

Ecosystems as Base of Pyramid business' enablers

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ECOSYSTEMS AS BASE OF PYRAMID BUSINESS' ENABLERS

1. INTRODUCTION

In recent years, the Bottom of the Pyramid (BoP) market has undergone scrutiny, with authors declaring a significant proportion of BoP ventures as either outright failures or falling drastically short of initial expectations (Derks et al., 2022). A realization of the challenges faced by these ventures prompted focused research on the nature and requirements of BoP Business Models (BM) scaling strategies and the challenges faced by International Businesses (IBs) trying to enter these markets. In response, a conceptual shift has occurred in the BoP community, emphasizing the need for new business models that facilitate multi-stakeholder collaboration, diverse value creation, and societally transformative development. This shift is encapsulated in the transition from business models to business ecosystems, fostering a broader outlook to navigate scaling challenges strategically (Derks et al., 2022).

The BoP strategy alone posits that businesses must collaboratively engage with a diverse array of stakeholders. Broadening the concept into the enterprise's ecosystem (Surie, 2017), there is an reinforcement in the need for collaboration, which is recognized as crucial for overcoming the multifaceted challenges associated with serving BoP markets, necessitating engagement with various actors, including local communities (Sottini et al., 2022). The collaborative dynamic within the ecosystem contributes to the creation of more value than individual parties might achieve in isolation. This interconnection significantly influences the business model, leading to adjustments in response to changes within the ecosystem.

Building upon the existing studies, this paper analyzes the literature on business models developed for BoP markets to uncover innovative mechanisms included to overcome contextual challenges. The examination of the extant literature is focused on answering the following question: What is the intellectual map around BoP ecosystems? To address the research question, we proceeded with a bibliographic analysis of the academic literature that connects the BoP concept with the presence of business-related ecosystems, using WoS and Scopus databases. The publications were screened both manually and with the assistance of Biblioshiny and MS Excel.

2. THEORETICAL BACKGROUND

2.1 Bottom/Base of the Pyramid (BoP)

BoP is an acronym that alludes to the bottom tier of the world income pyramid, a group living in extreme or moderate poverty (Gold et al., 2013; Hahn, 2009; Sharma and Jaiswal, 2018), with incomes ranging from 8 USD per person per day to less than 1.25 USD pppd (Goyal et al., 2014). They are cross-national, living in both developed and developing countries, reside mostly in urban slums, semi-urban and rural areas, live and transact in informal economies, and lack access to mechanisms to fulfill basic human needs like nutrition, basic sanitation, healthcare, education, energy, and housing (Goyal et al., 2020; Viswanathan and Sridharan, 2012).

Prahalad and Hart were the first ones to fully articulate the BoP concept, in 1999, in a working paper directed at practitioners (Prahalad and Hart, 1999). But the seminal work on the theme is considered to be "the fortune at the bottom of the pyramid" (Coimbatore Krishnarao Prahalad and Hart, 2002) because it provides the foundational basis for the

conceptual development of the BoP (Pineda-Escobar, 2013). From 2007 onwards, academic article's numbers started to rise significantly (Kolk et al., 2014), and the concept evolved alongside several research waves.

The first generation, BoP 1.0, emphasized the profits that could be obtained in this largely untapped market, convening the private sector to provide underserved products and services to the poor, transforming them into consumers, while also contributing to the economic growth of local economies, and to the consequent resolution of related societal problems (Hahn, 2009; Olsen and Boxenbaum, 2009; Seuring et al., 2019; Viswanathan and Sridharan, 2012). But treating the BoP only as consumers provoked criticism, with scholars arguing that organizations could take advantage of their difficulties and imbalance in information access (Rahman et al., 2014).

BOP 2.0 moved beyond a relationship based on consumption to include co-creation (Lashitew et al., 2022) and business co-venturing (or partnerships), integrating the under-served communities in the value-creation process (Hahn, 2009; Karnani, 2007; London et al., 2010). Moving further, BoP 3.0 advocates the transformation of the socio-economic system around the BoP (van der Merwe et al., 2018). Researchers in this wave claim that poverty is a multifaceted and complex problem (Dembek and York, 2020), embrace concerns around environmental sustainability, and advocate that the combined effort of cross-sector partnerships and service ecosystems is necessary to overcome the poverty challenge (Von Janda et al., 2021). Lately, ICT-enabled innovations linking informal enterprises with MNCs have been called BoP 4.0 (Roll et al., 2021).

2.2 Ecosystem

Adopted from the biological domain, the term 'ecosystem' denotes a group of loosely interconnected entities mutually dependent on each other for survival. This concept has garnered increasing scholarly attention across diverse fields, including innovation, organization studies, regional science, and entrepreneurship (Sottini et al., 2022). The term 'ecosystem' has found association with various expressions such as business ecosystem, entrepreneurial ecosystem, innovation ecosystem, service ecosystem, frugal ecosystem and BOP ecosystem, with the 'ecosystem' always perceived as a catalyst for the success of enterprises.

An ecosystem is delineated as a community of actors within a specified scale, encompassing physical, market, and regulatory dimensions, wherein continual flows of knowledge, finance, and value occur interactively in an open manner (Derks et al., 2022). While the variables within the entrepreneurial ecosystem's subject and environment remain debated, the external environment may span human resources, financial capital, culture, leadership, education, networks, infrastructure, support services, policies, market, facilities, and institutions, among others. The various actors contributing to ecosystems include entrepreneurial ventures, NGOs, universities, government bodies, banks, telecommunication companies, and communities (Ambati, 2022; Huang et al., 2023; Mishra et al., 2022).

The fundamental assumption posits that the business ecosystem, situated within a social and economic environment, facilitates resource, knowledge, and competence sharing among entities (Borchardt et al., 2022). This collaborative dynamic within the ecosystem results in the creation of more value than individual parties might achieve in isolation (Sottini et al.,

2022). Consequently, the interconnection between the ecosystem and the enterprise influences the business model, evolving through interactions within the surrounding ecosystems.

From a business model perspective, the business ecosystem signifies the structure of a multilateral set of partners essential for the realization of the value proposition. Changes in one part of the ecosystem trigger adjustments in other parts, reinforcing the notion of business model dynamics adapting to external contexts and opportunities (Borchardt et al., 2022). Business model scaling up hinges on the business ecosystem's ability to harness complementary resources, organizational capacities, and knowledge in BoP settings more effectively than firm-centric models. It preserves critical capabilities for addressing the imperative of local flexibility, adaptability, and social engagement (Derks et al., 2022). Therefore, leveraging an ecosystem perspective is crucial for scaling strategy development, managing tensions, and aligning different actors within the ecosystem to create lasting value. This involves incorporating necessary business model adaptations for ecosystem actors to implement specific scaling strategies as a central aspect of strategy development (Derks et al., 2022).

3. RESEARCH METHODOLOGY

3.1. Sampling Process

The sampling process was conducted in two electronic databases: Web of Science (WoS) and Scopus. WoS encompasses all journals with impact factor in the Journal Citation Report (JCR) base, and Scopus consolidates a comprehensive journal base (Carvalho et al., 2013). The research string was "ecosystem*" and "bop" or "base of the pyramid" or "bottom of the pyramid" or "base of pyramid" or "bottom of pyramid". In WoS, the field researched was "topic", which includes title, abstract, author keywords and keywords plus. In Scopus, the fields researched were title, abstract and keywords. In both databases, the results were filtered by document type, and only "articles" or "early access" remained in the sample, because of the selective peer review process. A language filter was also applied, selecting only papers written in English. No date filters were applied, and all texts published until November 13th 2023 were included.

The search returned 50 papers from WoS, and 59 from Scopus. The merge of the results left the sample with 71 single papers, since 38 were listed in both databases. The titles and abstracts were analyzed, determining if the paper was aligned with the research goals. The exclusion protocol included the reading of the whole paper for confirmation, and the creation of an explanation for exclusion. **Error! Reference source not found.** indicates the number of articles removed by exclusion criteria.

Table 1. Number of papers excluded by exclusion criteria.

Criteria	Number of papers excluded
Cases written for teaching purposes	3
Term 'bop' used in other sciences, such as chemistry and ecology	8

As a result of the refinement process, 11 papers were excluded, leaving the sample with 60 articles. A backward snowballing process was also executed, aiming for a better

understanding of the concepts related to both BoP and ecosystem. The articles found in the snowballing, although included in our literature review, were not accounted in the systematic bibliographic review. Fig. 1 represents the sampling process.

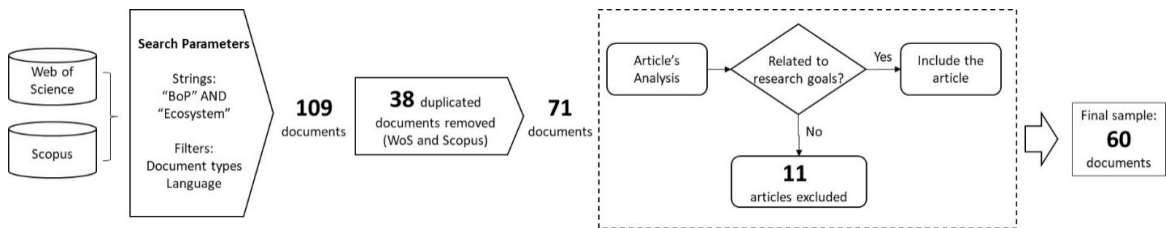


Fig. 1. Systematic literature review workflow

3.2. Data analysis

Bibliometric analysis supported by Biblioshiny (Aria and Cuccurullo, 2017) software were applied in the research. The sample from Scopus and WoS databases was pre-processed and merged in RStudio. We promoted the grooming of metadata for keywords and references.

Using Biblioshiny, we created the keyword co-occurrence and the reference co-citation networks. The co-occurrence shows the network of keywords that have been combined in the sampled articles, either by authors or by editors, indicating how frequently they were used together. The co-citation shows the network of papers that have been referenced together and contributes for the understanding of the intellectual map of an area. Biblioshiny also supported the creation of a thematic map to analyze the centrality and density of the network. The centrality measures the importance of a theme, while density measures the development of this theme. Finally, the top productivity authors and the most local cited documents and references were identified with this software.

To complement the answer to the research question, the authors performed a manual screening on the selected sample of papers attributing codes using MS Excel. The manual coding process followed the coding cycles described by Skjøtt Linneberg & Korsgaard (2019).

4. RESULTS AND DISCUSSION

4.1 Sample demographics

The evolution of publications over time, presented in Fig. 1, has shown little interest in publishing about the relationships between BoP and ecosystems until 2020, and a peak in 2022. The last 4 years (2020, 2021, 2022 and 2023) account for 52% of the publications on the theme, with 2022 alone accounting for 25% of total articles. The publications are spread amongst several journals, mostly with one article published by each one. The exceptions are Business and Society with three papers, and Journal of Marketing Management, Journal of Entrepreneurship in Emerging Economies, Technovation, and Technological Forecasting and Social Change with two articles each.

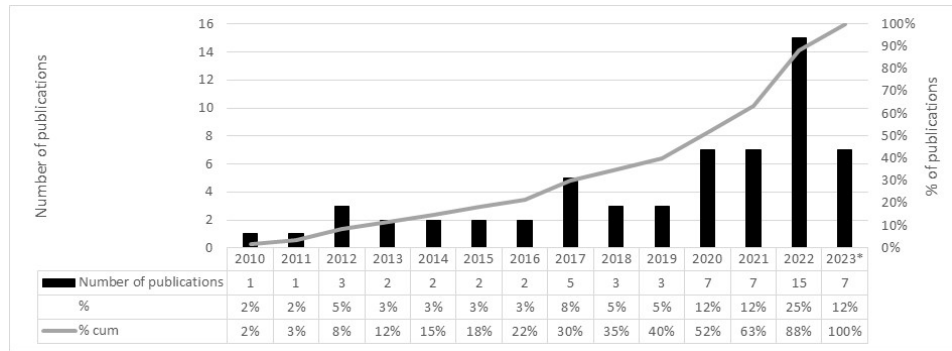


Fig. 1. Evolution of publications over time. The year of 2023 includes papers published until November 13th.

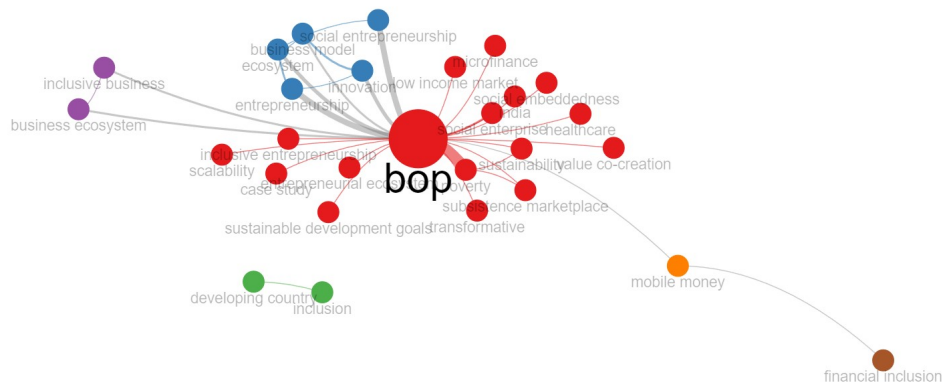
4.2 Co-occurrence network

The keywords co-occurrence analysis presented in Note: Biblioshiny software using sample metadata

Fig. 2 includes six different clusters. The main one, represented in red, has the word ‘bop’ in the center, connected to several major themes: (i) challenges encountered when addressing bop market issues, such as scalability, sustainability, and value co-creation; (ii) economic sectors, like microfinance and healthcare; (iii) expressions used almost as synonyms, like ‘subsistence marketplace’ and ‘low income market’; (iv) sub-themes frequently associated with the entrepreneurial ventures in bop markets, like inclusive entrepreneurship, social enterprise and entrepreneurial ecosystem. Additionally, this cluster includes the main research method used, case study, and the country where many of the described cases were found, India.

Second in number of nodes, the blue cluster encompasses other sub-themes linked to entrepreneurial ventures, such as social entrepreneurship, entrepreneurship, innovation and business model ecosystem. Similarly, the purple cluster is composed of inclusive business and business ecosystem. The similarities between the purple and blue clusters, and some of red cluster nodes, lead to the hypothesis that there are different groups of authors discussing similar themes, using different expressions.

Distant from the main clusters, orange cluster is composed only of one node, ‘mobile money’, as well as brown cluster, with the ‘financial inclusion’ node. Indeed, the concerns around providing financial resources for bop populations is a research stream with its own relevance, although the discussion is also embedded in most of the bop works. Disconnected from the other clusters, green one is focused on developing countries and inclusion, themes that debate the mechanisms around inclusion.



Note: Biblioshiny software using sample metadata

Fig. 2. Keywords co-occurrence analysis using author keywords

4.3 Co-citation analysis

The co-citation analysis presented in Fig. 3 includes four clusters.

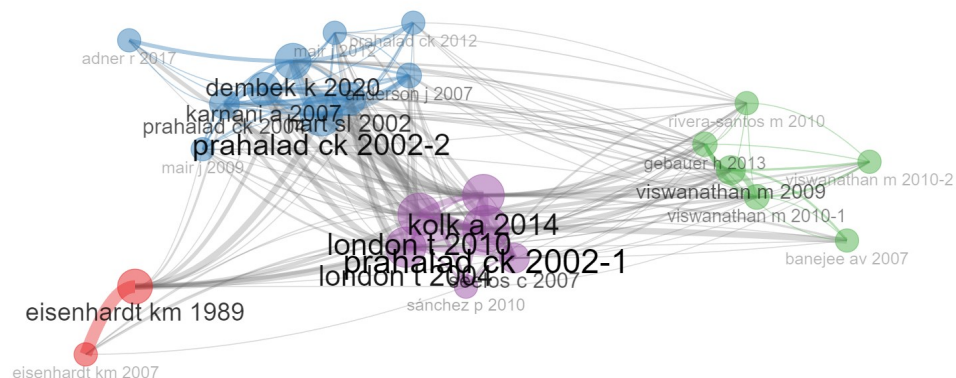
Blue cluster, the largest one, is comprised of ten papers. Mostly, they are highly cited works on the BoP literature. Here are two seminal papers written by Prahalad and Hart urging multinationals to explore BoP markets, ‘The fortune at the bottom of the pyramid’ (Coimbatore K Prahalad and Hart, 2002), and ‘The great leap: Driving innovation from the base of the pyramid’ (Hart and Christensen, 2002), as well as an update written ten years later, ‘Bottom of the Pyramid as a Source of Breakthrough Innovations’ (Prahalad, 2012). The relevance of innovation is crowned by the presence of a third article dedicated to it, ‘Strategic innovation at the base of the pyramid’ (Anderson and Markides, 2002). Another relevant theme in BoP discussions are the institutional voids, which have two dedicated papers (Mair et al., 2012; Mair and Marti, 2009). The cluster also contains a literature review that covers the three research waves on BoP (Dembek et al., 2020), and one of the main critics to the idea of economically exploring the BoP markets, where Karnani express concerns about the actual size of BoP market and about its profitability (Karnani, 2007). Finally, the only paper directly dedicated to the ecosystem discussion is in this cluster: ‘Ecosystem as Structure: An Actionable Construct for Strategy’ (Adner, 2017) examines the relationship between the ecosystem construct and several other constructs of interest to BoP discussions, such as business models and networks.

Green and purple have six articles each. Green cluster includes one work that digs in the details of poverty, including the definition of poverty, the consumption habits of the poor, and how they earn money (Banerjee and Duflo, 2007), and three works that use the expression ‘subsistence markets’ to describe the business environment in BoP contexts (Viswanathan et al., 2010a, 2010b, 2009) and discuss different aspects of relationships between buyers and sellers in such contexts. Two articles in the cluster include the concept of network. The first, also related to subsistence markets, discusses the influence of social networks in the dynamics of BoP markets (Viswanathan et al., 2010b), and the other compare business networks at the BoP and at the Top of the Pyramid (TOP) (Rivera-Santos and Rufin, 2010). The last article in this cluster discuss more specific item: pay-per-use (PPU) services (Gebauer et al., 2017), arguing that this model contribute to sustainable consumption and to resource-efficient product designs.

Interestingly, although there are no clusters directly dedicated to the ecosystem concept, several articles in green cluster introduce ideas that are relevant for the ecosystem discussion. For instance, the importance of networks (Rivera-Santos and Rufin, 2010; Viswanathan et al., 2010b). But also the ‘social environment at the marketplace level’ (Viswanathan et al., 2009), and the ‘closed loops’ (Viswanathan et al., 2010a). The first one suggests this social environment as a level of analysis and argues that resource constraints result in interdependence among groups and organizations. The second is defined as a series of activities where the outcomes from one activity initiate subsequent activities and interconnected effects, that circulate back to the initial activity, exerting positive or negative influences that contribute to the maintenance of a stable system – an idea that comes from ecology, but that can be applied to organizations.

Purple cluster contains four works published during 2000’s first decade that optimistically urge multinationals to explore the economic potential of BoP markets (Prahalad and Hammond, 2002), and discuss mechanisms for overcoming the challenges of such endeavor, successfully adapting traditional business strategies and innovating in their business models to fit low income contexts (London and Hart, 2004; Sánchez and Ricart, 2010; Seelos and Mair, 2007). The cluster also includes two works from the following decade: an analysis on the evolution of the BOP concept (Kolk et al., 2014); and a discussion on mutual value creation (London et al., 2010). This cluster is closed related to the blue one, where other seminal works have also been included.

Finally, the red cluster is composed of two nodes, and both are Eisenhardt’s articles on technics for applying study case research (Eisenhardt, 1989; Eisenhardt and Graebner, 2007), which indicates a strong presence of this research methodology.



Note: Biblioshiny software using sample metadata

Fig. 3. Co-citation reference network

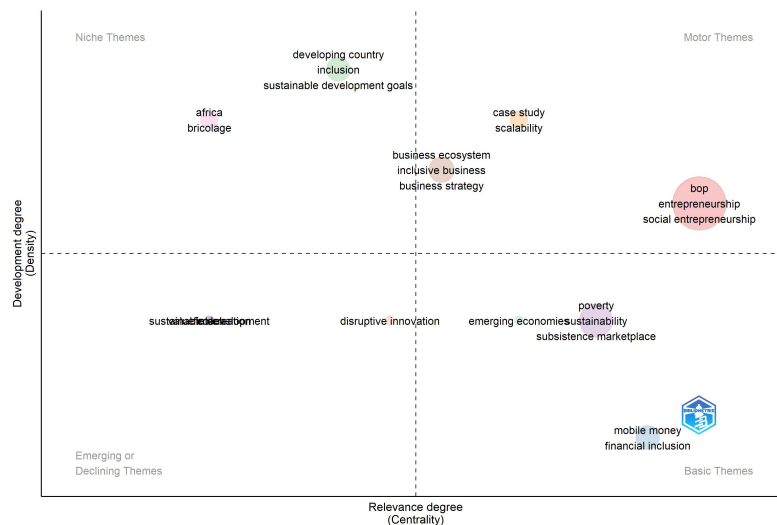
3.4 Thematic map

Fig. 4 illustrates the thematic map, delineating distinct clusters of themes.

Situated in the upper-right quadrant, the motor themes display robust centrality and high density. These themes bridge BoP with entrepreneurship and social entrepreneurship. Other motor themes are ‘scalability’, that has been explored through several case studies, and ‘business ecosystem’. Found within the upper left quadrant, the niche themes display heightened development (high density) but exist as isolated topics (low centrality). That is the case for ‘bricolage’, a technic often associated with the creation of efficient solutions in

environments with scarcity of resources. Bricolage seems to be associated with case studies located in Africa. The ‘sustainable development goals’ also appear in this quadrant, showing links with developing countries and inclusion.

In the lower-left quadrant, less-developed and peripheral themes are situated (low density and centrality). These themes signify emerging or waning areas. ‘Sustainable development’ and ‘disruptive innovation’ were included in this quadrant. Finally, the lower-right quadrant showcases high centrality and low density, which characterize fundamental themes. ‘Mobile money’ and ‘financial inclusion’ are connected and located in this quadrant. Another group of fundamental themes is comprised of ‘poverty’, ‘emerging economies’, ‘sustainability’ and ‘subsistence marketplace’.



Note: Biblioshiny software using sample metadata

Fig. 4. Thematic mapping

5. CONCLUSION

This study delves into the intersection of Bottom of the Pyramid (BoP) markets and business ecosystems. The investigation reveals a growing interest in the relationship between BoP and ecosystems, particularly in recent years. The conceptual shift from traditional business models to business ecosystems reflects an increased emphasis on multi-stakeholder collaboration, diverse value creation, and societally transformative development.

The study contributes to theoretical advancements by mapping the intellectual landscape around BoP ecosystems and elucidating how ecosystems enable BoP businesses. The co-occurrence and co-citation analyses reveal clusters of keywords and seminal papers, providing a comprehensive understanding of the key themes and influential works in the field. The integration of business ecosystem perspectives into the analysis offers theoretical insights into the dynamic interplay between ecosystems and business models, shedding light on the factors that influence adaptability and scalability. Contributions to practice include the findings that underscore the importance of collaborative efforts within the ecosystem for businesses operating in BoP markets. The study highlights the role of ecosystems in facilitating resource, knowledge, and competence sharing among various entities, contributing to more effective business model scaling in BoP settings. Practitioners can leverage these insights to develop

strategies that prioritize collaboration, adaptability, and value creation for all key actors in the ecosystem.

Amongst the limitations, the authors include the specific set of keywords and databases used in the research, potentially excluding relevant literature that may use different terminologies or be found in other sources. Additionally, the focus on English-language publications may introduce language bias.

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