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Creating Shared Value in BoP Communities with Micro-Manufacturing Factories: A Systematized Literature Review

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Abstract: Background: Shared value creation in base of the pyramid (BoP) communities is a crucial process towards building sustainable societies. BoP communities in developing countries represent more than 4 billion people who live on low incomes with limited access to basic products and services. Current or emerging technologies offer promising solutions for organisations pursuing manufacturing opportunities in BoP communities. This study seeks to explore the literature on how BoP communities may become active participants in sustainably manufacturing products using micro-manufacturing factories. The research question posed is: What are the core concepts that need to be taken into consideration for creating shared value through micro-manufacturing factories in BoP communities? Method: A systematised literature review (SLR) was completed following the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) method for data selection criteria and analysis. The SLR is used to explore the state of literature with regards to creating manufacturing shared value in BoP communities with the objective to identify study gaps and to explore manufacturing shared value creation concepts. Results: Literature indicates initiatives to engage BoP communities through various innovation strategies. The findings of the review are organised under three strategic pillars: capability building strategy, implementation process, and growth strategy. The capability building strategy defines the users' intention to create shared value in BoP communities with micro-manufacturing factories (MMF). It is followed by the implementation process which guides the users to create manufacturing shared value in BoP communities. This is followed by a growth strategy to scale for impact.

Keywords: systematized literature review; base of the pyramid; shared value creation; micro-manufacturing factories; business model

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1. Introduction

BoP communities constitute a group of people who are generally marginalized and have limited access to technologies that can enhance their lives. The concept of the BoP was first introduced by Prahalad and Hart at the turn of the 21st century. Prahalad (2009) defined the BoP as the world's 4 billion poor people who live on less than USD$2 per day [1]. A more recent definition is that the BoP represents a socio-economic segment that has a potentially enormous and relatively untapped market [2].

Strategies to include the BoP have moved from BoP 1.0 which proposed selling products and providing services to the poor towards a bottom-up approach of co-creation (BoP 2.0) [3,4]. The co-creation process moves beyond just mere inclusion to cross sector partnerships that work together to provide the best innovation products in BoP communities termed BoP 3.0 [5,6].

Creating shared value (CSV) was popularised by Porter and Kramer in the context of a company [7]. They defined CSV as the policies and operating practices that can enhance

the competitiveness of a company whilst advancing the economic and social conditions in the community it operates in. Through shared value, the needs and challenges faced by a society are met in the process of creating economic value [7]. The idea as approached in this article is for an organization to identify opportunities usually presented as problems in BoP communities and then solve them through innovation, often through the use of technology. Through this process current or emerging technologies are used to provide products and services in a way that creates value for the BoP community. Organizations that focus on CSV have been reported to create significant economic value for their external beneficiaries [8].

This article presents a systematized literature review (SLR) to explore manufacturing shared value (MSV) creation in BoP communities. Literature discuses reviews on various BoP innovation strategies as well as strategies for creating shared value. This article thus explores the extant literature dealing with manufacturing in BoP communities with a focus on micro-manufacturing factories which can be defined as not capital-intensive and employing less than 20 people. The choice for exploring manufacturing services in BoP communities is based on a proposition that most economies rely on the manufacturing industry to drive economic development [9]. Manufacturing is a driving force of economic growth, job creation and poverty reduction in developing countries as well as a means to accelerate rapid industrialization [10].

Micro-manufacturing is a process where manufacturing of small quantities of a product takes place in small manufacturing facilities (Micromanufacturing the future https://techcrunch.com/2016/04/03/micromanufacturing-the-future/ accessed on 23 July 2021) Micro-manufacturing factories can be implemented using modular factories that comprise several prefabricated volumetric elements to be assembled to make one factory or container based factories [11–13]. Implementation of micro-manufacturing factories can be seen as instrumental in overcoming the lack of infrastructure often encountered in BoP communities. These factories utilize locally sourced raw materials and human labor as well as sustainable manufacturing processes [11]. The products and processes are designed and operated considering the entire supply chain to ensure sustainability.

As this study seeks to understand the process of creating shared value in BoP communities with micro-manufacturing factories, the research question for this study is as follows:

> "*What are the core concepts that need to be taken into consideration for creating shared value with micro-manufacturing factories in communities at the BoP?*"

The SLR uses the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) method for data selection criteria and analysis. The methodology for conducting the SLR is discussed in Section 2 of this article. Section 3 present the descriptive and content analysis of the SLR. A discussion is given in Section 4 with the conclusions in Section 5 and future work and study limitations in Section 6.

2. Materials and Methods

This study follows a structured SLR approach. The approach helps to ensure a systematic and replicable study that draws conclusions in literature [14]. The PRISMA approach was adopted for data selection criteria and analysis [15]. The research process for SLR can be mapped out through the following steps by Kraus et al. (2020): Step 1: Planning the review; Step 2: Identifying and evaluating studies; Step 3: Extracting and synthesizing data and Step 4: Disseminating the review findings—these are described in the sections to follow.

2.1. Step 1: Planning the Review

Step 1 involved identifying the need to conduct a SLR and then develop a review protocol. An initial search of the research topic was done to establish if there was any prior SLR study that was already published. The review protocol was developed to ensure transparency of the SLR process in selecting databases and search strings. The databases

selected for review were Google Scholar, Web of Science core collection, Scopus and Science Direct Various combinations of the following search terms were used for each database, "Shared value creation", "Base of the pyramid", "container factories", "manufacturing factories", "factories" and "innovation" to form search strings. The search strings were combined as shown in Table 1.

Table 1. Search strings and search results.

Keywords	Search Strings	Science Direct Results	Scopus Results	Web of Science Results	Google Scholar Results
Shared value creation, base of the pyramid	"Shared value creation" AND "base of the pyramid"	8	3	7	245
Shared value creation, factories	"Shared value creation" AND "factories"	12	9	11	343
Base of the pyramid, Manufacturing factories	"Base of the pyramid" AND "manufacturing factories"	2	1	9	11
Base of the pyramid, factories	"Base of the pyramid" AND "factories"	173	6	15	2390
Base of the pyramid, container factories	"Base of the pyramid" AND "container factories"	0	0	0	2
Shared value creation, base of the pyramid, factories	"Shared value creation" AND "base of the pyramid" AND "factories"	3	1	1	56
Innovation, base of the pyramid, factories	"Innovation" AND "base of the pyramid" AND "factories"	89	0	1	1570
TOTAL		287	20	44	4617

To ensure that the SLR process can be replicated, the following search strategies were used. Google Scholar database search was made for articles, the search had no limitations. For the Web of Science platform, the Web of Science core collection database was selected, and the search was undertaken for all fields. For the Scopus database, the search was undertaken for documents by article title, abstract and keywords. Web of Science and Scopus database search strings were used with no parentheses. For the Science Direct database, the search was undertaken for articles using the advanced search option. The period for conducting the search was not limited for all database searches to ensure that all articles available on the databases were captured. This process was followed to assist readers to evaluate the reproducibility, quality and comprehensiveness of the search process.

Table 2 illustrates the inclusion and exclusion criteria for selecting articles. The criteria focused on studies that answered the research question for this study. The selected articles were to include various aspects that established how shared value can be created in BoP communities through micro-manufacturing factories (MMF).

Table 2. Inclusion and exclusion criteria for articles.

Research Themes	Inclusion Criteria	Exclusion Criteria
BoP communities	• Articles that focused on manufacturing factories or improving livelihoods in BoP communities • Articles that focussed on Base of the Pyramid (BoP) manufacturing innovation	• Articles that were generally referring to the BoP
Creating shared value	• Articles that explained how shared value can be created in BoP communities • Articles that focused on creating shared value in BoP communities	• Articles on creating shared value that do not focus on the BoP
Micro-manufacturing	• Articles that explained manufacturing using frugal innovations • Articles on manufacturing factories in BoP communities • Articles that described creating shared value through manufacturing factories	• Articles that generally described micro-manufacturing without referring to frugal innovations or BoP communities.

2.2. Step 2: Identifying and Evaluating Studies

The next step was to identify and evaluate studies from the selected databases and search strings. The initial search was conducted in December 2019 and then updated on 14 August 2021. Records were documented on Excel sheets for selected articles as well as those eliminated after the first screening process until only screened articles remained. The screening process resulted in 66 articles that were analysed to extract relevant concepts that answer the study research question, (see Figure 1).

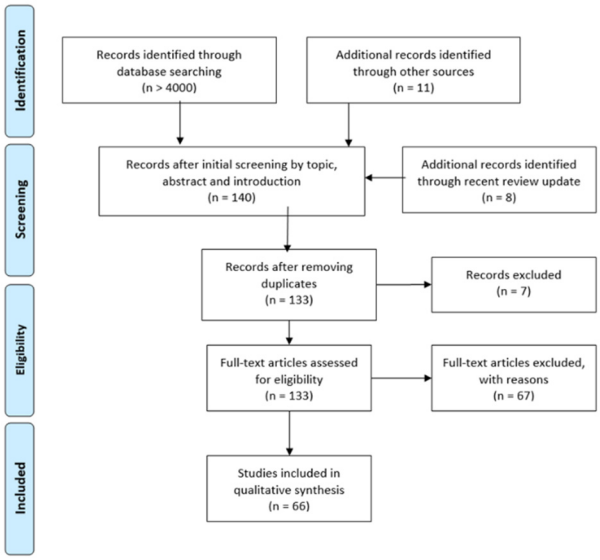


Figure 1. Systematized review data selection adopted from the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) [15].

2.3. Step 3: Extracting and Synthesizing Data

The review was used to extract different kinds of information in the following three categories: (i) conceptual aspects, (ii) empirical aspects and (iii) significance and conclusions (see Table 3). The conceptual aspects category gives information that establishes the type of document analyzed, where the research was conducted, and author analysis. The empirical aspects category analyzed the documents to extract information which includes the gap in literature addressed, how it was addressed, and the validation approaches used. The review process identified the significance of the document and the conclusions that were drawn from the document as well as recommendations for future studies. These insights were extracted from each review article and were summarized in MS Excel for further analysis.

Table 3. Categories for data extraction.

Category	Analysis	Information Extracted
Conceptual aspects	Descriptive statistics	• Type of document analyzed • Research case study focus • Author analysis
Empirical aspects	Content Analysis	• Gap in literature addressed • How the study gap was addressed • Validation approaches used
Significance and conclusions	Significance and Conclusions	• The significance of study • Key concepts identification • Conclusions drawn from study

2.4. Step 4: Disseminate the Review Findings

The results from the SLR are presented in Section 3. The analysis gives the descriptive statistics of the review as well as the content analysis from the findings. Section 3.2 gives the content analysis of the findings and collates the insights established from the SLR following the procedure described in Section 2.3. The findings from the SLR are discussed in Section 4. In Section 4.2 a synthesis is presented from the key concepts as identified in the review—this then forms the basis of the conceptual review presented in the conclusion in Section 5. The future work and research limitations are discussed in Section 6.

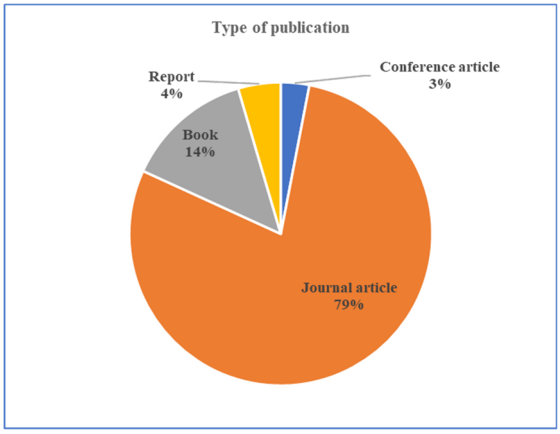
3. Results

The following section presents the descriptive statistics of the literature review and the content analysis. It summarizes the key concepts for creating manufacturing shared value (MSV) in BoP communities.

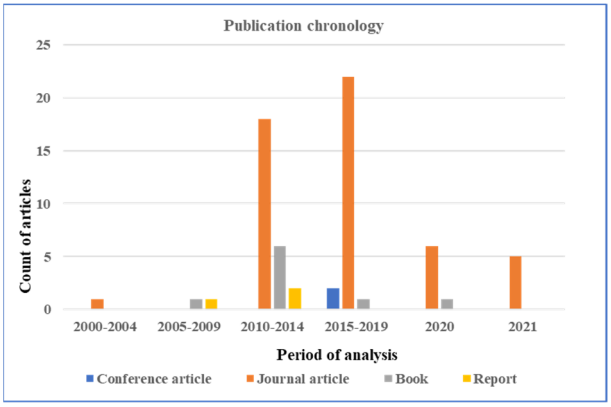
3.1. Descriptive Statistics Results

3.1.1. Type of Publication and Citation Data

The publishers of selected articles were from various disciplines indicating that this study is multidisciplinary. A total of 63 reviews were published in the last decade which is not surprising as the BoP concept became more prominent in the last decade. Also, the literature database for this study is mostly made up of journal articles as can be seen in Figure 2. The highest citations on articles were from Porter and Kramer (2011) who popularised the CSV concept and Prahalad (2002) who introduced the BoP concept.



(**a**)



(**b**)

Figure 2. A description of the publication data. (**a**) Type of publication. (**b**) Publication chronology.

3.1.2. Geographical Location of Authors

There has been an interest in the past decade by authors mostly from developed countries to study how livelihoods can be improved in BoP communities of developing countries.

The articles selected in our sample show that the USA had the most significant number of authors publishing articles (see Figure 3). It is important to note that the studies in our sample have been written mostly by authors from developed countries except for India where the BoP concept originated. This may be indicative of a gap in this regard where research in the study area seems to be poorly developed, especially in Africa. More insights can be gained from researchers as they explore the various initiatives that have been taken or are being undertaken on manufacturing shared value creation in BoP communities. Studies have been done on how sustainable business models can be used to create shared value in BoP communities. These business models emphasize the need to co-create products and services in the BoP communities. The process involves employing frugal innovations (Frugal innovation is defined as methods and designs applied for low-cost new products, that have been created for or come out of the BoP (Available online: https://www.oxford-review.com/oxford-review-encyclopaedia-terms/frugal-innovation/ (accessed on 23 July 2021))) that use emerging or current technologies to solve problems in these communities.

Figure 3. Geographic location of authors.

3.1.3. Geographic Focus Areas of the Studies

Most of the articles reviewed were not specifically conducted for any BoP geographical location (see Figure 4). Our study sample shows that case studies were undertaken of companies which pursued opportunities in BoP communities in Asia. For those who conducted case studies, they were mostly undertaken in line with the author trends. It is noted that the studies have little coverage of the African context. This indicates an opportunity for future work to focus on case studies in Southern Africa with an intent of adding to the body of knowledge on how manufacturing shared value can be created in BoP communities.

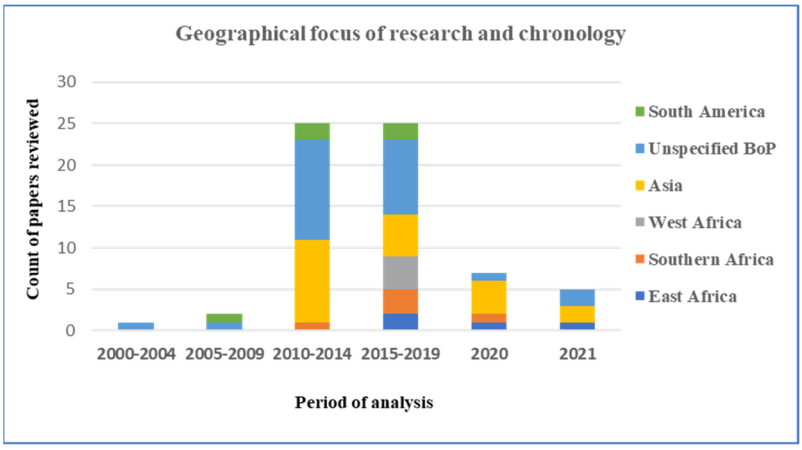


Figure 4. Geographic focus of research case studies and chronology.

3.2. Content Analysis Results

Content analysis helps collate and synthesise information to derive valid insights [16]. In this section, the articles in our sample are analysed considering issues related to creating manufacturing shared value in BoP communities. The content analysis was achieved following the process described in Section 2.3. The analysis extracted information which includes the insight on the gap in literature addressed, how it was addressed, and the validation approaches used.

The following paragraphs give the results derived from all the articles in our sample considering issues related to creating manufacturing shared value in BoP communities. It includes insights on value creation strategies for BoP communities, how shared value can be created in BoP communities, innovation in BoP communities, BoP supply chains, creating manufacturing shared value in BoP communities, partnerships and stakeholders involved in creating shared value in BoP communities, BoP frameworks and business models and

validation approaches, and how micro-manufacturing factories can be implemented in BoP communities.

Results from the review in Figure 5 echo the transition of BoP 1.0 to BoP 3.0 and show that value creation in BoP communities has gained more interest in the last decade. Studies focussed increasingly on co-creation of products or services between 2012 and 2015 (in line with the BoP 2.0 approach by Simanis and Hart (2008)). Studies on business model approaches for BoP value creation have shown growth in the last two decades. The shift in the last five years mainly focuses on the sustainable business model approach and shared value creation which is indicative of the move towards the BoP 3.0 strategy.

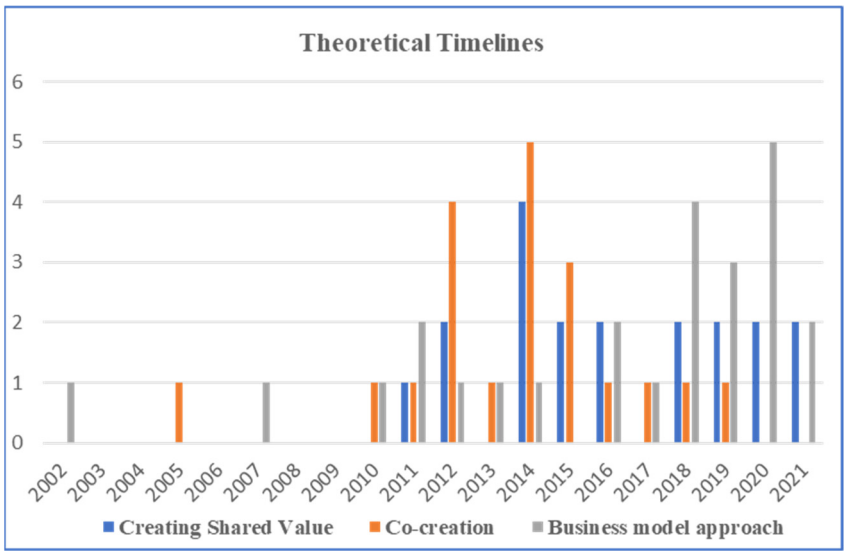


Figure 5. Theoretical timelines for value creation in BoP communities.

The concept of creating shared value (CSV) as conceptualized by Porter and Kramer (2011) focusses on three key pillars i.e., Key pillar 1: Reimagining products and markets, Key pillar 2: Redefining productivity in the value chain and Key pillar 3: Enabling local cluster development [7]. These key pillars can be argued to address fundamental concepts that are required to create manufacturing shared value in BoP communities.

We reflect on our sample and the extent to which articles considered these pillars. Most of the articles reviewed did not address all three the key pillars for CSV especially the pillar on enabling local cluster development (see Figure 6). It was noted that most ventures studied only focused on reimagining products and services for the BoP communities. This shows the need for further research to demonstrate how all the three key pillars of CSV can be applied through manufacturing in BoP communities.

The articles reviewed in our sample were analyzed to explore innovation pursued in BoP communities. Most articles reviewed included BoP innovation with a focus on products as well as technology transfer. Technology transfer to the BoP is seemingly more attractive and has better payoffs compared to product innovation.

The sample reviewed highlighted the need for inclusive and effective supply chain networks in BoP communities. To achieve shared value creation in BoP communities, the supply chains must involve BoP community members. It should be noted that the route to market for BoP suppliers who are in the informal market is considered as a risk and requires trust to thrive [17]. This impediment can be improved if the BoP suppliers acquire unique skills and resources that allow them to operate with profitable business models which are more acceptable in formal markets [17].

In our sample of literature, it has come to light that there is a need to create manufacturing shared value in BoP communities. Within the application area of this article, the evidence shows that this is a relatively unexplored area and only 9 reviewed articles could be found that focus on manufacturing factories in BoP communities.

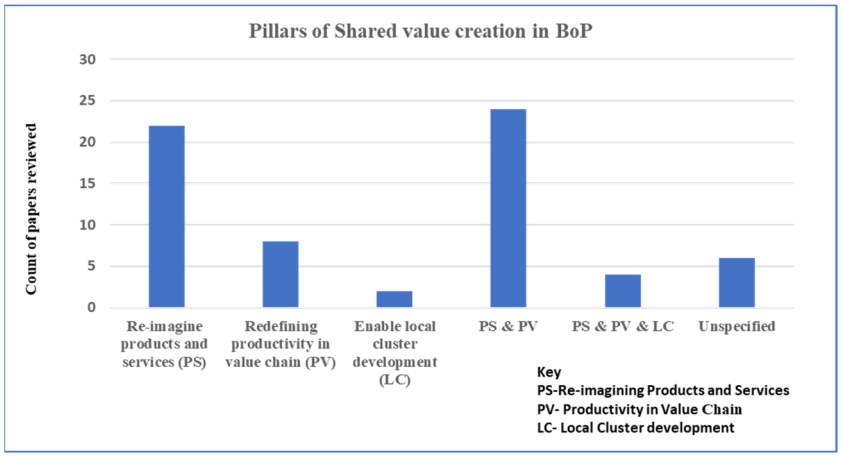


Figure 6. Pillars of creating shared value (CSV) in BoP.

Our study sample gave insight into the various stakeholders and partnerships that are required when operating in BoP communities. Involving strategic partners and stakeholders from the beginning is seen as important. Every partner is crucial and hence their inclusion has to be carefully considered [18].

These partnerships allow companies to gain credibility or legitimacy as they operate in BoP communities [19]. Various role players contribute to make partnerships stronger. Cross-sectoral partnerships (government, business and civil society) are required to create employment opportunities, increase employability as well as make the labor market more efficient [20]. In these partnerships, roles may exist for companies to identify opportunities and provide financial capability; NGOs can integrate and connect the companies with the local people [21]. NGOs and other intermediary organizations can provide access to knowledge and strengthen skill building through training and coaching, facilitate access to information and finance, and build networks [22]. The role of civil society is often to advocate on behalf of the BoP to ensure that they have jobs and all the capabilities they require to become employable.

The literature reviewed emphasised the need for companies to develop business models that are specific for the BoP [23]. This enables actionable approaches for knowledge sharing, learning, creating mutual value, and building ecosystems [24]. Focus is to be on approaches that take into consideration the widely acknowledged 4 A's framework: acceptability, affordability, awareness and availability of products [25]. Ensuring sustainability as a factor in the business model is important and can be built through support from the government which provides legitimacy, attractive regulations and partnerships that help to reduce costs [23,26,27].

Literature reviewed revealed that that there are various means of validating business model approaches and proposed frameworks. It was interesting to note that most approaches were validated using case studies where expert opinion is sought and then triangulating data with other sources to ensure validity.

The study has shown an inclination in the literature towards the implementation of micro-manufacturing factories as social enterprises. Social enterprises can be defined as for-profit, social-purpose investments and organizations whose goal is economic betterment of deprived groups [28]. Through social purpose business ventures, stable economic opportunities for the BoP community may be achieved [29,30].

4. Discussion

This section discusses the results derived from the review. The insights derived from manufacturing shared value creation and innovation strategies for BoP communities are discussed.

In order to contextualise our analysis of value creation approaches, it is necessary to revisit the evolution of the field from BoP 1.0 to BoP 3.0. The BoP 1.0 strategy was about

selling basic products and services to the BoP i.e., treating the BoP as a market [31]. This strategy mostly benefited BoP ventures but is widely seen to have lacked the empowerment and inclusion of BoP communities. Critics argue that this can lead to the poor being exploited and seen as purely a market [32].

This led to a shift towards the BoP 2.0 strategy which incorporated community members in value chains through co-creation [4]. However, this has been seen not to be enough with the current move towards BoP 3.0 strategies that create win-win relationships through long-term investments and focus on innovation ecosystems embedded in the BoP communities [5,33,34].

In line with the philosophy of BoP 3.0, and as explained earlier, this study organizes the concept of CSV as conceptualized by Porter and Kramer (2011) i.e., Key pillar 1: Reimagining products and markets, Key pillar 2: Redefining productivity in the value chain and Key pillar 3: Enabling local cluster development [7].

In our discussion we argue that these key pillars can be achieved through MSV strategies for BoP communities namely: Capability building strategy, Implementation process, and Growth strategy. The capability building strategy achieves CSV Key pillar 1 where organizations come up with innovative and sustainable business models that identify and address opportunities for manufacturing shared value in BoP communities [23,35]. The Implementation process achieves CSV Key pillar 2 by defining the processes required to address these opportunities in BoP communities taking into consideration efficiency in entire value chains [36,37]. The growth strategy achieves CSV Key pillar 3 which then addresses scaling strategies and sustainability issues necessary for social and economic impact [38].

4.1. Capability Building Strategy

The capability building strategy can be accomplished by identifying opportunities in the BoP community, conducting a preliminary implementation strategy, and building effective partnerships which work together to develop ideal products and services. These key aspects are discussed in the following sub sections.

To build capability for organisations, it is important to first and foremost identify opportunities for creating manufacturing shared value in BoP communities. BoP communities present various opportunities for creating shared value. These opportunities are usually presented as social problems. Literature suggests that value creation in BoP communities must offer affordable, user-friendly and environmentally sustainable products [36,38]. Local empowerment through the use of local resources and capability building is acknowledge as important [39]. This can assist in eliminating issues of poverty and violent conflict that impede growth [40]. A study on BoP communities revealed that they can be grouped into segments based on their level of income [41]. It is hence insightful to map out which value creation strategies work best for each specific segment of the BoP.

After establishing opportunities available it will then be necessary to carry out a preliminary implementation strategy where a sustainable and inclusive business model is crafted. These business models map out the strategies for value proposition in the BoP communities [42]. The proposed micro-manufacturing factories should use business models and frameworks that overcome socio-cultural, religious, infrastructural, and structural challenges [43]. It was noted that having a manufacturing factory near raw materials and supply chain networks will help to reduce costs and is more practical [44].

The business models should be evaluated to ensure that they are sustainable and replicable in the long term for scaling [45]. Evaluation requires frameworks that offer variables for measuring affordability, profitability, and sustainability [36,37].

These business models are to be co-created with the assistance of cross-sector partnerships. These cross-sector partnerships assist to become more responsiveness to market conditions and customer needs as well as the environmental requirements in the BoP communities [19]. These partnerships need to be leveraged to ensure local communities are included in the manufacture, supply chains and distribution of products [36].

Finding common ground for all parties is necessary to the success of partnerships. BoP incubators and BoP knowledge centers have in the past proven to provide a pool of valuable information that can assist BoP ventures with minimal critical specifications for capability building [38]. These knowledge centers can be used to train students from local universities to design innovative products and services for the BoP. They can also be used for training youths in local community vocational skills so that they can be employable in the micro-manufacturing factories.

Synergies between the various actors in BoP ventures require careful identification of the most appropriate partners and then further developing personal relationships, communication routines, common goals and vision, long-term commitment, and partner-specific capacity building [18]. Inclusive innovation through human capital development and capability building is fundamental to growth and value creation in BoP communities [46]. It is also necessary to create partnerships between companies operating in BoP communities and consultancy firms that assist in measurement of metrics to evaluate their impact in BoP communities [37]. Performance measurement is always important so that you can pause and reflect on progress made and then rectify where it is necessary to adjust. Partnerships involving all these stakeholders if possible are key to successful BoP ventures.

These partnerships work together on product development to come up with innovative products and services for BoP communities. The literature review explored how BoP communities can benefit from innovations that offer affordable products and technology transfer which adds value and improve livelihoods [36,47]. Technology is here acknowledged to often drive innovation in BoP communities [48]. Breakthrough product innovations also develop ecosystems that enable an environment where businesses thrive [49].

Product designs are mostly focused on employing frugal innovations that use modular and scalable designs with flexible production systems [21,50]). It is also widely acknowledged that it is necessary to become embedded and more acquainted with the BoP way of life for inspiration to design innovative products or services for BoP communities [51]. Becoming embedded in the BoP community will also build trust in the BoP communities and enable products and technologies to be adopted.

Innovations that address local waste streams and environmental issues are also important. They are part of viable options for creating manufacturing shared value in BoP communities [52,53].

Part of the preliminary implementation strategy is to mobilize resources for start-up capital for the BoP suppliers. Lack of start-up capital to ensure the successful implementation of product innovations can be overcome by having initial capital costs of some innovations covered by grants or subsidies and then developing effective means to grow profitably [45]. This approach allows the realization of the product innovation as most BoP community developments are impeded by lack of start-up capital.

4.2. Implementation Process

The implementation process for the Micro-manufacturing factories (MMF) initially considers the supply chain networks. This will ensure a reliable source of raw materials and a guaranteed market for products for sustainability. After crafting a sustainable business model through cross-sector partnerships to develop innovative products for the BoP community, the next important consideration will be the supply chain networks. In many cases BoP suppliers find themselves earning very little from their products because they do not have access to markets. This has been addressed by creating supply chain networks that protect them from middlemen. This is achieved by formation of cooperatives, working alongside government unions for strong influence in supply chains and creating social networks that expand beyond local communities [54].

Strategies for sales effectiveness, product distribution and awareness campaigns should be considered to counter the negative impacts on sales whenever there is a price change [55]. This is done because BoP customers are sensitive to price changes. Design-

ing BoP supply chains with long-term relationships and capacity building is a key to success [56].

For successful implementation of MMF in BoP communities, it is important to ensure that the right skills are available. The process of building human capabilities to create local expertise is considered necessary for the micro-manufacturing production processes. The employment of local BoP community members will provide cheap labour and at the same time create a reliable source of income to families. The bias is to empower women as they are usually the ones who are key in building communities by taking care of family needs [43,57]. This process empowers locals through training, coaching and skills development.

When the right skills are available the next stage will be factory development where MMF are set up in the BoP communities taking into consideration all the aspects that will ensure sustainability. These considerations will be the factory location, the availability of reliable sources of water and energy as well as the access to markets. The process of implementing MMF at the BoP requires frugal innovations [21,58] in order for manufacturing systems to meet the requirements of price-sensitive customers, and yet still be of good quality [35,59]. Various design considerations are thus to be considered for MMF in BoP communities: [43,44]. The MMF require careful consideration for process development to ensure efficient process systems.

As micro-manufacturing is defined by Slepov (2016) (Micromanufacturing the future https://techcrunch.com/2016/04/03/micromanufacturing-the-future/ (accessed on 23 July 2021) as a process where small quantities of a product are produced at a time in a small factory, proposals have been made for micro-containerised factories that provide portable, scalable technologies to produce valuable products from sustainable locally sourced resources or waste streams [13]. They can also be designed as moveable factories that cover various places in BoP communities and have the capacity to carry their own power generation [11].

Implementing CSV principles allows BoP communities to learn organizational and business management skills as they participate in supply chains. The result is a community with members who are self-dependent. The goal for CSV is to serve customers profitably and, look after the BoP communities [60]. MMF tend to manage productivity constraints that affect their operations [61]. Manufacturing in BoP communities thus requires the ability to adapt production techniques and to co-create products with locals [62]. The final factory location decision also depends on the individual company, its strategy, its preferences, and its circumstances [63].

For research to have practical impact, it is necessary for one to show that the approach you are proposing has been tested and validated. Frameworks and business models can be validated by conducting case studies of previous BoP ventures to evaluate where their strategies succeeded or failed. Here it is important to develop sound monitoring and evaluation metrics for evaluating measurable impact [22]. Metrics that measure the economic, social and environmental impact of creating manufacturing shared value in BoP communities are used to highlight key performance indicators. The evaluation process reveals whether there is shared value creation and if there is a need to change the business model approach.

Creating shared value connects the economic success of an organization with the BoP community's improvement. The improvement in the BoP community is based on the social and environmental conservation processes of the organization's activities. The findings propose that the MMF take into consideration all measures necessary to ensure that natural resources are preserved and that there is minimal waste. From this study, it can be concluded that the ability to balance social, economic, and environmental value creation is of importance when pursuing manufacturing shared value in BoP communities.

Social product innovations are capable of solving social problems in BoP communities resulting in a win-win situation [35]. Social value creation entails building human capabilities, socio-economic equity, and self-respect. It ensures a good source of sustenance and

builds self-confidence as well as freedom of choice [64]. This brings about well-being which can be interpreted as pleasure, desire-fulfilment, or freedom of choice [65]. There is favorable bias from BoP community members to support those investing in their community if they are seen to be consciously preserving their environment [37].

This study is inclined towards operating the MMF as social enterprises. Social enterprises can create opportunities for BoP community members and ensure their well-being which may not be addressed by the government and private sector [66,67]. These social enterprises have capabilities to create shared value in BoP communities by fostering inclusive social innovation [68]. They attain social bricolage by ensuring continuous innovation, improvising constrained resources and empowering the disadvantaged for inclusive growth [69,70].

Social enterprises are usually managed by social entrepreneurs using a bottom up approach with support of resources from companies [66]. Selection of social entrepreneurs are to be based on certain attributes including a strong emotional attachment to the BoP communities [71]. A social enterprise can leverage on its impact to source funding to scale [30].

4.3. Growth Strategy

When the initial MMF is implemented and well established, the next step is scaling for growth. Scaling of the MMF may be undertaken in other parts of the same BoP community or in other similar BoP communities in different regions when resources are ready for expansion. All risks involved in the process of scaling can be thoroughly considered and mitigated [38]. A three phased market approach to scaling impact can be used which starts with negotiating impact for resources, designing operations, and then integrating financing and impact logics [30]. Scaling of the MMF is meant to increase both social and economic impact. This will help to ensure sustainability as more factories will be able to meet the high demand of product as the market grows.

Adopting inclusive business models to expand economic opportunities is necessary to build local enterprises that can be scaled for impact [72,73]. There is a need for business models with innovations that are easily replicable, and have easy market penetration for scaling to other geographical locations [38]. Market-based business oriented models provide win-win scenarios for the poor by covering part of their costs [28,47]. This business model approach tends to be more effective because an entrepreneur or individual contributes towards initial investments which instils a sense of ownership in them.

The MMF will need other complementary BoP ventures around them to thrive. This can be achieved by helping the surrounding businesses to grow. An example is given of a crude oil refinery where they empowered the locals to form local co-operatives which operated a fuel station and other business around the fuel stations [60]. Cluster capability building will ensure that the locals have capability to operate complementary businesses which will improve livelihoods for the BoP community.

4.4. Key Concepts for BoP Manufacturing Shared Value Creation towards a Conceptual Framework

Keys concepts for creating manufacturing shared value in BoP communities from the previous sections were identified from the reviewed literature. The identified concepts are used to develop a conceptual framework for future work. The conceptual framework is based on three MSV strategies adopted from the three key pillars of CSV by Porter and Kramer (2011).

The capability building strategy defines the users' intention to create shared value in BoP communities with MMF according to Key pillar 1: Reimagining products and markets. It is followed by the implementation process which guides the users to create manufacturing shared value in BoP communities according to Key pillar 2: Redefining productivity in the value chain. This will be followed by a growth strategy to scale for impact according to Key pillar 3: Enabling local cluster development.

The MSV strategies discussed in Section 4.1 are categorized into key aspects which define the process. The activities involved for each of the key aspects to be considered in executing the MSV strategies is described and followed up with questions to be addressed by the users (see Table 4).

Table 4. Key concepts for creating manufacturing shared value (MSV) in BoP communities.

CSV KeyPillars	MSV Strategies	Key Aspects	Activity Description	Key Questions to Be Addressed
Key Pillar 1: Reconceiving products and markets	Capability building strategy	• Opportunity identification strategy	• Identifying opportunities that solve problems in BoP communities.	• Which opportunities are available in BoP communities? • Can our organisation offer solutions that solve these problems?
		• Preliminary implementation strategy	• Crafting a sustainable and inclusive business model • Mobilising resources required	• Who are the key partners to work with? • What are the organisation's key activities? • Which key resources are required? • What value does the organisation propose to offer? • Who are the customers? • Which supply chain channels will be used? • What is the cost structure for profitability with low prices? • What are the revenue streams?
		• Building partnerships	• Identifying key partnerships • Building trust • Defining roles and responsibilities for all actors • Defining effective communication channels	• Which partners best suit our organisational vision? • What are the roles and responsibilities for all actors? • Which channels of communication are effective amongst all actors?
		• Product development	• Co-creating innovative products to be manufactured in BoP communities	• Which products are more relevant? • Does the product meet the needs of the BoP community? • How can the co-creation of products be achieved? • Which manufacturing processes are required for the products? • What is the product shelf life? Are there any storage requirements? • What are the packaging needs for the product? Are they easily available? • What is the product life cycle? Does it need technical support or any service requirements?

Table 4. *Cont.*

CSV KeyPillars	MSV Strategies	Key Aspects	Activity Description	Key Questions to Be Addressed
Key pillar 2: Redefine productivity in the value chain	Implementation process	• Supply chain networks	• Planning the most effective supply chain networks • Training BoP raw material suppliers	• Who are our suppliers for raw materials? • Are the raw materials we require available locally? • How can the organisation improve quality from raw material suppliers to ensure a constant supply? • What types of contract are to be made with all suppliers and distributers? • Are there existing sales and distribution networks the organisation can leverage? • Does the supply chain include a channel for returning products for recycling or remanufacturing?
		• Building human capability	• Training and coaching factory personnel	• What skills requirements are required? • What is the hiring policy? What proportion of the employees will be women? • Are these skills available locally? • What are the training needs? • How will training be conducted? • Who will conduct training?
		• Factory development	• Setting up and running the MMF	• Which is the most appropriate site location for the micro manufacturing factories MMF? • What type of factory offers the best solution? • What type of factory set up is required? How can this be maximised for productivity? • What are the infrastructure requirements? Is there any existing infrastructure to leverage from? • How much capital is required? How can the capital costs be reduced? • Where can the best quality equipment be sourced? • Does the equipment have low maintenance requirements? • Which innovation technologies can be used in the MMF? • Which sources of energy is most efficient and cheap? • How will a reliable source of water for production processes come from?

Table 4. *Cont.*

CSV KeyPillars	MSV Strategies	Key Aspects	Activity Description	Key Questions to Be Addressed
		• Process development	• Efficient production process planning	• Which manufacturing processes are required? • What floor plan arrangement is most efficient? • What is the production capacity? Can the capacity meet demand? • Which technologies are required for the manufacturing process? • Are the production processes simple? • What are the energy and water requirements for the production processes? How can these be minimised? • Is there any need for waste management?
		• Environmental conservation processes	• Waste management and mitigation processes	• Is there any waste from the production processes? • Does the product packaging cause any environmental damage? • Which environmental mitigation process can be implemented?
		• Monitoring and evaluation (M&E)	• Measurement of key performance indicators	• Which metrics of evaluation are to be used? • How will the metrics of evaluation be measured? • How often does M&E need to be done? • Who will perform the M&E process?
Key pillar 3: Local cluster development	Growth strategy	• Scaling	• Implementing more MMF to meet increasing product demand in current or new BoP markets	• Is the current MMF fully operational and profitable? • Are there resources for implementing other MMF factories? • How will the scaling process be done? Should the same products be produced in the same community or a different product using the same model? • Are there other similar BoP communities where the same business model can be implemented?
		• Cluster capability building	• Empowering surrounding supporting business • Improving BoP community livelihoods	• Which surrounding businesses are key to the MMF operations? • How can the company support other surrounding businesses to build their cluster network? • Which businesses require support and in what ways?

Table 4. *Cont.*

CSV KeyPillars	MSV Strategies	Key Aspects	Activity Description	Key Questions to Be Addressed
		• Sustainability	• Ensuring that all company activities have economic and social impact and are environmentally friendly	• Is the MMF profitable? • Is the MMF creating shared value in the community? • Are the operations environmentally safe?

The next sections give a conclusion of the study, its limitations and future work.

5. Conclusions

The study recognized the potential for pursuing manufacturing shared value in BoP communities. The road towards this achievement has various challenges and limitations. However, the fulfillment surpasses the challenges faced. The beauty of it all being that it is a mutual fulfilment where shared value is created.

The study identified concepts that are key to creating shared value in BoP communities through micro-manufacturing factories. These concepts were used to develop a conceptual framework illustrated in Figure 7.

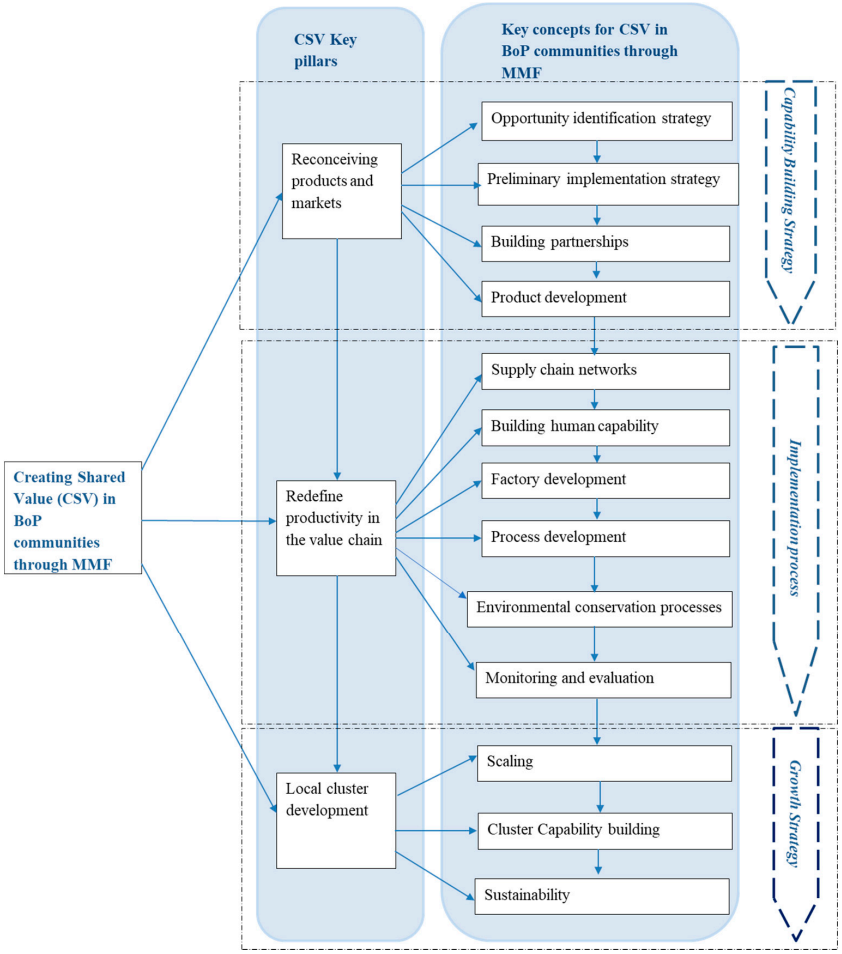


Figure 7. Conceptual framework for creating shared value in BoP communities through MMF.

In conclusion, creating manufacturing shared value in BoP communities with micro-manufacturing factories is an important area of study. It provides a means for those seeking to do well by doing good to grow whilst the communities they operate in grow with them. It was noted that many solutions have been offered to BoP communities but there is still a gap in literature on how manufacturing shared value can be created with micro-manufacturing factories in Southern Africa. There has been some interest by researchers in the past decade to explore growth strategies in BoP communities using innovative solutions for social problems. Literature reveals great strides and milestones towards this. However, pursuing these in underprivileged communities has many hurdles. It requires determination and a desire to see livelihoods improved at the expense of short-term profitability. This review indicates that providing technologically innovative solutions in BoP communities works for those who do so with a long-term focus.

6. Future Work and Limitations

A systematized literature review can be used to meet various goals. The general limitation of a systematized review is that it may or may not include a comprehensive literature search which may present limitations of methodology. The study also avoids this as it was scoped to be limited in its focus on BoP communities and manufacturing and searched a limited range of databases to extract articles. Future work may include expanding this study to grey literature. Future studies may expand the search terms to also explore other kinds of shared value beyond manufacturing and the BoP.

This study sought to answer the research question on the key concepts that are to be considered for creating shared value in BoP communities with micro-manufacturing factories. These concepts were used to come up with a conceptual framework which will be evaluated and developed in further studies. The evaluation process will be used to refine the conceptual framework to provide a roadmap for creating manufacturing shared value in BoP communities through micro-manufacturing factories. The review also assisted in identifying research gaps.

The goal for this study is to persuade various organizations to form beneficial partnerships which focus on creating shared value in BoP communities through micro-manufac turing factories. This will see these BoP communities empowered and possibly included in the formal economy value chains. The idea of the research presented in this article is thus to improve understanding of various important aspects to improve livelihoods in marginalized BoP communities.

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