

36th EGOS Colloquium

To be submitted to Sub-theme 46: Responsible Innovation for Sustainable Development

Why would private firms be interested in fighting hunger? Institutional pressures leading to responsible innovation

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Abstract

Private companies have increasingly sought to invest in responsible innovation, in many cases focusing in dealing with grand challenges, the ambitious objectives that are essential for the sustainable development of humankind. In this paper, we look for the reasons private organizations invest significant resources in tackling a grand challenge, such as food production that is linked to the commitment to eradicate hunger and why this is often done through responsible innovation. We propose a conceptual model using social movement theory to understand why private companies embrace grand challenges following a societal change in public expectations towards food-related businesses. We also apply institutional theory to comprehend the isomorphic mechanism through which other organizations within the same field replicate this behaviour, engaging themselves in their own responsible innovation for food production and argue that this is the best course of action to respond to these pressures. The example of Ocado and Marks and Spencer retailers is used to illustrate how this dynamic works.

Introduction

Private companies have increasingly sought to invest in responsible innovation to develop products, organization and processes. This type of innovation takes into account the ethical, sustainable and societal impacts of both the process of developing and the implications of an innovation (von Schomberg, 2011). In addition, responsible innovation has considerable potential to address issues related to sustainability that serve the public interest (Nilsson, 2017), in what has been described as "grand challenges" (Stilgoe et al., 2013). However these private companies often see a dilemma when choosing to invest in innovations that address social and ecological issues. While these responsible innovation initiatives are perceived positively by the public as being welcome and necessary, the financial value of this type of investment within a for-profit organization is often questionable (Gao and Bansal, 2013; Siegel, 2009). Despite this, the role of the private sector in harnessing responsible innovation is becoming more prominent (Aguilera, 2007), as evidenced by cooperative efforts such as the UN Global Compact or the World Business Council for Sustainable Development (Siegel, 2019).

When responsible innovation efforts are applied to the production of food, it becomes intrinsically linked to the commitment of eradicating hunger and the adoption of sustainable forms of food production to face the growing demand for food. Thus, to achieve responsible development within food security, firms are embracing initiatives such as Corporate Social Responsibility (CSR) and public-private partnerships (PPP's). Furthermore, when applying responsible innovation to food production, organizations must recognize that, while food production generate livelihoods for farming communities, it also contributes to environmental degradation and incentivizes land grabs (Columbia Center on Sustainable Investment, 2019).

Hence, this paper's overarching objective is to open up a discussion around the reasons private organizations invest significant resources in tackling grand challenges. To accomplish

this, we first look into the concepts of innovation and responsible innovation, followed by an analysis of grand challenges and sustainable development, examining social movement and institutional theories. We also discuss how sustainable development can be applied to fight hunger and the mechanisms private companies deploy such that they can engage in sustainable issues. The scale and advantages that urban farmed food can provide for the development of cities is presented, as well as a short vignette of a food retailer chain adopting an in-store urban farming innovation via an isomorphic response, after one of its competitors had completed a similar project.

We will end by proposing a conceptual model that explains how social and institutional pressures act in shaping private organizations' responses towards grand challenges and why this is achieved principally through responsible innovation. In addition, we will explain the advantages for private organizations who engage in responsible innovation, specifically in food production and note the shortcomings of this model.

From hunger to food production innovation

Explaining grand challenges and how they affect sustainable development

Grand, global or societal challenges (GCs) are ambitious, but achievable, goals that harness politics, science, technology and innovation to solve important complex issues, which are also compelling and intrinsically motivating (Kalil, 2012). These act as a locus where science meets social demands, putting forward the idea that scientists' intrinsic motivations should not be restricted to inner-scientific questions or solely profit-related contributions, but may be, in some instances, channelled towards societal goals (Kaldewey, 2018).

The fact that specific phenomena are codified and showcased as 'grand challenges' exemplifies the magnitude of the task in hand and points to the need for new modes of interaction between scientists, engineers, policymakers and other stakeholders (Hicks, 2016; Kaldewey, 2018). Unlike preceding scientific issues, often referred to as 'problems', the grand challenge concept has successfully diffused into other disciplines, such as social sciences and other institutional settings (Kaldewey, 2018). By using the term 'challenge' instead of 'problems', the issue is framed into a wider social context, with its own history, which helps different actors to perceive it as an important issue to be addressed. According to Kaldewey (2018), and based on a social constructionist epistemology, this is done primarily because a GC is seen as a "social fact", a transformative term that relates to both the identity of the work of scientists and policymakers and their way of communicating with one another. A GC is, thus, not interpreted as an analyst's category, but rather as an actor's category, a sociological analysis rooted in the actors' world that convenes the gravity and urgency of the issue (Collins, 2008; Kaldewey, 2018).

One of the aspects that has helped this shift in perception is the inherent principle of feasibility present in GC, i.e. one based on an implicit understanding that current capabilities

must be acknowledged (NRC, 2001). In light of this new feasibility-focused approach, specific actions are being explored to address GCs, of which one of the most promising is through sustainable development. In this case, the UN's 2015 Sustainable Development Goals (SDGs) is a good example. Arguably the most influential current framework that relates to the grand challenges, the SDGs approach issues of sustainable development for all countries, while recognizing that each nation will adapt and prioritize the goals in accordance with its own needs and policies (von Grebmer et al., 2016). Thus, integration between all stakeholders is key for an effective and achievable policy. The SDGs address the interconnected root causes of the most persistent issues the world faces, including an ambitious target to eradicate hunger and malnutrition by 2030 (UN, 2019; von Grebmer et al., 2016). "Goal 2: Zero Hunger" (n.d.), for example, emphasizes ways to "rethink how we grow, share and consume our food" and advocates for "increasing the capacity for agricultural productivity and sustainable food production systems (that) are necessary to help alleviate the perils of hunger". Importantly, the SDGs also include a vision of a systematic partnership with the private sector to achieve sustainable development (Kumar et al., 2016). Hunger, therefore, can be considered both a SDG and a GC.

How Social Movements and Institutional Theory View the Notion of Change

The study of social movements and the way they create societal pressures can help us understand how SDGs and GCs have become so pertinent today. Schneiberg and Lounsbury (2012) use social movement theory and the study of collective mobilization to overcome an 'excessive institutional determinism' (p. 281) and understand how groups organize in order to create or resist new institutional arrangements or transform existing ones. This concept expands on organizational theory's level of analysis, from organizational to field analysis, in an attempt to understand when and how paths or fields become established around multiple, competing

logics. They also examine how these logics, with their contradictions and ambiguities, influence field-level change and new path creation, mainly through contestation of existing logics and institutional forms. Accordingly, social movements' studies also derive contestation from established cultural practice, specifically from the increasing penetration of market and state institutions into the private sphere of individuals' lives (Weber and King, 2014). These movements politicize and bring into the public sphere practices such as ethical consumption and sustainability through a cumulative cultural process.

These changes are possible because social actors attribute meaning to all kinds of environments, constructing them as commons, and formulate collective strategies to govern them (Ansari et al., 2013). Three conditions are necessary for the construction of a commons logic. First, actors need to be collectively complicit in being held responsible, creating and addressing the commons problem, like in a GC context. Issues also need to be framed similarly without necessitating identical theorizations and interpretations, as is evident in the discourse on sustainable development. Finally, the diffusion process needs to be different, due to the renewed opportunities for collective action, which are echoed by responsible innovation initiatives (Ansari et al., 2013).

While social movement theory helps explain the reasons for this shift in public perception towards sustainability, institutional theory can provide a framework to understand why a growing number of private organizations are taking sustainable initiatives. As this societal discourse becomes more embedded, private actors across fields tend to adopt initiatives that are aligned within the context of the GCs. Thus, GCs here provide the institutional framework necessary for organizations to seek both legitimacy (Powell, 1991) and competitive advantage(s) within their field.

Organizations tend to converge on the same response, given a shared institutional environment, a movement that DiMaggio and Powell (1983) call 'isomorphism'. They define

isomorphism as organizations that adopt practices motivated by their interpretation of other firms' successful behaviours, while normative isomorphism occurs when organizations are motivated to respect social obligations. The institutional change that will later lead to responsible innovation is, then, the result of a multitude of initiatives spearheaded by individuals and organizations to address GCs (Ferraro et al., 2015). The first-mover innovator obeys a normative dynamic, unleashing isomorphic responses from its competitors, who adapt and reproduce these initiatives within the field. This should, in theory, grant the first-mover innovator an advantage in the market, as it should place the firm favourably over its competitors.

Responsible innovation

Due to the broad applicability of the concept, the term “innovation” can morph to reflect the underlying concept one wishes to highlight. Hence, innovation can be seen through any one of a series of lenses, such as value, behaviours, business models and practical application of the ideas (Taylor, 2017). It may also be seen as the “successful creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in outcomes, efficiency, effectiveness or quality” (Mulgan and Albery, 2003:3).

Stemming from these broad definitions, innovation can also be applied to specific fields. In this paper, we focus on responsible innovation, which is the “transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products” (von Schomberg, 2011, p. 50). Hence, ‘responsibility’ related to the societal values and norms taken into account at an early stage of development of the technology, which helps to recognize products that are broadly accepted and widely used (Von

Schomberg, 2011; Owen et al., 2013). According to Voegtlin and Scherer (2017), one of the main aspects of responsible innovation is the requirement to do good by engaging in beneficial societal actions.

For a responsible innovation to be responsive, possessing the ability to react and to answer, it must be situated in a privileged position that considers the product and its purposes within society. Stilgoe et al. (2013) highlight that one of the main aspects of responsible innovation is ‘responsiveness’, i.e. its adaptability to the needs of stakeholders, public values, and any changing circumstances. For von Schomberg (2011), the main challenge of responsible innovation is to become more responsive to societal challenges, hence making it one of the most encouraging paths to deal with societal GCs (Stilgoe et al., 2013).

For example, discussing the effects of digital technologies within the farming sector, Van der Burg et al. (2019) sees ‘responsible innovation’ as one that seeks to align technology with the values and norms of the envisioned end-users, and, regarding technology’s interactions with its responsibilities to the eventual environmental, social and human consequences. The end-users, thus, should not be seen as passive recipients of new technologies, but they rather can also take a role in co-shaping the technological future, reflecting on the preferred direction that the further development of the technology should take.

Food production innovation

One particularly promising area for responsible innovation is food production. In this case, responsible innovation has historically been in response to issues such as welfare of livestock, use of pesticides, soil erosion and the high use of antibiotics and vaccines (Gremmen et al., 2019). Because innovations applied to food production can have negative societal consequences, such as environmental degradation, a responsible innovation framework enables

a debate on the ethical relations between animals, agriculture and food, as well as the way social issues can be applied and addressed in agriculture (Gremmen et al., 2019). Hence, such innovations need a full assessment of possible problems deriving from their impacts and associated technologies, going further than a more commonplace responsible innovation management practice (Hellström, 2003).

The importance of responsible innovation in food can be highlighted by an influential paper published by the FAO, “How to Feed the World in 2050”. It predicted that food production would need to nearly double to feed a future global population of 9-10 billion people. This would, in turn, require a doubling of food production, using 2009 as a benchmark, an increase that can only be achieved if the necessary policies and innovations are in place (FAO, 2009). Since the general rate of growth in yields of major cereal crops has been declining steadily for decades, investment in technology to reverse this trend is one of the options to deal with this challenging scenario (FAO, 2009). In developing countries, for example, only 20% of the projected production increases would come from expansion of arable land, while 80% would need to come from increases in yields and cropping intensity (FAO, 2009). The fight against hunger must, therefore, include technological development that increases yields and lowers production costs, while also embracing responsible innovation.

Discussion

The fight against hunger and sustainable development

The food sector presents particular and significant sustainable development challenges. The fight on hunger, for example, is not restricted to the amount of calories ingested per day, but also whether these calories are nutritiously beneficial or not (García et al., 2019). For example, approximately two billion people suffer from micronutrient deficiencies as a form of malnutrition, especially from a lack of vitamin A, iodine and iron (Shaw, 2009: 8). Therefore, when discussing food production within sustainable development, we must acknowledge that the global population should have access to nutritious food in adequate quantities. Fighting hunger must, therefore, be approached from two perspectives: quantitative and qualitative (García et al., 2019).

Food production presents an interesting paradox: it contributes to environmental degradation, while also suffering from its effects; it provides farming communities with livelihoods and incomes, while also potentially fuelling land grabs that undermine community rights and wellbeing; and, it feeds the growing global population, yet contributes to the epidemic of obesity diseases, not to mention that chronic malnutrition has continued to worsen even since the adoption of the SDGs (Columbia Center on Sustainable Investment, 2019). Furthermore, the efforts aimed to create guidelines for more sustainable practices in the food industry have lacked industry consensus and fall short of a holistic, comprehensive framework for responsible practices in the food sector that would align with the SDGs (Columbia Center on Sustainable Investment, 2019).

The 2030 Agenda for Sustainable Development recognizes that a lasting end to hunger and undernutrition cannot be achieved in isolation, necessitating multiple, coherent actions from numerous participants. Chiefly, von Grebmer et al. (2016) focus on four areas of inter-

arrangements: universal government commitment, inclusion and participation of all members of society, rigorous monitoring to hold stakeholders to account and transformation of food systems (von Grebmer et al., 2016). The latter includes methods such as genetic modification, nanotechnology, genomics, droplet irrigation and computerisation, all with the aim of producing more food from less resources (land, energy, water, etc.) (Lang and Barling, 2012). This paper will discuss one of these methods, namely urban farming and, more specifically, the role private companies are playing in this type of activity.

The framing of hunger within responsible innovation by private companies

The role of the private companies in the governance of the agri-food system has been described by several authors (Henson, 2011). These studies tend to focus on reputational gains from engagement with NGOs and other organizations, the ability to influence policy institutions and the creation of market opportunities. Despite the inherent costs and risks, there is some consensus on the perceived benefits of such interactions (Henson, 2011). Thus, private firms, individually and collectively, tolerate and accommodate some of the demands of environmental NGOs, and contribute to the creation of private standards, codes of conducts and other governance mechanisms, in order to enhance profits and gain market share (Henson, 2011).

However, the push to eradicating hunger and the imminent growing demand for food has further propelled societal actors to embrace this GC. In this context, private companies have resorted to different means of participation in mitigating actions to combat hunger. Describing public–private partnerships (PPPs) against hunger and malnutrition, Kaan and Liese (2011) evaluate how these provide input and output legitimacy for both public and private organizations. Input legitimacy refers to features of the decision-making process, in particular participation, transparency and accountability (Kaan and Liese, 2011), while output legitimacy

acknowledges the desirability of the goals, implementation and the provision of public goods. Although PPPs have emerged in the fight against hunger and malnutrition, there is no scheme that combines high input legitimacy with high output legitimacy (Kaan and Liese, 2011).

In this scenario, Corporate Social Responsibility (CSR) initiatives play an important role. Rose and Chilvers (2018) argue that the concept of responsible innovation within food security should ensure that innovations designed to improve productivity also provide social benefits, meet human needs and are socially responsible. Dyllick and Hockerts (2002) believe that this approach is limited and assert that corporate sustainability has evolved to embrace not only economic aspects, but also natural and social capital such that firms can truly become sustainable, satisfying eco-efficiency, socio-efficiency, eco-effectiveness, socio-effectiveness, sufficiency and ecological equity. While the established responsible innovation frameworks rely on “big emergent smart technologies”, this concept should be broadened to include other types of agricultural solutions and so connect with a wider range of innovations that may be relevant (Rose and Chilvers, 2018).

Urban farming as a responsible innovation

Amongst the many innovations that aim to increase food supply, urban farming is one of the most promising options. The FAO (2009) defines urban agriculture, or urban agriculture, as growing of food products from different types of crops, within and around cities. It is a responsible innovation that aligns with the SDGs to fight a GC, with the potential to significantly support the fight against hunger in urban areas. Proponents believe that, with technological advances, urban farming could help feed the population when climate change and environmental concerns may limit expansion of the agricultural sector (Terazono, 2019).

Urban farms can be installed in greenhouses, indoor environments, like a vertically stacked layer system, and outdoor settings, such as rooftops and green walls (Conserve Energy Future, 2020). They have the potential to supply almost all the recommended consumption of vegetables for city dwellers (Martellozzo et al., 2014), while cutting food waste (Kulak et al., 2013) and reducing emissions from the transportation of agricultural products (Weber and Matthews, 2008). Urban farming improves access to fresh fruits and vegetables in countries with a temperate climate (McCormack et al., 2010), resulting in higher quality, accessible nutrition. Moreover, it can also add value to sub utilized urban spaces, being a tool for income generation and providing social inclusiveness (Prain and de Zeeuw, 2007). Aside from the gains in food production, urban farms also increase vegetation cover, helping balance carbon dioxide emissions, reducing the “urban heat island effect” in cities (Susca et al, 2011), lowering the risk of flooding during heavy downpours and retaining water in dry areas (Win, 2018). Despite higher energy costs normally associated with some urban farming models (such as indoor urban farming), investors have been attracted due to projected higher yields and lower consumption of water, fertilizers and pesticides (Terazono, 2019).

Giving a sense of the scale of the potential, Clinton et al. (2018) has projected an annual food production of 100–180 million tonnes, with energy savings ranging from 14-15 billion kilowatt hours, nitrogen sequestration between 100,000-170,000 tonnes, and avoided storm water runoff between 45-57 billion cubic meters annually. The same study estimated that urban farming could contribute about 5–10% of the global production of pulses, roots and tubers, and vegetables (Clinton et al., 2018).

Urban agriculture and the subsequent development of sustainable urban food systems have gradually been incorporated in cities’ plans for social innovation. This stems from the understanding that the complex issues faced by contemporary cities can no longer be addressed solely through conventional solutions, and the way in which food is produced and consumed is

no exception to this (Jégou and Bonneau, 2014). In this context, urban farming can be seen as a vehicle through which multiple resources within a city are combined to create opportunities and challenges tailored for a particular urban setting (Renting et al., 2014). The built environment in which an urban farm is inserted plays a defining role in the impact of said farm, as the scope for the farm to improve food security can vary significantly, depending on its geographic setting (Clinton et al., 2018).

Vignette of Innovation in Food Production in Cities

As an increasing number of supermarkets and restaurants turn to indoor or “vertical” farming, we examine the case of a large retailer in the UK, Marks & Spencer (M&S), that started to sell fresh greens and herbs grown on site in some of its stores, developed in partnership with a German start-up, Infarm (Terazono, 2019).

Infarm’s technology consists of a two square metre glass cabinet module, where each unit is remotely controlled using a cloud-based platform and machine learning, which provides a controlled eco-system with the optimum amount of light, air and nutrients (Marks and Spencer, 2019). Infarm’s employees visit the stores at least twice a week to maintain, harvest and add new seedlings (Marks and Spencer, 2019). Each unit uses zero pesticide, 95% less water and 75% less fertiliser than conventional, soil-based agriculture and is capable of producing a yield equivalent to 400 square meters of farmland (Marks and Spencer, 2019). The end product is a fresher, nutritious and tastier product than that delivered by conventional techniques, while also curbing associated financial and environmental logistics costs.

Launched in September 2019, the partnership between M&S and Infarm had installed, as of December 2019, six in-store vertical farms in London (Marks and Spencer, 2019). The first herbs to be available to the public were thyme, basil, mint, mountain coriander and flat-

leaf parsley (Marks and Spencer, 2019). According to the Store Manager of the first location to adopt the new technology, the indoor farming unit had helped change local perceptions of M&S Food, while also encouraging customers to discuss sustainability benefits (Marks and Spencer, 2019). In addition, the feedback concerning the product quality and flavour was outstanding, with customers reporting that the herbs had met their expectations (Marks and Spencer, 2019).

The implementation of the M&S initiative came after the announcement in June 2019 that Ocado, an online grocery retailer, had invested 17 million GBP in two projects with the aim of growing herbs and other produce alongside its robot-run distribution centres (Butler, 2019). Its first step was acquiring a 58% stake in Jones Food, an indoor urban farm that grows 420 tonnes of hydroponic herbs per annum in an automatized system of stacked trays under LED lights with recycled water, renewable energy and without the use of pesticides (Butler, 2019). Ocado has signalled that it might open at least 10 similar farms within five years, using acquired expertise in robotics and AI to make the farms more efficient, and integrate them fully with the distribution centres (Butler, 2019). In addition, Ocado has formed a joint-venture with a US-based vertical farming company and a Dutch agricultural technology supplier to develop off-the-shelf vertical farming systems that can be sold to retail and other businesses worldwide (Butler, 2019; Terazono, 2019).

Despite Ocado being an online grocery retailer, and as such outside of M&S's traditional in-store base of competitors and being a potential supplier of the technology to M&S itself, Ocado is nonetheless a disruptor in the field, creating pressure for in-store retailers to either partner with Ocado, or create their own responsible innovation. The isomorphic answer from M&S came in the form of adopting and integrating an antecedent technological innovation from an organization from another field, InFarm, to its business model, thus creating its own responsible innovation.

Societal and isomorphic pressures into adopting responsible innovation

As discussed, organizations take into account institutional pressures, both from society and within their field, to orientate their actions. Hence, to understand why private companies invest in responsible innovation for a GC, we must first acknowledge that a significant change in the societal expectations towards private companies has occurred.

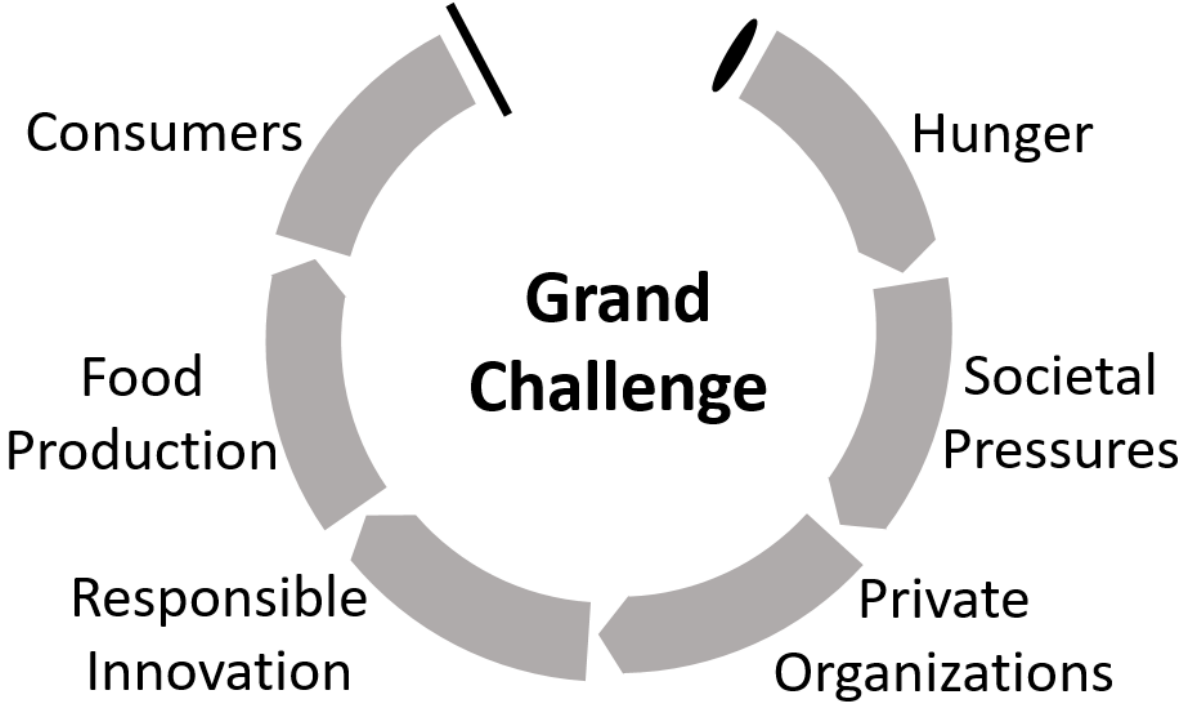
There has been a shift in the general perception of the value of nutrition in society, with food acquiring a status beyond a mere utility. As societies grow wealthier, individuals tend not only to consume more food per capita, but to have corresponding increases in the quality of food and the nutrients it consumes. Moreover, the societal discourse and the associated benefits derived from a healthy lifestyle have pushed many individuals to reconfigure their eating habits. Thus, there is a growing emphasis on the consumption of organic, pesticide-free and fresh food. At the same time, there is an increasing awareness regarding the sources and origins of food, which encourages environmentally sustainable consumption from either local producers or that adheres to fair trade principles. These movements towards different forms of food consumption are a consequence of the external pressures originating from and within society, as explored earlier, in relation to social movement theory.

This process, i.e. the contestation of existing logics and institutional forms at a societal level leads, then, to a field change. Organizations are not only welcomed, but also expected, to guide their business strategies within socially responsible guidelines and to heavily feature sustainable actions. Directly addressing a GC is not a private organization's primary motivation, but, the isomorphic replication of responsible innovation by private organizations, within a wider context of sustainable societal demands, can help global efforts to fight hunger. Thus, we argue that, in order to address these societal pressures, the best course of action for food-related organizations is through the adoption of responsible innovation. In addition, by adopting responsible innovation initiatives, organizations are not only gaining efficiencies in

their products and processes, but, due to the sustainable nature of these innovations, their adoption becomes, themselves, already part of an organizational answer to societal pressures.

Figure 1 shows the social dynamic in which the need for food as utility (“hunger”) heightens the social pressures for private organizations to take action by adopting responsible innovation.

Figure 1 – How private organizations indirectly address a grand challenge through food production (by authors).

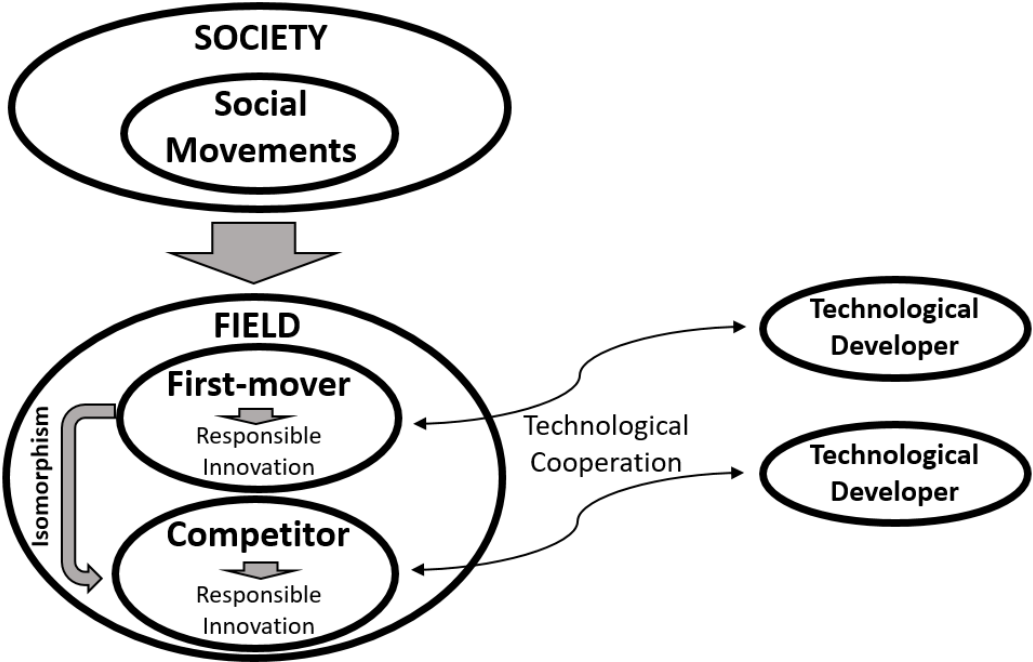


As shown in Figure 1, first-mover organizations identify this trend and adapt or create responsible innovations into their products and processes, either through organizational means or through technological investments. This, in turn, improves the production of food, both in quantity and quality, creating added value to its consumers.

This can be exemplified by the case of M&S and Ocado. By identifying consumers’ needs for fresh, sustainable food while acknowledging the importance of engaging in responsible innovation for its social setting, Ocado has become the first-mover in the field through its investment in urban agriculture.

Once the first-mover’s action is regarded as successful within the field, competitors will then engage in an isomorphic behaviour, forging responsible innovation of their own. In this process, there is a diffusion of the successful practices of the first-mover organization where an innovation is communicated through certain channels to members of a specific social system and over a given period of time (Rogers, 2003). This is illustrated by *Figure 2*:

Figure 2 – The isomorphic process for the adoption of a responsible innovation (by authors).



Following the Ocado initiative, the M&S urban farming project is representative of this isomorphic process. The first-mover's field competitors, pressured now not only by societal changes, but also by the first-mover's actions, mimic this movement and are stimulated to create their own responsible innovations under this new framework.

In cases where technological innovations are key to responsible innovations, this dynamic also involves the participation of technology firms from other fields. In such circumstances, first-movers cooperate with specialized technology firms from other fields, e.g. via joint-ventures or similar arrangements, such as the case of Jones Food and Ocado, while their competitors forge collaborations of their own, as Infarm and M&S chose to do.

While we recognize that this movement alone makes only a small contribution to fighting hunger in the GC context, we believe that this isomorphic process has significant scope to help private companies, through responsible innovations such as urban farming, to ultimately increase the supply of food and facilitate actions towards this GC.

The advantages of responsible innovation in food production by private companies

In the specific case of responsible innovations aimed at reducing hunger, and which consequently help address a GC, we argue that food production has four characteristics that will enable more organizations to take an interest in this activity. Firstly, it is part of the sustainability trend, conferring both legitimacy and marketing opportunities for organizations to present themselves as a green business to consumers and civil society. Secondly, responsible innovations for food, such as urban farming, do not require huge capital and technological investments. In addition, the small-scale product-development phase tends to be cheaper and, since this subject enjoys a strong subsidy from public agencies, access to credit is likely to be easier. Thirdly, it is a rather quick form of responsible innovation, because the period between

development and first production tends to be short. Finally, despite some technological inputs, responsible innovation in food production is mostly a process innovation, making it easy to implement. And while intellectual property laws protect specific designs and techniques, the democratization of information allows food production know-how to be disseminated easily.

Hence, this kind of responsible innovation is a prominent area for entrepreneurs to cheaply, quickly, and easily invest in high impact innovation in a growing and ever-consuming market. These factors explain, in part, why an organization such as M&S, that normally does not produce in-store food (with the exception of baked goods), would now engage in urban farming.

Conclusion

This aim of this paper was to open up a discussion around the reasons private organizations invest significant resources in tackling grand challenges. In so doing, we have proposed a new conceptual framework to understand why such organizations adopt responsible innovations to address GCs, using hunger as a vignette, to articulate our thinking. We have thus described a social mechanism in which private firms are being encouraged into adopting sustainable practices and outlined the institutional process which results in replication of these practices within the field.

First, the concepts of responsible innovation and GCs, in the context of hunger as an SDG, were presented. This was followed by an explanation of the two theoretical constructs used: social movement and isomorphic institutional theory. Secondly, we discussed the specific challenges concerning fighting hunger with sustainable development and the benefits private companies enjoy when pursuing this course of action, as well as highlighting some of the

mechanisms through which this is done. We defined the advantages that urban farming presents for cities and its potential to increase the supply of food as a responsible innovation. We closed the discussion by examining the example of retailer Marks and Spencer which, following a partnership of Ocado, one of its competitors, with an urban farming company, decided to undertake its own urban farming initiative.

Having discussed the above, we have also proposed a novel conceptual model which argues that private companies are now motivated to embrace GCs, due to a societal change in public expectations towards a businesses' social and environmental responsibilities. For these organizations, implementing responsible innovation becomes a suitable course of action to respond to these pressures, not only because of the efficiency of these innovations, but also because their adoption is, in itself, a response to the pressures. Once one organization successfully innovates, the consequent isomorphic diffusion process follows, in which competing organizations embark on their own responsible innovations. We believe the food sector to be particularly promising for this dynamic, as responsible innovations in this sector tend to be trendy, cheap, easy to engage and can yield fast results.

Although it provides a modest counter measure to the problem of hunger at a global scale, there is an encouraging prospect for private organizations to engage in responsible innovations to increase food production for the good of all. The successful example of companies investing in responsible innovation and instigating isomorphic responses might resonate across other fields to harness new, multiple actions aimed at alleviating hunger, and so moving society a step closer to solving this global grand challenge.

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