



Research article

Unravelling inclusive business models for achieving food and nutrition security in BOP markets



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ABSTRACT

There is a growing consensus that one of the key priorities to address food and nutrition security is to aim at the transformation of agriculture and food systems. The private sector can fulfil an important role in this. It is often argued that the success at low income markets (denoted here as Bottom of the Pyramid - BOP) requires innovative and inclusive business models. However, research findings on this have been quite descriptive and generic. The literature on private sector engagement and food and nutrition security has a strong focus on the participation of businesses in the value chain and the food system, but does generally not unravel the specific characteristics of the inclusive business model itself. This article aims to contribute to an improved understanding with regard to inclusive business model characteristics of private sector interventions aiming at food and nutrition security improvements, by scrutinizing 16 cases from Africa, Asia and Latin America. The study focuses on the internal fitness of the strategic business model by analysing the foundation level components of the inclusive business model. Important findings are the relevance of quality of product or service besides its affordability, marketing and distribution strategies to link the different actors in the value chain, and training as well as coalition building to overcome institutional and cultural gaps and increase the success of the inclusive business model for improved nutrition and food security. An important conclusion is that the business model and business ecosystem of BOP markets is crucial. Also, the findings indicate a need for intermediaries to overcome cultural and institutional gaps in implementing inclusive business models.

1. Introduction

Food and nutrition security is a central and persistent challenge for global development.¹ A substantial proportion of the world's 795 million people who are unable to meet daily food needs are food-producers, such as small-scale farmers and fishers. It has been argued that global targets for improving nutrition cannot be solved by nutrition-specific interventions implemented at scale only (Carletto et al., 2015). There is a growing consensus that one of the key priorities to address undernutrition is to aim at the transformation of the agriculture and food systems (Maestre et al., 2017; Masset et al., 2012). According to Maestre et al. (2017), agriculture has strong potential to contribute due to the many ways in which it can influence the underlying determinants of nutrition outcomes, including through improving global food availability and access and through enhancing household food and nutrition

security, dietary quality, income, and women's empowerment. Scholars and policymakers increasingly recognize the relevance of the involvement of the private sector in the fight against poverty issues such as food insecurity (Breeman et al., 2015; FAO, 2013; Fuglie, 2016). The benefits of involving the private sector in strategies do not only contribute to the increase of food production but may tackle also consumption and undernutrition (Maestre et al., 2017).

Rather than the aid and charity approaches that have dominated the scene for the past few decades, an alternative line of discussion around inclusive business (IB) and Base of the Pyramid (BOP) approaches has emerged, which emphasizes the role of inclusive innovation and pro-poor entrepreneurship (Halme et al., 2012; Prahalad, 2004; Veglio, 2011). There is a distinction between the IB and BOP approach (Halme et al., 2012). The BOP proposition emphasizes the untapped opportunities for win-win business as companies engage in serving this

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¹ Food and nutrition security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food, which meets their dietary needs and food preferences for an active and healthy life" (FAO, 2013).

previously neglected socio-economic segment – the BOP market (Goyal et al., 2014; Hart, 2005; Prahalad, 2004). IB focuses on the potential for development opened up by the integration of the previously excluded poor in the global economy, also emphasizing the role of governments and other institutions in creating conducive conditions (Veglio, 2011). Inclusiveness has been advocated to overcome negative effects such as adverse power relationships within poor communities, hierarchies between the poor and outsiders who administer poverty-reduction interventions, and local vulnerabilities induced by global currents in products, services, information and ideologies (Arora and Romijn, 2012). The IB approach may be the way to reach scale in BOP markets (Gradl and Jenkins, 2011). In this article we use the terms BOP market or context when talking about the low-income socio-economic population segment, but refer to IB models or IB development when describing business efforts in this area.

Private sector involvement could bring sizeable gains to companies and poor food producer and/or poor food consumer, achieving food and nutrition security by increasing food production, enhancing food distribution and/or ensuring food consumption (Gaffney et al., 2016; Patel et al., 2014; Mangnus, 2019; van Westen et al., 2019), and hence contributing to sustainable food systems (Pouw et al., 2019). The private sector is interested in entering low income food markets (roughly 4.5 billion low income people in developing countries) as they offer growth opportunities, a source of innovation, efficiency advantages, and reputation advantages (Christensen et al., 2001; Hamilton, 2013). Food-insecure communities may benefit of collaborating with the private sector, as they offer research and extension services, inputs, infrastructure, equipment, and marketing (Tuttle, 2012), and in some cases the introduction of international sustainability standards (Kleemann et al., 2014). But there have also been criticisms on the extent these advantages have been effectively realized (Arora and Romijn, 2012) and as to its negative effects (Hall et al., 2012; Karnani, 2009, 2010; Landrum, 2007). The characteristics of food value chains may leave little space for business models and management strategies starting from capacities, skills and ideas embedded in the constraints faced by smallholders and micro and small business in the food sector in developing countries, which may result in exclusion of these actors from agri-food chains (Bekele et al., 2011; Danse and Vellema, 2005; Vellema and Danse, 2007; Ros-Tonen et al., 2019). Also, a growing world population for at least another half century, combined with changing diets arising from increasing urbanisation and consumption of meat products, will bring greater pressures on the existing food system (Allen and de Brauw, 2018; Pretty et al., 2003), and require new business models to satisfy this growing demand for food to meet the marketing mix for the BOP: awareness, accessibility, affordability and availability (Chikweche, 2013; Prahalad, 2004), and to bring sizeable gains to both poor, food-insecure communities and the private sector itself (Poulton et al., 2010; Prahalad, 2004; Simanis and Hart, 2006; Vellema and Danse, 2007).

It is often argued that the success at the BOP requires innovative business approaches of which the logic significantly differs from approaches used at other tiers of the pyramid (Gradl and Jenkins, 2011; London and Anupindi, 2012; London and Hart, 2004; Seelos, 2010; Seelos and Mair, 2006). However, research findings on this are still quite descriptive and reflect on IB models at the BOP in general (Gradl et al., 2008; Jun et al., 2013; Klein, 2008; Kolk & van den Buuse, 2012; Prahalad, 2004; Ricart, 2010; Seelos and Mair, 2006), and as such do not provide specific insights for IB models for improved food and nutrition security.

The literature on private sector engagement and food and nutrition security has a strong focus on the participation of businesses in the value chain and the food system (Berti et al., 2004; Bird et al., 2018; Chevrollier et al., 2012; Dangour et al., 2012; Hawkes and Ruel, 2012; Kracht and Huq, 1996; Maestre et al., 2017; Olivier Kayser and Simon, 2014; Pinstrop-Andersen, 2013; Reardon et al., 2009; Schouten and Vellema, 2019). In the context of improved food and nutrition security

at the BOP, a number of IB intervention strategies (BIS) have been identified (Chevrollier et al., 2012; Poulton et al., 2010; Vorley et al., 2009), which Chevrollier et al. (2012) groups in 5 clusters that cover both the food production and food consumption aspects:

1. Farmer development services: the private sector supplies BOP food producers as customers of goods and services that aim to improve their own food production for the local market;
2. Secured sourcing schemes: the private sector sources from BOP food producers for local or international higher income food consumers;
3. Rural retail hubs: the private sector acts as retailer and supplies an assortment of products and services to BOP food producers and BOP food consumers;
4. Food product adaptation: the private sector expands its existing healthy food product to BOP food consumers;
5. Hybrid market creation: the private sector co-creates with local parties new healthy and nutritious food products for a new BOP food consumer market;

While IB approaches hence have been found in the context of food and nutrition security, a systematic mapping of the business model aspects of these intervention strategies is lacking. The study of Chevrollier et al. (2012), to the best of our knowledge, is one of the few that makes an attempt to structure the characteristics of the business model aiming at food and nutrition security, but describes mainly the interaction at value chain level. Drawing on the generic literature on business models for the BOP, relevant elements to analyse the IB model to achieve improved food and nutrition security strategies, are to analyse the strategic business model on key components of its foundation as this is a prerequisite for better decision making for the parties involved to scale up to serve more poor people or for replicating these models in different geographic context (Goyal et al., 2014; Hamilton, 2013; Klein, 2008; London and Anupindi, 2012; Seelos and Mair, 2010), and how it interacts with its context (Allen and de Brauw, 2018; Carletto et al., 2015; Hawkes and Ruel, 2012; London and Anupindi, 2012; London and Hart, 2004; Maestre et al., 2017).

This article aims to fill these knowledge gaps outlined above and responds to a need for an improved understanding with regard to business model characteristics of private sector interventions aiming at food and nutrition security improvements. The article is organized as follows: Section 2 provides a review of pertinent literature that contribute to the selection of the relevant scope and components to analyse 16 cases from Africa, Asia and Latin America. Section 3 presents that findings, followed by section 4 in which the merits and limitations of the private sector in supporting scalable solutions on food and nutrition security is being discussed. The article concludes with theoretical and practical implications of the findings.

2. Research approach

2.1. Initiators of inclusive business

A number of players are repeatedly mentioned in studies on inclusive business for developing countries, including the research, education and training infrastructure, multinational enterprises (MNEs), local suppliers, and financial markets and labour market arrangements (Bell & Pavitt, 1992; Dosi et al., 1990). And Prahalad (2004) specifically called MNEs to target BOP markets and thus help alleviate poverty. However, a literature review of Kolk & van den Buuse (2012) on a decade of research on the BOP concept reveals that many of these initiatives are initiated by small, rather than large, and local, rather than multinational, firms. In some cases the initiatives are even initiated by not-for-profit organisations, which somewhat surprising considering that the core premise of the BOP concept is the possibility to combine profits with poverty alleviation. This reveals a need for a better understanding of the different roles that large and small MNEs, large and

small domestic companies, social entrepreneurs, and not-for-profit organizations can play in inclusive business initiatives.

2.2. IB model for food and nutrition security: a focus on foundational level

Conventional business model scholars presuppose a well-functioning and supportive environment for business to develop and function (e.g., well-functioning infrastructure, clear institutional frameworks). Inclusive business scholars emphasize different circumstances in low income markets as opposed to developed markets, which may influence the configuration of the business model (Goyal et al., 2014; Gradl and Jenkins, 2011; Gradl et al., 2008; London and Anupindi, 2012; Prahalad, 2004). Institutional voids are extremely important in this context (Khanna and Palepu, 1999; Ricart et al., 2004). The lack of formal market institutions in low-income markets causes high transaction costs and thus the firm has to look for alternative ways to organize such transactions. One way to work around this is engaging so-called fringe stakeholders,² which helps to embed the business model in the local context (Breeman et al., 2015; Patel et al., 2014; Sharma, 2004). But often firms decide to internalize solutions for market failures (e.g. building water facilities, training of suppliers, and provision of financial services). However, these high-touch models are expensive (Gradl and Jenkins, 2011). Deliberately improving the business ecosystem around inclusive business models can help overcome the market gaps that make those models high-touch, high-cost, and-often – small-scale (Foster and Heeks, 2013; Gradl and Jenkins, 2011).

The business model has been recognized as a useful unit of analysis to better understand the characteristics of firms that develop inclusive business strategies to improve the food security of the BOP market, as it takes a multi-theoretical approach (Klein, 2008; Kolk & van den Buuse, 2012; London and Hart, 2004; Christina Seelos and Mair, 2006). Though identified as very relevant for the better understanding of the performance of the private sector in connecting to the BOP, scholars and practitioners remain vague when specifying what the business model entails and often refer to different phenomena (Klein, 2008). Research by Klein (2008) points to the relevance of the strategic business model for the analysis of value creation and value appropriation in the BOP context, as it is more concerned than the economic and operational business model with market positioning, overall direction in the organizational boundaries, and growth opportunities. Morris et al. (2005) emphasizes on the importance of internal and external fitness of the strategic business model to develop sustainable business. External fitness reflects on the degree to which the strategic business model is adapted to, suited for, and optimally uses its external business environment. Internal fitness refers to the business model's ability to maintain externally fit under environmental changes.

This study aims to unravel the business model characteristics that contribute to internal fitness, as we need to understand better the capacity of the private sector itself to position itself in its context. Internal fitness can be attained by creating a robust business model, and by creating a flexible business model (Zajac et al., 2000). A robust business model is resistant to external perturbations, fluctuations, and noise without a qualitative structural change (Jen, 2003). A flexible business model maintains external fit by adjusting in response to environmental change, while a robust business model maintains external fit through the ability to buffer environmental change. There are two ways to create a robust strategic business model (Zajac et al., 2000). One way is

² Fringe stakeholders are typically disconnected from or invisible to the firm because they are remote, weak, poor, disinterested, isolated, non-legitimate, or non-human. They may be affected by the firm but have little, if any, direct connection to the firm's current activities. However, fringe stakeholders may hold knowledge and perspectives that are key both to anticipating potential future sources of problems and to identifying innovative opportunities and business models for the future.

by creating an effective business model that manages to parry any external changes (Nilsson and Rapp, 2005). The other way is to build or select a local environment that shelters the business model from larger changes in its business environment (Zajac et al., 2000). It is the first form of robustness that is created by internal fit between components, and it is this form of robustness that our study focuses on.

Morris et al. (2005) proposes an integrative framework that allows designing, describing, categorizing, criticising, and analysing a strategic business model for any type of company at three increasingly specific levels of decision making, termed the foundation, proprietary and rules levels. Research on the business model for the BOP by (Klein, 2008) indicates that the foundation level is most relevant for IB model analysis as it allows to compare business initiatives in different context. The foundation level refers to generic decisions on what the business is, ensures that such decisions are internally consistent and relate to its context. This level consists of six components: value proposition (e.g. is it tailor-made or standardized, internal manufacturing or reselling), market (e.g. business to business, local or international, what type of customer), internal capability (e.g. production systems, supply chain management), competitive strategy (e.g. competition on quality or cost, innovation leadership, customer relationship), economic factors (e.g. pricing and revenue sources, volumes), personal/investor factors (e.g. pricing and revenue sources).

The framework is useful for the analysis of IB models that aim to contribute to improved food and nutrition security at the BOP, as it allows comparing across different business models from a broad universe of ventures. This is important due to the great variety of ventures involved in improved food and nutrition security for the BOP, such as: Multi National Enterprises (MNE), Small and Medium Sized Enterprises (SME), and public private partnerships (PPP), both based in industrialized economies as developing economies (Kolk et al., 2013) as well as specifically focussed on food and nutrition security (Forum, 2010). Additionally, the framework provides some generic features to analyse the adaptability of business models to complex environments through the characteristics at proprietary levels and the basic set of operating rules a business puts in place. There is internal fit when there is a coherent configuration of foundation factors. The external fit addresses the appropriateness of the configuration given specific and often changing external environmental conditions (Morris et al., 2005). Consequently, the model responds to the presence of many in-company and external interdependencies. Business model components may have little value in isolation but can offer a sustainable competitive advantage as a bundle. Linkages govern the way components connect together, thereby having a governing/control function, as well as the choice to include certain components (Klein, 2008). Table 1 summarizes the elements and specific variables that are used to analyse the IB models that aim to contribute to improved food and nutrition security.

2.3. Research method

Understanding business models in a poverty context requires explorative approaches able to deal with rich contextual data (Christina Seelos and Mair, 2006). Our study builds on a database of 71 carefully selected private sector driven initiatives on food and nutrition security for the BOP created by Chevrollier et al. (2012). These cases were identified through desk research and semi structured interviews with an international pool of experts in the field of private sector initiatives and food and nutrition security. Key selection criteria were: 1) agro/food activities focused at the local and/or regional market (no export to industrialized economies) and with the ambition to contribute to improved food and nutrition security, 2) the innovations aim at poor food producers and/or poor food consumers, 3) not strictly grant or subsidy dependent, and 4) still active at the time of the study (end of 2012). Consecutively, the 71 cases were clustered in 5 business intervention strategies (BIS) spread over the food value chain, including

Table 1

Foundation components for a strategic business model.

Source: [Morris et al. \(2005\)](#).

Component 1 factors related to the offering: How do we create value?	<ul style="list-style-type: none"> - primarily products/primarily services/heavy mix - standardized/some customization/high customization - broad line/medium breadth/narrow line - deep lines/medium depth/shallow lines - access to product/product itself/product bundled with other firm's product
Component 2 (market factors): Who do we create value for?	<ul style="list-style-type: none"> - internal manufacturing or service delivery/outsourcing/licensing/reselling/value added reselling - type of organization: b-to-b/b-to-c/both - local/regional/national/international - where customer is in value chain: upstream supplier/downstream supplier/government/institutional/wholesaler/retailer/service provider/final consumer - broad or general market/multiple segment/niche market - transactional/relational
Component 3 (internal capability factors): What is our source of competence?	<ul style="list-style-type: none"> - production/operating systems - selling/marketing - information management/mining/packaging - technology/R&D/creative or innovative capability/intellectual - financial transactions/arbitrage - supply chain management - networking/resource leveraging
Component 4 (competitive strategy factors): How do we competitively position ourselves?	<ul style="list-style-type: none"> - image of operational excellence/consistency/dependability/speed - product or service quality/selection/features/availability - innovation leadership - low cost/efficiency - intimate customer relationship/experience
Component 5 (economic factors): How we make money?	<ul style="list-style-type: none"> - pricing and revenue sources: fixed/mixed/flexible - operating leverage: high/medium/low - volumes: high/medium/low - margins: high/medium/low
Component 6 (personal/investor factors): What are our time, scope, and size ambitions?	<ul style="list-style-type: none"> - subsistence model - income model - growth model - speculative model

interventions that relate to food production as well as the market introduction of nutritious food products. This is relevant because agricultural growth may contribute to reduced levels of hunger ([Hoddinott, 2013](#)). And even institutional developments such as contract farming have been found to reduce food insecurity among participating households, either through income effects or through productive spillovers from commercial to subsistence crops ([Maestre et al., 2017](#)). However, value chain interventions in the past aimed mainly on increasing income for farmers or other actors along the value chain, but this is not necessarily sufficient for alleviating malnutrition. We followed here the ordering into 5 BIS by [Chevrollier et al. \(2012\)](#) which we found to provide a useful base for such analysis as it organizes BIS along the food value chain and helps to look at the IB model for improved food and nutrition security from different angles. Hence, the 5 BIS defined, are: 1. farmer development services (BIS1), 2. secured sourcing schemes (BIS2), 3. rural retail hubs (BIS3), 4. food product adaptation (BIS4), and 5. hybrid market creation (BIS5) ([Chevrollier et al., 2012](#)).

In the case of BIS1 the private sector supplies products and value-added services to small and medium farmers to increase the quality and volume of food products and improve the market position of the farmer. Most of the farmers involved are BOP farmers/consumers themselves. The production of these farmers is mainly aimed at the local market, and supplies for a good part BOP consumers. The other part goes to middle and higher income consumers. BIS2 put the (large) commercial buyer (e.g., agribusiness firms, processors, retailers) central, which link to smallholder agricultural producers to improve the quality of raw material and create economies of scale of processing and retail activities. The farmers involved are mostly based in the BOP, but often this is combined with bigger, more commercial farmers whom can be a cluster

leader. The food produced under this strategy is mainly supplied to middle and high income consumers. The income generated can contribute to increased purchases of nutritious food by BOP producers involved. BIS 3 is an innovative combination of forward and backward integration strategies in the value chain. Intermediaries offer goods and services to both BOP food producers and food consumers for improved food production and to improved access to food products. BIS4 is a market development strategy by businesses already active in the local food market. By adapting their business case they expand the sales of existing food products to the BOP with the aim to contribute to improved nutrition security. BIS5 is a diversification strategy. It is the most risky strategy because both product and market development is required ([Ansoff, 1964](#)). Cooperative models and partnerships appear to be crucial business model elements to achieve success for this BIS.

For this article, we further elaborate on the cases that [Chevrollier et al. \(2012\)](#) used to show case the characteristics of each of the 5 BIS. These are; 3 cases for BIS1, 4 for BIS2, 3 for BIS3, 2 for BIS4 and 4 for BIS5. More detailed information for each case is presented in [annex 1](#). Only one of the cases is related to Latin American, nine are related to Asia, and six to Africa. This is most probably a research bias caused by conducting the online research only with English search terms. All cases are partially or fully funded by the private sector, which is due to one of the selection criteria used to define the delimitations of the database. All cases that depend mainly on public funding were excluded from the overall database ([Chevrollier et al., 2012](#)). The 16 selected cases were analyzed based on online available secondary data (publications, project reports, business website, information available on social media), and verification interviews with at least one key representative of the lead organisation involved.

Table 2
Business intervention strategy by type of lead organization.

	SMEs	PPP	MNE	LC	SE
BIS1	3				
BIS2	1	1	2		
BIS3			2	1	
BIS4			1	1	
BIS5					4

3. Results

3.1. Inclusive business model initiator

An overview of the business intervention strategy by type of lead organization is presented in Table 2. Half of the 16 BIS analyzed are led by bigger companies. These are either locally based (LC) or Multi National Enterprise (MNE). One case concerns a MNE joining forces with a multilateral governmental organisation (Heineken and the European Union) in a public private partnership (PPP). All BIS 1 are led by SMEs. This BIS aims at providing services to farmers to improve their local food production. All BIS5 are led by social enterprises (SE). This BIS aims at developing new nutritious food products for BOP consumers. MNEs lead BIS that aim at sourcing from the BOP (BIS2), or retailing to BOP food producers and BOP food consumers (BIS3) & (BIS4) strategies. In the case of BIS 2 the selling of the food produce is directed at middle and high income food consumers. In BIS 3 large commercial retail companies (LC) supply inputs to BOP food producers (seeds, equipment, fertilizers), and (nutritious) food to different consumer segments, among other BOP food consumers. In the case of BIS 4, MNEs and LCs purposely sell nutritious food in high volumes to BOP food consumers. Finally, large commercial companies participate in BIS5 but in these alliances they do not lead the business interventions, but the SE does instead.

3.2. Foundation level components of IB models for food and nutrition security

The 16 business cases were analyzed based on the 6 foundation level components of Table 1. The summary of the results per BIS is presented in Table 3. The detailed information on the elements for each case is presented in annex 2.

3.2.1. Value creation

The cases do not provide a discrete answer to the question on who the value has been created for. Over time, all cases seem to evolve from a narrow focus on either BOP food producers or BOP food consumers, to strategies where they target both. This might be a response to institutional voids in the food system that force lead organizations to take care of multiple activities in the value chain in order to safeguard their competitive position and develop a sustainable business model. In the case of BIS1 and BIS2, BOP food consumers need to buy the products of the farmers to create demand for the inputs, processing and/or distribution services. In the case of nutritious food products, raw materials need to be available and brought to the processing units to assure food product availability. The type of market (general/broad/niche) and the nature of the customer relationship (transactional/relational) differ considerably between cases and there is no specific distinction between different BIS types.

For thirteen cases product or service quality is an important competitive value of the business model. Technology development and

research and development (R&D) are relevant for BIS1 and BIS4. In these cases, these investments enable the private sector to adapt technology to the needs of low income users, such as high tech processing techniques to small holder farmers (f.e. BIS1 Dadtco cassava processing AMPU Nigeria), inputs to farmers (f.e. hybrid vegetables seeds BIS1 East West Seeds Thailand) or nutrient powders to food consumers (BIS4 Valid Nutrition South East Africa) at low cost. This creates a unique access to innovative products or services to BOP food producers.

All cases develop upgrading strategies to improve their value proposition. A product upgrading strategy is prevalent in the retail based BIS3, and the BOP food consumer focused BIS4 and BIS5. A process upgrading strategy is a preferred strategy for BOP food producer focused BIS1. This means that adjustments are made in the process, f.e. by introducing an innovative technology to process cassava at farm site such as in the BIS1 Dadtco AMPU case in Nigeria. Only in one case interchain upgrading happened, which is the Heineken sorghum case in Sierra Leone. In this case, small holder farmers were stimulated to supply sorghum for local beer production. Sorghum was not a major food staple in the target country. Farmers were taught to produce sorghum that complies with the brewery requirements. The extra income generated by selling sorghum to Heineken, provided farmers more financial means which eventually could be used to improve their food and nutrition security, but the business model did not monitor that side effect.

All cases of process upgrading were led by SMEs. It shows that SMEs use the collaboration with value chain actors to adapt or innovate on process activities and as such increase the added value of the business. This seems logical as collaboration with others to add process improvements is a relatively easy and low risk collaboration strategy. SME's also used functional upgrading, but product or chain upgrading was not observed in SME led cases. On the contrary, 3 cases of product upgrading were led by social enterprises. The only case in which the intervention can be defined as interchain upgrading had a PPP as lead agent, which is the collaboration between Heineken and the EU.

For some cases, more than one upgrading strategy could be observed. In these cases the introduced business intervention provided the opportunity for upgrading strategies at two or more levels of the value chain, such as product and process upgrading. The time that the business is already active in the BOP market seems to influence this result as well. Most cases that were active for several years in the BOP market show a number of consecutive upgrading strategies that have been implemented over time.

All cases add value to the business model by engaging with one or more partners. NGO's are the most common partner, followed by governments. Interestingly, in the cases where NGOs were partners, the lead organization is always a bigger company and never an SME. In the case of BIS4 Valid Nutrition South East Africa and BIS5 KeBal Indonesia the social enterprise was established by an NGO.

3.2.2. Market factor

BIS 1 and BIS2 aim to create value for BOP food producers. In the case of BIS1, the customer relation is more personalized which enables the private sector to develop products and services that help BOP food producers to position themselves better in the local food market. The companies in the BIS2 use a more standardized/impersonal customer relation strategy. For both BIS the business development leads to increased income for the BOP food producers which may contribute to an improved food and nutrition security situation, however this effect is not measured by the private sector or other partners involved in the business cases.

In the case of the BIS3, the strategy aims at BOP food consumers and BOP food producers, and the customer relation is more personalized to

Table 3
Foundation level components per BIS on improved food and nutrition security.

	How does lead organisation create value to improved food and nutrition security?	For who is improved food and nutrition security created?	Which are the internal capabilities?	Which is the main competitive value?	What is the main pricing strategy?	Personal/investor factor
BIS1	Adapts high end market product or service for BOP farmers, distribution mainly through indirect channels, product manufactured by lead organisation, establishes vertical alliances to get to the customer, and develops process and functional upgrading strategies in the value chain	Product/service enable BOP farmers to access higher value food market. Contribute to food and nutrition security by income generation of farmers and more and better food for the local market. The intervention often results in an improvement of the livelihoods of BOP food producers	Mainly research and technology combined with market intelligence, they offer BOP awareness raising or capacity building strategies and stimulate coalition building to improve the capacity of their customers. The majority conduct research, engage in public policy dialogue, and build new organizations to strengthen the link between the customer and the market	Product quality	Average volume- average margin	Growth model
BIS2	Better food quality by improving the sourcing, processing and/or storage techniques mainly by process and functional upgrading strategies. They enable linkages to higher value customer. Distribution is mainly organized through indirect distribution chains	The process improvements enable BOP food producers to connect to higher value food markets. Impact on food security mainly through the increased income of value chain actors, including BOP food producers	Supply chain management, they develop awareness and capacity building strategies to their customers to help them improve their position in the market. Most of them establish new organizations to support their BOP customers to position themselves better in the market. Half of them develop policy dialogues and only one invests in research	Product quality and operational excellence	Big volume- low margin	Growth model
BIS3	Introduces direct distribution systems and reselling services to BOP food producers and BOP food consumers. They invest in functional and product upgrading strategies to strengthen their position in the value chain	The supply chain improvements enable BOP food producers to improve their production and storage practices, and BOP food consumers to get access to a bigger range of affordable food products	Marketing and supply chain management, they invest in BOP awareness and capacity building strategies for their customers to help them to improve their position in the market, and participate in policy dialogue to stimulate changes in the regulatory system, they also establish new organisation to support their customers to improve their performance. The majority build coalitions and half of them conduct research	Product selection and availability	Big volume- low margin	Growth model
BIS4	Adapt existing food product and introduce a narrow range of highly standardized nutritious food products through indirect distribution channels to BOP consumers	It improves the access to affordable nutritious food to BOP food consumers which contributes to an improved food and nutrition security	Strong in marketing, they develop BOP awareness and capacity building strategies to improve the performance of other actors in the value chain, they establish new organizations for their customers to improve their position in the market, invest in establishing new organizations, policy dialogue and research	Brand and reliable product quality	Big volume- low margin	Growth model
BIS5	Lead organisation develops tailor made food product for BOP food consumer and introduces this through indirect multiple distribution channels of partners, which are part of a coalition that becomes part of a new social business	Product innovation and supply chain strategy improve the access to affordable, nutritious food products to BOP food consumers, which contributes to their improved food and nutrition security	Production system, R/D and marketing, they develop BOP awareness raising and capacity building strategies for their customers, and invest in research and policy dialogues	Product quality and product features	Big volume- low margin	Growth model

meet their needs. They introduce a variety of products and services, and their use is evaluated by the customers. BIS4 and BIS5 aim at BOP food customers. The business model is based on selling big volumes. The customer relation is more standardized and not so personal. These BIS aim to improve the food and nutrition security of the customer by increasing the availability and affordability of nutritious food, however the impact of these products on nutrition security is not specifically measured by the company or the other partners involved in the business case.

3.2.3. Internal capability factors

The most important internal capability of a business model on food and nutrition security is supply chain management and selling/marketing. All cases include in their business model specific arrangements to supply their products or services to BOP food producers and/or BOP food consumers. Supply chain management is a key factor for cases ranging from BIS1 to BIS4. Six cases use a direct distribution strategy based on a retail business model, which means that distribution is part of the core responsibilities of the lead organisation itself. In the case of BIS2 Metro AG Vietnam the lead firm provides direct distribution services from the farmers to the supermarket sales points in urban areas, while in the case of BIS5 KeBal Indonesia the lead firm provides food sales points to low income food consumers in slums. All other cases leverage on indirect distribution channels, in which case this service is provided by third parties. The BIS that aim at BOP food producers mostly define a service supplier contract with local commercial traders, in case they add the product to their existing assortment. The BIS that aim at BOP food consumers (BIS4 and BIS5) mostly leverage on public agencies and development aid parties such as Pushtikona on development agency BRAC, Grameen Foundation distributing Danone's Shokti yoghurt, Britannia Biscuits distributed by the Indian public sector for school feeding programs, and World Food Program including micro nutrient powder of Valid Nutrition in their product assortment and distributing it to emergency areas in South East Africa. Only in the case of BIS4 Minute Maid Uganda the success of the business model is due to the commercial distribution system of the lead organisation- Coca Cola itself to distribute fruit juices to the BOP.

Additionally, having the right production/operating system in place is another key factor in all cases. Only for the BIS3 this is not a key characteristic to create value, as in this case retailing instead of production is the core of the business model. Efficient production/operating systems enable firms to generate big volumes of low price products and to get them to the right location. The product itself is central to the offering of the business model, and internal manufacturing is the central value creating activity in the business model.

Nine cases provide narrow product lines of one to a limited number of products. Cases that offer a broad product line are retail concepts distributing input supplies for food production to farmers (f.e. BIS3 DCM Hariyali Kisaan Bazaar India), or nutritious food products to consumer (f.e. BIS2 Metro AG Vietnam).

None of the cases showed evidence of building horizontal alliances to create linkages with other actors in the food value chain that are based at the same level of the chain. Twelve cases established vertical alliances, of which ten are related to BIS1, BIS2 and BIS3. These BIS are focused at strengthening the position of BOP food producers. The vertical alliances are mostly led by MNEs and SMEs. Diagonal alliances are only found for BIS5 cases, and these are all led by social enterprises. In all diagonal alliances at least one non-governmental organization (NGO) is involved. Other alliance partners identified in these diagonal alliances are government (2 cases), businesses (2 cases) and multilateral organization (1).

Further, internal capabilities also relate to the development of capacities of their customers and other actors in the food system. All BIS invest in awareness raising/capacity building of their customers, and coalition building with other actors in the value chain to influence the institutional context. In some cases even new organizations are established. For BIS 2 this situation applies to all cases, while the other BIS only some cases develop that strategy.

3.2.4. Competitive strategy

Product quality combined with affordability is the most important differentiator of the competitive strategy of the vast majority of BIS. In the case of BIS3 the focus is on product selection, as this business model brings products of other suppliers and producers together through retailing.

3.2.5. Economic factors

Only in the case of BIS1 the pricing strategy is based on the average volume and average margin. This can be explained by the more personal relation in BIS1 with the BOP food producer in order to be able to offer products and services that relate to their needs. For the other 4 BIS the strategy is based on high volume and low price. For none of the cases we were able to collect detailed financial information, which limits the possibility of providing a detailed analysis of the financial strength of the cases.

3.2.6. Personal/investor factor

The personal/investor factor is similar for all the cases in this study, and it is a growth model. This is the result of applying the selection criteria 'long term viability and scaling potential' when defining and selecting the cases. Only cases that showed results of consolidation and scaling became part of the sample, and hence this displays a selection bias.

4. Discussion

4.1. Diversity of lead firms in inclusive business models for food and nutrition security

As Table 2 shows, 5 of the 16 cases analyzed are led by MNEs. This can be explained by the global scope of the food industry driven by MNEs (Filippaios and Rama, 2008), as well as the declining economic growth of the European and USA home markets of these companies which has stimulated companies to search for new growth markets (Regmi and Mark Gehlhar, 2005). But the majority of the cases are initiated by small, rather than large, and local, rather than multinational firms.

This research also shows that all cases of BIS 5 are developed by partnerships between the private sector and a local or international NGO. And this collaboration is then structured in a social enterprise. This creates advantages for the business model as it leverages on rural distribution systems of the aid organizations like the Bangladeshi BRAC, to distribute nutritious food products BIS 5 Pushtikona to the rural poor in Indonesia, and the UN World Food Program to distribute BIS 5 Valid Nutrition micro nutrient powder to BOP food consumers in emergency camps in East Africa. And it also contributes to the strengthening of the internal capabilities to reach out to value chain actors.

4.2. Standardized low cost but high quality products contribute to food and nutrition security

The most relevant foundation level components of an IB model on

food and nutrition security are; end user focused (either small holder farmers or low income food consumers), highly standardized products, supplied in big volumes, for low prices but based on quality. This finding confirms Prahalaad's (2004) observation that that low income markets appreciate quality and innovation, and means that also business models for improved food and nutrition security have to take this into account.

Most cases aim at BOP food producers and food traders rather than BOP food consumers. But one can also observe that the cases diversify their customer focus over time to both BOP food consumers, BOP food traders and BOP food producers. This is positive and in line with recent findings that both nutrition specific interventions and sector improvement strategies especially in the agriculture sector has strong potential to influence the underlying determinants of nutrition outcomes (Ruel et al., 2018).

The higher number of BOP food producer BIS in the dataset is probably a time bound result. More recently the attention of business ecosystem actors such as donor agencies, NGOs and research institutes on food and nutrition security strategies has moved from strengthening food producers to improving the access and quality of food for low income consumers (Fiorella et al., 2016; Godfray et al., 2010). This can also be noted by the characteristics of the cases. All food consumer focused cases (BIS4 and BIS5) were initiated in less than 5 years, while the BOP food producer driven cases started more than 5 years ago.

The results of the analysis confirm that the business model for improved food and nutrition security at the BOP is based on an alternative marketing mix that aims at awareness, accessibility, affordability and availability (Chikweche, 2013). Marketing, sales and supply chain management are key internal capability components of the business model for improved food and nutrition security, which is in line with findings of (Hawkes and Ruel, 2012; Olivier Kayser and Simon, 2014). This can be explained by the contextual characteristics of BOP food market. Most BOP food producers are situated in remote rural areas, and most BOP food consumers are situated in crowded urban slum areas that lack proper infrastructure. It requires appropriate distribution strategies and structures to be able to reach these customers.

For some cases it was a challenge to distinguish singular unique foundation compounds characteristics using Morris' business model framework, as the parties involved develop double (or mixed) business models over time. This may be explained by the observation of Poulton and Macartney (2012) that companies engage in service delivery in addition to their core activities to overcome value chain challenges and institutional voids. This creates situations in which some cases started their business model with a strong focus on product delivery activities, but developed over time into a business model with a strong focus on end-market distribution and marketing activities to enable the businesses they were serving to sustain themselves.

4.3. Uniqueness of inclusive business models for food and nutrition security

The elements used to unravel the IB model for food and nutrition security (see Table 1) are generic and can be used for business models analysis of different BOP markets and development challenges. However, the findings of the case analysis show that applying the variables of these elements on business model for food and nutrition security generate specific insights for business models. It confirms findings of (Maestre et al., 2017; Ruel et al., 2018) that a crucial element of the inclusive business model to distinguish and create a unique impact on food and nutrition security is by investing especially in infrastructure and/or the distribution system. The set of cases show that either direct distribution systems are developed by the private sector initiative or leverage on existing networks of distribution systems, which is in line

with findings of Olivier Kayser and Simon (2014). Achieving innovation in product development on nutritious food and getting it to the BOP requires at least vertical linkages with actors in the food value chain. Beyond that, it may require engaging in diagonal alliances in order to be able to implement IB ecosystem strengthening strategies that help to overcome institutional voids as well as to get locally embedded by engaging with fringe stakeholders.

The initiatives that developed the distribution systems themselves all relate to either retail companies, for which distribution is their core business, or combine sourcing of food products with direct sales of food or beverages. The distribution strategies that leverage on existing networks, either established by the distribution provider itself, or by establishing an innovative partnership with organizations that already reach the BOP market. These partnerships can be explained by the fact that for building a loyal customer and producer base at the BOP, the supply and uptake of products and services needs to be stable and constant. This is a challenging endeavor in markets that lack an established logistics infrastructure. Leveraging on existing distribution strategies, enables the company to enter immediately with certain volumes, and they can benefit of the trust base these distribution parties have already established in these markets, which confirms insights of Maestre et al. (2017). These partnerships are mainly established for the food and nutrition security strategies aiming at BOP food consumers (BIS4 and BIS5), rather than BOP producers (BIS1 and BIS2).

However, the limitation of the generic analytical model focusing on foundation components of business models (see Table 1) when using it for the analysis of an IB model is the lack of insight it can provide on the characteristics of the interdependencies that may exist between the firm and "fringe stakeholders" (London and Anupindi, 2012; London and Hart, 2004), the type of value chain upgrading that is desired (Hawkes and Ruel, 2012; Maestre et al., 2017; Vellema and Danse, 2007), and the interaction between the business model and the broader business ecosystem (Gradl and Jenkins, 2011; Mashelkar, 2012; Pretty et al., 2003). Reviews of the different pathways for agri-food value chain interventions show that parties involved face multiple challenges in distributing their products to undernourished consumers (Maestre et al., 2017; Olivier Kayser and Simon, 2014). The success of such interventions relies heavily on well-functioning markets and distribution systems, and on consumer awareness of the value of nutrition, which is often lacking (Maestre et al., 2017). All appear to be relevant for the local embeddedness of the business model in low income markets that face food and nutrition security challenges. It requires further research to obtain a more in-depth understanding on the unique characteristics of food consumer driven business models versus producer driven business models that require partnerships with fringe stakeholders, such as street vendors, community leaders, health workers and public authorities, with which businesses normally do not work together (following Schouten and Vellema, 2019; van Westen et al., 2019).

4.4. Linkages aim more at achieving upgrading than economies of scale

A company establishes linkages with other external parties to improve its competitive position, to reach economies of scale, to acquire unique competences or to reach new market segments. Horizontal alliances often aim at reaching economies of scale or to improve the countervailing power. While this is an important strategy that contributes to a stronger business model and can contribute to improved food and nutrition security, the lead organizations of the BIS did not focus specifically on establishing a horizontal alliance strategy in the period that data were collected for the case studies. This may be explained by the fact that other business ecosystem parties such as the public sector or NGOs may take care of horizontal alliances among

producers or other actors in the food value chain parallel to the business model development that was the focus of this study. But this result may also be explained by the fact that most BIS were analyzed in their initial stage of business model development. At this stage collaboration for scaling up is most of the time not the focus, as the business model first has to show its viability in the local context. Hence, it requires more research to obtain a better understanding on the opportunities and constraints of horizontal alliances by lead organizations in IB models aiming at improved food and nutrition security.

All the cases develop vertical alliances. Only in the case of BIS4 and BIS5 two of the six cases related to these BIS have developed diagonal alliances. These cases combine a product development strategy of nutritious food product with marketing and distribution strategies to reach out to BOP consumers. The complexity of these business development strategies requires the collaboration with a diversity of stakeholders to respond to institutional voids and create local embeddedness and acceptance of the product. This finding is in line with [London and Hart \(2004\)](#) regarding the relevance of collaborating with fringe stakeholders, and [Olivier Kayser and Simon \(2014\)](#) on the marketing and distribution strategies that are being developed to improve the access to nutritious food for BOP consumers. These cases also invest in a full package of “IB ecosystem” strengthening strategies, which requires the collaboration with multiples parties, which explains also the establishment of a diagonal alliance as part of the business model.

The majority of the cases aim at strengthening producers which explains the dominance in using vertical alliance strategies. Functional and process oriented upgrading strategies are used to strengthen the business model along the food value chain. Consumer driven cases require the involvement of other actors besides the value chain parties.

4.5. Business ecosystem strengthening aims mostly on creating awareness

The business model for improved food and nutrition security includes awareness raising activities with customers and other actors of the value chain as an important internal capability. Awareness raising is a strategy that can contribute to an improved external fit of the business model to the market, as suppliers and/or consumers obtain a better understanding of the unique proposition (e.g. product, functional or process upgrading) that is being introduced.

Coalition building is a common used strategy for BIS development to improve food and nutrition security at the BOP to overcome risks on institutional voids, overcome cultural differences, or to overcome innovation challenges ([Calton et al., 2013](#); [London and Anupindi, 2012](#)). Also, in most cases one or more organizations have been involved that facilitate the lead organization of the BIS and other actors to develop the business case and the process of embedding. This confirms findings on the relevance of intermediary or brokering organizations to develop coalitions and partnerships ([Manning and Roessler, 2014](#); [Stadler and Prost, 2012](#)). It requires further research to obtain a better understanding on the way the business ecosystem of the BOP market influences the business model, as well as the characteristics of intermediaries to facilitate the development of inclusive business in BOP markets.

5. Conclusion

The aim of this article was to unravel the business model characteristics of private sector initiatives that intend to contribute to improved food and nutrition security of BOP consumers. This links to current debates on the role of private sector to contribute to poverty alleviation, and its specific added value to improve the quality and volume of food production for local markets, as well as the availability

of nutritious food ([Allen and de Brauw, 2018](#); [Berti et al., 2004](#); [Breeman et al., 2015](#); [FAO, 2013](#); [Fuglie, 2016](#); [Maestre et al., 2017](#)). At the same time, we acknowledge the existing debate of the effects of the private sector on nutrition and health in society, i.e. growing obesity problems on the one hand and access to more fresh food and less ultra-processed ones on the other (see e.g. [Gaitán-Cremaschi et al., 2019](#)). This article does not contribute to this debate. It requires further research to explore how enabling environments can be created that promote business models aimed at more healthy and diverse diets.

This article makes several contributions to the understanding of the role of private sector in enhancing food and nutrition security. Firstly, our study sharpens the five BIS clusters proposed by [Chevrollier et al. \(2012\)](#) by deepening the understanding of the foundation level components that contribute to the internal fitness of the strategic business model for improved food and nutrition security. The analytical perspective used provides more detailed insights in the interrelation between foundation components vital to the IB model on food and nutrition security which are; affordable product quality, personalized customer relations combined with appropriate distribution strategies and structures, and investments in building relations with value chain actors. It shows that BIS aimed at improved local food production tend to embed more by establishing vertical alliances, while the BIS on nutrition and food consumption embed both by vertical alliances but also the more complex diagonal alliances. It also reveals insights on the stage of the IB model and predominant embedding strategies, and ecosystem strengthening strategies. The early stage of business development of the IB cases analyzed, shows that the focus of the lead party is more on strengthening its internal fitness combined with upgrading strategies, than economies of scale. Further research on the different stages of business development or public private partnership development and IB model elements, is required to provide more insights on similarities and differences of the IB model over time.

Secondly, the case studies confirm the importance of the 4's of the marketing mix with the BOP also for business models on food and nutrition security. Our study adds insights to this by showing that IB models for food and nutrition security for the vast majority combine affordability and product quality with accessibility through the appropriate strategies on marketing and distribution. These appear to be crucial elements to be able to reach the BOP with products and services that contribute to improved food and nutrition security.

Thirdly, our study shows that BIS that aim at improved nutrition through the development and sales of new or adapted food formulas require the collaboration with multiple actors in the food system. These BIS always involve one or more intermediaries that are supportive to these processes by brokering partnerships. Intermediaries have also been identified by others as relevant parties to build inclusive business partnerships ([Mair et al., 2012](#); [Manning and Roessler, 2014](#); [Stadler and Prost, 2012](#)) and mediate in international and crossborder settings for business and innovation ([Ma et al., 2014](#); [Klerkx and Guimón, 2017](#)). Future research on the roles and responsibilities of these intermediaries would be relevant, to create more detailed insights on the way intermediaries contribute to inclusive innovation processes and the efficiency and effectiveness of the development of BIS on food and nutrition security.

The study also has a number of policy and practical implications. The clustering in 5 dominant BIS by ([Chevrollier et al., 2012](#)) is helpful for policy makers, private sector representatives and innovation intermediaries to bench mark a plan for IB on food and nutrition security. This enables policy makers and innovation intermediaries to interact with private sector representatives, identify the dominant BIS proposed, and check and eventually complete key elements and variables in the design and implementation of the IB model proposed. This may

contribute to a more successful and sustainable business. The elements for embedding and ecosystem strengthening strategies enable policy makers and intermediaries to deep dive better into an IB model they support and reflect and act upon the appropriate embedding strategy as well as specific variables of eco system strategy options. This may contribute to a faster or better change of the context, which may favor the performance of the IB model.

Our study also has certain limitations. One limitation is that the cases do not provide specific information on the impact of the business model foundation components on the change of food and nutrition security of its customers. There is a strong suggestion that food based programs could plausibly have effects on nutritional outcomes due to their impacts on intermediate factors associated with nutrition outcomes (e.g. dietary diversity). In spite of these attributes, methodological limitations are still largely limited which hampers the understanding of the effects of household food production interventions on nutrition security. It requires further research on methodologies to measure the impact of inclusive business strategies on the change of the food and nutrition security of its customers, and awareness as well as access to tools for practitioners to include data collection and monitoring activities in the development of the BIS.

Our study provides qualitative information on the challenges and opportunities of returns of the BIS as well as its sustainability over time. However, no detailed information could be obtained on income and profit/loss data and the viability of the business model. Hence the relation between the level of impact of the business model on improving food and nutrition requirements and having a viable business model could not be assessed in this study, and further research on this aspect is required. Also, following [Schouten and Vellema \(2019\)](#), more critical

research could be done on how partnering processes within BIS take shape and affect inclusion, and how they contribute to broader systemic change in terms of food and nutrition security. Furthermore, the recent trend of digitalization of food systems and supply chains ([Klerkx et al., 2019](#); [Klerkx and Rose, 2020](#); [Kos and Kloppenburg, 2019](#); [Hinson et al., 2019](#)) likely has major implications for how IB models that aim to contribute to improved food and nutrition security at the BOP operate, and this would merit further scrutiny.

Author contributions

MD conceived the idea for the article, gathered the data, performed the analysis, and led the writing and revision of the article. LK provided support in the theoretical positioning and the structuring of the article, and contributed to the writing and the revision of the article. JR contributed to the data analysis, and JR, CL and RR provided overall intellectual input to the project this article is derived from.

Declaration of competing interest

The authors report no conflict of interest.

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Appendix

Annex 1 General description of 16 cases

Case name	Case description
Dadco AMPU Nigeria	Dadco, a social enterprise established in 2002, develops mobile small-scale cassava processing units in Nigeria known as Autonomous Mobile Processing Units (AMPU) which allow first processing close to farms. Connecting smallholders to the processing units involves a cooperative alliance made up of Dadco, the International Fertilizer Development Center (IFDC), and the Dutch Ministry of Foreign Affairs. Dadco supplies the inputs the farmers need to grow and harvest their crops: reproduction, fertilizer, harvesting equipment, and credit. The semi-finished product – the “cake” – is readily marketable and yields considerably higher margins in the markets than the unprocessed crop. Dadco purchases these products from the farmers and sells them in local and international markets.
East West Seeds Thailand	East West Seeds (EWS) is a Dutch-Thai seed company that was founded in 1986 to improve local seed varieties locally and sell them, via intermediaries, to local South-East Asian smallholders. EWS successfully developed suitable small-scale production formats and invested considerably in demonstrating and transferring knowledge of the improved cultivation practices. It makes hybrid seeds available to growers via the establishment of local distribution centers. Growth of 15-20% is projected by EWS for the next few years.
Tanga Fresh Tanzania	Tanga Fresh Ltd. is a medium scale dairy company from Northern Tanzania. Tanga Fresh Ltd. operates a coordinated dairy value chain of milk collection, processing and marketing, combined with growth opportunities offered to smallholders through heifer availability and cattle credit, known as the ‘Tanga Model’. The company is market leader in Tanzania and sells several low to medium cost dairy products, mainly fresh milk and mtindi (sour milk), in Tanga and Dar-es- Salaam. The main innovation in the Tanga Model is the creation of rural Milk Collection Centers (MCC), that act as a one-stopshop for farmers by providing animal feed, medicine and advice for farmers all on the same premises. Furthermore, through a cattle credit scheme combined with a modern breeding farm, smallholders are offered more opportunities to increase their productivity.
Alquería dairy Colombia	Alquería is a family-owned Colombia-based dairy business Alquería's mission is to ensure the production of top-quality milk products, as well as to serve local communities by allowing them to benefit from the business and its products. The company currently sources its milk from 5,000–6,000 smallholders, and is focused on expanding its reach further into remote areas of Colombia, so as to provide market access to farmers who would otherwise remain isolated. All of the milk collected, be it from smallholders or larger operations, is channeled into the same products.
Sierra Leone Breweries	Heineken's local subsidiary in Sierra Leone, Sierra Leone Breweries Ltd. (SLBL), mainly produces beer for the West African market. Sierra Leone Brewery replaced imported European malted barley with locally grown sorghum as its beer's main ingredient. Since sorghum was solely produced as a minor subsistence crop, the recipe change implied a drastic increase of smallholders in Heineken's supply chain. The underlying reason to invest in the local production of sorghum, which was rarely available on the market, was mainly operational (reduce import costs of raw materials, reduce raw material storage costs, reduce impact of currency fluctuations). Since the start of the pilot, the number of smallholders has increased to around 3,000. Due to an increase in the local consumption of the beverages produced by SLBL, Heineken expects it will expand its investments into technological innovations involving the plant as well as the establishment of a sorghum-processing facility in order to add value to the sorghum and use it for other consumer products.
Metro AG Vietnam	Metro Cash & Carry Vietnam operates as a modern wholesaler and is competing with traditional wholesale markets for business customers (fresh food and catering sectors). Fruits and vegetables are important in the product portfolio of the Metro CC stores. With the support of Fresh Studio Asia, Metro

	CC built a fresh distribution center (DC), situated in Vietnam's premium vegetable growing area (Dalat) and within an hour of the farmer. By sourcing directly from (small-scale) farmers, instead of working with a long chain of collectors and traditional wholesalers, Metro CC ensured that vegetables could get in the cold chain as soon as they are harvested.
Unilever Kecap Bango Indonesia	Kecap Bango, a specialty sweet soy sauce made from black soy beans. It was originally produced using Javanese soy beans and was marketed and sold exclusively in Java. PT Unilever Indonesia, the local subsidiary of multinational Unilever, acquired a majority stake in the Bango brand in 2000. Unilever decided to use only locally grown beans, given that it was part of the Bango brand identity to be 'local' – and that Java provides ideal conditions to cultivate black soy beans. The company decided to focus its development of new suppliers in central and East Java. The Black Soy Bean Farmers Development Program is still growing. To date it has involved, via the farmer-owned cooperatives, some 6,600 smallholder farmers, who now grow approximately 25–30 per cent of the black soy beans used to produce the Bango brand.
DCM Hariyali Kisaan Bazaar India	DCM Shriram Consolidated Ltd. (DSCL), a leading diversified Indian corporate house in the agri-input markets with first-hand knowledge of Indian farmers, established an innovative business venture called DCM Hariyali Kisaan Bazaar. The rural retailer sells agri-inputs and consumer goods through its chain of centers, which also serve as a common platform for providers of financial services, health services, etc.
MMD Kheir Zaman Egypt	Started in 2006, Kheir Zamaan is an urban retailer focusing especially on low-income groups such as government employees, retired people, drivers, manual labours, nurses and teachers. As low-income people constitute a majority of the Egyptian population, the Mansour Company capitalized on its well developed retail experience in the Egyptian market to adapt its high-end business model to suit the needs of this important, low-income, market segment (the Kheir Zamaan supermarkets).
Suguo supermarket China	Nanjing-based supermarket chain Suguo is consistently ranked in the top ten supermarkets in China. Suguo has successfully penetrated rural Chinese markets by persuading rural cooperatives to become franchisees of the supermarket and so building on existing networks. Helped by a central government subsidy of USD 400 per store, Suguo helps remodel retail outlets and keeps them stocked. The main innovation of Suguo was the transformation of cooperatives into retail stores. So far, around 1,500 rural outlet stores have been created (50% of Suguo sales in rural areas).
Britannia Biscuits India	Britannia is one of India's leading food companies and a leading name in the bakery and dairy segments in the Indian marketplace with revenues close to USD 1 Billion annually. Britannia has launched commercially an iron-fortified version of its popular Tiger biscuits in 2007, based on two different recipes. The first contains a higher dosage of iron and is distributed via the Naandi Foundation's midday meal program (250-300k children) in a relation facilitated by GAIN. The second contains a lower dosage of iron and is distributed via 3.5 million rural and urban retail outlets throughout India. Today, fortified products including Tiger Iron Zor, MarieGold, Milk Biki & staples like bread sell close to 3.6 billion units annually and constitute 55% of Britannia bakery volumes.
Minute Maid Uganda	Coca Cola Juices Kenya Ltd. has an offering that targets both the BoP and high end consumers. It sells its juice drinks in 300ml, 500ml and 2L PET bottles via big supermarkets, but also adopts a very elaborated distribution strategy to reach shops and kiosks in Nairobi or Kampala's townships. Each urban Manual Distribution Center services an area 1 km in circumference, reaching a maximum of 150 retail outlets. Coca Cola Juices Kenya serves 15 distributors in the country, including 7 in Nairobi (60% of the total market). In addition, other bottling franchisees also have a network of MDCs operating in various other territories. Coca-Cola's Minute Maid juice brand was introduced in the market early 2010 and is inspired by Uganda and Kenya's increasingly health-conscious lifestyle. The product is affordable for people living in slums and is retailed in Uganda at UGX2,000 (USD 0,77) per 400ml returnable glass bottle and in Kenya at Ksh40 (USD 0,45) per 300ml plastic bottle and Sh55 (USD 0,62) per 500ml bottle. The sales-target for a distributor in Nairobi is on average 6500 bottles per year, which leads to an average annual profit of USD 588.
Danone Grameen Shokti Doi Bangladesh	Grameen Danone Foods Limited is a joint venture between Groupe Danone and the following 4 Grameen Companies: Grameen Business Promotions Services, Grameen Welfare, Grameen Energy, Grameen Telecom. The focus of activities is to bring healthy nutrition to low-income populations in Bangladesh and alleviate poverty through implementation of a proximity model. The actual product 'Shokti Doi' is a fortified yoghurt aimed at children 6 to 9 years old. Idea formed in October 2005 and launch of yoghurt production in April 2007. In April 2010 – 1 in 4 children around Bogra classified as having eaten at least 1 Shokti product per week over previous 3 months. Grameen Danone Foods Limited plans to break even in 2013.
KeBal Indonesia	Initiated by Mercy Corps in Indonesia, KeBal is a micro enterprise that develops and sells healthy street foods, which is an innovative solution to fight against both child malnutrition and general poverty in a country where the urban poor often do not have access to cooking facilities and largely live on processed food purchased in the street. Centralized kitchens have been set up, where nutritious meals are cooked and then sold by street vendors in carts. The various menus, which consist of a variety of snacks and main dishes, have been designed by nutritionists, hired by Mercy Corps, so as to respond to the nutritional needs of children. The street vendors emanate from the BoP as Mercy Corps employs individuals living in the urban slums of Jakarta. Through a franchise system, vendors and kitchens will have to become self-sustainable and pay a fee to the KeBal headquarters. At the same time, this system offers franchisees the possibility to gradually pay back loans and eventually own their carts or kitchens.
Pushtikona Bangladesh	Renata Limited, a producer of human and animal health products in Bangladesh, and BRAC, a large grassroots non-governmental organization with a network of rural health volunteers have teamed up, with GAIN support, to produce and sell Pushtikona ('grains of nutrition') – an high quality and affordable sachets of vitamin and mineral powders to be added to home-cooked complementary foods for infants and young children (6 to 24 months old). This micronutrient powder contains 15 essential minerals and vitamins that improve the nutritional value of complementary foods (price per sachet = Tk. 2,50/USD 0,034). The product is being sold at the same price point across all income classes which is listed on the label. Also to be noted: a margin on the price goes to pay for breastfeeding promotion. = Tk. 2,50/USD 0,034).
Valid Nutrition South East Africa	Launched in 2008, Valid Nutrition (VN) is a pure social business model (not-for-profit, but run as a business and financially self sufficient) that develops, manufactures and distributes a range of highly nutritious ready-to-use foods (RUFs) on the African continent. These ready-to-use foods are highly fortified, lipid-based nutrient dense pastes specifically designed for the prevention and treatment of malnutrition. At this moment VN is mainly selling products to treat severe acute malnutrition, so-called ready-to-use therapeutic foods (RUTFs). To stimulate the local economy as well as providing life-saving products at affordable prices, Valid Nutrition produces RUFs in the regions in which they are consumed, under licence from Nutriset, the company that developed the original RUTF formula. It established production and sales facilities in Malawi, Ethiopia and, previously, Kenya. The end-users are children between 6 and 36 months of age that suffer from severe acute malnutrition. To reach this targetgroup, VN sells its products on humanitarian markets; to NGOs, governments and international institutions (UNICEF 65%).

Annex 2. Cases specified on functional factors of the business model, linkages and upgrading strategies

Case name	BIS	Lead org	Component 1 (factors related to the offering): How do we create value?	Component 2 (market factors): Who do we create value on food and nutrition security?	Component 3 (internal capability factors): What is our source of competence?	Component 4 (competitive strategy factors): How do we competitively position ourselves?	Component 5 (economic factors): How do we make money?	Component 6 (personal/investor factors): What are our time, scope, and size ambitions?	Linkages	Upgrading
Daditco AMPU Nigeria	1	SME	heavy mix; some customization; medium breadth; shallow; product itself; internal manufacturing; direct distribution	B2B; regional; upstream suppliers and downstream processors; niche market; relational B2B; international; upstream suppliers; niche market; transactional	Technology, production system, supply chain management R&D; marketing	Innovation leadership	Mixed; NA; high; low	Growth model	Vertical	Process Upgrading
East West Seeds Thailand	1	SME	primarily products; standardized; narrow line; deep; product itself; internal manufacturing; indirect single channel distribution	B2B and B2C; regional; upstream suppliers and final consumers; multiple segments; B2C transactional; B2B relational	Production system; technology and innovative capability; Supply chain management; marketing	B2C: product quality and availability; B2B intimate customer relationship	Fixed; NA; high; low	Growth model	Vertical	Process Upgrading
Tanga Fresh Tanzania	1	SME	heavy mix; some customization; medium breadth; shallow; product itself; internal manufacturing and service delivery; indirect multichannel	B2B and B2C; regional; upstream suppliers and final consumers; multiple segments; B2C transactional; B2B relational	Production system; technology and innovative capability; Supply chain management; marketing	B2C: product quality and availability; B2B intimate customer relationship	Mixed; NA; high; low	Growth model	Vertical	Functional upgrading
Alquería Dairy Colombia	2	SME	primarily products to consumers and primarily services to businesses; standardized; narrow line; shallow; product itself; internal manufacturing; indirect distribution	B2B and B2C; national; upstream suppliers and final consumers; broad market; B2C transactional; B2B relational	Production system and supply chain management	B2C: product quality; B2B intimate customer relationship	Fixed; NA; high; low	Growth model	Vertical	Process Upgrading
Sierra Leone Breweries	2	PPP	primarily products; standardized; narrow line; medium depth; product itself; internal manufacturing; indirect multichannel	B2B and B2C; national; final consumers and downstream suppliers; broad market; transactional	Supply chain management/innovative capability	Product quality	Mixed; NA; high; low	Growth model	Vertical	Chain upgrading
Metro AG Vietnam	2	MNC	primarily products; standardized; broad line; deep; access to products; internal service delivery; direct distribution	B2B; regional; retailers; multiple segment; transactional	Supply chain management	Operational excellence; low cost	Mixed; NA; high; low	Growth model	Vertical	Functional upgrading
Unilever Kechap Bango Indonesia	2	MNC	primarily products; standardized; narrow line; medium depth; product itself; internal manufacturing; indirect distribution	B2C; national; final consumers; broad market; transactional	Marketing; supply chain management; innovative capability	Product quality; image of operational excellence	Fixed; NA; high; low	Growth model	Vertical	Functional upgrading
DCM Hariyali Kisaan Bazaar India	3	MNC	heavy mix; some customization; broad line; deep; access to products/services; value added reselling; direct distribution	B2B and B2C; national; upstream suppliers and final consumers; broad market; relational	Marketing; Supply chain management	Product selection; Intimate customer relationship	Mixed; NA; high; low	Growth model	Vertical	Functional upgrading
MCC Kheir Zaman Egypt	3	MNC	primarily products; standardized; broad line; medium depth; access to products; reselling; direct distribution	B2C; national; final consumers; broad market; transactional	Resource leveraging; marketing; Supply chain management	Low cost; product selection	Fixed; NA; high; low	Growth model	Vertical	Product upgrading
Suguo super-market China	3	LC	primarily products; standardized; broad line; deep; access to products; reselling; direct distribution	B2C; national; final consumers; multiple segment; transactional	Marketing; Supply chain management	Product selection and availability; low cost	Fixed; NA; high; low	Growth model	Vertical	Functional upgrading
Britannia Biscuits India	4	LC	primarily products; standardized; medium breadth; deep; product itself; internal manufacturing; indirect multichannel	B2C; national; final consumers; broad market; transactional;	Production system and marketing	Product quality/features; low cost	Mixed; NA; high; low	Growth model	Diagonal	Product upgrading
Coca Cola Minute Maid Uganda	4	MNC	primarily products; standardized; narrow line; deep; product itself; internal manufacturing; indirect single channel distribution	B2C; international; final consumers; broad market; transactional	Production system, supply chain management, marketing	Product quality/features	Fixed; NA; high; low	Growth model	Vertical	Product upgrading
Danone Grameen Shokti Doi Bangladesh	5	Social enterprise	primarily products; standardized; narrow line; shallow; product itself; internal manufacturing; indirect single channel distribution	B2C; regional; final consumers; broad market; relational	Selling/marketing	Product quality/features; low cost	Fixed; NA; high; low	Growth model	Diagonal	Product upgrading

KeBal Indonesia	5	Social enterprise	primarily products; standardized; narrow line; medium depth; product itself; internal manufacturing; direct distribution	B2C; local; final consumers; niche market; transactional	Production system; Selling/marketing	Product quality/features	Fixed; NA; medium; low	Growth model	Diagonal	Product upgrading
Pushtikona Bangladesh	5	Social enterprise	primarily products; standardized; narrow line; shallow; product itself; internal manufacturing; indirect multichannel	B2C; national; final consumers and service providers; multiple segment; transactional	Selling/marketing; production system	Product quality/features	Mixed; NA; high; low	Growth model	Diagonal	Functional upgrading
Valid Nutrition South East Africa	5	Social enterprise	primarily products; standardized; narrow line; shallow; product itself; internal manufacturing; indirect multichannel	government/institutional; market niche; relational	Production system; technology/R&D and intellectual capability	Product quality/features; low cost	Mixed; NA; high; low	Growth model	Vertical	Product upgrading

Annex 3. Cases specified on IB ecosystem strengthening strategies

Case name	BIS	Lead org	BOP Awareness	Research as strengthening strategy	Coalition building	Public policy dialogue as strengthening strategy	Creating new organizations as strengthening strategy	Strengthening strategies used
Dadto AMPU Nigeria	1	SME	Yes	Yes	Yes	No	Yes	BOP Awareness raising or capacity building; Research; Coalition building; Creating new organizations
East West Seeds Thailand	1	SME	Yes	Yes	Yes	Yes	No	BOP Awareness raising or capacity building; Research; Coalition building; Public policy dialogue
Tanga Fresh Tanzania	1	SME	Yes	No	Yes	Yes	Yes	BOP Awareness raising or capacity building; Coalition building; Public policy dialogue; Creating new organizations
Alqueria Dairy Colombia	2	SME	Yes	No	No	Yes	Yes	BOP Awareness raising or capacity building; Public policy dialogue; Creating new organizations
Sierra Leone Breweries	2	PPP	Yes	Yes	Yes	Yes	Yes	BOP Awareness raising or capacity building; Research; Coalition building; Public policy dialogue; Creating new organizations
Metro AG Vietnam	2	MNC	Yes	No	No	No	Yes	BOP Awareness raising or capacity building; Creating new organizations
Unilever Kecap Bango Indonesia	2	MNC	Yes	No	Yes	No	Yes	BOP Awareness raising or capacity building; Coalition building; Creating new organizations
DCM Hariyali Kisaan Bazaar India	3	MNC	Yes	Yes	Yes	Yes	Yes	BOP Awareness raising or capacity building; Research; Coalition building; Public policy dialogue; Creating new organizations
Kheir Zaman Egypt	3	MNC	Yes	No	No	Yes	Yes	BOP Awareness raising or capacity building; Public policy dialogue; Creating new organizations
Suguo supermarket China	3	LC	Yes	No	Yes	Yes	Yes	BOP Awareness raising or capacity building; Coalition building; Public policy dialogue; Creating new organizations
Britannia Biscuits India	4	LC	Yes	Yes	Yes	Yes	No	BOP Awareness raising or capacity building; Research; Coalition building; Public policy dialogue
Coca Cola Minute Maid Uganda	4	MNC	Yes	No	No	No	Yes	BOP Awareness raising or capacity building; Creating new organizations
Danone Grameen Shokti Doi Bangladesh	5	Social enterprise	Yes	Yes	Yes	No	Yes	BOP Awareness raising or capacity building; Research; Coalition building; Creating new organizations
KeBal Indonesia	5	Social enterprise	Yes	Yes	Yes	Yes	Yes	BOP Awareness raising or capacity building; Research; Coalition building; Public policy dialogue; Creating new organizations
Pushtikona Bangladesh	5	Social enterprise	Yes	Yes	Yes	Yes	Yes	BOP Awareness raising or capacity building; Research; Coalition building; Public policy dialogue; Creating new organizations
Valid Nutrition South East Africa	5	Social enterprise	Yes	Yes	Yes	Yes	No	BOP Awareness raising or capacity building; Research; Coalition building; Public policy dialogue

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