage of budget a company has to invest in Research and Development (R&D) translates the commitment the company embraces towards innovation.	
Formula	$pRD = \frac{budgetRD}{TotalB} \times 100 \quad (eq. i)$ <p>bRD - budget devoted to R&D; TotalB - total budget</p>	
Unit of measure	percentage	
Range	0% - 100%	
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Innovation and Competitiveness
	Stakeholder	Top management employees
	Frugal Characteristics	Growing/ Timely-to-market
	Measurement of	Social impact

Table V.2 – Indicator: Feedback management system, FbMng.

Feedback management system		
ID	FbMng	
Description	This indicator measures the number of standards used in feedback management system. As noticed by the references made in other indicators, and along this work, feedback is an important tool to use while developing and implementing Frugal Innovation. Therewith, the quality of the feedback management system might mean the systematisation and standardisation of the feedback mechanism. For example, the post-sales technicians should have a standardised way to report their feedback to the company each time they have a new input.	
Formula	$FbMng = \sum nStdFb \quad (eq. ii)$ <p>nStdFb - number of standards used in managing feedback contacts</p>	
Unit of measure	number	
Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Top management employees
	Frugal Characteristics	Growing/ Timely-to-market; Local
	Measurement of	Social impact

Table V.3 – Indicator: Changes and improvements embodied, ChImp.

Changes and improvements embodied	
ID	ChImp
Description	This indicator measures the changes made which came from feedback contacts. After receiving feedback, the company has to dedicate time to analyse the claims and to decide whether it should be embodied in next versions of the product, or not. The changes and improvements embodied from feedback let one know the efforts the company's top management is willing to take to make its product more functional to the local and neighbouring communities.
Formula	$nChImp = \frac{\sum nChImp}{TotChImp} \times 100 \quad (eq. iii)$ <p>nChImp - number of changes and improvements embodied into the process which came from feedback inputs; TotChImp - total number of changes and improvements suggested in feedback inputs</p>

Cont. **Table V.3** – Indicator: Changes and improvements embodied, ChImp.

Unit of measure	percentage	
Range	0-100%	
Trend	The higher the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Consumer Health and Safety; Product Management and Consumer Satisfaction
	Stakeholder	Top management employees
	Frugal Characteristics	Functional; Growing/ Timely-to-market; Local
	Measurement of	Social impact

2 – EMPLOYEES

Table V.4 – Indicator: Variation of employees, varEmp_t.

Variation of employees		
ID	varEmp _t	
Description	This indicator measures the impact the product has on the employment environment. A frugal innovation can enhance the production capacity of a business, in that case it can mean delocalization of workmen from production to the commercial department, for example, or in negative cases, it can mean the unemployment of a certain number of people. This is an indicator that should be analysed through the comparison between different periods of time t.	
Formula	$varEmp_t = TotalE_{t-1} - TotalE_t$ (eq. iv) TotalE _t – total number of employees of the company at period t.	
Unit of measure	number	
Range]-∞, +∞[
Trend	The more negative the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support; Fair Business Operations
	Stakeholder	Employees
	Frugal Characteristics	Growing/ Timely-to-market, Sustainable
	Measurement of	Social value and Social impact

Table V.5 – Indicator: Local employees, pLE.

Local employees		
ID	pLE	
Description	This indicator measures, in percentage, the quantity of local people employed at the company. In terms of business model, frugality implies also the engagement, development and support of local communities. In this sense, it is favoured that business model with higher percentage of local employees. This is a quantitative indicator, that serves to compare a business model, or finished product, to another.	
Formula	$pLE = \frac{LocE}{TotalE} \times 100$ (eq. v) LocE – number of local people employed at the company; TotalE – total number of employees of the company.	
Unit of measure	percentage	
Range	0% - 100%	
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support
	Stakeholder	Employees
	Frugal Characteristics	Local
	Measurement of	Social impact

Table V.6 – Indicator: Participation in local volunteering programs, PLVP.

Participation in local volunteering programs		
ID	PLVP	
Description	This indicator brings forward the importance of keeping the employees involved with the local community, and of promoting programs beyond compliance and beyond the business area, measuring the participation in local volunteering programs. The participation in voluntary programs not only keeps the employees engaged with the local community, but can also bring new ideas, new opportunities, or even the get to know a new business area to get in on. Although it might be more considered for companies from developed countries, those from emerging ones are also called to be in place helping their own community or neighbouring ones.	
Formula	$PLVP = \frac{nEVP}{TotalE} \times 100 \quad (eq. vi)$ <p>nEVP - number of employees who participate in local volunteering programs; TotalE- total number of employees of the company.</p>	
Unit of measure	Percentage	
Range	0% - 100%	
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Community Funding and Support
	Stakeholder	Employees
	Frugal Characteristics	Local
	Measurement of	Social impact

Table V.7 – Indicator: Individual hours of volunteering, indHV.

Individual hours of volunteering		
ID	indHV	
Description	This indicator quantifies the number of hours per month (among the working hours) each employee gives, dedicates, or is allowed to dedicate to volunteering programs (gross average). Obviously, even if the trend is the higher the better, the balance between what the community and what the company need is intended to exist.	
Formula	$indHV = \frac{\sum TotalHV}{TotalE} \quad (eq. vii)$ <p>TotalHV - total number of hours of volunteering of all company's workers; TotalE- total number of employees of the company.</p>	
Unit of measure	number	
Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Community Funding and Support
	Stakeholder	Employees
	Frugal Characteristics	Local
	Measurement of	Social impact

Table V.8 – Indicator: Impact of volunteering programs, VP.

Impact of volunteering programs	
ID	VP
Description	Aligned with the last two indicators, it is also important to assess the scope of those volunteering programs. Those with impact on education, human rights, make accessible the basics, etc are privileged comparing with others.
Formula	<i>Through application of SLCA – contribution.</i>
Unit of measure	score
Range	
Trend	The higher the better, or the more positive the better

Cont. **Table V.8** – Indicator: Impact of volunteering programs, VP

Scope	Endpoint	Society
	Midpoints	Community Funding and Support
	Stakeholder	Employees
	Frugal Characteristics	Local
	Measurement of	Social impact

3 – SHAREHOLDERS/ INVESTORS

Table V.9 – Indicator: Future Markets, FM.

Future Markets		
ID	FM	
Description	This indicators quantifies the number of potential buyers. The number of future markets is given by the neighbouring communities as they are defined in chapter 5. It is important for shareholders and investors as they consider the economic sustainability of the product: its profitability in mid- and long-term, since they are able to waive the short-term as the investment in Frugal Innovation might request it.	
Formula	$FM = \sum PotB$ (eq.viii) PotB – potential buyers from neighbouring communities (in terms of needs and characteristics)	
Unit of measure	number	
Range	[0, ∞[
Trend	The higher the better, because it is possible to exploit economies of scale.	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Shareholders/ Investors
	Frugal Characteristics	Growing/ Timely-to-market
	Measurement of	Social value and Social impact

Table V.10 – Indicator: Customer retention rate, CRR_t.

Customer retention rate		
ID	CRR _t	
Description	This indicator measures the variation of the quantity of customers over time. Customer retention rate is used to complete the big picture of the business' success alongside with other economic and marketing indicators. It is then important for shareholders as it can provide insight on how well adequate the product is to the market, and on the frugal product characteristics that translate it. A value of 100% in this indicator means that any customer quit the product or service in period t.	
Formula	$CRR_t = \frac{endC_t - retC_t}{startC_t} \times 100$ (eq.ix) endC _t – actual customers/users at the end of period t; retC _t – customers acquired during period t; startC _t – actual customers at the beginning of period t.	
Unit of measure	percentage	
Range	0% - 100%	
Trend	The higher the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Shareholders/ Investors
	Frugal Characteristics	Functional, Robust, User-friendly, Affordable
	Measurement of	Social value and Social impact

4 – SUPPLIERS

Table V.11 – Indicator: Contracts with local suppliers, CLS.

Contracts with local suppliers		
ID	CLS	
Description	This indicator measures, in percentage, the number of formal or informal contracts with local suppliers. It is relevant since local interaction is a requirement for Frugal Innovation – that is to say there is a privilege to those value chain actors who are from the local community (i.e. target market). The local procurement helps in reducing costs, risks, and complexity of the business model. Moreover, using local resources contributes to the community development. <i>Source: Searcy et al., 2007</i>	
Formula	$CLS = \frac{nCLS}{TotalS} \quad (eq.x)$ nCLS - number of suppliers from local community; TotalS - total number of suppliers.	
Unit of measure	ratio	
Range	[0, 1]	
Trend	The higher the better.	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support
	Stakeholder	Suppliers
	Frugal Characteristics	Local
	Measurement of	Social impact

Table V.12 – Indicator: Equality in suppliers selection, ESS.

Equality in suppliers selection		
ID	ESS	
Description	This indicator measures the number of suppliers submitted to the selection procedure. It suggests that the same criteria should be applied for all candidates. This equality is needed to assure the process is fair, as so the management of the company. It will contribute to the sustainability of the business. Related to the previous indicator (CLS), one criterion should obviously be the location of the supplier, since 'local' is a frugal characteristic.	
Formula	$ESS = \frac{nSp}{TotalS} \quad (eq.xi)$ nSp - number of suppliers submitted to the selection procedure; TotalS - total number of suppliers.	
Unit of measure	ratio	
Range	[0, 1]	
Trend	The higher the better.	
Scope	Endpoint	Society
	Midpoints	Fair Business Operations; Corruption in Business
	Stakeholder	Suppliers
	Frugal Characteristics	Growing/ Timely-to-market; Sustainable
	Measurement of	Social value and Social impact

5 – DISTRIBUTORS

Table V.13 – Indicator: Contracts with local distributors, CLD.

Contracts with local distributors		
ID	CLD	
Description	This indicator measures, in percentage, the number of formal or informal contracts with local distributors. It reflects the importance of using local people (distributors, salesmen, or salespoints) to commercialize the product. As referred, the BoP customers are often risk averse and do not rely on somebody they're seeing for the first time. Therewith, the number of local distributors tells a lot about the flexibility of the distribution model. <i>Source: adapted from Searcy et al., 2007.</i>	
Formula	$CLD = \frac{nCLD}{TotalD} \quad (eq. xii)$ nCLD – number of distributors from local community; TotalD – total number of distributors.	
Unit of measure	n.a.	
Range	[0, 1]	
Trend	The higher the better.	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support
	Stakeholder	Distributors
	Frugal Characteristics	Growing/ Timely-to-market; Local
	Measurement of	Social impact

Table V.14 – Indicator: Distributors per targeted people, rDTP.

Distributors per targeted people		
ID	rDTP	
Description	This indicator quantifies the number of distributors per targeted people. As the CLD – contracts with local distributors suggests, the closer a distributor is to the potential buyers, the better in a way the person knows the distributor, and consequently relies on him. The ration of number of distributors per total number of targeted people is then relevant due to the quantification of how well spread the distribution model is. Obviously, this indicator should be read and interpreted with the next one, rDTA.	
Formula	$rDTP = \frac{nD}{nTC} \quad (eq. xiii)$ nD – total number of distributors; nTC – number of targeted people	
Unit of measure	Distributors/targeted people	
Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Distributors
	Frugal Characteristics	Growing/ Timely-to-market, Local
	Measurement of	Social value

Table V.15 – Indicator: Distributors per targeted area, rDTA.

Distributors per targeted area	
ID	rDTA
Description	This indicator measures the number of distributors per unit of targeted area. Alongside with the previous indicator (rDTP), rDTA intends to quantify how well designed is the distribution model – here in terms of how dispersed in the targeted area the distributors (salesmen, salespoints) are. Targeted area is that one corresponding to the area where the targeted people live, or work, or that one in-between these. Logically, here is also important to take into consideration that the population density of an area might be very wide – so that this indicator should be read together with the previous rDTP.
Formula	$rDTA = \frac{nD}{TotalA} \quad (eq. xiv)$ nD – total number of distributors; TotalA – total targeted area
Unit of measure	Distributors/targeted square meters

Cont. **Table V.15** – Indicator: Distributors per targeted area, rDTA.

Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Distributors
	Frugal Characteristics	Growing/ Timely-to-market, Local
	Measurement of	Social value

6 – POST-SALES TECHNICIANS

Table V.16 – Indicator: Contracts with local people, CLPST.

Contracts with local people		
ID	CLPST	
Description	This indicator measures the number of local post-sales technicians. The customer profile was already mentioned due to its importance for the social assessment. In fact, BoP people are very unwilling to buy a product they don't know from a company they do not rely on. Frequently, one relevant fact is the post-sales assistance, so that this indicator intends to measure the number of local technicians who are trained to perform the maintenance as they offer a higher reliability for the customers or potential buyers. The ratio of local technicians per the total of them tells more than the nLMT indicator because companies will probably use both out-sourced and internal technicians, so that this represents the reality of business.	
Formula	$CLPST = \frac{nLPST}{TotalPST} \quad (eq. xv)$ <p>nLPST – number of local post-sales technicians; TotalPST – total number of post-sales technicians</p>	
Unit of measure	ratio	
Range	[0, 1]	
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support
	Stakeholder	Post-sales technicians
	Frugal Characteristics	Local
	Measurement of	Social value and Social impact

Table V.17 – Indicator: Technicians per sold product, nTSP.

Technicians per sold product		
ID	nTSP	
Description	The number of post-sales technicians per sold product provides information on how well prepared the business model is to respond to maintenance requests. The trend (*) is not direct because it depends on the type of product and its characteristics.	
Formula	$nTSP = \frac{TotalPST}{nSoldProd} \quad (eq. xvi)$ <p>TotalPST – total number of post-sales technicians; nSoldProd - number of sold products</p>	
Unit of measure	People per sold products	
Range	[0, ∞[
Trend	(*)	
Scope	Endpoint	Product Responsibility
	Midpoints	Product Management and Consumer Satisfaction
	Stakeholder	Post-sales technicians
	Frugal Characteristics	Robust, Growing/ Timely-to-market
	Measurement of	Social value

7 – SOCIETY AT LARGE

Table V.18 – Indicator: Impact on production capacity, PC.

Impact on production capacity		
ID	PC	
Description	This indicator measures the impact the assessed product can have in the capacity of a production to which it is related. For example: if the product function is to peel off nuts, the production be impacted by the product is the unpeel nuts to be commercialized to end-consumers or other companies. This indicator should only measure the impact that can be attributable to the frugal innovation being assessed.	
Formula	$PC = \frac{prod_{a_t}}{prod_{b_t}} \quad (eq. xvii)$ prod _{a_t} – production in a period of time <i>t</i> after implementing the product; prod _{b_t} – production in a period of time <i>t</i> before implementing the product	
Unit of measure	ratio	
Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare
	Stakeholder	Society at large
	Frugal Characteristics	Functional, Growing/ Timely-to-market
	Measurement of	Social value and Social impact

Table V.19 – Indicator: Indirect impact, IINU.

Indirect impact		
ID	IINU	
Description	The impact on non-users is also an aspect to be assessed since they are included in the concerned subjects of the Social Value scope, but also because a positive impact on them improves the Product Social Value. This indicator can sometimes not be taken as quantitative. For example: if the product is a tool which arises the production rate of a local business, and it allows the employer to rise the employees' wages, and consequently the employees' children are able to get education. In this scope, it will be considered those impacts on: education, housing conditions, access to basic goods.	
Formula	Applying SLCA (contribution)	
Unit of measure	score	
Range		
Trend	The higher the better, i.e. the more positive the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare
	Stakeholder	Society at large
	Frugal Characteristics	Functional
	Measurement of	Social value and Social impact

Table V.20 – Indicator: Impact of initiatives promoted beyond the business area, IIBBA.

Impact of initiatives promoted beyond the business area		
ID	IIBBA	
Description	Companies often promote initiatives beyond its business area. It deals with each CSR strategy and contributes to the brand reputation in a way it may increase the awareness the general public has about the company. For example, it is related to the Initiatives to raise awareness indicator as it intends to measure its impact.	
Formula	Applying SLCA (contribution)	
Unit of measure	score	
Range		
Trend	The higher the better, i.e. the more positive the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support

	Stakeholder	Society at large
	Frugal Characteristics	Growing/ Timely-to-market; Local
	Measurement of	Social value and Social impact

8 – GOVERNMENTS AND REGULATORS

Table V.21 – Indicator: Social and political participation and integration, SPPI.

Social and political participation and integration			
ID	SPPI		
Description	About the relationship the developer company should establish with the governments and local authorities, the integration and participation in the political life of the community can mean a better adequacy and match to the needs and requirements it has. Moreover, the right social and political links can mean a lot for the product sustainability in terms of economic advantages and environmental rights. This indicator is also a measure for the Product Responsibility midpoint because the interactions with the governments and regulators can also mean a right adequacy of the product to the quality and regulatory context.		
Formula	$SPPI = \sum actGovReg$ (eq. xviii) actGovReg – actions (meetings, contacts, ...) taken with governments and/or regulators to assure the adequacy of the product		
Unit of measure	Number		
Range	[0, ∞[
Trend	The higher the better		
Scope	Endpoint	Society	Product Responsibility
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support; Fair Business Operations; Corruption in Business; Stakeholder Participation	Consumer Health and Safety; Product Management and Consumer Satisfaction
	Stakeholder	Governments and regulators	
	Frugal Characteristics	Growing/ Timely-to-market, Local	
	Measurement of	Social impact	

Table V.22 – Indicator: Timely-to-market, TM.

Timely-to-market		
ID	TM	
Description	This indicator measures the effective and efficient actions taken to put the product on the market in a useful and adequate time. The flexibility and velocity a company can have are always advantages for its position in the market and a benefit over other companies. In this scope, what is being considered is the legal and bureaucratic action the company does to put the product into the marketplace. Here, what is being measured is the number of actions, but obviously their effectiveness and efficiency shall be taken into consideration. So that, the trend (*) is not generally the same.	
Formula	$TM = \sum actTM$ (eq. xix) actTM – effective and efficient actions taken to put the product on the market in a useful and adequate time	
Unit of measure	Number	
Range	[0, ∞[
Trend	(*)	
Scope	Endpoint	Product Responsibility
	Midpoints	Consumer Health and Safety; Product Management and Consumer Satisfaction
	Stakeholder	Governments and regulators
	Frugal Characteristics	Growing/ Timely-to-market, Local
	Measurement of	Social value and Social impact

Table V.23 – Indicator: Compliance with regulation, CwR.

Compliance with regulation		
ID	CwR	
Description	This indicator measures the total number of monetary fines and non-monetary sanctions for non-compliance with laws and regulations. Complying with regulation is logically something important to assure and protect the consumer health and safety, but also contributes to the brand reputation whenever the information is available for the general public (in sustainability reports, campaigns, ...) <i>Source: GRI 4.0 – SO8</i>	
Formula	$CwR = \sum mnmSNC$ (eq.xx) mnmSNC - number of monetary or non-monetary sanctions for non-compliance with laws and regulations	
Unit of measure	Number	
Range	[0, ∞[
Trend	The lower the better	
Scope	Endpoint	Product Responsibility
	Midpoints	Consumer Health and Safety; Product Management and Consumer Satisfaction
	Stakeholder	Governments and regulators
	Frugal Characteristics	Growing/ Timely-to-market
	Measurement of	Social value and Social impact

9 - NGOs

Table V.24 – Indicator: Support local NGOs, SNGO.

Support local NGOs		
ID	SNGO	
Description	This indicator measures the actions the company takes to support NGOs local work. NGOs operating in targeted communities are a strong resource of information and connections with the local people.	
Formula	$SNGO = \sum actSupNGO$ (eq.xxi) actSupNGO - number of actions (meetings, contacts, ...) taken to promote and support causes of NGOs operating locally	
Unit of measure	number	
Range	[0, ∞[
Trend	The higher the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support
	Stakeholder	Non-governmental organizations
	Frugal Characteristics	Local; Sustainable
	Measurement of	Social value and Social impact

Table V.25 – Indicator: Joint specific-studies, JSS.

Joint specific-studies	
ID	JSS
Description	This indicator measures the number of actions the company conducts together with local NGOs to study and access information on the local environment: specially social and economic conditions as the objective is to describe the customer profile and its preferences.
Formula	$JSS = \sum actSS$ (eq.xxii) actSS - number of actions conducted together with NGOs to study the local environment
Unit of measure	number
Range	[0, ∞[
Trend	The higher the better

Cont. **Table V.25** – Indicator: Joint specific-studies, JSS.

Scope	Endpoint	Product Responsibility
	Midpoints	Consumer Health and Safety; Product Management and Consumer Satisfaction
	Stakeholder	Non-governmental organizations
	Frugal Characteristics	Functional; Affordable; Local
	Measurement of	Social value and Social impact

10 – COMPETITORS

Table V.26 – Indicator: Job shift from an industry or company to another, pJS.

Job shift from an industry or company to another		
ID	pJS	
Description	This indicator measures the impact the company activities (related to the product) have on the employment environment of a community and/or of an industry or sector. The trend is the lower the better because, contrarily to the percentage of job shift (pJS) – i.e. (1 - pJS) - , there is the job creation which is very important in BoP contexts.	
Formula	$pJS = \frac{nEComp}{TotalE} \quad (eq. xxiii)$ nEComp – number of employees who were working in competitors' companies; TotalE – total number of employees of the company	
Unit of measure	percentage	
Range	0% - 100%	
Trend	The lower the better	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare
	Stakeholder	Competitors
	Frugal Characteristics	Sustainable
	Measurement of	Social impact

Table V.27 – Indicator: Number of substitute products, nSP.

Number of substitute products		
ID	nSP	
Description	The number of substitute products helps to describe the market environment. The number of products which exists to cover the same need, or needs, than the assessed product, provides information on the impact the product has for people, in a way it can be inefficient or ineffective if there are a number of substitute products. Therewith, the competitors' situation gives important information for the developer company.	
Formula	$nSP = \sum SubProd \quad (eq. xxiv)$ SubProd – number of different substitute products, i.e. existing products intending to cover the same need, or needs	
Unit of measure	number	
Range	[0, ∞[
Trend	The lower the better (because there is not products serving people with that need or those needs the product is covering)	
Scope	Endpoint	Society
	Midpoints	Business Impacts, Community Involvement and Welfare; Community Funding and Support
	Stakeholder	Competitors
	Frugal Characteristics	Growing/ Timely-to-market
	Measurement of	Social impact