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4. The apolitical framing of frugal innovation in the global south: beyond the tales of scarcity, heroic inventors and techno-fixes

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4.1. INTRODUCTION

The very concept of technical reason is perhaps ideological. Not only the application of technology but technology itself is domination (of nature and men) – methodical, scientific, calculated, calculating control. Specific purposes and interests of domination are not foisted upon technology “subsequently” and from the outside; they enter the very construction of the technical apparatus. Technology is always a historical-social project: in it is projected what a society and its ruling interests intend to do with men and things. Such a “purpose” of domination is “substantive” and to this extent belongs to the very form of technical reason.

(H. Marcuse, *One Dimensional Man*, 1966)

The literature on frugal innovation has flourished in the last two decades and has become very popular among an increasing variety of academics and practitioners (Pisoni, Michelini, & Martignoni, 2018; Tiwari, Fischer, & Kalogerakis, 2017). The idea underpinning most of this scholarship is that innovative thinking can be enhanced by financial, material and human resources scarcity (Pansera, 2013). If this is true, it means that innovation can also emerge from places that do not resemble the high-tech labs of the most prestigious universities, the R&D departments of multinational corporations or the secret bases of the world’s most powerful armies. Innovation, at least in its frugal, low-tech and low-cost forms, is possible everywhere. This is good news, not only for SMEs and entrepreneurs, but also for all those companies that are interested in reducing production costs under conditions of extreme global competition. At the same time, frugal innovation also attracts the attention of scholars and practitioners interested in improving the living conditions of the poor of the world, who are confronted with resource constraints on a daily basis. Frugal innovation literature, hence, is characterized by a huge variety of approaches that range from those focusing on product/process efficiency to more interdisciplinary research focused on the social and environmental benefit of frugality.

In this chapter, I focus on the notion of frugal innovation as a conceptual (but also practical) instrument for addressing poverty and/or economic development in the Global South. By ‘Global South’ I am not simply referring to what are commonly known as ‘developing countries’ or ‘less developed countries’, but rather to a specific geo-political order, an arrangement of power relationships that dominate the relations between the former dominant colonial empires and the dominated colonies. As Dados and Connell (2012) eloquently say, the term refers to these countries’ “interconnected histories of colonialism, neo-imperialism, and differential economic and social change through which large inequalities in living standards, life expectancy, and access to resources are maintained”. In the context of the Global South, frugal innovation has been evoked to deliver ‘good-enough’ solutions for the poor, reactivate economic development or to meet environmental sustainability goals (Hossain, 2016). In this

sense, this literature echoes the Appropriate Technology movement initiated by F. Schumacher in the 1970s (Kaplinsky, 2011; Schumacher, 1973) and, in a quite different fashion, the idea of ‘Convivial Tools’ proposed by Ivan Illich (1973). ‘Convivial Tools’ are tools, technologies and infrastructures accessible to everybody and easy to use that foster relations within and beyond the human world and bring about small, slow and beautifully simple energy-efficient solutions. The interesting thing – which is also a distinctive feature of this new wave of ‘innovation for the poor’ literature compared with the past – is the fact that frugal innovation literature has mostly become the field of business, innovation, organizational studies scholars rather than that of economists and development scholars (Pansera & Owen, 2018c). As I have argued elsewhere (e.g. Pansera & Owen, 2018a), this shift reflects an evolution of the discourse of development from a top-down, state-driven approach to a market-oriented logic based on strong (but contested) mobilizing concepts such as innovation, entrepreneurship and competitiveness, just to mention a few. In this evolution the notion of ‘innovation’, frequently used as a buzzword, is crucial. Since the 1970s, indeed, the project of development has witnessed a progressive shift in emphasis and delivery. A macroeconomic focus based largely on donor-led, institution-building initiatives, often involving state-funded finance and technology transfer from North to South, gave way to a more granular approach directed at local, situated interventions, often involving a wider range of funding sources (such as private foundations and companies) and stakeholders (such as Non-Governmental Organizations, local communities and social enterprises) (Escobar, 2012). In this shift, the discourse of innovation as a tool for development became crucial. Not only has innovation been sold as a magic formula for economic growth, it has also been promoted as a panacea for ‘inclusion’ and ‘equality’, i.e. the notion of *inclusive growth* and *inclusive innovation* (Pansera & Owen, 2018a). Until the end of the 1990s, in fact, the topics of development and poverty, once dominated by development economists, had gone largely under the radar of management, organization and innovation scholars (Kolk, Rivera-Santos, & Rufin 2013). A huge variety of terms then began to populate the business and management literature. This is when the notion of frugal innovation emerges in combination with a number of other appealing buzzwords such as ‘*reverse innovation*’ (Govindarajan & Euchner, 2012), ‘*Jugaad innovation*’ (Radjou, Prabhu, Ahuja, & Roberts, 2012), ‘*BOP innovation*’ (Pralhad, 2012), ‘*Gandhian innovation*’ (Mashelkar, 2010), ‘*empathetic innovation*’ and ‘*pro-poor vs. from-the-poor*’ (Gupta, 2010), ‘*long tail and long tailoring*’ innovation (Anderson & Markides, 2007), ‘*below-the-radar innovation*’ (Kaplinsky, 2011) and, more recently, ‘*inclusive innovation*’ (Heeks, Foster, & Nugroho, 2014). This proliferation of buzzwords suggests, at least in the academic publications, a ‘cross-pollination’ between the discourses of development and innovation (Pansera & Owen, 2018c).

The view that I will set forth here argues that, in spite of its own specific features, frugal innovation literature (and its corresponding buzzwords) should be historically situated in this evolution from a ‘discourse of development’ based on state-driven intervention to a market-oriented logic that emphasizes the role of innovation in the context of economic development. In other words, this emphasis on innovation in development reflects the *neoliberal turn* that has characterized the world global governance since the 1980s, i.e. the emphasis on the free market, private ownership, the liberalization and privatization of commons, the commodification (especially through an instrumental use of technology) of all aspects of social life, etc. There is growing empirical evidence that suggests that the neoliberal turn has been leading to increasing inequality (Hinkel, 2018; Piketty, 2014), social unrest (Harvey, 2007) and environmental degradation (Kallis, 2017, 2018). This does not necessary imply

that all research on frugal innovation underpins a neoliberal ideology. These notions, fortunately, are increasingly contested and debated in academia (see Pansera & Owen, 2018b). My argument in this chapter is that a huge portion (perhaps a vast majority) of frugal innovation literature focused on addressing the problem of poverty in the Global South is still problematically framed around neoliberal values, worldview and ideology. Under neoliberalism, Global South governments – often following advice provided by experts from the World Bank and other development agencies – have substantially reduced the role of the state as regulator of markets and its responsibility of securing essential services, such as healthcare, education and sanitation for the poorest in their societies (Arora & Romijn, 2011). As a consequence, the responsibility of securing one's livelihood and accessing essential services (now left to the forces of free market) has been almost totally placed on the shoulders of individual households (and innovators). However, perhaps the most problematic aspect is that neoliberalism has the effect of 'cancelling out politics' behind the illusion that poverty and social exclusion can be addressed by boosting economic efficiency through the implementation of free market policies instead of questioning and restructuring the power relations and the political arrangements that cause inequality.

In the remainder of the chapter, I would like to focus on three manifestations of this ideology, which I call *tales*. These tales have to do with: the notion of scarcity, its politics and its causes; the actors, usually framed as individual male heroic inventors; and the ideology of technological fix, hence a depoliticized way of framing technology. Although complex and increasingly interdisciplinary, frugal innovation literature in my opinion is still dominated in various ways by different conceptualizations of these *three tales*. In the following sections I will analyse these aspects and propose a research agenda for overcoming those elements that to my mind risk encumbering the further progress of frugal innovation literature.

4.2. THE TALE OF SCARCITY

Frugal innovation literature starts from the premise that innovation can also occur under conditions of resource constraints. A flourishing literature focuses on how innovators make the most of what is at hand by tinkering, rearranging, downscaling existing technologies or coming up with new solutions that use fewer resources (Horn & Brem, 2013). In this view, the scarcity of material and/or human resources stimulates the search for innovative solutions that are cheaper, more efficient and often more socially acceptable and even more environmentally friendly. Far from being a curse, scarcity, according to frugal innovation proponents, can have a positive impact by boosting the innovation capacity and the competitiveness of the Global South (Zeschky, Widenmayer, & Gassmann, 2011; Zeschky, Winterhalter, & Gassmann, 2014) and it also represents an advantage with respect to achieving sustainable development (Rosca, Reedy, & Bendul, 2017). The idea of frugality and scarcity also pervade the so-called 'Bottom of the Pyramid' literature (Kolk, Rivera-Santos, & Rufin, 2013). The notion of the Bottom of the Pyramid (BOP), famously introduced by Prahalad in 2005 in his book *The Fortune at the Bottom of the Pyramid: Eradicating Poverty through Profits* (Prahalad, 2010), depict a Global South populated by un-served consumers (the poor) who represent an immense unexploited market in need of cheap products and services. Following the mantra of 'doing more with less and for more people', BOP innovation proponents call for a new stream of frugal innovations to address the problem of poverty (Prahalad, 2010, 2012;

Prahalad & Mashelkar, 2010) and at the same time make profits (Agnihotri, 2013; Bardy, Drew, & Kennedy, 2012; Chakravarti, 2007; Faulconbridge, 2013; Seelos & Mair, 2007). The notion of frugality that the BOP approach underpins (together with other approaches such as jugaad, resource-constrained innovation, etc.) – although flexible and contested, e.g. Soni and Krishnan (2014) and Arora and Romijn (2011) – is essentially based on the assumption that poverty is caused by a scarcity of resources. But, ironically, instead of discussing how to escape scarcity, most of this literature indulges in conceptual discussions about what capabilities are presumably needed for innovating in resource-scarce contexts, e.g. Srinivas and Sutz (2008). The implicit assumption behind these works is that scarcity is an inescapable condition that characterizes the Global South. As I have argued elsewhere (see Pansera, 2018), there are good reasons to think that this assumption is groundless.

Scarcity is not an inescapable condition of any given context; on the contrary, it is often a socially constructed arrangement produced by the politics of resources allocation that often have to do with unequal power relations rather than absolute scarcity. Mehta (2005), for example, distinguishes between ‘lived/experienced’ scarcity (i.e. shortages of food, water, fodder, etc. that local people experience cyclically due to biophysical conditions) and ‘constructed’ scarcity (i.e. shortages artificially manufactured through socio-political processes to suit the interests of powerful players). There are certainly regions of the world characterized by serious limitations in critical resources such as water, arable land or livestock. In these contexts, human societies that survived in such harsh conditions adapted by developing a variety of strategies for coping with cyclical scarcity. The work of Elinor Ostrom shows that human groups are able to build quite complex systems for the management of common (scarce) resource pools that are based on collaboration, solidarity and equality (Ostrom, 1990, 2010). In those contexts, scarcity as such is not perceived as a constraint because the *needs* of the community matched the availability of resources, that, in turn, are allocated through social processes that favour (at least in principle and under certain conditions, e.g. Ostrom 2010) equal allocation to guarantee the social stability of the group and the ecosystem resilience. Similar mechanisms have been observed by anthropologists who show how in *non-market* societies people satisfy their needs through a logic that includes reciprocity, redistribution and exchange (Polanyi, 2001; Sahlins, 1992).

Romano (2008, 2015), drawing on the work of George Bataille (1933), shows that in pre-industrial societies the cornerstone around which social life was organized was not scarcity but rather how surplus (energy in particular) was managed, who had access to it and through which symbolic mechanisms this functioned. Similarly, Sahlins (1974), in his *Stone Age Economics*, shows how pre-industrial societies compensated the scarcity of material means with an abundance of symbolic goods. At the same time, the surplus accumulated by the community was periodically *ritually wasted* in potlatch, collective festivals or simply burned to reinforce (often unequal) social bonds. Nevertheless, it is important here not to romanticize pre-industrial societies that, in many cases, have been proven to have been extremely oppressive and unjust.

The crucial lesson that comes from the ‘ethnography of the commons’ is that scarcity is very much related to a phenomenon of perception rather than an objective condition. Scarcity, in fact, can be often socially constructed. Yapa (1996), for instance, shows how in several cases scarcity is not experienced by society at large, but instead by specific social sectors and is a ‘socially specific condition’. In other words, scarcity is the result of exclusion and unequal gender, social and power relations that legitimize asymmetric access to and control over finite

resources (Mehta, 2010). As David Harvey (2014: 251) claims, “It is now generally accepted that almost all famines over the last 200 years have been socially produced and not naturally ordained”. Land grabbing, enclosures of commons, privatization of public goods and even infrastructures such as dams, mines and power plants can contribute to constructing scarcity by creating selective and exclusive access to certain resources (Baka, 2013; Escobar, 2012). The so-called ‘resource curse’ that characterize many regions in the Indian Subcontinent, Africa, Asia or the Americas that are rich in natural resources is dramatic evidence of this phenomenon. Hinkel (2018), for example, shows with a great deal of statistical data, that despite an enormous wealth of natural resources, a vast majority of the population in most African countries lives under conditions of severe material scarcity. This is mostly caused by unequal trade agreements and asymmetric power relations with the North, a heritage of the colonial past. Socially constructed scarcity also partially explains why relative poverty in the Global North is skyrocketing and the access to social welfare and public goods are decreasing despite unprecedented levels of wealth accumulation. The work of Piketty (2014), indeed, has demonstrated that the increase of factor productivity since the 1970s has been unequally distributed between the working class and the elites, favouring the latter. In other words, Piketty has shown that the erosion of welfare and the austerity measures in Europe, for example, are not caused by absolute resource scarcity, but rather by an unequal appropriation of the benefits of productivity growth.

The apolitical ways of framing scarcity described above are unfortunately still very common in frugal innovation literature that tends to neglect the politics of resource allocation and the ways scarcity is socially constructed, especially to suit the interests of powerful groups. By focusing on the capability or the incentives that are needed to innovate in resource-constrained contexts, most (but fortunately not all) frugal innovation literature has refused to critically engage with the social and political factors that oblige certain groups to innovate under conditions of scarcity.

4.3. THE TALE OF THE HEROIC INVENTOR

Another pervasive element of frugal innovation literature in the Global South is the emphasis given to individual heroic innovators. While the literature that addresses frugal innovation developed by SME or Multi-National corporations (MNC) in the North is very much focused on process and product development, in the South there is a proliferation of stories of heroic individuals who come up with brilliant solutions to daily-life problems. One of the most famous cases of this was Mitticool, an eco-friendly clay pots enterprise started by Mr Mansukhbhai Prajapati in India, which was described, together with many other similar cases, by Radjou et al. (2012) in the book *Jugaad Innovation: Think Frugal, Be Flexible, Generate Breakthrough Growth*. The narrative is simple and attractive: an individual protagonist with a dream in the face of resource constraints. This protagonist – invariably a male – eventually comes up with a solution that typically involves a low-tech, low-cost affordable process or artefact. After a long and troubled journey, the lonely gifted innovator achieves the recognition he deserves (which, in the case of Mr Prajapati, meant receiving an award from the hands of Prime Minister Modi himself). This narrative, which is surprisingly reminiscent of the American dream in which anybody with a good idea can become rich, is pervasive in most newspapers’ coverage of frugal innovation, but also in some strands of grassroots innovation

literature. The Anil Gupta National Innovation Foundation (NIF) repository¹ of grassroots innovators is virtually exclusively composed of male individuals with very similar stories.

This approach is appealing to journalists and media because it provides nice stories, but it is problematic for many reasons. First, it neglects the fact that these so-called innovators are embedded in networks of relationships (power relations and cultural, kinship bonds) that influence and shape their actions. Second, the focus on individuals creates the illusion that single isolated actions can change circumstances that are, in fact, complex and require collective actions. For instance, most NIF ‘innovations’ do not even lead to commercial success because they are not conceived as ‘marketable’ innovations in the first place. They are mostly the results of individual ingenuity disengaged from an organic and collective strategy that is crucial for solving complex, wicked problems such as how to provide access to basic needs, energy, health services or education or how to increase agriculture productivity, to mention just a few. Third, this narrative almost exclusively neglects women. When women are considered they are usually part of a group led by a man, e.g. the Grameen Shakti story (Pansera & Owen, 2015). Finally, the heroic entrepreneur tale is usually – but not always – too narrowly focused on market-oriented solutions and neglects the reality that poverty and social exclusion are complex phenomena that are not easily ‘fixed’ by delivering this or that product but rather, as history has often proved, by a process of social change, struggles and conflicts aimed at the reconfiguration of the power relationships that create them.

Nevertheless, other lines of innovation studies have focused on the community level. The work on grassroots innovation – as well as makers, fablabs, ‘tecnologias sociales’ in Latin America, etc. – has contributed to highlighting the importance of communities, groups and collective actions (Seyfang & Haxeltine, 2012; Smith, Fressoli, & Thomas, 2014; Smith, Hielscher, Dickel, Soderberg, & van Oost, 2013). A concrete example of this alternative way of framing frugal innovation at a community level is the People’s Technology Initiatives (PTIs) proposed by the People Science Movements in India in the 1980s (for more details, see Pansera & Owen, 2018b). The theoretical approach of People Science Movements is not very different from the concept of the Innovation System framework (Lundvall, 2010a, 2010b). According to this framework, the single, small and isolated farmers cannot scale up their activities to compete with big business unless they become part of a network of producers. By discouraging competition within the local economy and encouraging collaboration in networks of rural producers, the People Science Movements activists were convinced they could make the rural economy more competitive vis-à-vis the bigger urban industry. The practical application of this idea resulted in the People Technology Initiatives (PTIs), a sort of ‘proto innovation system’ applied to the Indian rural world. PTIs arose from the conviction that mainstream thinking only focuses on how to remove the barriers that encumber the interactions between research organizations and the practitioners’ world in the limited context of public–private relationships.

By focusing on heroic innovators, frugal innovation literature often neglects the question of participation and equality of access from the weakest sections of society. The villagers’ role is merely to make their land and labour available for agricultural production, or at best, to participate in the process of value creation as lower-end producers in long value chains controlled by large-scale private/public organizations. While many either state-driven or market-oriented development initiatives seek to *replace* the existing relations between the productive forces of the economy with more efficient technological systems, the PTIs attempted to do the opposite: to build a technology system *around* local knowledge and resources. Another aspect of

initiatives such as the PTIs is their explicit political goals. Most of them, in fact, emerged as a reaction to the failure of the many national programmes to address the needs of the poor. Those failures include the shortcomings of the Green Revolution paradigm, e.g. degradation of land, pollution, exclusion of poor farmers, dependency on big agro-business for pesticides and fertilizers (see also the extensive work documenting the politics of the green revolution in Shiva, 1991) and the limits of the rural development plans promoted by the central government, i.e. framing traditional farmers as competitive individuals (see also Escobar, 2012 for the Colombia case). Thus, the PTIs rejected the notion of standalone small-scale producers and suggested a network-based approach. At the same time, the PTIs' approach rejects the dependency on intermediate actors as proposed by the recent literature of 'social enterprise' (very much connected to the notion of frugal innovation in the Global South, see London, Esper, Grogan-Kaylor, & Kistruck, 2014; Yunus, Moingeon, & Lehmann-Ortega, 2010).

The ultimate goal of the PTIs, indeed, was to empower the producers and built-up network of producers who could *independently* deal with local, national or international markets. Nevertheless, the PTIs were also a reaction to the failure of the appropriate and intermediate technology movements to restructure the relations between technology and development. By placing too much emphasis on technological aspects, the appropriate technology movement indeed failed to understand that the real problem of rural settings is the way in which the production is organized and the relationships that govern it (Smith et al., 2014). This last point serves to introduce the other problematic narrative that characterizes some of frugal innovation literature: the 'tale of the technological fix'.

4.5. THE TALE OF THE TECHNOLOGICAL FIX

As mentioned in the introduction, frugal innovation is usually associated with other concepts. Among these, the notion of 'inclusion' has acquired a particular prominence in recent years. Inclusion is often reframed in terms of 'Inclusive Growth/Development' (George, McGahan, Prabhu, 2012; Sachs, 2004; World Bank, 2008). Pursued through 'inclusive forms of innovation' (Altenburg, 2009; Heeks et al., 2014; Nijhof, Fisscher, & Looise, 2002), 'inclusive innovation systems' (Foster & Heeks, 2013) and 'inclusive Business Models' (UNDP, 2008), the concept of '*inclusive growth*' remains vague and heterogeneous. Inclusiveness in general advocates for a more equal and fair distribution of the economic benefits of innovation, development and economic growth (Cozzens & Sutz, 2012; Papaioannou, 2011), with an underlying theme being that the poor are excluded from the benefits of development and consequently need to be *included* in those productive activities that create economic growth (Peredo, 2012). The roles of technology and innovation assume slightly different orientations when associated with ideas of inclusion. The mission of innovation becomes that of *including* the poor in benefiting from those resources that are considered basic human needs, e.g. energy, formal education, universal welfare, housing, water and sanitation. In this case, the role of innovation is clear: innovation (of technologies, of business models, or of repositioning) is indispensable to providing solutions for those who remain currently excluded. The discourse of inclusion, however, automatically constructs two arguments: one of business-as-usual where goods and services are produced by empowered individuals in an economic and efficient way, and one in which this logic is considered as being currently non-existent or somehow flawed, i.e. *it needs to be fixed*. This distinction in turn implies the need for a community of people who

participate in ‘normal’, market-based economic activity (as consumers, as producers) and a community which is currently *excluded*.² This logic is yet another crucial element that characterizes neoliberal expansionism within the development discourse (Harvey, 2007). The idea that there are sections of society – in this case the underdeveloped, ‘the others’ – that need to be embraced in the comfortable, understandable and Western realm of free market economics is a fundament of neoliberal thinking.³ This anxiety and restless urge for expansion is often framed in terms of *scalability*. The urgency to find scalable, universal solutions is also an important element of the mantra of inclusivity and the obsession with scalability and reproducibility of business solutions is often a major feature of the discourse of inclusive business models and frugal innovation. Technical reason, and therefore technology and innovation, has a crucial role in the creation of the illusion that there are simple and easy technical solutions to ‘underdevelopment’.

Within the constellation of buzzwords that constitutes the mantra of inclusion, innovation then occupies a special role. Innovation in its vagueness is crucial to enforcing the idea that exclusion is a problem that requires a *technical fix* rather than a social and/or political transformation. In other words, politics is not up for discussion. Development in this frame is again reduced to a problem of management and the delivery of financially viable, innovative (frugal) solutions. This approach excludes fundamental political questions such as: Who should be included and where? Are people willing to be included and if so for what reasons? Are they free to decide? Can people refuse to be included and, if so, what would be the consequences?

For those who are concerned with the problems of the poor and the excluded, these are fundamental questions. Furthermore, as White (1996: 6, emphasis in original) argues, “*sharing through participation* – or co-production of consumption goods – *does not necessarily mean sharing in power*”. The problem is that the market economy and the ideology of the technical fix are generally more likely to deliver inequality and exclusion rather the equality and inclusion (Arora & Romijn, 2011; Strand et al., 2018). Technology is never neutral and apolitical, but always constructed around social (often unequal) relations of dependency and in many cases of domination (Pansera & Owen, 2018c; Winner, 1980). Research by Graham et al. (2012, 2014), for example, suggests that even the apparently affordable-for-all ICT sector is not delivering the expected results in terms of inequality reduction and equality of access to information. From their analysis of internet access around the globe and the process of content creation in Wikipedia, it emerges that technology might actually enforce power asymmetry between privileged users in the North and their followers in the South. The study shows that, despite the expansion of web access, the process of content creation and distribution is still strongly controlled and managed by a relatively few people living in the industrialized world. As a consequence, different kinds of knowledge, views and perspectives are underrepresented, misrepresented or even silenced. The authors conclude that better connectivity is a necessary but not sufficient condition for guaranteeing a plurality of knowledge sources on the internet. But what is really problematic in the fixation on technology to deliver social goods is that it risks silencing alternative solutions that are not marketable because they are designed to be outside the logic of the market. For example, in a personal interview that I conducted in Gujarat in 2013, Professor Anil Gupta wondered why the Indian press, academics and politicians were so enthusiastic about the research programmes on connectivity for the illiterate carried out by IBM and Microsoft and yet completely ignored the fact that in the state of Gujarat alone the Honey Bee Network has discovered more than a hundred educational innovations for speeding up literacy acquisition, determinedly carried out by rural teachers without any governmental

support. Since these non-tech solutions are not marketable, they usually go unnoticed or often deliberately neglected by frugal innovation scholars interested in ‘making profits by doing good’.

In a nutshell, the tale of the technological fix consists of the belief that technology, usually framed in terms of ‘commercial technology’, is always an essential part of the solution to any social or environmental problem. A recent review on frugal innovation literature conducted by Pisoni et al. (2018) clearly shows an emphasis on ‘technical fixes’ (see the evolution of frugal innovation definitions in Figure 7 on page 112 of Pisoni et al., 2018) while simultaneously a-politicizing (or depoliticizing) the notion of development, locating it within a market paradigm while disconnecting it from the social, cultural, environmental and political context, particularly in relation to poverty, social exclusion, financial and material scarcity and political instability (e.g. Ferguson, 1990; Swyngedouw, 2015; White, 1996).

4.6. (RE)POLITICIZING FRUGAL INNOVATION: A RESEARCH AGENDA

In the previous sections, I have argued that a great deal of frugal innovation literature focused on the Global South presents three broad underpinning assumptions: poverty is unreflectively linked to absolute material scarcity, a ubiquitous condition of the Global South; technological change (and then innovation) is often driven by bright male individuals and framed within a market-oriented logic of entrepreneurial success/failure; poverty is a ‘delivery problem’ that can be fixed by technology, i.e. a problem of ‘delivering’ the right (frugal) technology to the right people, in the right places. I have also argued that the rise of the discourse of innovation (with its prefixes such as *frugal*, *inclusive*, *jugaad*, etc.) is symptomatic of a process of depoliticization of the broader discourse of development (see also Pansera & Owen, 2018a, 2018b). Despite a number of attempts to re-politicize innovation in the context of the Global South, e.g. the work of the STEPS centre in the UK (Leach et al., 2012), a majority of the literature on the topic is still characterized by a variety of different combinations of the ‘tales’ described above or refurbished versions of the BOP simplistic narrative (see BOP 2.0 or BOP 3.0 by Chmielewski, Dembek, & Beckett, 2018). My feeling is that the field needs a new wave of studies that overcome this narrow approach to frugal innovation. This could be done by building collaborations with colleagues from other disciplines such as development and post-development scholars, Science Technology and Society (STS) studies and anthropology. In particular, I propose the following lines of research:

- We need to situate the problem of poverty and social exclusion within a global politicized context. Poverty is not simply caused by material scarcity, but it is a complex and contested phenomenon whose causes often lie in unequal local and global power relations (Hinkel, 2018). A potentially promising path would be to draw on post-colonial and post-development scholarship and explore how technology could be used to reshape power structures or create/disrupt systems of domination. For example, what are the social and political mechanisms that create scarcity in a given context? How can (local or foreign) technology disrupt such mechanisms? What is the role of technology in upgrading indigenous/local knowledge? How can new forms of technology development oppose post-colonial appropriation mechanisms (see the examples of the PTIs)?

- We need to replace the tale of the isolated heroic inventor (e.g. Miticool) with a more nuanced, complex and rich account of how frugal innovation emerges in the Global South. A possibility would be to focus on the networks around such inventors, depict how other groups of people were involved in the process, and explain the knowledge, where it comes from and how it is collectively used to produce a specific invention (Peredo & Chrisman, 2006). In other words, we need to focus on the collective process of innovating rather than on the stories of individuals. In particular, what are the processes and mechanisms that characterize the emergence of collective forms of frugal innovation?
- More research is needed to investigate networks of diffusion based on sharing the design of frugal technology instead of protecting it with patents; in other words, the focus should be on open science and the economy of the commons and their connection to frugality. This is also related to the notion of technology governance and technological imaginaries. What future do we want to live in? Which technologies would enable such a future? Who wins and who loses? Who decides? A particularly interesting research path might be what Illich (1973) calls ‘convivial technologies’. Technology has to create relatedness assuming that humans cannot live isolated existences but have to rely on a network of relationships. Therefore, a ‘convivial frugal innovation’ would imply the development of technologies that contribute to the expansion of human relationships and capacities and do not simply focus on revenue. Convivial technology has to be accessible in that users have to be able to access and understand the design, the code, adequate documentation and standards. Accessibility also implies the possibility for minorities to access, modify and adapt technology. This requires educated and empowered users-citizens who are able to make informed decisions. Empowerment, in turn, implies framing and understanding technology as a choice, not as a form of technocratic domination (Vetter, 2018). Who can design, build or use it? Where, how, for what purposes? These questions are rarely posed in conventional innovation projects.
- Furthermore, why only males? Putting more emphasis on diversity, especially gender, is crucial. We should be able to bring women to the fore in the narrative of frugal innovators; they have been always there, but they have been neglected.
- Finally, I think more emphasis should be placed on the idea of frugal innovation as a tool for producing social transformation, reshaping power relations or enabling more democratic forms of thinking about technology. Frugal innovation literature puts too much emphasis on the creation of economic value and business models. I do not think this is a fruitful path. The commercial flops of most of the NIF cases provide clear evidence that they cannot compete on the basis of “making money” with conventional innovation. Moreover, as Bhaduri and Kumar (2011) have documented, frugal and grassroots innovators are driven by a complex mix of motivations. Profits and economic viability drive only a fraction of individual innovative behaviour. Frugal innovation should offer alternative ways of innovating outside the paradigm and logic of the market economy. What would these alternatives look like? I think this is a crucial question.

4.7. CONCLUSION

I started this chapter by discussing how the emphasis on development interventions in the Global South has increasingly shifted towards a rhetoric of *innovation for development* in

which the rhetoric of BOP and frugal innovation (combined with a plethora of other buzzwords) is central. I then argued that a substantial part of frugal innovation literature in the context of Global South is characterized by questionable assumptions, i.e. the tales of scarcity, heroic inventors and techno-fixes. However, the rise of innovation in the development discourse has not gone unnoticed. Indeed, the concept of innovation for development stands on deeply contested ground. This is in part because it has the capacity to shelter multiple (political, economic) agendas, from a desire to use it to open up the ‘fortune at the bottom of the pyramid’ for multinational companies, to foster community emancipation, to ignite social and political revolution and to redistribute power and the means and ownership of production. Innovation for development, in which the idea of frugality plays a key role, can be considered as an umbrella term that can be co-opted to propagate, tacitly or explicitly, particular world views, normative stances and political ideologies. This contested meaning of innovation also makes it particularly difficult to articulate whether technological development and, consequently, innovation can be framed within the Western categories of efficiency and productivity. Because of its normative basis, I argue that technology in the Global South is likely to be framed in a variety of different forms (sometimes radically different) that do not necessarily overlap with the positivistic idea of innovation as an engine of economic growth that is hegemonic in the North. It is crucial, in my opinion, that the next generation of scholars interested in frugal innovation understands the ideological and political battlefield in which the notion of innovation is framed and contested in the Global South. Do we want frugal innovation literature to be just another decaf formulation of the market-oriented BOP approach that intentionally or unintentionally expands and reproduces the commodification of resources, local knowledge systems and social relationships in the South? Or do we want to explore different ways of framing technological innovation that are able to challenge and perhaps restructure the unequal power relations that cause social exclusion and poverty? Whether frugal innovation will have a meaningful impact in the future will depend on how we answer such a question.

NOTES

1. See, for example, <http://nif.org.in/GTIAF> – accessed in January 2019.
2. The idea that the *deviant* has to be reduced, standardized or *included* in the *norm* is recurrent in the work of M. Foucault. Through normalization – or *inclusion* – individuals are organized in hierarchies, split into those who are capable and those who are incapable, those who can be corrected and those who can’t be. According to Foucault (1977) a process of normalization is necessary within the market organization of capitalist economies because it is the only mechanism that assures an efficient organization of productivity (see also Foucault, 2012: 30–46). In this view, the ideology of inclusive capitalism appears to be a sophisticated mechanism for excluding alternatives to the market economy rather than for sharing the benefits of the market economy with the poor by including them in the productive system.
3. This dynamic is well described by Polanyi (2001) in his famous passage on the *fictions of land and labour* as commodities. He argues that the creation of a labour market and the transformation of land into a commodity that can be sold and bought were crucial for creating an industrial capitalist society. Those two social artefacts, which nowadays are considered unquestionable truths, have constituted the basis of the *economization* of the social life of the others, first through the colonial order, later through the ideology of the *state nation* and now through the market economy. A similar process is described by Illich (1981), Federici (2010) and Rahnema (1991) when they describe the capitalist expansion as a ‘war against subsistence’.

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