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## RESEARCH ARTICLE

# Resolving the base of the pyramid inclusion paradox through supplier development

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## Abstract

Resulting from divergent business environments between actors, the integration of the base of the pyramid (BoP) into formal supply chain (SC) structures is often hampered by institutional voids, which can result in the emergence of paradoxical situations. This paper analyzes the potential of supplier development (SD) for addressing the BoP inclusion paradox. The study develops a framework based on the assumption that SD enables the development of capabilities and supplier performance, which is especially relevant when operating in BoP contexts. Seventy-two semi-structured interviews stemming from two case studies of (a) a local dairy and (b) an international certified pineapple SCs with BoP involvement provide empirical insights into the theoretical framework. Paradox resolution strategies (temporal separation, spatial separation, and synthesis) are related to (direct and indirect) SD practices. The proposed framework and results show that indirect SD can be used as temporal and spatial separation, but not as synthesis strategy. Contrastingly, direct SD can be used as temporal separation and synthesis. The BoP context needs direct SD to address two sustainability goals simultaneously: the social dimension of BoP inclusion and the economic dimension of formal and efficient SCs. This research extends the discussion on paradoxes in sustainability management to SCs, especially to BoP SCs. It is relevant to show that BoP inclusion is neither a sole win-win nor trade-off scenario. Resulting paradoxical situations can be addressed by SD, thereby moving to sustainable supply chain management (SSCM).

## KEYWORDS

bottom of the pyramid, fair trade, institutional voids, paradox theory, supplier development, sustainability tensions

**Abbreviations:** BoP, base of the pyramid; NGO, nongovernmental organization; SC, supply chain; SCM, supply chain management; SD, supplier development; SS, spatial separation strategy; SSCM, sustainable supply chain management; SY, synthesis strategy; TS, temporal separation strategy.

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## 1 | INTRODUCTION

Alleviating poverty by doing business with the poor is the aspiration of the base of the pyramid (BoP) business approach (e.g., Kolk et al., 2014). Moreover, the BoP approach calls for sustainable development by reaching social and economic goals in line with societal ones (Manzhynski & Figge, 2020; Yawar & Seuring, 2018), which include steering against exclusion by promoting the inclusion of the BoP in supply chains (SCs) and creating profitable businesses (Dembek et al., 2020; Rehman et al., 2020; Schrader et al., 2012). This means including BoP actors into formal SC structures as a producer, service provider, or customer (Bendul & Rosca, 2019). However, because the BoP environment is characterized by informality and institutional voids (Khanna & Palepu, 1997; Silvestre, 2015), the inclusion of BoP actors into formal SC structures presents tremendous challenges and risks. This raises the BoP inclusion paradox, as informal actors (e.g., small-scale farmers) are to be integrated into formalized SCs. However, this social objective is hampered by the demands of the SC, which such BoP actors might not be able to or find very hard to fulfill.

Many of these challenges can be framed as sustainability paradoxes caused by conflicts among the environmental, social, and economic dimensions of sustainability (Hahn et al., 2018, 2015; Van der Byl & Slawinski, 2015). Until now, there is little paradox research on sustainable supply chain management (SSCM) and related sustainability paradoxes in the corporate responsibility literature (e.g., Govindan et al., 2021; Wannags & Gold, 2020) despite the impacts of SCs and SSCM on sustainability paradoxes (e.g., Brix-Asala et al., 2018; Sandberg, 2017; Xiao et al., 2019). Therefore, more research on sustainability paradoxes with an SC lens has been called for to extend related concepts (e.g., Hahn et al., 2015) to the SC and inter-organizational level (Govindan et al., 2021).

This research looks at the intersection of informal BoP and formal SCs, which are often difficult to unite (Silvestre, 2015). Understanding this relationship as paradoxical, it is referred to as the BoP inclusion paradox. According to Hargrave and van de Ven (2017), current paradox frameworks lack the consideration of the economic, political, social, and institutional contexts in which organizations are embedded, thereby carrying the danger of being too generic. One of the few exceptions stems from Xiao et al. (2019) who suggest the contextualization of Western sustainability standards in emerging markets to alleviate paradoxical tensions emerging from implementing these standards. The present study addresses the lacking consideration of the business environment in the paradox literature by conducting an in-depth examination of how informal BoP and formal SC actors can cooperate to create efficient and profitable SCs. To achieve a better match between the BoP and the remaining SC, supplier development (SD) is key in the BoP context (Khalid & Seuring, 2019; Yawar & Seuring, 2018). However, the potential and the limitations of SD in addressing the BoP inclusion paradox still need to be addressed. Hence, this results in the research question:

- How can SD (in a BoP context) be applied as a strategy for managing the BoP inclusion paradox?

To address this question, a framework is developed that will be supported by an empirical investigation of SCs that include both informal BoP actors and formal SC partners.

In Section 2, the literature review provides insights into the BoP inclusion paradox before elaborating the framework of SD as a strategy for managing this paradox. This is followed by the methods and results sections; after which, the discussion highlights the contributions and limitations of the present study and recommends avenues for future research. The conclusion provides answers to the research questions.

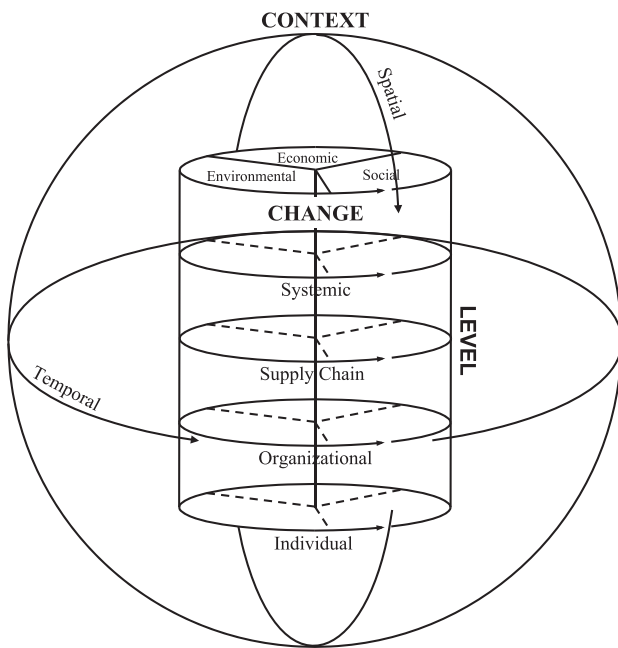
## 2 | LITERATURE REVIEW

This chapter starts with presenting the paradox perspective on sustainability tensions and continues with outlining the BoP inclusion paradox, emerging from the mismatch between the informal environment of BoP actors and the formal SC environment. Moreover, SD is presented as a resolution strategy for bridging institutional voids and addressing the underlying BoP inclusion paradox.

### 2.1 | Paradox perspective on sustainability tensions

Paradoxical tensions consist of “contradictory yet interrelated elements that exist simultaneously and persist over time” (Smith & Lewis, 2011, p. 387). The elements of paradoxes seem logical and desirable in isolation but irrational and absurd when juxtaposed (Lewis, 2000; Smith & Lewis, 2011). Instead of viewing interrelated features as either positively interrelated (win-wins) or contradictory (trade-offs), the paradox perspective offers a more nuanced perspective on tensions and oppositions (Lewis, 2000; Poole & Van de Ven, 1989; Smith & Lewis, 2011). By acknowledging tensions and the coexistence of contradictory elements, paradoxical thinking creates a cognitive frame that enables to develop more creative solutions for responding to complex problems and contributing to sustainable development (Smith & Lewis, 2011; Van der Byl & Slawinski, 2015). Paradoxical tensions typically emerge between environmental, social, and economic concerns (Hahn et al., 2018, 2015; Van der Byl & Slawinski, 2015). According to Hahn et al. (2015), sustainability tensions and paradoxes can emerge within and between different context levels (e.g., systemic, organizational, and individual) and at different points in time. In this study, we outline and propose the SC level as an additional source of sustainability tensions and unit of analysis (see Figure 1).

Despite the considerable potential to transfer paradoxical framing to SSCM research (Matthews et al., 2016), studies applying an explicit paradox perspective are still scarce (Zhang et al., 2021), even more, when empirical data are considered. However, it can be assumed that organizations and entire SCs face sustainability tensions and paradoxes when aiming to contribute to sustainable development and tackle social problems while simultaneously meeting the demands



**FIGURE 1** Adding the supply chain (SC) level to the systematic framework for the analysis of tensions (adapted from Hahn et al., 2015)

and expectations of the economic markets (Brix-Asala et al., 2018; Longoni et al., 2019; Rehman et al., 2020). Among the few studies that adopt an explicit paradox perspective, Sandberg (2017) and Brix-Asala et al. (2018) study paradoxes in global sourcing contexts. Xiao et al. (2019) framed the sensemaking of sustainability managers in a buying company to address paradoxes in the implementation of sustainability standards and suggested contextualizing Western standards in emerging countries to alleviate paradoxical tensions. Although Sharma and Jaiswal (2018) addressed paradox tensions around the cognitive frames of actors in BoP projects, paradox scholars have not directly addressed the intersection of SCs and the BoP research. The study at hand looks at this intersection by investigating the tension between the institutional environments of the informal BoP and formal SC from a paradox perspective.

## 2.2 | BoP inclusion paradox

The inclusion of BoP actors into SC structures with formal “institutions necessary to support basic business operations” (Khanna & Palepu, 1997, p. 41) is often associated with various challenges and complexities. Particularly the “absence of specialized intermediaries, regulatory systems, and contract-enforcing mechanisms” (Khanna et al., 2005, p. 4) in emerging markets frequently results in the emergence of institutional voids, which are the outcomes of divergent institutional environments, as small-scale (sometimes illiterate) farmers and their processes are often not prepared for entering highly formalized SCs with standardized processes (see e.g., also Rehman et al., 2020). This mismatch between institutional environments drives

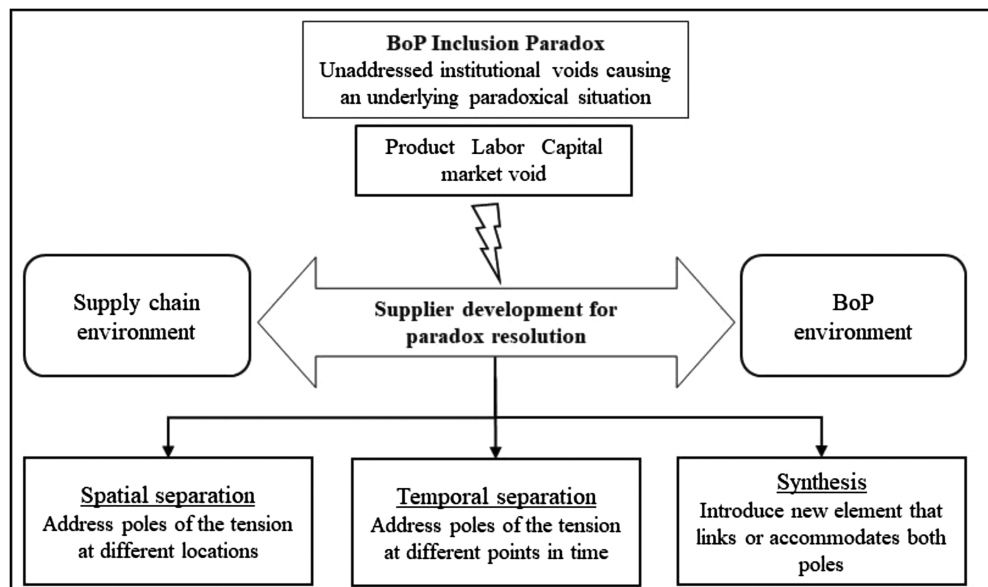
the challenges of including the informal BoP into formal SC environments, which are necessary to operate in larger markets. Silvestre (2015, p. 519) underlines that “when trying to develop sustainable supply chains in developing and emerging countries, the combination of high environmental turbulence and institutional voids lead decision-makers to face extreme ambiguity when making decisions”. Because a search for “win-win” situations by individual organizations is not always preferable for sustainability from a societal perspective (Manzhynski & Figge, 2020), many organizations and managers still strive for the integration of marginalized BoP actors to open up opportunities for sustainable development and poverty alleviation (Rosca et al., 2018). They do so despite the considerable challenges and efforts associated with their inclusion into formal SC structures. In this study, we label this phenomenon the BoP inclusion paradox arising from the conflicting elements of including marginalized BoP actors into different SC stages, while simultaneously pursuing formal and efficient SC structures.

To further illustrate underlying paradoxical situations, we outline the BoP inclusion paradox with the help of institutional voids (see Figure 2). Previous literature (e.g., Khanna & Palepu, 1997; Parmigiani & Rivera-Santos, 2015) presented five sources of institutional voids that organizations and SCs need to overcome in BoP contexts. Although contracting voids and regulatory voids are mainly determined by the national and local governments, the other three sources of institutional voids (product market voids, labor market voids, and capital market voids) largely arise from the informal characteristics of BoP markets and its actors. We argue that particularly the latter sources of market based institutional voids are responsible for the manifestation of the BoP inclusion paradox, so we focus on those three here. Considering the mismatch of business (or market) environments, an underlying paradoxical situation can be assumed that emerges from attempts to integrate informal BoP actors into the stages of the formal SCs. The specific way in which institutional voids result in the BoP inclusion paradox are explained subsequently.

- **Product market voids** stem from information asymmetries between buyers and suppliers, which cause difficulties to monitor and assess the quality of products (Parmigiani & Rivera-Santos, 2015). The BoP inclusion paradox emerges from the BoP's simple and trust-based way of meeting product requirements, which diverges from the demand for formal documents and quality assessments of products in formal SC environments. Information asymmetries about products are caused by the lacking availability of intermediaries and standards in BoP contexts (Brix-Asala & Seuring, 2020; Parmigiani & Rivera-Santos, 2015). Product market voids are particularly problematic when buyers (and entire SCs) depend on the BoP actors as the main suppliers of agricultural products and goods.
- **Labor market voids** cause difficulties to identify SC partners with the desired skills and knowledge. In some instances, suitable partners or employees with the required skills are not available in the specific environment or context (Brix-Asala & Seuring, 2020; Rehman et al., 2020). The BoP inclusion paradox arises from the



**FIGURE 2** Theoretical framework linking the base of the pyramid (BoP) inclusion paradox to supplier development



limited formal education and rather hands-on experience of the BoP, which conflicts with the SC environment's demand for formal education and training (Parmigiani & Rivera-Santos, 2015). In addition, the lacking business skills of the BoP can be another challenge preventing the desired profitability of their businesses (Gold, Chesney, et al., 2020; Heuer et al., 2020).

- **Capital market voids** emerge from the scarceness of financial institutions that provide capital to entrepreneurs and companies in BoP contexts (Brix-Asala & Seuring, 2020; Parmigiani & Rivera-Santos, 2015). The BoP inclusion paradox originates from the BoP's limited access to financial services and capital sources, which conflicts with the regular demand for intensive investments in formal SC environments. The lack of significant capital infusion might hinder investments that are necessary for the BoP to even enter formal SC structures (Parmigiani & Rivera-Santos, 2015).

Given these voids, actors in related SCs have to address these voids and implement related measures. SD offers one such set of processes, so this is explored next.

### 2.3 | Supplier development (SD) at the BoP as paradox resolution strategy

Instead of trying to diminish tensions, which can rarely be achieved, paradox theory advocates the working through tensions using acceptance and resolution strategies (e.g., Hahn et al., 2015; Poole & Van de Ven, 1989). Although acceptance strategies keep the paradox open by finding ways to live with paradoxical tensions, the resolution strategies of (temporal and spatial) separation and synthesis seek to transform paradoxical tensions into more manageable situations. Temporal separation allocates paradox elements to sequential time periods, whereas spatial separation locates the paradox

elements at different context levels (e.g., SC systemic in Figure 1) or different social or physical locations (Hahn et al., 2015; Poole & Van de Ven, 1989). Synthesis strategies introduce new elements enabling to accommodate both paradox poles, which still remain contradictory (Hahn et al., 2015; Poole & Van de Ven, 1989). Because institutional voids can be viewed as “an actionable construct, that can be reacted to or shaped” (Doh et al., 2017, p. 294) to overcome market failures (Brix-Asala & Seuring, 2020; Rivera-Santos et al., 2015), we argue that SD practices allow moving toward resolution strategies, helping to bridge institutional voids and respond to the underlying BoP inclusion paradox. SD aims to improve the situation of BoP suppliers while resolving the inclusion paradox. Because SD transforms the underlying paradoxical situation, SD cannot be perceived as an acceptance strategy seeking to live with the paradox.

SD involves “actions taken up by firms to upgrade, help and train suppliers directly and indirectly to fulfill the demands of stakeholders” (Yawar & Seuring, 2017, p. 626). The reasons and extent to which SD is implemented vary among institutional contexts (Yawar & Kauppi, 2018). SD is generally perceived as a key strategy in BoP environments, enabling the integration of disadvantaged producers into formal markets (Gold, Chesney, et al., 2020; Khalid & Seuring, 2019). Besides addressing social topics in SCs (Yawar & Seuring, 2018), SD enables improvements of the economic performance and capabilities (Busse et al., 2016; Wagner, 2010). While indirect SD is based on communication and evaluation, direct SD is characterized by direct investment (Wagner, 2010). Previous studies also find that indirect SD is an enabler for direct SD (Wagner, 2006). Overall, indirect SD can be used to identify risks and exclude suppliers, whereas direct SD builds long-term relationships and supports developing capabilities (Busse et al., 2016; Yawar & Seuring, 2018). Table 1 provides an overview of direct and indirect SD practices identified in literature.

**TABLE 1** Overview of indirect and direct supplier development practices

	Supplier development practices	Practice description
<b>Indirect supplier development</b>	<ul style="list-style-type: none"> <li>• Supplier selection/assessment (Govindan et al., 2021; Wagner, 2010; Yawar &amp; Seuring, 2018)</li> <li>• Evaluation and feedback (Wagner, 2006; Yawar &amp; Seuring, 2018)</li> <li>• Cooperation if objectives set are attained (Wagner, 2010)</li> <li>• Communicating of goals and increasing suppliers' performance goals (Khalid et al., 2020; Wagner, 2010)</li> <li>• Supplier rewards (Wagner, 2010; Yawar &amp; Seuring, 2018)</li> <li>• Instilling of competition using multiple sources (Wagner, 2010)</li> <li>• Auditing and certification (Hiete et al., 2019; Modi &amp; Mabert, 2007; Vermeulen, 2015)</li> <li>• Supplier visits (Modi &amp; Mabert, 2007)</li> </ul>	<ul style="list-style-type: none"> <li>• Filtering out potential suppliers in the first step</li> <li>• Creating transparency concerning the supplier performance between buyers and suppliers</li> <li>• Merging future economic efforts based on the attainment of goals</li> <li>• Establishing an indirect incentive system</li> <li>• Triggering the attainment of goals</li> <li>• Placing pressure on suppliers to improve SC performance</li> <li>• Validating quality aspects or social or/and environmental practices</li> <li>• Investigating the situation at the supplier end</li> </ul>
<b>Direct supplier development</b>	<ul style="list-style-type: none"> <li>• Training and educating the suppliers (Krause, 1997; Modi &amp; Mabert, 2007; Wagner, 2010; Yawar &amp; Seuring, 2018)</li> <li>• On-site consultation (Wagner, 2006)</li> <li>• Temporary personnel transfer (Wagner, 2006)</li> <li>• Inviting supplier's personnel (Wagner, 2006)</li> <li>• Continuous supplier monitoring (Govindan et al., 2021; Yawar &amp; Seuring, 2018)</li> <li>• Logistical integration (Chen &amp; Paulraj, 2004; Sauer &amp; Seuring, 2017)</li> <li>• Financial assistance (Govindan et al., 2021; Yawar &amp; Seuring, 2018)</li> </ul>	<ul style="list-style-type: none"> <li>• Improving the skills in the SC as well as the related knowledge transfer</li> <li>• Supporting the supplier at the processing site providing advice</li> <li>• Supporting the supplier at the processing site supplying workforce</li> <li>• Improving the knowledge transfer and coordinating the SC processes accordingly</li> <li>• Ensuring that product specifications are met</li> <li>• Reducing information asymmetries and creating efficient processes by establishing infrastructure</li> <li>• Providing monetary resources, for example, credits, to improve the supplier's facilities</li> </ul>

## 2.4 | Conceptualizing the research framework

Figure 2 takes the parts of the theory introduced in the previous sections together. Starting top-down, unaddressed institutional voids at the intersection of the formalized SC environment and the informal BoP environment, causing market failure. This is operationalized in product, labor, and capital market voids, which drive the paradoxes emerging among SC and BoP environments. These paradoxes can then be addressed by spatial and temporal separation as well as synthesis strategies as shown at the bottom of the figure.

## 3 | METHOD

Two case studies aim to provide empirical evidence for the developed theoretical framework. While the empirical findings are used to explore the relationships developed in the theory section, that is, the theoretical framework, the theory section itself contributes to theory elaboration. The relationships among SD and paradox resolution strategies for dealing with institutional voids are investigated. Case study research (Voss et al., 2002) is one approach that was suggested to explore paradoxical sustainability tensions (Van der Byl &



Slawinski, 2015) in order to extend the generalizability of sustainability paradoxes to different contexts.

### 3.1 | Case selection and background

The two cases were selected because both involve informal BoP and formal SC actors, thus representing examples of BoP actor based SCs. In both cases, the skills of the BoP actors need to be adopted to existing or emerging demands. Both cases were part of an interdisciplinary research project where two of the authors were involved. This ensured access to the field.

- Case 1: Local milk SC in Kenya

The Kenyan case study analyzes a local dairy SC that was in transition from producing and distributing raw milk to a formal pasteurized milk SC. The institutional voids become salient because of the interaction of informal BoP raw milk producers and the formal industry that processes pasteurized milk. This resulted in a critical change in the dairy SC, which triggered paradoxes to surface (Smith & Lewis, 2011). The BoP environment consists of farmers, traders, and milk bars. Each farmer supplies 8 to 45 L daily to cooperatives, which handle between 450 and 10,000 L a day. In this case study, the BoP farmers are the major suppliers of raw milk, and the processors usually rely on their supply. Depending on their equipment and size, cooperatives belong to BoP or/and formal SC structures. Milk processors usually operate within formal structures. In this case study, two researchers conducted fieldwork in Nakuru, Kenya, from January to April 2014 and October 2015. Nakuru County is one of the most productive districts in the Rift Valley Province, where 53% of the Kenyan dairy production is located, and milk is the major source of income. The two researchers conducted 37 semi-structured interviews along the SC. A snowball sampling strategy was applied (see Table 2) because of the participants' higher willingness to share information when being connected through a confidant and the sector's general informality that hinders other sampling approaches.

**TABLE 2** Overview of the interviews in the two case studies

Kenya (dairy SC)		Uganda (pineapple SC)	
Farmer	8	Farmer	10
Trader	6	Local processor (dryer)	9
Milk bar	10	Exporter	8
Cooperative/processor	6	Importer	2
Processor	1	Cooperative	3
Government	3	Certification body	1
NGO	2	NGO	1
Research institution	1	Research institution	1
Total interviews	37	Total interviews	35
<b>Total interviews: 72</b>			

Abbreviations: NGO, nongovernmental organization; SC, supply chain.

- Case 2: International pineapple SC in Uganda

The Ugandan case study was an international organic and fair-trade certified pineapple SC. The BoP actors in the SC were farmers and small-scale pineapple processors, such as pineapple dryers. In Uganda, only fair-trade and organic pineapples are exported as the profit margin for conventionally grown pineapples is too low in this landlocked country. The pineapples are grown on 1 to 5-ha fields owned by smallholders, which is why buyers depend on BoP farmers. Indeed, this SC represents a typical setting where the farmers are dependent on group certification (from exporter or cooperative) in order to sell their product. The pineapples are processed by local dryers, who are also pineapple farmers that earn an additional income. Institutional voids become salient due to the certification requirements, the changing quality requirements for the dried fruit, and the complexity of multiple simultaneous constraints. Because of the changing quality requirements, the exporters aim to become processors and invest in modernized drying machines. In this case study, a team of four researchers conducted 35 semi-structured interviews (Table 2) during two field stays in 2015 (May–June and October–November).

Both cases cover a BoP setting but differed in the product market because the Kenyan milk SC included local formal and informal markets, whereas the Ugandan certified pineapple SC was international. Based on subsets of the data, Seuring et al. (2019) analyzed sustainable SC practices, while the Uganda case was interpreted towards respective tensions by Brix-Asala and Seuring (2020). While this is linked to the extant paper, the paradox perspective adds theoretical depth not analyzed so far and allows a much deeper comparison of the case settings. The handling of the SD practices varied because of the different focal firms involved. Furthermore, both SCs depended on the inclusion of actors at the BoP. To date, both SCs are still operating in this manner.

### 3.2 | Data collection and analysis

The interviews persisting from 20 to 120 min were recorded and transcribed. In some cases, local students who functioned as translators accompanied the researchers. The interview guideline explored resolution strategies for SSCM, that is, SD, and addressed sustainability challenges in the specific SC. Observations and secondary material obtained from nongovernmental organizations (NGOs) and governmental institutions contributed to the data triangulation (Eisenhardt, 1989). The interview guidelines were aimed to explore SD strategies and related sustainability challenges. The focus was on the exploration of sustainability topics, which were important to the interviewees. In addition, general questions about the challenges faced by the actors were asked.

The empirical data were analyzed by means of a qualitative content analysis (Mayring, 2010) to determine the relationship between SD as paradox strategies for addressing the institutional voids, which

result in the underlying BoP inclusion paradox. The data were coded according to the identified SD practices (see Table 1), the paradox resolution strategies the SD practices reflect (temporal separation, spatial separation, and synthesis), and the institutional voids the identified SD practices address. This can also be seen in Appendix A, where the interview paragraphs were connected to the SD practices and the paradox strategies (details in Tables A3 to A6).

### 3.3 | Research quality

To ensure research quality, state of the art guidelines by Mayring (2010) and Yin (2018) have been applied. For realizing internal validity, key informants from the Kenyan government and the Kenyan dairy trader association were involved in the discussion of our observations and results on multiple occasions. In Uganda, we revisited the fieldwork site, enabling us to reconnect with the interviewees and discuss the first round's findings. To achieve construct validity, we involved several researchers in the data collection, who iteratively discussed the findings during the field research. To encounter a bias of involving multiple interviewees, a fixed researcher started off with each interviewee for the first couple of interviews to train the same understanding of interviewing. The use of multiple cases contributes to the external validity of the research (Voss et al., 2002). Moreover, the findings were discussed in peer debriefings during and after data analysis to enhance reliability. Throughout the entire research project, a database was built consisting of the interview guidelines, the transcribed interviews, and the interviewees' contact information also contributing to the study's reliability (Voss et al., 2002). To establish transparency of the findings, Appendix A presents an overview of both cases with illustrative data, including quotations and observations.

## 4 | RESULTS

The results show how SD practices address the BoP inclusion paradox caused by the three institutional market voids (product market void, labor market void, and capital market void). The application of the indirect and direct SD practices as resolution strategies is presented before the last section provides a summary comparing the identified (temporal and spatial) separation and synthesis strategies for responding to the underlying BoP inclusion paradox. To facilitate the recognition of the SD practices, these are written in bold when first mentioned.

### 4.1 | Indirect SD

In both cases, **evaluation and feedback** was regularly used to address the information asymmetries about products. In the Kenyan dairy SC, the buying processors tested the delivered milk because of lacking transparent information about its quality and sent feedback to the farmers. In the Ugandan pineapple SC, the exporting company sorted

the dried pineapples and provided feedback to the BoP farmers and pineapple dryers. Both cases aimed to secure quality of products for economic reasons, which is why products were only included when the product quality met the buyer's demand. Evaluation and feedback enabled the suppliers to be aware of deficits and subsequently improve their skills, leading to enhanced products. The SD practice is thus a temporal separation strategy addressing product and labor market voids.

Furthermore, both cases applied **cooperation if set objectives are attained** as a temporal separation to address product market voids. The dairy SC was in transformation from raw to processed milk, which is why sales to processors were only possible with all required product characteristics in place. The organic fair-trade pineapples could be sold once the conversion period ended and/or the improved drying process was implemented. It is the special feature of fair-trade SCs also motivating the maintenance of organic and fair-trade practices and quality. In both cases, BoP inclusion in the supplier pool was prioritized over eventual economic returns.

**Supplier rewards** were used in the fair-trade business model, where a fair-trade premium enables water supply for the farming community. The suppliers are included before the SC benefits economically from it. Supplier rewards thus represent a temporal separation strategy addressing product and capital market voids. Contrastingly, the Kenyan case shows no supplier rewards.

**Instilling competition using multiple sources** was especially relevant in the dairy SC because it is a free market. In the wet season when cattle have enough fodder, there is an oversupply of milk, which drives supplier competition. In this shifting constellation of oversupply and undersupply across time and different regions, the SD practice is a temporal and spatial separation strategy addressing the product market void. The findings revealed that eventually all suppliers were again included. Contrastingly, the supply of pineapples was restricted to certified actors, due to the need for transparency and the competition factor did not apply.

**Auditing and certification** only applied in the international pineapple SC as a temporal separation strategy addressing product market voids, and as a spatial separation strategy addressing capital market voids. It enabled the supplier inclusion and ensured the long-term economic growth of the entire SC. Because the exporter paid the certificate, the exporter largely drove the economic success revealing the spatial separation in which the social goal of inclusion benefited the BoP, and the economic goal of the certificate benefited the exporter.

### 4.2 | Direct SD

**Training and education** were interpreted differently in the cases. In Uganda, it was analyzed as a temporal separation strategy for addressing the product and labor market void, whereas in Kenya, it was a synthesis strategy for these same voids. In Uganda, the fair-trade program specified the need for the training and education of the suppliers by the exporters before they could supply their products.





The SC benefited from their products only after a conversion period that improved transparent product flows and supplier skills. The Kenyan case showed that continuous training and knowledge transfer enabled the SC inclusion of BoP actors, because the dairy market is a free market. Thus, training is essential to ensure both inclusion and updated awareness of changing product quality demands in the established SC.

In both cases, **providing materials and services** was found to be a temporal separation strategy for managing product and capital market voids. In Kenya, there are services such as fodder provision in the dry season when the fodder is scarce. Furthermore, artificial insemination, which benefited especially productive animals, improved the overall SC quality. In Uganda, building materials for improved pineapple dryers were provided by the exporter to ensure the quality of the facilities. The findings of this case study showed that the social dimension of assisting the farmers for SC inclusion by providing materials and services was temporarily prioritized before potential long-term economic benefits for the SC occurred.

**On-site consultation** encompassed, for example, field extension services for the farmers and BoP actors to improve their product characteristics, achieve transparency, and upgrade the BoP actors' skills. The Kenyan case revealed different models, like a milk processor directly engaged in on-site consultation with an external NGO. In the Ugandan case, the exporters offered field extensions and visited the farmer every month to supervise and maintain contact with them. Consequently, this SD practice is interpreted as a temporal separation strategy for addressing product and labor market voids, because BoP actors were included into the supplier base and their skills were upgraded before achieving the long-term economic goal of quality improvement. Moreover, this SD practice is a synthesis strategy because, for example, advices to buy a different fodder had immediate effects while upgraded milk handling requires some time.

In both cases **continuous supplier monitoring** ensured inclusion and long-term success only when the practices adhered to the standards of the SC and monitoring revealed deficits in the labor skills as the first improvement step. It thus resembles a synthesis strategy addressing product and labor market voids.

**Inviting supplier's personnel** was applied in Uganda and Kenya, where farmers were invited to demonstration farms and revealed the benefits of organized information exchanges among farmers and the possibility of learning from demonstration farms. In Kenya, the preparation of fodder storages in the dry season was demonstrated. In Uganda, knowledge transfer was demonstrated in the new product requirements for dried pineapples and in teaching the farmers how to achieve organic or fair-trade certification. This SD practice addressed product and labor market voids and can be interpreted as a temporal separation and synthesis strategy depending on the topic addressed, because the actors were included as potential suppliers and the overall SC enjoyed immediate and long-term benefits of skill upgrading.

**Logistical integration** differed in the cases. In the certified pineapple SC, the product characteristics were ensured only by the farmer with no evidence that the pineapples were not produced by

noncertified farmers. It thus resembles a synthesis strategy for product market voids. In the dairy SC, logistical integration increased the amount of milk of acceptable quality by diminishing the risks of uncooled transport and nontransparent sourcing by possible intermediaries. Moreover, logistical integration ensured the inclusion of dairy farmers and cooperatives as well as quality and success. The processor built a cooling facility in a rural area, which enabled suppliers to monitor the cooling and quality of the milk. Consequently, the BoP actors were included, and the transparency of the product characteristics was achieved early in the delivery process thereby bridging product and capital market voids via a synthesis strategy.

Finally, both cases showed that **financial assistance** was provided to fill the capital market void as a temporal separation or synthesis strategy. Credits provided by exporters or processors fostered the BoP inclusion because farmers and driers could improve their facilities immediately or over time by buying new plants or other necessities.

### 4.3 | Summary of SD as a paradox resolution strategy

Table 3 provides an overview of the SD practices observed in the cases, thereby already eliminating the ones not found (see Table 1). While most of the SD practices found have already been considered in respective literature being presented in Table 1, the direct practice of providing materials and services emerged from the empirical findings.

In both cases, supplier selection did not have the potential to address the paradox. The data analysis did not reveal insights that this SD tool would actively be used. The milk was tested in every transaction in the Kenyan case study. This is interpreted as evaluation and feedback, because a negative test would imply that the product would be rejected, driving the learning of the farmers. In the Ugandan fair-trade and organic SC, the actors participated in this SD if they attended training and applied the practices. Thus, active supplier selection was irrelevant. The SD practice of supplier visits was not applicable because other SD practices, such as on-site consultation and a good knowledge of the area, made them redundant. It is also notable that the SD practice of communicating and increasing suppliers' performance goals was not observed. This might be an open issue, resulting from the specific context of the case studies, where such more formal efforts did not play a role.

The cases showed that a temporal separation strategy (TS) existed in all SD practices found, except for continuous supplier monitoring and logistical integration. The temporal separation of the aspects of product market voids was predominant in both cases, while aspects of the labor market were addressed in one indirect SD practice: evaluation and feedback. Regarding the capital market void, supplier rewards was found to be the only indirect SD practice used as temporal separation strategy. In the temporal separation strategy, one diverged goal is favored over the other at different points in time (Hahn et al., 2015; Poole & Van de Ven, 1989). Some SD practices are more likely to favor economic goals, because SCs must work

**TABLE 3** Paradox resolution strategies for institutional voids via supplier development in the case studies of the dairy SC in Kenya (K) and pineapple SC in Uganda (U)

Supplier development	Institutional voids					
	Product market		Labor market		Capital market	
	K	U	K	U	K	U
Indirect supplier development						
Evaluation and feedback	TS	TS	TS	TS		
Cooperation if set objectives are attained	TS	TS				
Supplier rewards		TS				TS
Instilling competition using multiple sources	TS/SS					
Auditing and certification		TS				SS
Direct supplier development						
Providing materials and services <sup>a</sup>	TS	TS			TS	TS
Training and education	SY	TS	SY	TS		
On-site consultation	TS/SY	TS/SY	TS/SY	TS/SY		
Inviting supplier's personnel	TS/SY	TS/SY	TS/SY	TS/SY		
Continuous supplier monitoring	SY	SY	SY	SY		
Logistical integration	SY	SY			SY	
Financial assistance					TS/SY	TS/SY

Abbreviations: SC, supply chain; SS = spatial separation strategy; SY = synthesis strategy; TS = temporal separation strategy.

<sup>a</sup>Inductively identified SD practice.

efficiently before (if at all) social goals can be considered. However, all SD practices have the potential to be applied in managing different aspects or institutional voids of the BoP inclusion paradox.

The spatial separation strategy (SS) was found in only two indirect SD practices (i.e., instilling competition by using multiple sources and auditing and certification). Contrastingly, no SD practices were found to engage in a spatial separation strategy regarding the labor market void. The reason could be that the supplier base in both case studies was currently irreplaceable; thus, a structural separation was impossible. Moreover, spatial separation results in the partial disadvantage of the SC actors, thus contrasting the intention of supporting suppliers. The spatial separation strategy, in the sense of a structural separation (e.g., Bradach, 1997), is interpreted in two indirect SD practices that are used to support BoP actors. Direct SD practices cannot be interpreted as a spatial separation strategy, because these practices require the prior integration of the BoP. If actors are not included, direct SD cannot be viewed as response to the BoP inclusion paradox.

The synthesis strategy (SY) was found only in direct SD practices because direct support was necessary to overcome the institutional voids. Regarding the SD practices related to knowledge transfer, on-site consultation and inviting supplier's personnel were found to be a temporal separation and synthesis, depending on the possible effects of knowledge transfer. The synthesis strategy is applied to attain the opposing poles of the BoP inclusion paradox simultaneously (Hahn et al., 2015; Poole & Van de Ven, 1989). Social goals are attained by including BoP actors into SC, and economic goals are attained by creating efficient and formal SC structures. In categorizing the SD practices, only direct SD meets this criterion. The BoP actors have to

be actively supported for possibly reaching the goals simultaneously (e.g., Yawar & Seuring, 2018).

## 5 | DISCUSSION

This research aimed to characterize the paradoxical differences between BoP and SC actors and to demonstrate how SD practices could be applied in the BoP context as a resolution strategy for the BoP inclusion paradox. The focus is put on one aspect central to the BoP debate, that is, on how informal actors might be integrated into SC activities. This yielded three contributions that are briefly presented and discussed in sub-sections. Further, we outline the managerial contribution, limitations, and future research directions.

### 5.1 | Extending paradox research to SCs

The findings of this study extend the debate on sustainability paradoxes in corporate social responsibility (e.g., Hahn et al., 2015; Van der Byl & Slawinski, 2015) to a SC perspective by discussing SD as a strategy for managing paradoxes. We approach this by answering Van der Byl and Slawinski's (2015) call to apply an inter-organizational perspective to the study of sustainable SCs. Our research suggests adding the inter-organizational perspectives to the conceptual framing of sustainability tension in a wider context (Hahn et al., 2015; Schad & Bansal, 2018). The SC perspective on sustainability paradoxes is relevant for enhancing the discussion in the SSCM and SD literature



(Govindan et al., 2021; Zhang et al., 2021). It is the first step toward extending the focus from tensions at the organizational level to a system perspective by increasing the complexity but stay within a manageable focus, for example, to examine the international connections and institutional voids in various SC contexts (Rehman et al., 2020). The extension of sustainability paradoxes to SCs answered the call by Matthews et al. (2016) to broaden the theory of SSCM and consider new perspectives. Hence, we moved to new discussions by taking a paradox perspective in SSCM (Brix-Asala et al., 2018; Sandberg, 2017; Xiao et al., 2019). The SC paradox is raised because SC partners are needed but often impossible to choose (Putnam et al., 2016). Previous studies analyzed neither BoP SCs nor the particular practices of SD. While Xiao et al. (2019) analyzed the sensemaking of sustainability managers, the present research uses a “helicopter” perspective to demonstrate that a paradox perspective on BoP SC inclusion offers additional insights. In this study, the focus is broadened from individual actors to general ideas.

Moreover, our research goes beyond existing contributions on the drivers and barriers to SSCM and follows the call to explore the implementation process of SSCM (Govindan et al., 2021), especially in SCs with highly heterogeneous members (Sauer & Seuring, 2018). Our analysis focuses on how the implementation of SD could be used as a strategy to manage paradoxes (Hahn et al., 2015; Poole & Van de Ven, 1989). We propose not only a paradox perspective in SC research but also the investigation of SCs in BoP research. Our findings provide support that such investigations might be fruitful, which links into recent contributions that ask for cooperation among actors in BoP markets and alternative arrangements (e.g., cooperative agreements) (Gold, Chowdhury, et al., 2020; Heuer et al., 2020; Manzhynski & Figge, 2020).

## 5.2 | Paradox perspective on BoP SCs

This paper delivers a critical perspective on BoP SCs. Until now, scholars have discussed the inclusion of the BoP as “win-win” by tapping new markets (Pralhad & Hammond, 2002) including the BoP in SCs as an ethical choice or as part of SSCM (Bendul & Rosca, 2019; Khalid & Seuring, 2019). This research takes a different perspective in analyzing BoP SC inclusion as a paradoxical situation. The inclusion of BoP actors is necessary in the investigated cases because they form the major supplier base or need to be developed as such. However, there are efficiency challenges. The extreme situations of cases where there is almost no choice regarding whether to include the BoP shows that the social goals of BoP inclusion and economically efficient SCs are difficult to align simultaneously. This supports Putnam et al. (2016), who stated that a paradox situation makes it almost impossible to choose or it makes the situation irrational or absurd. Similar to Sharma and Jaiswal (2018), this research found that BoP projects are fraught with tensions. Sharma and Jaiswal (2018) focused on cognitive frames, whereas this research was aimed to determine the nature of the BoP inclusion paradox and the potential for resolution strategies to deal with it.

## 5.3 | SD practices as paradox resolution strategies

Contrary to previous studies (e.g., Yawar & Kauppi, 2018; Yawar & Seuring, 2017), which follow the dominating “win-win” logic of SD research, the present research offers a nuanced perspective. Similarly, Busse et al. (2016) critically concluded that strong barriers, which can hardly be overcome, exist in reaching sustainability with SD. This is supported by the present research, which examined SD practices as means to overcome the barriers to sustainability, such as institutional voids. However, the present findings also point to limitations because of the paradoxical relationship between buyers and suppliers in the business environment. Because the BoP and the remaining SC are too different, the institutional voids are difficult to overcome, in line with Parmigiani and Rivera-Santos (2015). The case studies revealed that illiteracy of farmers, a feature of the labor market void, affects the fulfillment of transparency requirements, as reflected in the product market void. The paradoxical relationships in the business environments of the BoP SC were not dissolved by applying SD practices such as training and education. The reason is that they also depend on the actors' acceptance and implementation of SD measures. In the critical perspective of SD adopted in this research, it cannot be automatically assumed that SD leads to sustainable SCs by reaching all sustainability goals simultaneously.

Considering the limitations and negative consequences of sustainable product certification and standards (Vermeulen, 2015), SC cooperation is a step toward reaching economic and social goals. Therefore, the BoP depends on other SC partners for alleviating and overcoming institutional voids and the BoP inclusion paradox. Paradox resolution strategies need the SC perspective. For example, the certificate is bought and supervised by the exporter, and the BoP products are included. Thus, SD can address the paradox, but it is only one means. Rivera-Santos et al. (2012) and Parmigiani and Rivera-Santos (2015) suggested that all sectors (i.e., profit, non-profit, and the public) are needed to address institutional voids, each compensating a different aspect. The study at hand supports this by analyzing the SD strategies in the case studies. Second, not all BoP actors enjoyed the SD benefits. SD originating in the profit sector are therefore not the perfect solution to institutional voids because of the power imbalance manifested in the dominant decision making based on which SD is conducted as well as who benefits from such decisions. This finding is in line with Xiao et al. (2019), who concluded that the asymmetrical power distribution causes paradoxes.

Three different paradox resolution strategies (Hahn et al., 2015) were identified in the case studies. This is in line with the theoretical framework developed in this research. The study reveals a direct SD practice (providing materials and services) that has not been considered in previous literature (see Table 1). Indirect SD practices do not have the potential to be a synthesis paradox resolution strategy. In applying indirect SD, sustainability goals can be either temporal or spatial addressed. Only direct SD measures have the potential to be interpreted as a synthesis strategy because

achieving sustainability goals requires resources from the buyer (Wagner, 2010).

Our research focused the business environment and tools of SSCM and SD, which can address paradoxes without having to resolve larger systemic problems. BoP settings differ from other SC business environments, thus requiring adjustments for some SD practices. Indirect SD had to consider institutional voids. In applying them critically, we analyzed the limitations and potentials in BoP settings. The results revealed that indirect SD practices were focused first on economic goals and then on the social goal of inclusion. However, this finding differed particularly looking at features of the fair-trade SC, regarding the following SD practices: supplier rewards, auditing and certification, and cooperation if set objectives are attained. The direct SD practices mainly offered the companies a way to deal with the situation, such as by overcoming deficits in specialized knowledge or by supplying capital. The results revealed that direct SD first considered the inclusion of the BoP and then supported it. In line with this, the literature describes indirect SD as incentives and direct SD practices as support (Wagner, 2006).

## 5.4 | Managerial contribution

The investigation of SD practices in SSCM is relevant for a complete understanding of managerial action, which is discussed next. This research was conducted to gain insights into consequences and opportunities of the inclusion of BoP in international SCs. Hahn et al. (2015) concluded that although sustainability is not without tension and paradox, conflicting demands must be faced, instead of avoided. Based on this logic, it is important to include BoP actors into formal SC structures despite of the associated complexities and challenges. This research revealed that the applications of SD can alleviate paradoxical tensions by understanding their main causes. Not only companies but also BoP actors should examine the SD practices on offer. In fact, challenges depend also on the BoP's willingness to participate in SD.

Beside SD practices, other options may handle the institutional voids in BoP markets in a SC. Such options could be in line with a spatial separation strategy. Following Parmigiani and Rivera-Santos (2015), an "alternative may be to split the supply chain stage into parts, locating the more complex operation with very high void impact thresholds outside the subsistence markets and locating the simpler activities within the market" (Parmigiani & Rivera-Santos, 2015, p. 67). This was also analyzed in the case studies. For example, exporters in the formal sector used expensive technology to take over the pineapple drying. In the Kenyan case, the change from raw to pasteurized milk decreased the BoP's value created by establishing a product requiring the formal market's resources for pasteurization. This strategy generally allows the BoP inclusion in SCs. However, the institutional voids remain if the BoP actors are left unskilled, which further manifests the BoP inclusion paradox.

## 5.5 | Limitations

The typical limitations of time- and space-dependent qualitative case studies apply also in this case. Moreover, there are two specific limitations:

First, the question of who defines a paradox might have not received the attention it deserves. The paradoxical lens might represent a limitation because the researchers identified the paradoxical tension and situation. The actors involved in this study may not perceive the situation as such. However, relying and focusing only on paradoxes that are salient and cognitively perceived by individual actors runs the risk of overlooking the underlying causes of paradoxical tensions in the wider context of sustainable development (Schad & Bansal, 2018). Therefore, we consider our approach as justifiable, especially for outlining the BoP inclusion paradox that emerges from a latent mismatch between the informal BoP environment and the formal SC environment. This research raises the paradox perspective to an abstract level, but to gain deeper insights into their perceptions, the BoP community would have needed a stronger voice. Nevertheless, this research provides a starting point for analyzing and resolving the BoP inclusion paradox.

Second, the field research in Kenya and Uganda was partly conducted with translators, who could have changed the meanings of the interview questions, potentially limiting the validity of the findings. However, during transcription, the translations were back translated by another person into English to crosscheck their accuracy. This clarified that the meanings of the interview questions were rarely altered in the translations. Instead, the translators described the questions such that the farmers were able to understand them.

## 5.6 | Future research

This study investigated the BoP inclusion paradox in agricultural food SCs. Similar studies could research other industries or geographical regions. Moreover, the BoP inclusion paradox was addressed by focusing the social goal of BoP inclusion and the economic goal of SC success, which is why the environmental aspect could be added in future studies. Moreover, formal SC intermediary organizations (Heuer et al., 2020) could be considered to bridge upcoming paradoxes of cooperation within the BoP context (also Gold, Chesney, et al., 2020; Gold, Chowdhury, et al., 2020).

## 6 | CONCLUSION

This study answers the research question of how SD practices in a BoP context could be applied as strategies to resolve paradoxes. The Kenyan dairy SC and the Ugandan certified pineapple SC were challenged by institutional voids. The analysis revealed that institutional voids caused paradoxical relationships. Paradoxes occur in environments of scarcity (Smith & Lewis, 2011), such as the BoP environment. By extending the level of analysis for sustainability



paradoxes from a merely BoP setting to a SC level, that is from an individual/organizational towards a SC level, we found that the paradoxes could be addressed via SSCM practices like SD (Yawar & Seuring, 2018), thus transforming desperate situations into manageable SCs by applying temporal separation, spatial separation, and the synthesis of contradictory goals (Hahn et al., 2015; Poole & Van de Ven, 1989). Although the findings of this research might not be fully generalizable to other sustainability paradoxes and BoP SC partners, they provide the basis for the future upscaling of SSCM practices by focal companies or other SC actors. We therefore suggest the increased collaboration, continuity, and SD practices by the actors in BoP SCs to overcome shortcomings in the BoP environment, which could lead to overcoming the BoP inclusion paradox.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ETHICS STATEMENT

The authors have complied with ethical standards in conducting the research. This covers all parts of the research process and writing of the paper. All participants gave consent to be part of the research process.

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## APPENDIX A: DETAILS ON THE CASE STUDIES

### A.1 | Within-case analysis

#### A.1.1 | Paradox perspective on the Kenyan dairy SC

In this section, the paradox perspective on the Kenyan dairy SC is discussed, including the different business environments based on the supply of the BoP actors and the demands of the SC environment (Table A1) that manifested in institutional voids. In the following, the different business environments related to institutional voids are described.

**TABLE A1** Explanation of BoP SC inclusion paradox in the Kenyan dairy supply chain

Institutional voids	Business environment	
	BoP environment (supply)	Supply chain environment (demand)
<i>Product market void</i>	Simplicity/trust based: Milk tests rely on smell and taste	Complexity/control based: Milk tests rely on laboratories
<i>Labor market void</i>	Traditional knowledge: Milk testing based on smell and taste, if available, for example, lactometer	Specialized knowledge: Milk testing and handling for pasteurizing
<i>Capital market void</i>	Resource scarcity: High perishability of milk due to lacking cooling equipment	Investment intensive: Low perishability of milk due to the use of cooling equipment

*Note: Product market void:* The BoP suppliers of milk, who were farmers and cooperatives, relied on smell, taste, and appearance to ensure the quality of the product. Because they trusted their suppliers and partners, further tests were not relevant in this BoP environment. However, the quality of the milk must be consistent for processing, and the product attributes must therefore be controlled. Therefore, laboratory tests were conducted in the SC environment, which were more complex than the test that the BoP actors applied in the raw milk SC. In the shift of the final product throughout the SC, different product attributes are required. The actors in the raw milk SC easily perceived the attributes. However, the product attributes of milk that is processed were different and could not be easily seen or monitored. The challenge was that the raw milk was obtained from the same supplier base. Therefore, it was difficult to match the SC partners with their differing business environment characteristics. *Labor market void:* The BoP business environment relies on the traditional knowledge about milk quality testing. Farmers have in-depth knowledge about the traditional ways of examining raw milk quality. Nevertheless, the demands of the processing industry are different, and it is not enough anymore to test milk quality based on smell and taste; instead, lactometers and laboratory tests are used to examine milk quality. Moreover, suitable skills are missing in the earlier stages of the dairy SC. A desperate processor said, "In Kenya it is a matter of luck to get a good employee." While this statement should be interpreted carefully, it nevertheless describes the overall challenge of finding the required work skills in the BoP population. One interviewee from a bankrupt cooperative said that their cooperative did not succeed because the chairperson never went beyond secondary school level but was in charge of the entire administration. The raw milk SC had different demands and needed different skills compared to those required in the formal processed milk SC. *Capital market void:* The lack of knowledge and resources prevented the use of other tests. This case study revealed that in the raw milk BoP SC, less equipment than in the processing SC was needed. Thus, there was a higher entrance barrier to the processing SC. The small-scale farmers lived in low external input systems; however, in order to engage in business with the formal industry, high external inputs are needed. The equipment needed to store the milk at a consistent temperature level, which was requested by the industry, was not available. The results of this case study revealed that the capital market void was connected to the product market void, such that the scarcity of financial resources did not allow for cooling equipment. Thus, the milk cooling that was necessary to ensure the standard milk quality was compromised. The lack of resources was the basic challenge in all business transactions in the Kenian BoP setting, which led to the tension in the cooperation of the different actors in the SC.

Abbreviations: BoP, base of the pyramid; SC, supply chain.

## A.1.2 | Paradox perspective on the Ugandan pineapple supply chain

**TABLE A2** The BoP SC inclusion paradox in the Ugandan pineapple supply chain

Institutional voids	Business environment	
	BoP environment (supply)	Supply chain environment (demand)
<i>Product market void</i>	Simplicity/trust based: Solar drying yields fluctuating quality of product	Complexity/control based: Machine drying used for a continuous quality of product
<i>Labor market void</i>	Low education level: Solar drying skills	Specialized knowledge workers with certificates: Machine drying skills
<i>Capital market void</i>	Resource scarcity: Dependent on natural environment, sun as major factor for drying success	Investment intensive: Machines and continuous electricity supply

*Note: Product market void:* As displayed in Table A2, the product market void was evolving because of the changing demands of the SC. The market demanded the uniform quality of dried pineapple that was preferably processed in drying machines and not in traditional solar drying methods. The latter method does not produce uniform quality because the drying process depends on the weather. Thus, the farmer and dryer could not ensure value creation although that was the initial purpose of the fair-trade dried pineapple SC. *Labor market void:* In the Ugandan pineapple-drying SC, because the buyers' demands changed, the solar drying facilities and the related handling of the product were no longer acceptable. The BoP offered knowledge about traditional solar drying, but the international market demanded standardized machine-dried pineapples. The BoP had hands-on experience, whereas the change in the product requirements required specialized knowledge. Thus, in this SC, the BoP environment was perceived as consisting of unskilled workers. *Capital market void:* A paradox perspective had evolved from the capital market void. In the Ugandan drying pineapple SC, the processors lacked the capital required to invest in modern drying facilities. The scarcity of financial resources not only slowed business growth but also decreased the ability to participate in the formal SC, where the industry processor purchased the pineapple from the farmer and pineapple dryer. After clarifying the paradox, we analyzed the data to determine how SD practices could address the BoP inclusion paradox by bridging institutional voids.

Abbreviations: BoP, base of the pyramid; SC, supply chain.



A.2 | Illustrative quotes and case description for paradox management strategies of BoP SC inclusion paradox are shown in Tables A3–A6

**TABLE A3** Analysis of temporal separation strategy for BoP SC inclusion paradox: Indirect supplier development

SD practice	Institutional void	Interpretation for paradox resolution	Case detail (quote or observation)
Evaluation and feedback	Product market	Economic before social goals: The focus is on the economic success of the whole SC, but the suppliers can be included eventually when they deliver the next time and the quality is fitting.	<p><b>Kenya: Rejection and feedback</b> Cooperative/Processor1: “When we discover that a certain farmer is the one delivering milk of compromiseable quality we first of all confront the farmer not in a negative way, but positively. We inform him about the findings because some of them have employed someone to cater for the cattle so maybe that person who milked 10 kg now sells 3 kg and then adds water so that he can get extra cash. When you notify the farmer himself, he is able to check where the problem is. So when we detect something that is not right we inform the farmer and even if he is the one that is delivering and knows this people have detected whatever I am doing, by the next day he will have changed.”</p> <p><b>Uganda: Rejection and feedback</b> Dryer3: “When you make a delivery that they assess to be substandard, they reject it on spot so it's not just about the feedback. When we deliver the products, exporting company (E2) sorts them and only take in the quality portions to be paid for and subtract the substandard quality. You shall automatically know that your produce was of poor quality.”</p>
	Labor market	Economic before social goals: The feedback can help the suppliers to improve their skills.	
Cooperation if goal attainment	Product market	Economic before social goals: Quality and consequently profitability of SC come before social inclusion.	<p><b>Kenya: Quality improvement</b> Interviewer: “After you reject certain suppliers because of the lactometer test, do the suppliers come back?” Processor1: “They come back. Most of them would follow what I tell them. Because we do not have field extension services. We are still very young. So we rely the small education that we give them here.” Observation: Supplier can always come back to deliver milk, and if quality is reached buyer will take it.</p> <p><b>Uganda: Quality improvement</b> Dryer1: “Our buyer told me that these dryers, the solar driers, are not good at hygiene. So she wants me to change to bio mass. If I change to bio mass I can continue with her and even I got an order from Belgium, they told me the same.”</p>
Supplier rewards	Capital market	Social before economic goals: First inclusion and eventually additionally economic benefits.	<p><b>Uganda: Fair trade premium</b> NGO: “There was an analysis done on the whole chain and how the premium is distributed throughout the chain. About 45% of the premium goes to the farmers and about 30% goes towards paying for the certification and about 25% is what goes to the exporter.”</p>

(Continues)

TABLE A3 (Continued)

SD practice	Institutional void	Interpretation for paradox resolution	Case detail (quote or observation)
			Dryer8: "We are Fair Trade certified and get some premium from exporting company (E2) which is used also to maintain the dryers and also a revolving fund for the farmers to buy fertilizers for their gardens."
<i>Instilling competition using multiple sources</i>	Product market	Economic before social goals: Best quality will be included; improvement can lead eventually to inclusion.	<b>Kenya: Various dairy suppliers—search for best quality</b> Cooperative2: "But they are rejecting, because they do want a lot of milk they want to screen instead of telling you not to deliver, that is their method."
<i>Auditing and certification</i>	Product market	Social before economic Certifying supplier pool and second ensuring long-term economic sales of the whole SC.	<b>Uganda: Prepaying certification by exporter</b> Observation: Exporter pays certification and makes sure farmers are trained accordingly. Eventually the certification costs are covered by the sales.
<i>Ensuring sales</i>	Product market	Social before economic goals: First inclusion as a potential supplier and the promise to keep on buying products.	<b>Uganda: Maintaining sellers</b> Exporter8: "Once we have a contract with somebody is assured that his product is going to be bought, that is a motivating factor."

Abbreviations: BoP, base of the pyramid; NGO, nongovernmental organization; SC, supply chain; SD, supplier development.

TABLE A4 Analysis of temporal separation strategy for BoP SC inclusion paradox: Direct supplier development

SD practice	Institutional void	Interpretation for paradox resolution (temporal separation)	Case detail (quote or observation)
<i>Training and education</i>	Product market	Social before economic goals: First inclusion into potential supplier pool, when training and education are fruitful later on valuable for economic success of SC.	<b>Uganda: Training and conversion period</b> Exporter8: "So you have to wait for 3 years for us to buy from you but these 3 years we keep training you when the product is growing and you are not giving any income because we do not have a market for conversion."
	Labor market	Social before economic goals: Inclusion first and training and education eventually improve skills of actors.	
<i>Providing services</i>	Product market	Social before economic goals: Ensuring the resources, which are needed for quality products and are necessary for inclusion in the SC, benefit for whole SC later on.	<b>Kenya: Access to resources</b> Cooperative/Processor1: "We also give artificial insemination services which will be deducted from their supplies. We also give the animal feeds. We have stocks." <b>Uganda: Access to resources and services</b> Exporter8: "We also give manures to the farmer, for the soil fertility. We pay for it and take it to them and this is a 2 way traffic, it benefits us because they are able to give us good quality produce and also benefit them when they get more harvest, they get more income for themselves." Dryer9: "Exporting company (E2) gives us materials but sells them to us, they sell to us the polythene bags and the wire mesh for drying the pineapples, the rest we do it ourselves."
	Capital market	Social before economic goals: Ensuring the resources, which are necessary for inclusion in the SC, benefit for whole SC later on.	



TABLE A4 (Continued)

SD practice	Institutional void	Interpretation for paradox resolution (temporal separation)	Case detail (quote or observation)
On-site consultation	Product market	Social before economic goals: First, field extension and later on economic benefits from it because product improves.	<b>Kenya: field extension</b> Observation: Field extension service is a common practice from the cooperatives and processors who send their personnel to the field to check on the milk handling practices and issues concerning dairy farming. <b>Uganda: field extension</b> Observation: Field extension service is a common practice from the exporters who send their personnel to the field to check on the quality and readiness of pineapple. They are in continuous contact with the farmers.
	Labor market	Social before economic goals: First, field extension and later on economic benefits from it because actors improve skills and consequently product characteristics.	
Inviting of supplier's personnel	Product market	Social before economic goals: First inclusion into SC and through visits the farmers improve production and economic output in long term.	<b>Kenya: Information exchange with other farmers/actors of the SC</b> Observation: Farmers are sponsored to visit other farmer groups, or demonstrations farms are built as education centers. Cooperative/Processor3: "Like recently we were to Thika. We had taken our farmers to Thika to learn more about dairy farming." Cooperative/Processor2: "We organise field days and member education tours, those companies like Unga, Osho they support us, they sponsor the field days, they sponsor farm visits like we are planning." <b>Uganda: Information exchange with other farmers/actors of the SC</b> Cooperative/Processor6: "We establish demonstrations for them to learn, we also train them in the agronomy, management, in marketing process, in all the processes that are required for the farmer to benefit from that particular enterprise."
	Labor market	Social before economic goals: First, inviting of supplier's personnel and later on economic benefits from it because actors improve skills and consequently product characteristics.	

Abbreviations: BoP, base of the pyramid; SC, supply chain; SD, supplier development.

TABLE A5 Analysis of spatial separation strategy for BoP SC inclusion paradox: Indirect supplier development

SD practice	Institutional void	Interpretation for paradox resolution	Case detail (quote or observation)
Instilling competition using multiple sources	Product market	Economic and social goals distributed over SC Inclusion of BoP who fits best and thus is best for economic output.	<b>Kenya: Various dairy suppliers—search for best quality</b> Cooperative2: "But they are rejecting, because they do want a lot of milk they want to screen instead of telling you not to deliver, that is their method."
Auditing and certification	Capital market	Economic and social goals distributed over SC Inclusion of BoP into the whole SC, but certification, which is key for the economic success, belongs to exporter. Social and economic goals are with two different actor of the chain.	<b>Uganda: Certification ownership</b> Farmer1: "But since the funds are not mine, all the facilitation does for them [E8], does by them so when we complete the trainings then at the end of the day, they remain with the certificates. [The exporter] came and did the whole program but at the end of the day she went with the certificate."

Abbreviations: BoP, base of the pyramid; SC, supply chain; SD, supplier development.

**TABLE A6** Analysis of synthesis strategy for BoP SC inclusion paradox: Direct supplier development

SD practice	Institutional void	Interpretation for paradox resolution (temporal separation)	Case detail (quote or observation)
Training and education	Product market	Reaching economic and social goals simultaneously: Ongoing training and education, so that farmers can remain part of the SC, because SD fosters product quality improvements.	<b>Kenya: Training on milk handling</b> Processor1: "Because we do not have field extension services. We are still very young. So we rely the small education that we give them here. I actually give them a small kind of education." Observation: Training on milk handling, hygiene standards, process upgrading by government, NGO or buyer.
	Labor market	Reaching economic and social goals simultaneously: Ongoing training and education, so that farmers can remain part of the SC, because SD fosters upgrading of skills.	
Continuous supplier monitoring	Product market	Reaching economic and social goals simultaneously: Inclusion but success only when practices are according to standards.	<b>Kenya: Regularly milk quality tests and feedback</b> Observation: Upon ever delivery milk quality test are undertaken by the processors <b>Uganda: Checking compliance</b> Exporter4: "And now that I have a field buyer who is going to go out there from here to buy the fruits directly, he has been trained to also look for signals as to whether or not a farmer is violating. Like if he sees a weedy patch and all of the sudden sees a round yellow patch, then he knows that they have been spraying. So he has got to also be conscious. Every time we go out there ..."
	Labor market	Reaching economic and social goals simultaneously: Inclusion but success only when practices are according to standards; monitoring can improve skills.	
On-site consultation	Product market	Reaching economic and social goals simultaneously: Ongoing consultation, so that farmers can remain part of the SC. (depending on the topic of consulting/education success immediately)	<b>Kenya: Extension services</b> Observation: Field extension service is a common practice from the cooperatives and processors who send their personnel to the field to check on the milk handling practices and issues concerning dairy farming. <b>Uganda: Extension services</b> Exporter5: "Also a business has an extension work, who goes to the farmers, to advise them. We talk to them, we mobilize them, we sensitize them, we always teach them, we always do not get tired, we remind them of what to do because the moment you forget to do that, you go back after 2 weeks, they have not done what you want."
	Labor market	Reaching economic and social goals simultaneously: Ongoing consultation, so that farmers can remain part of the SC. (depending on the topic of consulting/education success immediately)	
Inviting of supplier's personnel	Product market	Reaching economic and social goals simultaneously: Ongoing exchange of personnel, so that farmers can remain part of the SC. (depending on the topic of consulting/education success immediately)	<b>Kenya: Information exchange with other farmers/actors of the SC</b> Observation: Farmers are sponsored to visit other farmer groups, or demonstrations farms are built as education centers. Cooperative/Processor3: "Like recently we were to Thika. We had taken our farmers to Thika to learn more about dairy farming." Cooperative/Processor2: "We organise field days and member education tours, those companies like Unga, Osho they support us, they sponsor the field days, they sponsor farm visits like we are planning." <b>Uganda: Information exchange with other farmers/actors of the SC</b> Cooperative/Processor6: "We establish demonstrations for them to learn, we also train them in the agronomy, management, in marketing process, in all the processes that are required for the farmer to benefit from that particular enterprise"
	Capital market	Reaching economic and social goals simultaneously: Ongoing exchange of personnel, so that farmers can remain part of the SC. (depending on the topic of consulting/education success immediately)	





TABLE A6 (Continued)

SD practice	Institutional void	Interpretation for paradox resolution (temporal separation)	Case detail (quote or observation)
<i>Logistical integration</i>	Product market	Reaching economic and social goals simultaneously: Inclusion while ensuring product characteristics early for economic success of SC.	<p><b>Kenya: Milk cooling</b> (product and capital market void)</p> <p>Processor1: “I procure my milk directly from the farmers. I have a transporter, a big lorry that usually carry milk from the farm to this destination. Immediately I receive the milk, this is a cooling tank if I want to pasteurize I do it.”</p> <p><b>Uganda: Origin control</b> (product market void)</p> <p>Exporter4: “We do not have collection centers, because we cannot guarantee the origin then. Because when we pick up fruit, we are actually cutting the pineapple off the plants. Because we cannot guarantee that they have not picked them up from their neighbors.”</p>
	Capital market	Reaching economic and social goals simultaneously: Inclusion while ensuring product characteristics via investments in infrastructure for economic success of SC.	
<i>Financial assistance</i>	Capital market	Reaching economic and social goals simultaneously: Inclusion and with credits farmers can improve in long term, which beneficial for whole SC.	<p><b>Kenya: Credits</b></p> <p>Cooperative/Processor3: “We also have a store, when members want feeds we give them on credit.”</p> <p><b>Uganda: Credits</b></p> <p>Exporter5: “We give interest free loans to farmers. Like if you get 5,000 UGS, he has to pay back 5,000 UGS, as he delivers his produce to us but with no interest at all.”</p>

Abbreviations: BoP, base of the pyramid; NGO, nongovernmental organization; SC, supply chain; SD, supplier development.