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Is Co-Creation Always Sustainable? Empirical Exploration of Co-Creation Patterns, Practices, and Outcomes in Bottom of the Pyramid Markets

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Abstract: Co-creation with the population at the Bottom of the Pyramid (BOP) was identified as pivotal for realizing the full potential of the BOP proposition, simultaneously creating economic value for companies in BOP markets, as well as social value for the individuals residing in them. However, research on co-creation and its outcomes has remained predominantly simplistic, often assuming that introducing any form of co-creation in company operations will lead to increased social value and economic gains. A more nuanced exploration of the different ways in which companies operationalize the principle of co-creation across their supply-chain and whether these indeed facilitate such a clear win-win scenario for both parties, remains relatively scarce. In this paper we address this gap and delve into the supply chains of 135 micro, small, and medium sized ventures operating in BOP markets. We identify four overarching patterns of co-creation and ten categories of specific practices used to achieve them, and ultimately show how these patterns facilitate very different levels of social sustainability and economic benefits across the supply chain.

Keywords: sustainable development; inclusive development; sustainability; sustainable supply chain management; base of the pyramid; co-creation

1. Introduction

Markets at the Bottom of the Pyramid (BOP) span geographic borders, and their population ranges from farmers, to day-laborers, and even bonded-labor. BOP markets are often defined through the daily income of their population, which can be as low as 1 United States Dollars (USD) for people living in extreme poverty, and up to 5 USD for those living on a low-income [1]. The widespread farmer suicides in India are a sobering example for what these figures mean in practice for people living in poverty. Carleton [2] found that a one-degree Celsius increase in temperature leads to 70 more farmer suicides, annually. This characteristic vulnerability of the people living at the BOP to fluctuations in external conditions makes it crucial for companies in these markets to not stop at simply reducing the "unsustainability" of their practices, but actively design them for creating sustainable value. To do so, scholars such as Bocken and colleagues argue that companies need to rethink their value proposition, but also how it is created and delivered [3]. Indeed, the importance of addressing company supply chains (SC) when tackling sustainability concerns is widely established [4–8]. However, research on sustainable supply chains (SSC) remains predominantly focused on environmental dimensions [8,9], with one such example being the growing literature base on the circular economy model and SC implementations necessary for achieving it [8]. Significantly less is known about potential models for creation of socially responsible SCs and how such models can be achieved in practice [5,8,10,11].

Co-creation is considered a particularly powerful principle for achieving socially responsible SCs in BOP markets [11,12] and can be broadly understood as an "interaction that integrates different partners' knowledge and capabilities" [13] (p. 419). Though co-creation can take place with a wide variety of stakeholders, co-creation with the BOP population itself is thought to have the greatest potential for achieving deep social sustainability [13], with an increasing number of companies finding "[...] mutually beneficial ways of engaging the people at the BOP not just as consumers but as co-creators of value – as suppliers, distributors, partners and employees" [14] (p. 365). By doing so, companies are thought to be able to simultaneously generate both social value for the BOP individuals and economic gains for themselves [10,13–16]. Companies stand to gain crucial consumer and market insights [17,18], while at the same time increasing the income of individuals at the BOP, which is considered crucial for poverty alleviation [15,19]. Thus, co-creation has become "a central tenet of "second generation" BOP strategies that seek to create a fortune with rather than at the BOP" [13] (p.1).

However, research increasingly questions whether co-creation with the BOP will always lead to increased social value, arguing that existing literature on co-creation's outcomes remains too simplistic and overly positive [12]. Additionally, researchers increasingly question whether co-creation is always economically indispensable for companies to succeed in BOP markets, and urge future research to consider the necessity of specific co-creation practices, rather than view co-creation as a "one-size fits all" solution [13,20]. A nuanced understanding of both how the co-creation model can be operationalized, as well as a deeper understanding of its social impact and economic necessity for companies operating at the BOP, is still missing. The purpose of this paper is to address this critical void by exploring, describing, and categorizing practices of co-creation with the BOP across the SC and providing a more nuanced understanding of their subsequent outcomes. More specifically, this paper builds on the existing research on sustainable development and co-creation [13,15,19,21] and sustainable supply chains [10–12,22] in BOP markets and aims to answer the following research question: How can companies operationalize co-creation across their different supply chain stages, and how does this facilitate different depths of social and economic value?

To answer this question, we utilize a multiple case study approach and build a robust case study database of 135 ventures providing clean energy, safe water, and sanitation, as well as sustainable agriculture solutions in BOP markets. We conducted bottom-up, thematic pattern derivation of the co-creation activities across the ventures' procurement, production, and distribution processes, resulting in four overarching patterns for co-creation, ten specific categories of co-creation practices used to achieve them, as well as numerous examples of specific implementations upstream and downstream of the SC. In addition to shedding light on the operationalization of co-creation, for each pattern we outline the social value incurred for the BOP individuals and economic necessity of such co-creation for the companies themselves. We find that the longstanding conceptual claim that any form of co-creation inherently results in social and economic value for both parties is indeed too simplistic. Instead, we show the diversity of co-creation's subsequent sustainability implications. Some of the identified patterns were found to be economically necessary for companies but insignificant from a social value perspective for the BOP individuals, or even contributing to the reinforcement of existing social inequalities, while other patterns resulted in significantly increased social value, though were not necessary from an economic standpoint, and even highly costly.

The rest of the paper is structured as follows: In the following section, we provide a brief overview of the literature on co-creation and its operationalization at the BOP, and then outline existing knowledge on the relationship between co-creation at the BOP and social and economic outcomes. In Section 3 we describe our chosen research design, and in Section 4, we proceed to describe its results. In Section 5 we further discuss our results, derive managerial implications, outline the limitations of our research, and provide avenues for future research.

2. Literature Review

In the following section we briefly introduce the roots of co-creation in broader literature and then specifically its operationalization in BOP contexts, and then delve deeper into existing work on the necessity of co-creation for economic performance of companies at the BOP and social value creation for its population.

2.1. Co-Creation and its Operationalization in BOP Markets

The principle of co-creation is considered vital for successfully addressing social aspects of sustainable development [15,23]. Khalid et al. note that in order "[. . .] to achieve the objective of sustainable development in the long run and create win-win scenarios, all stakeholders have to work together for co-creation of workable solutions for challenges faced by the poor at large [. . . .]" [12] (p.692). In its essence, the co-creation principle involves a paradigm shift away from the traditional conceptualization of value creation as constrained within company boundaries, and instead a focus on value-creation as found in consumer-company interactions [24]. Prahalad and Ramawamy note that "Co-creation puts the spotlight squarely on consumer-company interaction as the locus of value creation" [24] (p. 10). Others have since viewed co-creation more broadly, as company interaction with multiple stakeholders that are not necessarily only its potential customers [25,26].

In BOP markets, co-creation with BOP individuals takes on additional difficulties. In theory, individuals at the BOP are "Connected and informed customers [who] are aware, curious and knowledgeable. They desire to express their feelings, experiences, knowledge and skills about products, product development and their stake in the value network" [27] (p. 415). However, in practice, companies face a multitude of challenges when engaging in co-creation with the BOP [17]. In fact, in these markets, co-creation can be particularly complex and more difficult to successfully put to practice than in developed markets [13,28,29], because the participants of such co-creation come "[. . .] from different cultures, institutional contexts, educational conditions, and material circumstances" [13] (p. 419). Hall and Matos [4] explore the difficulties companies in the agriculture industry faced when engaging with BOP farmers, and note that the companies failed to develop the personal connection that is valued by individuals at the BOP [30], who in turn remained highly suspicious of the companies' intentions. A similar challenge was noted by Simanis and Hart, in the context of Hindustan Unilever's Shakti distribution program, who describe the issues that arose when the company operationalized co-creation with a persistently strong top-down mindset [31]. Bharti et al. identify 27 factors that drive BOP individuals in India to engage in co-creation with firms, such as convenience of the interaction's location and the opinion of influential members in the community [27]. In addition to lack of trust from the perspective of the BOP individuals, successfully engaging in co-creation with the BOP also involves overcoming possible lack of trust from the firms themselves. Such hesitance or suspicion often relate to the companies' intellectual property rights and the issues stemming from limited reach of formal regulatory bodies when it comes to settling such disputes in BOP markets [32]. Lastly, in order to operationalize co-creation, issues relating to information asymmetries in BOP markets should be addressed. For example, Dey et al. show how mobile telephony can facilitate co-creation with farmers in Bangladesh, and help companies mitigate the high effort needed to overcome the challenge of information asymmetry that affects co-creation [28]. In keeping with the numerous challenges companies face when implementing co-creation in their SC, research is increasingly calling for a more detailed understanding of how co-creation takes place (see Table 1), with relatively little empirical research investigating how co-creation with the BOP is operationalized across the SC.

Table 1. Illustrative Quotes for Gap on Operationalization of the Co-Creation Principle.

Gap.	Selected Examples of Concerns Raised in Literature
Nuanced understanding of the operationalization of the co-creation principle: i.e., how can companies co-create with the BOP in practice?	"[. . .] there is a need to examine how these [co-creation] programs are operationalized so that we can gain a deeper understanding about the impact of these programs on the society at large" [10] (p. 9). "Unfortunately, there are to date no empirical BOP studies that focus on cocreation, and we know little about the processes or methods of cocreation at the BOP" [13] (p. 427). "Thus, while the recent discourse on social exclusion and BOP has identified participation of impoverished communities within modern supply chains as a solution to poverty, little is known about how this can occur" [4] (p. 127).

2.2. Social Value and Economic Necessity of Co-Creation at the BOP

Despite the complexity of operationalizing co-creation in BOP markets, it is often considered necessary for companies wishing to succeed in these challenging environments. In BOP markets in particular, the more traditional conceptualization of value creation as carried out solely by a focal company is thought of as nearly impossible, as the challenges companies face at the BOP often prove too difficult to be overcome by a single stakeholder; "No firm can do this [succeed in BOP markets] alone [. . .]" [33] (p. 6). Co-creating with the BOP is thought of as necessary for bringing different degrees of technical know-how, local understanding, production capacities, financial resources, sales and marketing insights, and other resources in order to solve the complexed challenges this market holds [33].

The importance of co-creation with the BOP for the creation of social value was introduced by BOP researchers who were critical of the traditional BOP approach, which originally viewed the BOP as passive consumers [33]. Proponents of co-creating with the BOP questioned whether a purely consumerist approach can truly address a complex phenomenon such as poverty [15]. Many authors [19,30,31,34,35] have echoed these concerns since. Through engaging the BOP actively within various company activities, as suppliers, producers, and distributors, companies can better tackle the more structural roots of poverty, empowering the individuals at the BOP who would have otherwise "lack[ed] financial means to become independent entrepreneurs" [10] (p. 3), as well as generate jobs and thus increase the income of individuals [10,15,16]. Additionally, co-creation is thought to "ensure that the needs of vulnerable stakeholders are always represented" [36] (p. 510). Currently, "Cocreation has become a central tenet of "second generation" BOP strategies that seek to create a fortune with rather than at the BOP" [13] (p.1).

In addition to the social value created, co-creation with the BOP individuals is considered as crucial from an economic perspective, and key for helping companies at the BOP overcome the complex challenges these markets hold. Two examples of such key challenges are the BOP market's informal economy and gaps in the supply chain [30]. First, the informal economy prevalent in BOP markets essentially means that transactions are primarily grounded on social and not legal contracts [30] and are not regulated by formal bodies. The lack of competent formal institutions in place to mitigate the issues resulting from companies transacting with outside parties can be a great deterrence for companies thinking to enter the market, as they could result in lack of dispute resolution mechanisms, and issues such as corruption and infringement of property rights. Co-creation with BOP individuals can mitigate such issues, by enabling companies to build and strengthen their social contracts with BOP stakeholders in their target market instead [17,37,38]. Hart and London [39] (p. 34) in particular note that "Successfully operating in this space [BOP markets] requires a capability to understand and appreciate the benefits of the existing social infrastructure, not complain about its lack of Western-style institutions". A second example is the often poorly developed educational, legal, political, and business systems at the BOP [40], which cause significant gaps in companies' value chains. Services such as electricity, water supply, and support activities like financing distribution or information infrastructure

are lacking or missing altogether [40]. Co-creating with the BOP can help companies overcome such operational challenges, as while these challenges are unfamiliar to the company, they are highly familiar to the BOP individuals, who are "[. . .] masters in maneuvering their operating environment" [13] (p. 421). Lastly, by co-creating with the BOP, companies discover new opportunities that they would have not been able to detect otherwise [39].

However, despite the initial understanding on the simultaneous and complementary social-economic value created through co-creation, research on the topic is increasingly scrutinizing this win-win assumption and calls emerge for more nuanced understanding of co-creation and its sustainability outcomes (see Table 2). On the one hand, when scrutinizing the social impact created by co-creation, a growing body of research doubts whether all forms of co-creation can empower individuals, and opine that an increase in income does not necessarily address the structural roots of poverty either [19]. Scholars are increasingly referring to the seminal work on poverty and capabilities by Sen [41] and arguing that it is the development of capabilities at the BOP that leads to empowerment and subsequent poverty eradication, and not just an income increase [19], but this development of capabilities is not necessarily present in all instances of co-creation with the BOP. Additionally, research thus far has referred to BOP individuals as providers of intellectual property [42,43], noting that the vast reservoirs of tacit knowledge they possess should be harnessed by companies for both economic gain and in order to connect these individuals to global knowledge networks. This has been framed as resulting in mainly positive outcomes for the BOP individuals. For example, Shivarajan and Srinivasan [42] (p. 381), note that "Providing the poor access to global knowledge networks as rightful participants—as suppliers of intellectual property—leads to poverty alleviation as a result of their increased social inclusion, not only through economic benefits, but also through the poor's improved well-being as a result of their increased self-esteem and dignity". However, development-oriented researchers such as Meagher [37] or Pansera [44], argue that such aspects of co-creation are exploitative in nature, as the economic benefits of the exchange are not shared fairly amongst its participants.

Table 2. Illustrative Quotes for Gap on Outcomes of Co-Creation.

Gap.	Selected Examples of Concerns Raised in Literature
Deeper understanding of the social impact and economic necessity of co-creation: i.e., does co-creation always facilitate increased social and economic value for both parties?	"[. . .] when it comes to business implementation strategy, there is a myopic focus on the consumer engagement process. Going native, immersing oneself in the local culture and social structure, building trust through dialogue and mutual exchange, and then co-creating the offering in close partnership with BOP consumers are presented as virtual cure-alls to the business challenge of BOP markets" [20] (p.84). "While consumer engagement is, without question, a valuable tool for addressing certain business challenges, the field's captivation with co-creation is distracting companies from the key issues that impact success" [20] (p.87). "[. . .] yet there remain major problems with these wider participatory schemes [. . . .] such social concerns are emerging as the key challenge in sustainable supply chains, yet remain poorly understood" [4] (p. 125). "Moreover, trade-offs between cost effectiveness and impact provide further evidence for the difficulties encountered by firms to include BoP in supply chains as active economic value creators" [36] (p. 509). "Since significant firm investments are required to engage BOP consumers in value chain activities, it is essential to examine the potential value of BOP consumer integration" [17] (p. 163).

From an economic value perspective, scholars are also increasingly critical of co-creation [45,46], arguing that research should refrain from suggesting it as a "virtual cure-all" [20] (p. 84) to all operational challenges at the BOP, and arguing that it "has taken on excessive emphasis as a "onesize- fits-all" recommendation, but is actually rare and not worthwhile in all industries, business environments, or societies" [13] (p. 417). Instead of assuming a win-win relationship, there is a need to better understand

how to balance economic and social dimensions, and in particular better understand the trade-offs between difficulties and cost effectiveness of co-creation and the social impact it would catalyses [36]. In similar vein, Tang [10] asks "What is the "right" supply chain that can truly balance the social welfare of the poor and the supply chain efficiency?" [10] (p. 8)

2.3. Research Gap

In the previous section we have outlined how co-creation has become an integral part of the win-win narrative that has shaped BOP debates [11–13,21,30]. Co-creating with BOP individuals in particular has been heralded as a useful tool for simultaneously achieving both a deep social impact [13,21], as well as contributing to the companies' financial success [9,11,20]. However, existing research also calls for a more nuanced understanding of how the principle of co-creation can be operationalized in the complex operational environment at the BOP, as well as a deeper and more guarded understanding of the social value it facilitates for BOP individuals and its economic necessity for the companies themselves. Taking a SC approach can be particularly relevant for bridging the operationalization of different co-creation configurations and the depth of their subsequent impact [12,17]. Khalid et al. articulate this particular opportunity and write that "BoP-related research often takes a too simplistic and positive turn on related corporate activities, and thus a more detailed analysis of such integration activities [of BOP individuals within the SC] would be required. This would be an opportunity for SCM [supply-chain management] researchers to address this gap in research and thereby contribute to SSCM-related [sustainable supply-chain management] research, which is rarely based on empirical data from BoP-related research" [12] (p. 692).

3. Materials and Methods

The purpose of this paper is to address this gap and provide a more in depth, empirical exploration of co-creation with the BOP within different SC stages, and the social and economic value it catalyzes. To do so, we drew on insights from the SC practices of 135 micro, small, and medium sized BOP ventures that target important grievances in their respective markets, such as provision of clean electricity, clean drinking water, safe sanitation, and increased food security. The decision to exclude multinational corporations (MNCs) from this particular study and focus on micro, small, and medium sized, BOP ventures stemmed from the growing work emphasizing the significant role the latter play in driving sustainable development [17,22,30,47]. Our understanding of what defines a BOP venture followed the categorization of London [48], who characterized two main types of BOP ventures; those that connect nonlocal products or services to individuals in BOP markets as well as those that connect goods or services made in the BOP market to non-BOP markets in their country or abroad. For both categories, he stressed the importance of a BOP venture being "catalyzed by external participation and co-created with those at the BoP" [48] (p. 5). In our final sample, we included both BOP ventures that targeted individuals at the BOP as consumers (56%), as well as those that did not (44%), but ensured that for all ventures co-creation with the BOP occurred in at least one stage of the SC.

As our aim was not to assess the prevalence of companies practicing integration in BOP markets, but rather understand how such co-creation was operationalized and its outcomes in ventures that do so, and do so well, we decided for a best-practice oriented case-selection. The compiling of initial cases was of initiatives that have already been proven successful or innovative by winning the prestigious "SEED" award [49], jointly founded by several prominent institutes to identify outstanding ventures that actively target sustainability concerns at the BOP. Publically available descriptive data on each venture was compiled from the award website using a self-developed web-crawler, including the year it was founded, product offering, geographic market, and industry. In keeping with suggestions of Yin on database creation and maintaining a chain of evidence [50], this initial data was aggregated, cleaned, standardized, and inputted into a systematic and robust case-study protocol in Excel, initially consisting of 213 cases. Then, secondary data collection was carried out manually and independently by two coders, on the processes each venture employs at each stage of its SC (Procurement, Production,

Sales and Distribution). This included extensive and meticulous data collection from a wide-range of secondary sources, with multiple sources per venture for most ventures, as well as different data types, both video and text. For most ventures, sources included a combination of financial reports, news articles, official social-media presence, as well as videos of interviews by founders or key employees in each company in reputable news sources or from the ventures' own (official) online outlets. By doing so, we aimed to ensure the highest levels of data triangulation, despite the limitations of relying on secondary rather than primary data. Additionally, in order to further facilitate transparency and replicability of our findings, we include the full list of venture names, as well as the number and type of sources that were used for each case (see Appendix A).

At this stage, we began the processes of excluding cases. First, ventures for which an insufficient amount of information on SC practices could be found were excluded. Then, for each remaining venture, the coders marked a binary yes/no for whether co-creation with BOP individuals takes place. Ventures for which proof of co-creation could not be found in at least one stage of the SC were removed from this study. This process resulted in a final database of 135 front-running BOP ventures that were included for subsequent analysis, operating across 29 countries and in 3 key industries; agriculture, energy provision, and waste and sanitation. The cases are distributed across two decades, but with a strong focus on more recently established ventures, with 82% of ventures founded after 2008 (see Figure 1).

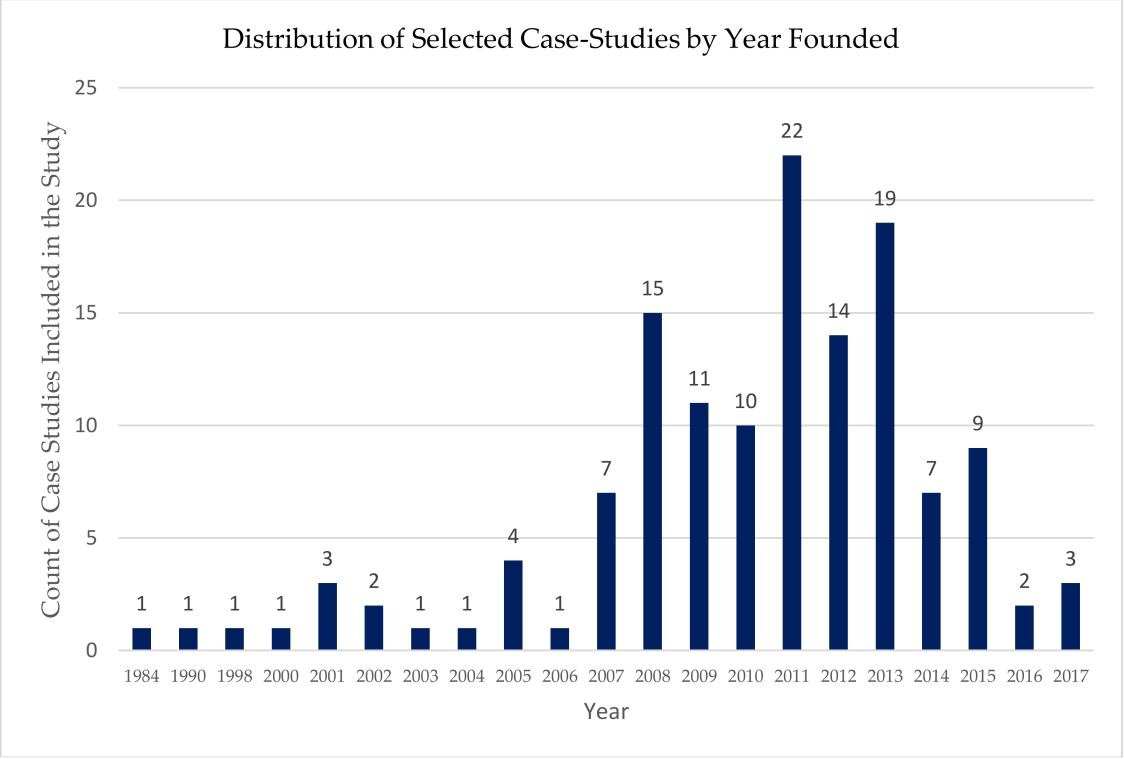


Figure 1. Distribution of Cases by Year Established.

Additionally, the final case-study sample has a strong geographic focus on the African continent (see Figure 2), which could limit the potential generalizability of the findings. It corresponds nonetheless to calls by researchers to provide more empirical work in the context of the BOP in Africa, due to the under-representation of African countries in research on BOP market approaches, in comparison to, for example, the Indian sub-continent [17,51].

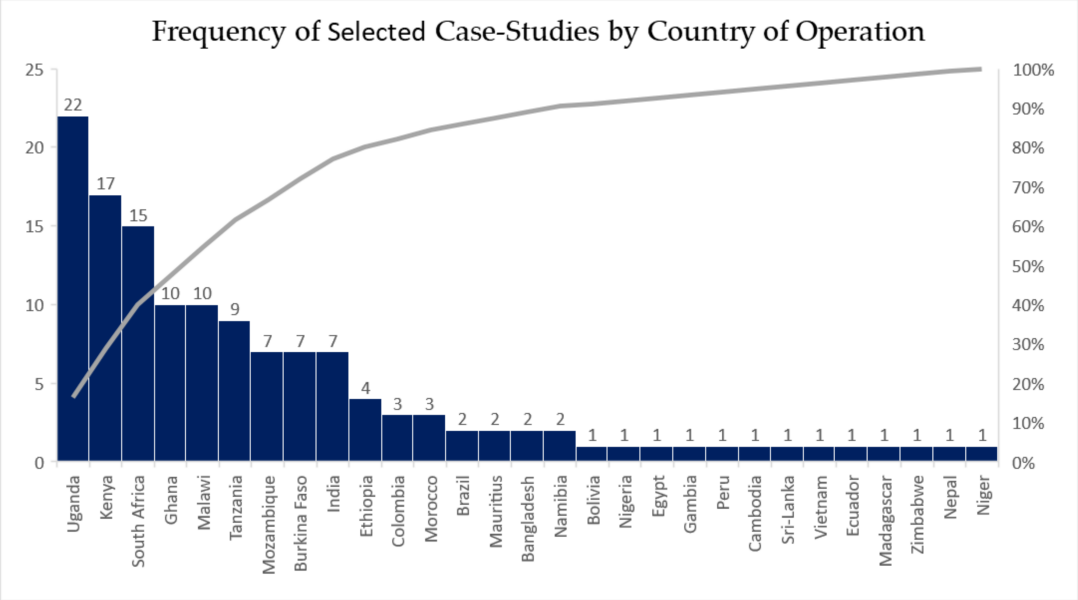


Figure 2. Distribution of Cases by Country of Operation.

For the analysis of the collected data, we utilized a bottom-up coding approach, which is particularly useful for uncovering emerging themes in the data [22]. Bottom-up thematic pattern derivation of co-creation activities was conducted, deriving codes iteratively as needed from the ventures and aggregating them into second- and first-order patterns. For example, "Community members are trained to become green ambassadors" (from the venture Belle Verte Ltée), correlates to the code "ambassadors", and along with other codes such as "community elders", "word of mouth", or "demonstrations", was aggregated into a second order pattern of "legitimization". Both "legitimization" and another second-order pattern of "localization" practices were aggregated to the first order co-creation pattern "BOP as a marketing gateway to local communities". This multi-level coding provides information on high-level co-creation patterns as well as the supply chain practices companies employ for their operationalization, thus helping to bridge the operationalization of co-creation, into both high-level models and specific practices. For a more detailed overview of the thematic categorization and example codes, please refer to Table 3. Lastly, a quantitative visualization was carried out to identify the relationship between the overarching patterns of co-creation and the various stages in the SC (Figure 3), as well as the more specific, granular practices and their presence in different SC stages (Figure 4). First, we cumulated all instances of ventures according the discovered practices, and then these absolute figures were made relative to the total number of ventures co-creating in each SC stage, in order to facilitates a more accurate comparison between the different practices. For example, out of 135 ventures studied, 86 co-created with the BOP in their procurement processes, 82 in their production processes, and 57 in their distribution. The practice of "Formalization" (see Table 3) was identified in the procurement processes of 17 ventures, in the production processes of 53 ventures, and in the distribution processes of only 7 ventures. Correspondingly, in Figure 2, Formalization is noted as prevalent in 19.77% of ventures co-creating in procurement, 64.63% of ventures co-creating in production and only 12.23% of ventures co-creating in distribution. In essence, we were interested in understanding how many of the ventures that co-create with the BOP individuals in their distribution utilized formalization practices, how many utilized ownership and agency, and how many incorporated fringe stakeholders. These were then combined into higher order aggregation by co-creation patterns, in this case of "Companies as facilitators of more structural social value for local communities", whereby any venture that exhibited either one of the three practices would be considered as employing the corresponding overall co-creation pattern (see Figure 3).

Table 3. Coding Co-creation with the BOP.

Example Codes	Second Order Categories: Supply Chain Practices	First Order Categories: Co-Creation Pattern
elder/community elders/business owner/shop owner/existing businesses/church/word of mouth/leaders/demonstrations/graduates/dialogue/ambassadors	Legitimization	BOP as marketing gateway to local communities
locally procure/indigenous/traditional/artisanal/local production/locally produce/local skills/artisan/mason/crafts/artisans/time-honored techniques/door to door/hyper-local	Localization	
Local sales-agent/micro-entrepreneur/village level entrepreneurs/commission-based/indirect employment/micro-franchisee/franchise/additional source of income/micro-entrepreneurs/collectors/part-time/indirect jobs/additional source of income	Creating Access	BOP as capacity builders
peer group/bulk/centralization/aggregation/centralized demand/drop-off points/collection-points/women group/youth group/pool resources/self-managed groups/community groups/self-organizing/collection yards/collection centers/savings groups	Aggregation	
monitor/guide/mentor/support/consult/guide/train/develop/know-how	Training and Support	
certification/provide inputs/provide land/micro credit/micro loans/micro-finance/low-interest/no interest/loans/micro-savings/social lending/health insurance/scholarships/on site housing/market linkages/on-site childcare	Provision of Tools or Assets	Companies as providers of additional social value for individuals
fair prices/premium prices/fair market value/above market value/above market wage/export/premium quality/high quality/gourmet/niche/organic/export/niche/premium/upcycling/tourist/boutique/organic	Provision of Economic Premium	
local employees/full-time employees/direct employment/regular income/directly employed/formalized/full-employment	Formalization	Companies as facilitators of more structural social value for local community
independently-owned/women-owned/ micro-business/micro-cooperatives/cooperatives/community-owned/local-ownership/ women-owned/woman-led/cooperative	Ownership and Agency	
unemployed/youth/marginalized/mothers/school-dropouts/seasonal workers/disadvantaged/vulnerable/illiterate/disabled/refugees/ex-combatants/ HIV/mothers/marginalized/disabilities/underprivileged	Focus on Fringe Stakeholders	

4. Results

Generally, we found that ventures co-creating with BOP individuals do so within their upstream processes, with 64% (n = 86) of all ventures co-creating with the BOP in their procurement processes and 61% (n = 82) in their production. Co-creation is also done in ventures' distribution, though to a lesser degree, with 42% of ventures co-creating downstream (n = 57). Interestingly, ventures tend to focus on either upstream or downstream processes, with only 13% (n = 17) of ventures co-creating with BOP individuals in all SC stages. In following subsections, we present the four co-creation patterns distilled from the previously elaborated upon research design (see Figure 3), explaining both how they are operationalized across the SC (see Figure 4), as well as the social and economic value in which they result.

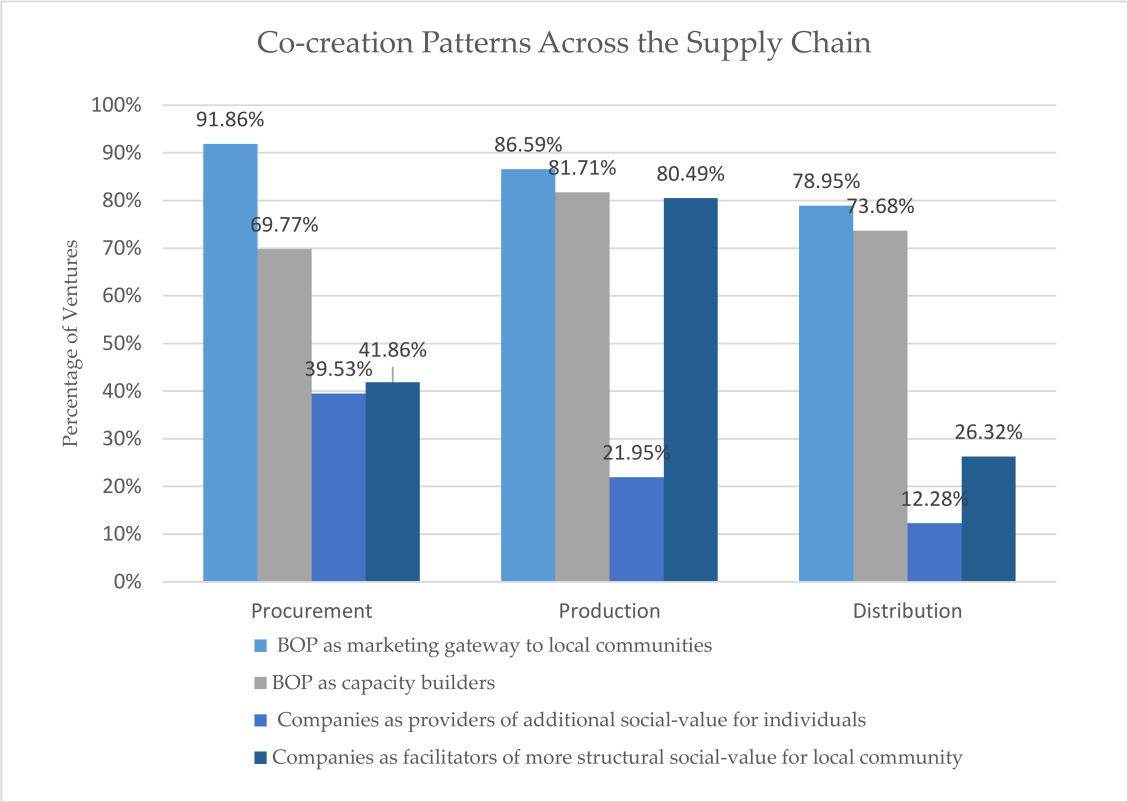


Figure 3. Overview of Ventures' Co-Creation Patterns Across the Supply Chain. BOP, Bottom of the Pyramid.

4.1. BOP as a Marketing Gateway to Local Communities

In this co-creation pattern, ventures engage with the BOP in order to gain recognition and trust of the local communities, as well as gain access to their resources and know-how. This pattern was used consistently by a dominant majority of companies, across their entire SC (in 92% of ventures that co-create with the BOP in procurement, 87% in production, and 79% in distribution), and was operationalized through two main practices; creating legitimization, and ensuring localization. Legitimization involves a focus on creating awareness and gaining trust within local communities, of the the venture itself and the cause it works towards, or its specific products. Companies engage in dialogue with key figures of high social-standing in the community, such as village elders or the local doctor and teacher, or ensure participation in campaigns. Alternatively, companies work with established businesses in the community to achieve similar social acceptance. Lastly, some companies focus on creating "brand ambassadors", training BOP individuals as spokesmen for the venture and its cause, and generating word of mouth interest. For example, the venture Days for Girls Uganda

focuses on "[. . .] training of locals to become ambassadors for women's health and hygiene services, providing both products and vital health knowledge at the community level". Localization involves both physical localization of the company in the local market, as well as tapping into and capitalizing on local knowledge and traditions. This can range from co-creating with individuals in order to gain access to local inputs such as agriculture produce in procurement processes, co-creating in order to gain access to and incorporate the local, traditional manufacturing techniques in production processes, as well as co-creating to ensure a greater access depth in the final product's distribution, for example to every household in the local community.

From an economic perspective, BOP as a marketing gateway to local communities appears to be a highly necessary co-creation pattern for companies. Legitimization is crucial for penetrating BOP markets, as individuals within them tend to place a high importance on social ties and relationships [36], which can explain its prevalence in distribution in particular (see Figure 4). Similarly, localization can help companies overcome the skepticism or even suspicion that is often associated with foreign, nonlocal firms by BOP communities [27]. Localization is also beneficial in overcoming resource scarcity at the BOP, as companies instead focus on working with individuals to work with raw material and inputs that already exist locally. Lastly, localization can help overcome challenges associated with the notorious lack of skilled labor at the BOP [22], as by utilizing traditional methods that are already widely used, companies can avoid the financial and time investments necessary for training individuals in new methods without suffering from a shortage of staff. However, the social value created through this co-creation approach is not as straightforward. Though in some cases, community members are trained to become ambassadors, in most cases ventures utilize members of the community that are already knowledgeable or influential in the community, be it the community elders or doctor. By nature of their position, these individuals already enjoy a relatively high social-standing and power in local communities and are already relatively more well-off financially. Though this makes them ideal candidates for easily building repertoire, by continuously working primarily with the more well-off individuals in communities, co-creation can make the already influential members even more influential, with the relatively less powerful members of the local community remaining passive consumers at best. This means that co-creation can also result in simply re-enforcing uneven social structures and power differences in communities. Additionally, this pattern substantiates to a degree the concerns voiced by development researchers such as Meagher [37], according to which companies who engage with the BOP monetize local know-how without an adequate share of the subsequent economic benefits actually shared with the BOP individuals themselves. For an overview of the operationalization and outcomes of the pattern "BOP as a marketing gateway to local communities" please refer to Table 4.

Table 4. Bop as a Marketing Gateway to Local Communities: Operationalization and Outcomes.

Co-Creation Pattern.	Sustainability Outcomes of Co-Creation		Operationalization of Co-Creation		
	Social Value for BOP Individuals	Economic Necessity for Ventures	Co-Creation Practices	Implementation Example Upstream the SC	Implementation Example Downstream the SC
BOP as a marketing gateway to local communities	Decreased or Neutral	Significantly Necessary	Legitimization	Promoting awareness of venture's cause through brand ambassadors	Marketing through word of mouth marketing, repertoire and trust building through key figures in community
			Localization	Local sourcing, integration of local know-how in production (e.g., specialized artisanal techniques)	Ensuring hyper-local consumption of goods

4.2. BOP as Capacity Builders

In this co-creation pattern, ventures engage with the BOP in order to ensure they have sufficient physical capacities in their procurement, production, and distribution networks, to successfully operate in their respective markets. This pattern was also highly prevalent and utilized by the majority of

companies, across their entire SC (in 70% of ventures that co-create with the BOP in procurement, in 81% who co-create in production and in 74% in distribution), and was enabled through the practices of creating access, aggregation, and provision of training and support. Creating access included ensuring the venture has access to a sufficient number of suppliers and subsequently to raw material, sufficient manufacturing capabilities, as well as ensuring physical access of customers to their products. In procurement, ventures tend to ensure physical access by sourcing from a great number of individuals. For example, in the agriculture industry ventures tend to focus on sourcing from a multitude of smallholder farmers in an area, and in the waste and sanitation industry, firms often choose to source from individual collectors of street waste. In distribution, this decentralized structure was particularly noticeable, with ventures working with a vast network of individuals they often refer to as "Micro-Entrepreneurs", who work on a village level to sell and deliver the products. In production, this co-creation practice was relatively less prevalent. One interesting example is the venture Provokame, which produces plates and dishes from recycled inputs. The venture focuses on building a decentralized production network they refer to as "production satellites", whereby multiple individuals at the BOP produce the ventures' products independently for the company. In short, creating access is most often characterized by co-creating with a highly decentralized network of individuals at the BOP, each able to supply, produce, or sell only a relatively small amount of units. The second practice noticed, which corresponds to this decentralized nature of capacity building networks, is the aggregation of either supply (for example, through predetermining drop-off points for suppliers) or demand (for example, by engaging with self-managed groups of BOP individuals, rather than each individual by themselves). Lastly, companies who co-create with the BOP as capacity builders, also need to undertake some form of training and support, which was not necessary in the previous co-creation pattern (BOP as marketing gateway to local communities). For example, ventures train individuals in new agriculture techniques or in machinery operation and maintenance. Alternatively, some ventures also provide support and consultation for BOP individuals in aspects such as opening and managing a bank account or basic accounting.

From an economic perspective, BOP as capacity builders is a necessary co-creation pattern for companies at the BOP. Creating access by co-creating with BOP individuals, in combination with aggregation, is particularly useful for overcoming the notorious operational challenges of BOP markets, such as the vast distances between villages or lack of infrastructure [32]. Additionally, although training and support of the BOP individuals as providers of capacity requires a certain degree of investment from ventures, without it companies might struggle to obtain the necessary amount and quality of inputs, production capacity, and physical market presence in distribution processes needed to scale-up their operations. Utilizing more modern manufacturing techniques can result in higher production output or productivity than traditional and highly manual methods. Utilizing a vast decentralized network of individuals to sell products enables greater physical presence of the company's distribution channels, who can effectively sell on a village or even household level. From a social value perspective, this co-creation pattern also results in more value for individuals with which the ventures co-create. At the very least, this co-creation pattern results in an increase in income and generation of many, though relatively small, jobs. However, the impact this job generation makes remains highly limited, due to the nature of the positions the BOP individuals hold. In this pattern, the majority of individuals engage with the ventures on a commission-basis as opposed to full time, formal employees. The decision to do so was noted by the ventures as stemming from high costs of formalizing the positions of the BOP individuals (for more information see the later section, Section 4.4, on Formalization), as well as practical considerations relating to working hours and localization. For example, the venture Kumudzi Kuwale, which supplies a wide range of clean energy solutions, from hand-held solar lamps to larger standalone systems for off-grid businesses in Malawi, mention in their annual report for 2017 that "For practical reasons, Kumudzi Kuwale has decided to assign charging station operators as agents and not employees. The agents are to a large extent choosing their own working hours, using their own home as a base for Kumudzi Kuwale activities, which often is combined with other business".

Alternatively, they note that ensuring the individuals remain motivated to perform was noted for the commission-based configuration of integration; "The agents get a fixed percentage of their earnings to keep for themselves, instead of a salary [. . .] as a fair way to reward agents that perform well". Lastly, social value is particularly relevant where training and support also takes place, as these result not just in the varying degrees of income increase mentioned above, but also in personal development of capabilities, which is often referred to as a necessary condition for a longer term eradication of poverty [19]. For an overview of the operationalization and outcomes of the pattern "BOP as capacity builders" please refer to Table 5.

Table 5. Bop as Capacity Builders: Operationalization and Outcomes.

Co-Creation Pattern.	Sustainability Outcomes of Co-Creation		Operationalization of Co-Creation		
	Social Value for BOP Individuals	**Economic Necessity for Ventures**	**Specific Supply Chain Practices**	**Implementation Examples Upstream**	**Implementation Examples Downstream**
BOP as capacity builders	Neutral or Slightly Increased	Necessary	Creating Access	Building a network of small scale suppliers (e.g., small-holder farmer) or working with existing networks (e.g., collectors)	Building a network of small scale BOP distributors
			Aggregation	Utilizing standard, agreed upon drop off points for potential small scale suppliers to sell raw material	Working with consumer peer groups, church groups, self-organized groups
			Training and Support	Training in new skills such as sustainable farming, semi-automated manufacturing, and machinery maintenance	Supporting in administrative task such as opening a bank account, training in book-keeping

4.3. Companies as Providers of Additional Social Value for Individuals

In this co-creation pattern, companies provide BOP individuals with tools, assets, or financing as part of the co-creation exchange. This was significantly less prevalent than the two previous co-creation patterns discussed, and was utilized by a minority of ventures (in 40% of ventures that co-create with the BOP in procurement, 22% in production, and only 13% in distribution). This pattern was operationalized through two main practices, provision of economic premium as well as provision of tools or assets. Provision of tools or assets often involved companies providing the BOP individuals with which they engage with social benefits that are not purely monetary, such as scholarships for individuals to participate in vocational school (for example the ventures SPOUTS of Water and greenAble), child care (Days for Girls Uganda), or health insurance (Green Road). Alternately, ventures also provide the individuals with monetary tools, for example connecting them to socially responsible organizations that provide loans at a fair interest, or even ventures themselves providing micro-loans to the BOP individuals. The second practice is provision of economic premium, which refers to a purely monetary increase in income. This can be directly facilitated by the company, by paying higher wages than the average in the area, for example paying "fair prices" or "above-market" prices to their BOP suppliers. Alternatively, some ventures actively work with the BOP to ensure the competitiveness of the products made by BOP individuals (as suppliers or producers) in more lucrative markets, such as export markets, or non-BOP markets in the same country. For example, Life Out Of Plastic sells merchandise locally produced in the BOP to corporate clients in Lima Peru who are looking for unique employee gifts. Thus, the ventures provide individuals with an economic premium from the difference between the price they would receive by selling locally versus in more lucrative, yet harder to reach, markets.

From a social value perspective, both practices used for operationalizing this co-creation pattern result in increased social value. Ventures enable the BOP individuals to reap the economic premium from the increased prices they can receive in more lucrative markets, or pay the costs of such income increase themselves. This helps alleviate one of the reasons for the persistence of poverty noted by Sodhi and Tang, who ask why, despite BOP producers not being subject to taxes or minimum wage restrictions, "[. . .] do these people [BOP producers] remain persistently poor? One reason is that

without efficient marketing and sales channels, the poor find it challenging to sell their products at a fair price" [11] (p. 127). Additionally, providing tools and assets corresponds even more to empowerment than just income increase. It enables individuals who would have not necessarily been able to generate such income easily with the opportunity to do so; for example, enables mothers to work due to the on-site childcare. Another example is that the provision of formal credentials of skills, such as a vocational degree, reduces the dependency of the individual on a single company and provides them with more power in the overall job market. Though the significant financial investment into individuals that is seen in this pattern does not seem to result in an immediate economic impact for the company, there are grounds to argue that this deeper supplier decommoditization will facilitate increased productivity and capacity, and therefore profit for the company in the long run [4]. For an overview of the operationalization and outcomes of the pattern "Companies as providers of additional social value for individuals" please refer to Table 6.

Table 6. Companies as Providers of Additional Social Value for Individuals: Operationalization and Outcomes.

Co-Creation Pattern	Sustainability Outcomes of Co-Creation		Operationalization of Co-Creation		
	Social Value for BOP Individuals	Economic Necessity for Ventures	Specific Supply Chain Practices	Implementation Examples Upstream	Implementation Examples Downstream
Companies as providers of additional social value for individuals	Increased	Somewhat necessary	Provision of Tools or Assets	Provision of child-care for female employees, scholarships for vocational school, healthcare, access to higher quality inputs, lending land	Providing certificate, Microfinancing, or connection to fair organizations providing microfinancing for initial investments into franchise/new business
			Provision of Economic Premium	Paying above market prices for inputs	Providing support and linkage to more lucrative markets

4.4. Companies as Facilitators of More Structural Social Value for Local Communities

In this co-creation pattern, the manner in which companies co-create with individuals predominantly targets the roots of social inequalities within the local communities in which they operate, and aims at a more long-term and structural impact. This pattern was utilized by a minority of ventures in procurement (in 42% of ventures that co-create with the BOP in procurement) and distribution (in 26% of ventures that co-create with the BOP in distribution), but was highly prevalent when companies co-create with the BOP in production (found in 80% of ventures that co-created with the BOP in production). This pattern was operationalized through three main practices: formalization, ownership and agency, and a clear focus on fringe stakeholders. Formalization refers to providing salaried employment to the BOP individuals, and integrating them as official employees of the company. Creation of ownership and agency for the individuals can be through creation of new businesses that will be fully owned by the BOP individuals operating them, as opposed to supporting an existing business owner as a new franchiser of the firm's products, or working with "micro-entrepreneurs" on commission. Alternatively, companies promote agency by encouraging or actively assisting creation of cooperatives. A third practice found relevant was focusing on co-creating specifically with fringe stakeholders. Although the BOP market is often wrongly thought of as a homogenous mass of "the poor" [30], there are individuals within communities at the BOP that are relatively more disenfranchised, such as minorities or specific castes, ex-combatants, illiterate individuals, the physically handicapped, and many others. In this context, some ventures have a specific focus on co-creation with these individuals in the communities in which they operate. For example, the venture Eco-Shoes operating in Kumasi, Ghana actively procures items such as tires and fabric waste from families who rely on scrapyard foraging, and employs physically disabled artisans in its production. Another example is Oribags Innovations Ltd., operating in Kampala, Uganda. Oribags actively employs only disabled persons in its production processes, and has developed specialized training to suit their needs.

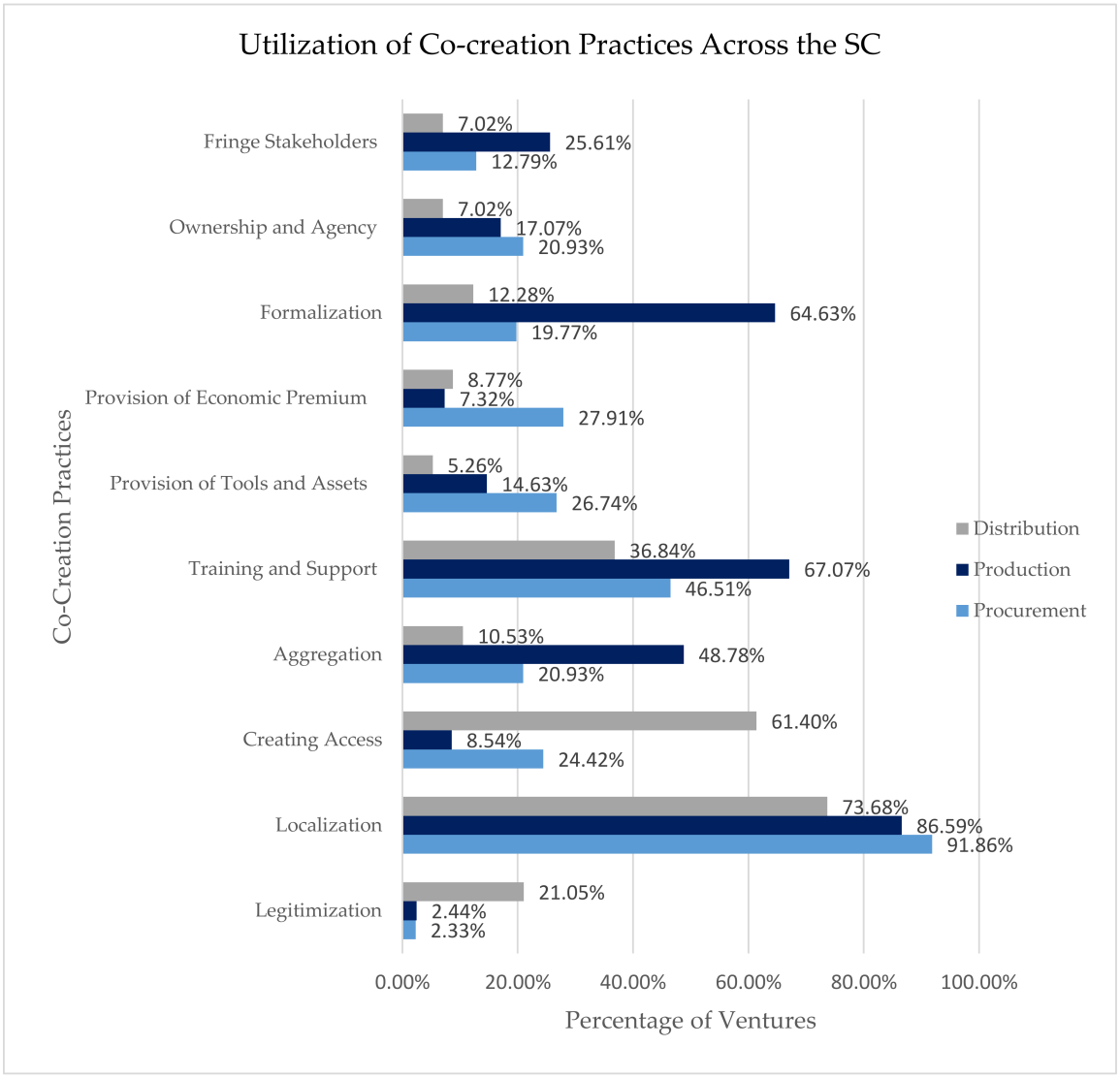


Figure 4. Utilization of Co-Creation Practices Across the Supply Chains (SC).

From an economic perspective, we found little evidence to support increased economic benefit for ventures exhibiting this co-creation pattern. In fact, some practices, such as formalization, can potentially adversely impact the ventures' financial performance, due to the significantly higher costs associated with their implementation. For example, Mr. Malherbe, the founder of the venture 5 Star Stoves noted that "being a small entrepreneur everything is about your cash flow […] you don't actually need employees, you can buy services and get somebody to render a service for you without you putting out and paying a monthly salary and monthly taxes for employing somebody". However, from a social perspective, this co-creation pattern is most significant in not only providing additional social benefits, or increased welfare, but also addressing the structural roots of poverty. Formalization in-and-of itself is considered crucial, as without it, co-creating ventures essentially treat the individuals with which they co-create as "little more than a pool of labour and institutional resources to be mixed and matched […]" [37] (p. 5). Additionally, formalization of employment assists in alleviating one of the key challenges for BOP individuals, who not only suffer from a small income, but also from not being able to predict their future cash flow [52]. This can have a significant impact on the social wellbeing of individuals, for example, one of the employees of the venture Rural Enterprise Network (REN), W. Gnanawathie, mentioned "I was a wage-laborer with no consistent income. Now I work in this program. Compared to the days prior to joining here, I am happier and feeling more

stable". Secondly, ensuring ownership and agency empowers the individuals the venture engages with by increasing their relative power in the market, for example through representation as part of a cooperative rather than individuals, or their relative power in their community, for example due to the increased social status accompanying owning their own business. Lastly, focusing on co-creation with the relatively marginalized or even alienated members of BOP communities can result in greater personal development and dignity for the individuals. For an overview of the operationalization and outcomes of the pattern "Companies as facilitators of structural social value for local communities" please refer to Table 7.

Table 7. Companies as Facilitators of More Structural Social Value for Local Communities: Operationalization and Outcomes.

Co-Creation Pattern.	Sustainability Outcomes of Co-Creation		Operationalization of Co-Creation		
	Social Value for BOP Individuals	**Economic Necessity for Ventures**	**Specific Supply Chain Practices**	**Implementation Examples Upstream**	**Implementation Examples Downstream**
Companies as facilitators of more structural social value for local communities	Significantly Increased	Not necessary	Formalization	Full employment as manufacturing employees, formalizing positions of waste-collectors by coordination through an online app, and ensuring regular payment	Direct employment through kiosk or hub model
			Ownership and Agency	Creation or encouragement of cooperatives or microcooperatives	Building new businesses, women led or owned businesses
			Focus on Fringe Stakeholders	Integration of wide range of marginalized stakeholders in production, focus on sourcing from individuals who have seasonal employment	Primarily through focusing on creating decentralized distribution networks with women

5. Discussion and Concluding Remarks

When we combine the essence of the previously presented findings (see Table 8), the diverse practices and patterns by which companies operationalize co-creation, as well as the correspondingly diverse social value and economic value that is incurred, are clearly evident. Though early research on co-creation at the BOP assumed a positive relationship between economic necessity and social value creation generated by co-creation, our findings do not show a clear win-win between these two outcome categories, but rather the opposite. Co-creating with the BOP as a marketing gateway to local communities is highly necessary from an economic standpoint, but does not generate any significant social value to the BOP individuals with which the companies engage, and in some cases can even reinforce structural social inequalities in local communities. On the reverse side of the spectrum, companies as facilitators of structural social value for local communities result in a significantly increased social value for individuals, and possibly towards more long term changes in their social wellbeing and status. However, such co-creation is costly, and particularly in such a price-sensitive market such as the BOP, whereby companies already deal with extremely low margins, this increase in costs with relatively low economic benefits could be detrimental for companies in the long run.

From a managerial perspective, whether a company is financially able to shoulder such economic costs and risk, as well as whether it is willing to, is therefore strongly connected to its motivation to co-create in the first place. Current understanding in research on what drives organizations to co-create is still divided. Rosca and Bendul, who focus on the connection between drivers for engaging in co-creation with the BOP, and co-creation's success, found that companies' motivation to engage in such practices stem primarily from a strong socially driven motivation rather than pragmatic reasoning [17]. In stark contrast, Karamchandani et al. [52] (p. 72) state that the reason companies engage with the BOP "[...] lies almost wholly with its cost function: their labor is inexpensive and, in most cases, underpriced". The framework we present can guide both socially and economically motivated decision makers in BOP ventures in better understanding the tradeoffs necessary for achieving social and economic value through co-creation, and what best practices they can utilize to achieve either goal.

Table 8. Guiding Framework for Co-Creation and its Sustainable Outcomes.

Operationalization of Co-Creation.		**Social and Economic Outcomes of Co-Creation**	
Co-Creation Pattern	**Co-Creation Practices**	**Social Value for BOP Individuals**	**Economic Necessity for Ventures**
BOP as marketing gateway to local communities	Legitimization Localization	Decreased or Neutral	Significantly Necessary
BOP as capacity builders	Creating Access Aggregation Training and Support	Neutral or Slightly Increased	Necessary
Companies as providers of additional social value for individuals	Provision of Tools or Assets Provision of Economic Premium	Increased	Somewhat necessary
Companies as facilitators of more structural social value for local communities	Formalization Ownership and Agency Focus on Fringe Stakeholders	Significantly Increased	Not necessary

From a theoretical perspective, our findings empirically support previous concerns raised by scholars on the limitations of co-creation in BOP ventures [12,15,19,37], and our guiding framework can facilitate a more systematic future discussion on tradeoffs between social and economic concerns for SCs in BOP markets. Based on our findings, we have identified several interesting avenues for further research at the intersection of SSC and co-creation at the BOP. Firstly, though economically beneficial co-creation practices are evident throughout the entire SC, we note a difference between the different SC stages when it comes to prevalence of co-creation that also results in social value. Co-creation practices in distribution processes in particular tend to "stop" at business-oriented co-creation, whilst ventures who co-create with the BOP in upstream processes also result to a larger degree in increased social value. In particular, co-creation with the BOP in production processes contributed more than any other SC stage to empowerment and structural social value. Despite its importance, we know very little about production in BOP settings, with very few papers on BOP operations focusing on manufacturing [22]. We therefore suggest that future research investigates the challenges associated with production in BOP environments and possible best practices for co-creation in this SC stage. A second opportunity for future research stems from a limitation of the current study. Though we have attempted to mitigate the limitations stemming from reliance on secondary data, and have noted the limitations in the generalizability of our results, given their focus on African countries, a third limitation involves the temporal nature of our data collection. The database provides a "screenshot" in time of a company's processes with no time dimension studied. However, there is great potential in addressing specifically the long term effects of co-creation on social and economic outcomes through longitudinal studies, because "[. . .] social capital in BoP markets can be translated in economic value in the long-run" [36] (p. 510).

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Appendix A

Table A1. Full list of venture names, number and type of sources that were used for each case.

Case Name	Video	Social Media	Official Website	Company Reports	Other (ex. Additional Websites, SEED in Depth Case-Study Series)	Total
5 Star Stoves	8	1	1	0	4	14
Alternative Energy Source for Heating	0	0	0	0	4	4
Amazóniko	1	1	0	0	2	4
Asrat and Helawi Engineering	0	0	0	0	3	3
Awamu Biomass Energy Ltd.	1	1	1	0	7	10
Bringing gas nearer to people	3	1	3	0	4	11
EcoBrick Exchange	0	0	2	0	3	5
Ekasi Energy	2	0	1	0	2	5
Electricity4all	1	0	1	0	2	4
Energy Unlimited	2	0	0	0	3	5
Frontier Markets: Last Mile Distribution for Solar	0	0	2	0	3	5
Ghana Bamboo Bikes Initiative	0	0	1	0	4	5
Gogle Energy Saving Stoves and Engineering	1	0	0	0	1	2
GreenTech Company Ltd - fuel briquettes from groundnut shells combined with fuel efficient stoves	1	0	2	0	2	5
JITA Social Business Bangladesh Ltd.	0	0	2	0	4	6
KARIBU Solar Power	3	0	2	0	8	13
Khainza Energy Limited	1	1	2	0	4	8
Khoelife Organic Soap and Oils Primary Co-operative	1	1	2	0	3	7
Kumudzi Kuwale	1	2	1	0	2	6
L's solution ltd	0	2	0	0	3	5
Lagazel	0	1	3	0	2	6
Lighting Up Women's Lives	0	0	0	0	4	4
Loja de Energias	0	0	0	0	3	3
Magiro Hydro Electric Limited (MHEL)	2	0	0	0	4	6
MakaaZingira	0	0	0	0	4	4
Man and Man Enterprise	0	0	0	0	5	5
Mozambikes	0	0	2	0	4	6
Nafore and Afrisolar Energy Kiosks	0	0	1	0	4	5
Nuru Energy	0	1	5	0	2	8
One Million Rural Cisterns	0	0	1	0	4	5
Papyrus Reeds, Our Future Hope	0	0	0	0	3	3
Pollinate Energy	0	0	1	0	3	4
Powering the Future with SuryaHurricanes	0	0	0	0	3	3
PROVOKAME	0	0	0	0	5	5
RECAPO CBO	0	0	1	0	0	1
RISE	0	0	0	0	2	2
RK Renew Energy PLC	0	0	0	0	3	3
Sahelia Solar	1	0	1	0	3	5
Solanterns: Replacing 1 Million Kerosene Lanterns with 1 Million Solar Lanterns	2	1	0	0	3	6
Solar Bread Oven	0	0	0	0	2	2
Solar Serve	0	0	8	0	2	10
Solar Sister – African women led grassroots green energy revolution	0	0	0	0	3	3
SolarTurtle	0	0	0	0	2	2
SPOUTS of Water	1	0	4	1	3	9
STM Solar Technologies Manufacturing	0	0	0	0	5	5
Sunny Money	0	0	20	0	2	22
Sustaintech India Pvt. Ltd.	0	0	3	0	2	5
Switch ON- ONergy	0	1	5	0	3	9
Village Energy	1	0	6	0	2	9
Waste Ventures India	0	0	1	0	2	3

Table A1. *Cont.*

Case Name	Video	Social Media	Official Website	Company Reports	Other (ex. Additional Websites, SEED in Depth Case-Study Series)	Total
A Global Marketing Partnership for SRI Indigenous Rice	0	0	2	0	0	2
Agroforestry for sustainable land use and economic empowerment	0	0	0	0	2	2
Agua Para Todos/Water for All	0	0	0	0	2	2
All Women Recycling	3	1	1	0	3	8
ALMODO	2	1	0	0	7	10
Appropriate Energy saving Technologies LTD	3	0	3	0	1	7
Arusha Women Entrepreneur	0	0	0	0	3	3
Au Grain de Sésame	1	0	1	0	3	5
Backpack Farm Agriculture Program	0	0	3	0	0	3
Baobab Products Mozambique	0	0	0	0	3	3
Belle Verte Ltée	0	1	0	0	1	2
Black Gold Farm Manure	0	0	0	0	1	1
Botanic Treasures	0	0	2	0	3	5
Brent Technologies	1	0	0	0	5	6
Chonona Aquaculture	0	0	0	0	3	3
City Waste Recycling	0	0	0	0	1	1
Claire Reid Reel Gardening	1	1	1	0	4	7
COMSOL Cooperative for Environmental Solutions	0	0	0	0	1	1
Coopérative Sahel Vert	0	0	0	0	2	2
Cows to Kilowatts	1	0	0	0	5	6
Dagoretti Market Biogas Latrine	0	0	0	0	2	2
Daily Dump (PBK Waste Solutions Private Limited)	0	2	1	0	5	8
Days for Girls Uganda	1	1	0	0	3	5
DeCo!—Decentralized Composting for Sustainable Farming and Development	0	0	2	0	2	4
Diseclar: Ecological design and production	1	0	0	0	4	5
Duncan Village Secondary Recycling Cooperative	0	0	0	0	2	2
East Africa Fruit Farm and Company	0	0	2	0	1	3
Eco-Amazon Piabas of Rio Negro	0	0	0	0	2	2
Eco-Shoes	0	1	2	0	3	6
EcoAct Tanzania	0	1	1	0	4	6
EcoPost—Fencing Posts from Recycled Post-Consumer Waste Plastic	0	0	1	0	4	5
G-lish: Income Generation, Re-Generation, Next Generation	0	1	3	0	2	6
Gorilla Conservation Coffee	0	0	2	0	4	6
Green Acre Living	0	0	0	0	2	2
Green Bio Energy	0	1	3	0	3	7
Green Heat	0	0	0	0	2	2
Green Organic Watch Cocoa Project	0	0	0	0	1	1
Green Road	0	0	0	0	4	4
Green the Map	0	0	3	0	2	5
greenABLE	0	0	1	0	3	4
Growing the Future	0	0	0	0	1	1
High Atlas Agriculture	0	0	1	0	1	2
Horizon Business Ventures Limited	0	2	1	0	2	5
Hortinet	0	0	0	0	3	3
ICOSEED Enterprises	0	0	0	0	2	2
Imai Farming Cooperative	0	0	0	0	3	3
KadAfrica: Girls Agro Investment (GAIN) Project	0	0	2	0	3	5
Karama	0	0	0	0	3	3
Kataara Women's Poverty Alleviation Group	0	0	1	0	3	4
Kencoco Limited	0	1	0	0	4	5
KingFire Briquettes	0	0	0	0	3	3
Kisumu Innovation Center	0	0	0	0	3	3

Table A1. *Cont.*

Case Name	Video	Social Media	Official Website	Company Reports	Other (ex. Additional Websites, SEED in Depth Case-Study Series)	Total
KOLCAFÉ	0	0	0	0	4	4
Life Out Of Plastic—L.O.O.P.	0	0	0	0	4	4
Linking Small-Scale Farmers to Input-Output Markets through Rural Enterprise Network (REN)	0	0	1	0	4	5
Mashandilo Co-operative	0	0	1	0	2	3
Masole Ammele	0	0	0	0	3	3
Masupa Enterprises	0	1	0	0	3	4
Mesula—Meru Sustainable Land Ltd.	0	0	1	0	2	3
New Life	0	0	0	0	2	2
O Viveiro	0	0	0	0	2	2
Organic Farm Inputs and Farm Produce—(KOFAr Ltd)	0	1	1	0	2	4
ORIBAGS INNOVATIONS (U) LTD	0	0	0	0	5	5
P.E.A.C.E.—Thinana Recycling Cooperative	0	0	0	0	2	2
People of the Sun	0	0	4	0	2	6
Piratas do Pau Upcycling Centre	0	0	2	0	3	5
Plastic Waste Recycling as an Alternative to Burning and Landfilling	0	0	1	0	1	2
Precious Life Foundation's Outgrower Project	0	1	0	0	1	2
Pumpkin Value Addition Enterprise	0	0	0	0	7	7
RECFAM—PRIDE Pads	0	0	0	0	1	1
Recycling Centre for Used Plastic Bags	0	0	0	0	2	2
Recycling for Environmental Recovery	0	0	0	0	2	2
Resentse Sinqobile Trust Trading (Zondi BuyBack Initiative)	0	0	0	0	1	1
Safi Organics	0	0	2	0	3	5
SEPALI—community based silk producers association	0	0	3	0	4	7
TECOCARRE	0	0	1	0	1	2
Terra Nova Waste to Farming	0	0	0	0	6	6
The Shea Economic Empowerment Program (SEEP)	0	1	0	0	4	5
Tii Ki Komi Cassava Commercial Growers (TCCG)	0	0	0	0	3	3
Unique Quality Product Enterprise	0	0	0	0	1	1
Village Cereal Aggregation Centres (VCAC)	0	0	0	0	2	2
Walali Company Limited	0	0	0	0	2	2
WASHKing	0	0	5	0	5	10
Waste to Food	0	0	0	0	4	4
Women's Off-season Vegetable Production Group	0	0	0	0	3	3
Total	**47**	**32**	**146**	**1**	**386**	**612**

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