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# Producer organizations in the last 25 years: a bibliometric analysis and meta-review of the literature

Shantanu Bhunia [1] & Piyush Kumar Singh [1]✉

Over the past few decades, producer organizations (POs) have garnered significant attention and policy support due to their potential for wealth creation and sustainable rural livelihoods. Research in this area typically focuses on the rural context, highlighting the services POs offer, their roles in market linkage activities, and their contribution to financial inclusion and rural growth. However, there is currently no comprehensive review of the literature that explores the organizational attributes of various collective forms and their role in sustainable development goals. We, therefore, conduct a meta-analysis of the literature based on bibliometrics to understand current research trends and identify existing gaps. We used Scopus as the bibliometric data source and focused on PO-related developments during 1998–2023 for our analysis. A total of 74 papers were found eligible for this meta-review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were applied to extract papers based on inclusion criteria. Bibliometric analysis was performed using the VOSviewer tool. We discussed the findings based on the clusters generated in the co-citation study. Indeed, this research summarizes major structural reforms, market linkages by the POs, and the impact of membership on rural livelihood. A range of organizational attributes, including ownership, control, benefit, profit share, governance, autonomy, marketing, and liability factors of cooperatives and producer companies, have been analyzed and compared. We found that producer companies carry both the goodness of co-operative structure, i.e. credit access, training, bargaining ability, and other technical facilities and the vibrancy and efficacy of private companies. The role of POs in contract farming and value chain integration is extensively discussed in the selected literature. Using Cohen's *d*, we further demonstrate that membership in a PO significantly enhances farmers' bargaining power, market access, and credit acquisition compared to non-members. Based on our analysis, we conclude that POs have the potential to play a pivotal role in achieving the sustainable development goals (SDGs) by 2030, which are critical for the development of emerging economies. However, this is the first attempt to investigate POs in such a holistic way using bibliometrics, to the best of the authors' knowledge. These findings could be meaningful in shaping regional policy and expediting future investments to establish robust business ventures.

[1] Centre for Rural Development and Innovative Sustainable Technology, Indian Institute of Technology Kharagpur, Kharagpur 721302, India.
✉email: psingh@iitkgp.ac.in

## Introduction

In 2015, the United Nations framed 17 Sustainable Development Goals (SDGs) to achieve economic, social, and environmental sustainability on a global scale by the year 2030 (Scheyvens et al., 2016). Complementing these goals, the Paris Agreement, signed at COP 21, seeks to combat climate change and promote a sustainable low-carbon future. The UNFCCC has urged member states to actively endorse both the 2030 Agenda and the Paris Agreement (UNFCCC, 2017). In this landscape, producer organizations (POs) become vital, acting as key drivers of wealth creation and pro-poor rural development in emerging economies (Singh, 2021; Lafont et al., 2023). Indeed, POs offer substantial opportunities for advancing the goals of the Paris Agreement by improving access to climate-resilient practices and helping to reduce greenhouse gas emissions through the adoption of PO-based shorter supply chains.

POs are member-based legal entities that can be a producer company, a co-operative society, or any other legal form of federation, promoting collective action. While they may vary in size, organizational structure, internal governance, and membership criteria, POs consistently operate with the common goal of serving their member producers (Groot-Kormelinck et al., 2022). The advantages and benefits of joining agricultural POs are well known. Membership in POs has been shown to improve smallholder's income and well-being (Bizikova et al., 2020), enhance food production (Dower and Gaddis, 2021; Duque-Acevedo et al., 2022), increase market participation (Shiferaw et al., 2011; Kashyap and Bhuyan, 2023), strengthen bargaining power (Di Marcantonio et al., 2022), and provide faster access to credit (Benson and Faguet, 2023). Furthermore, POs facilitate better networking (Bernard et al., 2021; Ofolsha et al., 2022), reduce transportation costs (Siwale, 2018), and promote technological advancements (Kapelko et al., 2019). POs have also been found to be crucial in empowering women and the backwards (Mwambi et al., 2021) and in the adoption of safe and sustainable production systems and practices, including organic farming (Tabe-Ojong, 2023). Despite such advantages, the success of POs has so far been limited in developing countries.

In India, there are approximately 8.54 lakh co-operative units operating across various sectors mostly in agriculture (NCUI, 2018). However, the effectiveness of co-operative marketing in many Indian states suffers from inadequate governance. In several cases, the governing bodies of these cooperatives are fully unaware of the market forces (Shah, 2020). Other significant challenges include corruption, external interference, high dependency on government funding, and low-level technology adoption (Singh, 2021). As a result, traditional cooperatives have lost their vibrancy and are often associated with loss-making practices and poor performance. Likewise, the Kenyan and Ethiopian cooperatives suffer from mismanagement and inefficiencies (Tshishonga and Okem, 2016; Awoke and Alam, 2021). In response to these challenges, producer companies emerged in India in the early 2000s (Kakati and Roy, 2022). Indeed, the same structure, known as new generation cooperatives, first evolved in the United States during the 1990s. After Sri Lanka, India became the second Asian country to experiment with this type of organization. While attempts in Sri Lanka during the 1990s were largely unsuccessful (Esham and Kobayashi, 2013), India seems to have a better promise of their success by blending the corporate and cooperation principles to make them more resilient in a liberalized and globalized market (Singh, 2022).

Using bibliometrics and visualization tools, the present study aims to provide a comprehensive understanding of producer organizations for the last 25 years. The specific objectives include (a) identifying trending topics and major research themes related to POs, (b) summarizing current developments across different clusters, and (c) outlining policy implications and future research perspectives based on the findings. To the best of the authors' knowledge, this is the first attempt to investigate producer organizations in such a holistic manner using bibliometrics. Additionally, it identifies top-cited papers, frequently used keywords, and the potential for achieving major SDG goals. Furthermore, it examines the factors driving the transition to producer companies and assesses the membership effect on livelihood components using Cohen's *d*. Compared to narrative reviews, this research provides a more transparent and replicable structured process that enhances rigor and thoroughness while reducing bias. This approach, which has not been extensively used in previous investigations, ensures the reliability and robustness of our findings and interpretations.

The rest of the paper is structured as follows: the section "Methodology" outlines methodology and bibliometric techniques applied, sections "Results and discussion" and section "Sustainability and POs" represent findings and discussion, and section "Conclusions" concludes with policy implications and major limitations.

## Methodology

### Bibliometric analysis

*Data source*. The present study adopts Scopus (launched in 2004 by Elsevier) as a data source for the period of 1998–2023. Scopus indexed more than 94 million scholarly records and over 29,200 active serial titles from 7000 registered publishers with 2.4 billion cited references (Elsevier, 2023), is the largest, most comprehensive and trustworthy database of peer-reviewed literature and international publishers for bibliometric analysis. We therefore applied the terms "producer organization*" OR "producer co-operative*" OR "producer company*" in Scopus for data aggregation, and the search was performed in January 2024. The annual scientific yield is depicted in Fig. 1. See Supplementary Table 1 for basic information about the database.

*Research method applied*. The retrieved data was then analyzed using VOSviewer (version 1.6.20; Center for Science and Technology Studies, Leiden University, Netherlands) (Van Eck and Waltman, 2010). The analysis included citation, co-citation, and keyword co-occurrence, three different approximations of bibliometrics. Indeed, bibliometrics offers novel insights backed by the quantitative strength of the methodology and objectives

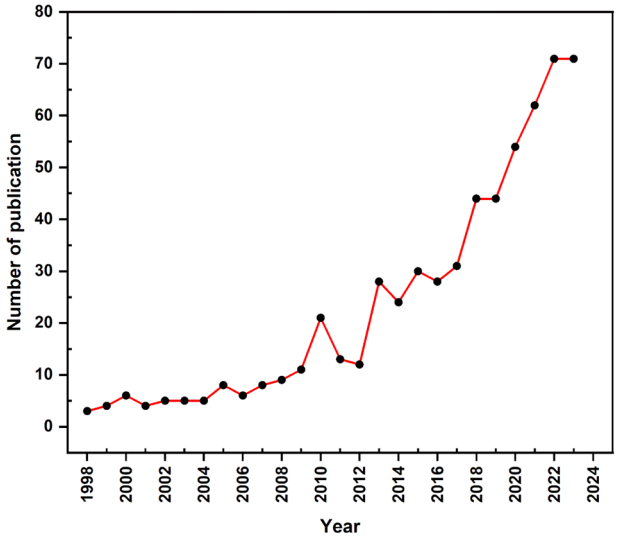


**Fig. 1** Annual scientific output on producer organizations. (Author's compilation).

(Casillas and Acedo, 2007), and is generally performed to uncover the existing paradigms and research gaps based on similarity (Thelwall, 2008). The keyword co-occurrence analysis enabled us to explore the main links and terms related to POs (Ding and Yang, 2020). Citation analysis, we performed to identify the most influential authors and their publications (Gundolf and Filser, 2013), and co-citation analysis of references to investigate new clusters for topics classification and emergent research gaps (Nerur et al., 2008). It is noteworthy to mention that publications belong to the same cluster because of the similarity of their topics, but they may have contradicting viewpoints. Adopting a similar approach, Luo et al. (2020) and Lafont et al. (2023) previously explored new clusters for topic classification and meta-review.

### Meta-analysis

*Study selection*. The study selection followed a structured three-stage process. In the first stage, documents that were not peer-reviewed journal articles were excluded. The second stage involved screening titles and abstracts to identify relevant studies. The final stage consisted of a detailed content analysis of the papers that met the inclusion criteria (Bizikova et al., 2020). Inclusion criteria were as follows: (a) publications focused on producer companies, producer cooperatives, and producer organizations; (b) clusters (sub-groups) identified through co-citation analysis; and (c) studies published in English after 1997. The search yielded a total of 1,099 documents. After the screening, 607 documents were retained, and ultimately, 74 studies were found eligible for meta-analysis. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were applied to extract the papers, as illustrated in Fig. 2.

*Data extraction and analysis*. A data extraction template was developed. Based on clusters identified through co-citation analysis, data was extracted from the selected papers. The extracted data included details on structural reforms within POs, the wealth generated by these organizations, and their effects on rural livelihoods. Additionally, the potential of POs in achieving SDG targets was discussed. We employed Cohen's *d* to assess the impact of PO on rural welfare, following the methodology outlined by Morris and Deshon (2002).

*Effect size calculation*. Effect size (EF) is the quantified magnitude of the differences between two groups. EF generally calculates to check whether a variable fits under a large scale or not. In the present study, EF is calculated by taking the mean difference between two groups, and then dividing the result by the pooled standard deviation, and expressed as trivial (>0.2), small (0.2–0.5), medium (0.5–0.8) or large (>0.8). We applied the tool ReviewManager 5.4 (RevMan, The Cochrane Collaboration, NCC, Denmark) for meta-analysis of the literature. A large EF offered wider practical significance of a research, while a small EF indicated limited application.

$$d = \frac{\overline{X}_1 - \overline{X}_2}{S_{pooled}} \tag{1}$$

$$S_{pooled} = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_1 - 1)S_2^2}{n_1 + n_2 - 2}} \tag{2}$$

where, $d$ is the effect size (EF), $\overline{X}_1$ and $\overline{X}_2$ are means of two groups, $S_1$ and $S_2$ are standard deviations of two groups, and $n_1$ and $n_2$ are the sample sizes.

To obtain a 95% confidence interval (CI), we multiplied Cohen's $d$ by a correction factor of 1.96 ($\alpha$).

$$\alpha = \sqrt{\frac{n_1 + n_2}{n_1 \times n_2} + \frac{d^2}{2(n_1 + n_2)}} \tag{3}$$

$$95\%CI = d \pm 1.96\alpha(d) \tag{4}$$

## Results and discussion

**Bibliometric outcome**. The annual scientific yield reflects the prominence and relevance of research within a specific area, as well as indicating the pace of development and various perspectives in the field (Wang et al., 2021). In our analysis, we identified 607 papers from Scopus published between 1998 and 2023 by searching for relevant subject terms. Notably, there has been a significant increase in publications since 2018. From 2009 to 2018, the growth in publications showed fluctuations, while prior to 2009, the rate remained slow and steady at approximately 6 publications per year. Figure 1 shows the year-wise distribution of the scholarly articles published. We documented an average scientific yield of 24.28 per annum, an average citation rate of 14.77 per article, and a total of 1,622 authors involved in these publications, as detailed in Supplementary Table 1. Post-2018, the annual scientific yield surged to around 58 publications per year, reflecting a heightened interest among researchers in works related to PO. Specifically, the number of publications soared from just 6 in 2000 to 44 in 2018, reaching a peak of 71 in 2023. This increase gained momentum after 2010, driven by the growing importance of POs in the food supply system and pro-poor rural development (Surendran-Padmaja and Ojha, 2023) and enhanced funding support from governments, corporations, and global organizations (Lafont et al., 2023). The Forest and Farm Facility (FFF), launched in 2012 as a partnership among the FAO, IIED, IUCN, and AgriCord, provides vital financial and technical assistance to forest and farm producer organizations (FFPOs). In its initial phase (2012–2017), the FFF directly supported 947 FFPOs. In its second phase (2018–2023), about sixty-seven percent of the FFF's budget was dedicated to supporting these organizations, including 169 majority-women groups (FAO, 2024). Similarly, the Global Agriculture and Food Security Program (GAFSP), established by the G20 in response to the 2007–08 food price crisis, linked with the World Bank, IFAD, and other international forums to deliver financial and technical support for agricultural development in rural. Since its inception in 2010, GAFSP has mobilized over United States Dollars 2 billion in donor funding, benefiting more than 16.6 million people (World Bank, 2023). Both programs play crucial roles in empowering POs and contributing to global food security and sustainable development.

Compiling all related research, the present study conducted a keyword synthesis using VOSviewer, as displayed in Supplementary Table 2. In bibliometrics, keywords are instrumental in uncovering emerging research trends and directions, as they encapsulate crucial information about published articles (Dixit and Jakhar, 2021). According to Xie et al. (2020), keywords not only highlight key research topics but also help assess their potential. Our analysis revealed "Smallholder", "Agriculture", "Collective Action", and "Sustainable Development" as the most prevalent keywords, indicating that significant research is centered on agricultural collectives as a means to achieve sustainable rural development. Therefore, special attention is given to smallholder organizations and explores their role in achieving certain SDGs. Furthermore, the study conducted a citation analysis of the literature to identify impactful publications and their influential authors. The number of citations signifies the impact and relevance of any research published, as well as the

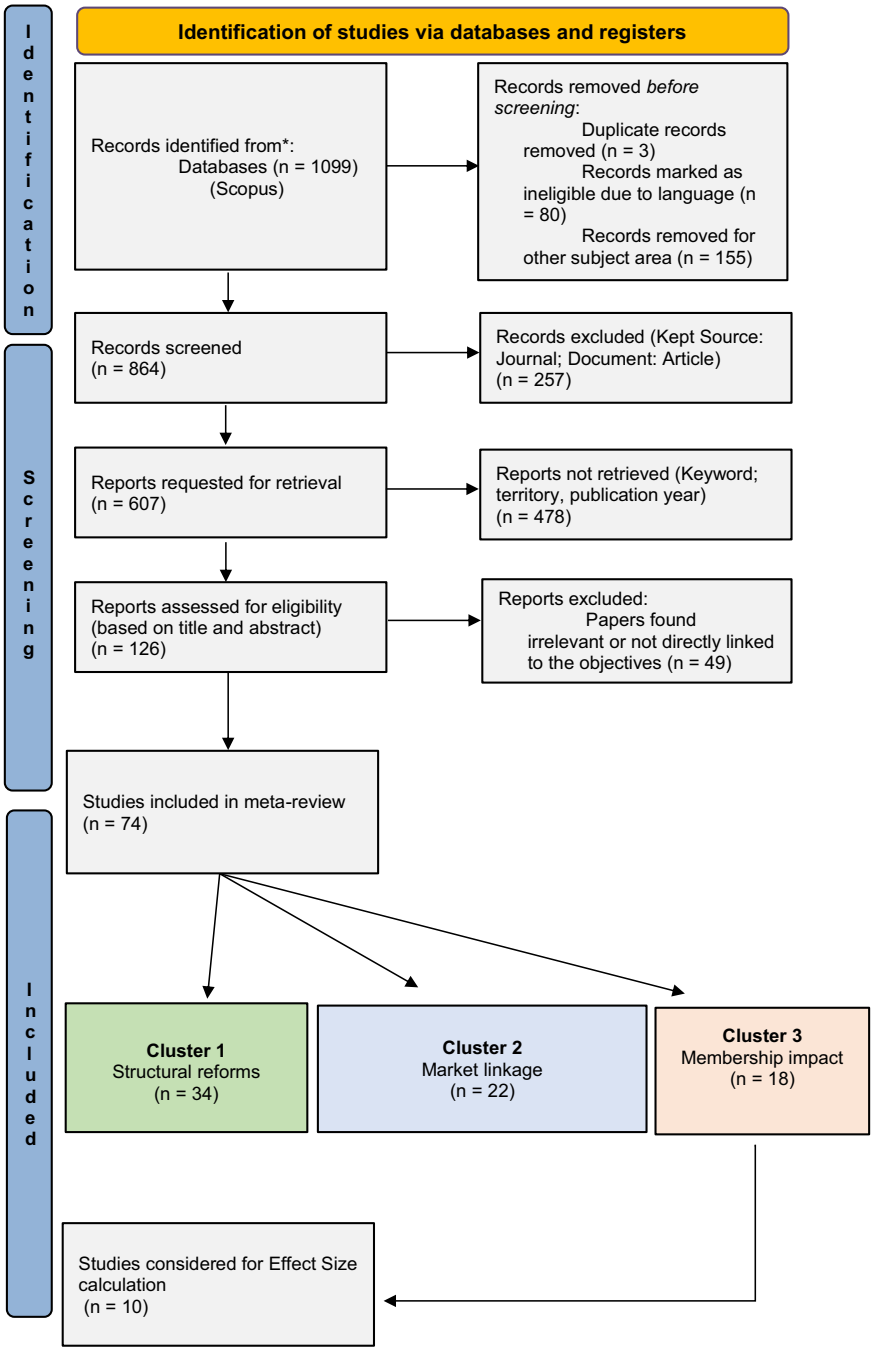


**Fig. 2** PRISMA flow diagram of literature screening. (Author's compilation).

popularity of the authors associated with it (Gundolf and Filser, 2013). Through this analysis, it is possible to uncover knowledge flow and communication links between the authors, as well as explore the changes and evolution that occur by tracing the links between cited and citing works (Pournader et al., 2020). Supplementary Table 3 enlisted the top-cited articles and authors from 1998 to 2023. The majority of the articles highlight the role of POs in wealth generation and smallholder well-being (Tallontire, 2000; Markelova et al., 2009; Bernard and Spielman, 2009). This underscores the need for understanding the impact of POs on various livelihood components. However, co-citation analysis of the references is important for topic classification and systematic synthesis (Bronk et al., 2023). According to Gmür (2003), reference co-citation finds similarities in publications and clusters them accordingly. The present study identifies three major clusters from the co-citation analysis, as shown in Fig. 3. Documents grouped in the green cluster discuss structural reforms and advancements within POs. Publications in the gray cluster focus on market linkages by the POs, while studies reported in the red cluster highlight social aspects and membership benefits from POs. See Supplementary Table 4 for co-citation clusters and associated publications.

## Meta-review

*Current developments in organization structure*. To succeed in modern markets, producer collectives worldwide have undergone various institutional and structural reforms (Lalitha et al., 2022). Market-oriented collective organizations first emerged in the United States in the 1990s. In contrast to traditional

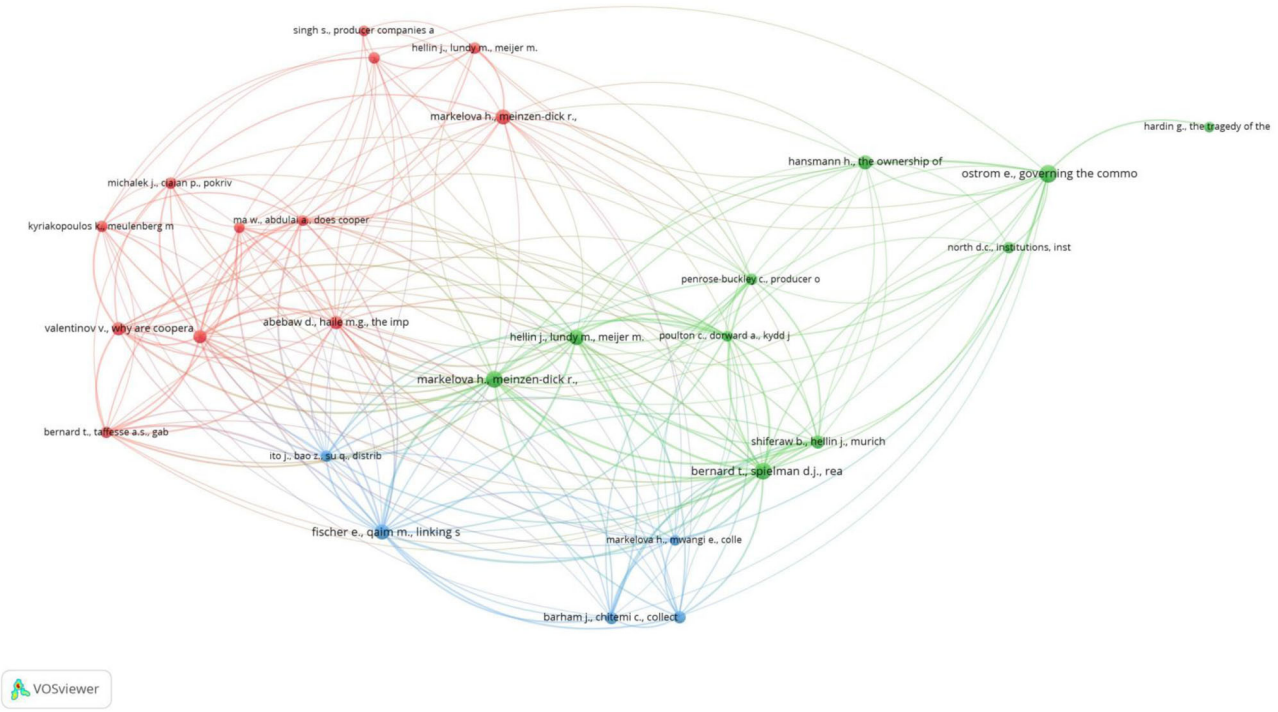


**Fig. 3** Co-citation analysis of references related to POs. (Author's compilation).

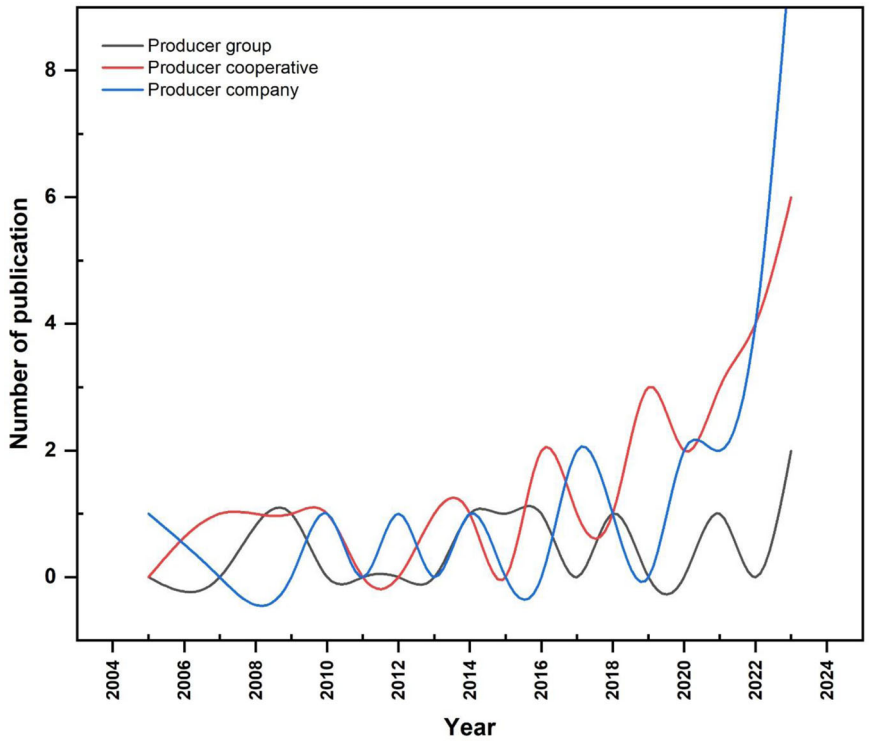


**Fig. 4** Predominant forms of PO evolved over the period. (Author's compilation).

cooperatives, these structures offer stronger market orientation, enhanced equity shares, higher supply commitments, and greater borrowing power with financial institutions (Grashuis, 2018). In India, the shift began in the early 2000s (Singh, 2023). Sri Lanka was the first Asian country to experiment with such organizational models (Fernando et al., 2021). In countries like Australia, Denmark, and New Zealand, the majority of dairy cooperatives operate as co-operative companies (Singh, 2021). According to Fernando et al. (2021) and Surendran-Padmaja and Ojha (2023), producer companies are similar to business enterprises but provide co-operative benefits to their members. Figure 4 illustrates the growing interest in producer companies, reflecting increased government attention and support. For example, under the central sector scheme, the Government of India promotes the "Formation and Promotion of 10,000 new Farmer Producer Organizations" until 2027–28 to transform its

**Table 1 Key differences between producer companies and traditional cooperatives.**

| Parameters | Producer company | Producer co-operative |
|---|---|---|
| Legislation | Companies Act | Co-operative Societies Act |
| Agenda/objective (s) | Multiple | Single |
| Area of operation | Regional/niche | Restricted, local |
| Membership size | Large | Small |
| Activity | Mainly economic | Economic, Social |
| Governance | Single layer | Multi-layer |
| Ownership | Producer members and their agencies | Individuals, group and co-operative members |
| Equity share | Tradable within member community | Non-tradable |
| Profit share | Dividends on shares | Patronage based |
| Voting rights | One member, one vote. Non-producer cannot vote | One member, one vote, but Government and Registrar of Cooperatives hold veto power |
| Target product | Single, specific | Multiple |
| Mode of business/consumer dealing | Formalized | Traditional |
| Services to members | Limited (fertilizer, agrochemicals, seed and credit) | Wide (fertilizer, agrochemicals, seed, credit, technology, training etc.) |
| Non-member/shareholder investment | Accepted | Not accepted |
| Government support | Minimal, limited to statutory requirements | Highly patronized to the extent of interference |
| Autonomy | Fully autonomous, approval from external authorities not required, audit independently. | Limited, approval required for development projects, audit by external agencies recommended. |
| Borrowing power | Freedom given, many options | Restricted |
| Reserves | Mandatory | Created if profits made |
| Dispute settlement | Arbitration, only option | Through co-operative system |
| Professionals/experts on the Board of Directors | Yes, advisory directors without voting rights. | No such provision. Co-operative development officer can be named. |
| Liability in Income tax | Tax is not exempted. Relaxation given. | Exempted from income tax |
| Relationship with other organizations/entities | Transaction based | Collaborative |

Source: Kontogeorgos et al. (2018), Grashuis (2018), Deka et al. (2020), Fernando et al. (2021), Groot-Kormelinck et al. (2022).

agriculture into a sustainable enterprise (GOI, 2021). In a similar vein, the United States recently invested over 1.2 billion USD in modern producer cooperatives to enhance rural livelihoods and economic opportunities (USDA, 2023). A study by Grashuis et al. (2018) highlighted the advantages of joint ownership models between farmers and investors in the agri-food industry. Additionally, Adu-Baffour et al. (2019) demonstrated how small farms in Zambia benefited from large company initiatives. In contrast, in India and Sri Lanka like developing countries, traditional cooperatives have lost their vibrancy due to mismanagement of resources, poor market orientation, external interference, and corruption issues (Singh, 2021; Fernando et al., 2021). Likewise, producer cooperatives in Kenya and Ethiopia are suffering from similar issues (Tshishonga and Okem, 2016; Awoke and Alam, 2021). Studies led by Deka et al. (2020) and Singh (2021; 2022) demonstrated the factors contributing to the success of producer companies over traditional organizational structures. Kaur and Singla (2022) examined the performance of various forms of producer organizations, with a particular focus on their effects on farmers' income. This study compares and contrasts two primary types of producer organizations, evaluating them based on their organizational attributes.

Table 1 summarizes the key differences between traditional cooperatives and producer companies. Cooperatives provided use rights to non-members, while the capital-seeking producer enterprises accepted investments from external investors (Chaddad and Cook, 2004; Kontogeorgos et al., 2018). Cooperatives benefit from economies of scale through non-member transactions, while share tradability in producer companies encourages additional investment (Fernando et al., 2021). Regarding profit distribution, cooperatives allocate profits based on patronage, while producer companies distribute profits according to share ownership (Deka et al., 2020). Profit distribution in Ethiopian cooperatives differs from the approach used in most Western cooperatives, where profits are allocated based on usage, a method more akin to the structure of producer companies (Ebbes, 2017). The governance of both, the cooperatives and the producer companies are typically similar. Voting rights in both structures follow the principle of one member, one vote, though in cooperatives, government and the Registrar of Cooperatives hold veto power (Fernando et al., 2021). The producer companies needed to have advisory directors. In contrast the co-operative had a representative from the department of co-operative (Singh, 2021). Producer companies target specific products and deal with consumers through formalized business processes in India, while cooperatives often handle multiple products and adopt more traditional methods (Surendran-Padmaja & Ojha, 2023). The services offered to members by producer companies are limited, whereas cooperatives provide a broader range of services, including technology, training, and more (Groot-Kormelinck et al., 2022). In terms of flexibility and external influence, producer companies have more autonomy, with fewer restrictions on borrowing power and no external approval needed for audits. Conversely, cooperatives face more constraints, requiring external approval for development projects, and borrowing options are more limited (Deka et al., 2020; Kaur and Singla, 2022). Interestingly, producer companies engage in transactional relationships with other entities, whereas cooperatives tend to foster more collaborative connections. However, both the cooperatives and the producer companies have suffered from the weakness of lack of product traceability and quality monitoring of their products (Fernando et al., 2021). Recently, the United States adopted a limited co-operative association

**Table 2 Market approaches by the Pos.**

| Rank | Major activities | References |
|---|---|---|
| 1 | Supply chain integration | Krishnan et al. (2021); Koutsou and Sergaki (2020); Ruggeri and Corsi (2019); Dal Belo Leite et al. (2014); Camanzi et al. (2011); Saitone and Sexton (2010) |
| 2 | Value addition to produce | Kashyap & Bhuyan (2023); Pröll et al. (2022); Javornicky et al. (2021); Trebbin (2014) |
| 3 | Fairtrade and labeling | Pietrangeli et al. (2023); Mook and Overdevest (2020); Ruggeri and Corsi (2019) |
| 4 | Contract farming | Yu et al. (2023); Beverland (2007) |

Ranked based on percentage of study share.

(LCA) model to overcome challenges associated with modern cooperatives, a new legal entity allowing joint ownership by member patrons and member investors to facilitate large-scale equity acquisition (Grashuis, 2018).

*Understanding market approaches*. Producer organizations represent a more formalized form of collective action (Shiferaw et al., 2011). These organizations can range from informal groups of farmers to highly formalized structures with legal standing, governance structures, and official membership. The degree of formalization depends on the context and objectives of the organization (Muniyoor, Pandey (2024)). By formalizing the collective actions of producers, the POs better interact with market structures and subsequent profits (Sisay et al., 2023). A previous investigation by Sisay et al. (2017; 2022) examined the benefits of market-centric approaches of Ethiopian seed cooperatives on firm performance and members' livelihoods. Among the existing literature, marketing aspects of producer organizations have received significant attention. This paper seeks to explore the specific market areas that POs prioritize. The study identifies key intervention areas, including supply chain, integration, value addition approach of POs, fairtrade and labeling. These are followed by contract markets and brand building, as summarized in Table 2. The role of POs in supply chain integration has been briefed by Krishnan et al. (2021), Koutsou and Sergaki (2020) Ruggeri and Corsi (2019), Dal Belo Leite et al., (2014), and Saitone and Sexton (2010). This approach focuses on the coordination and optimization of various stages of the supply chain, facilitating smoother operations and improved efficiency. Another important activity is value addition to produce, which helps increase the market value of raw agricultural products through processes such as processing, branding, and packaging (Kashyap & Bhuyan, 2023; Pröll et al., 2022; Javornicky et al., 2021; Trebbin, 2014). By adding value, POs can access premium markets and command higher prices. Fairtrade and labeling also form a significant part of market approaches, as they offer certification that ensures fairtrade practices and enhances product appeal (Pietrangeli et al., 2023; Mook and Overdevest, 2020; Ruggeri and Corsi, 2019). Finally, contract farming represents another key strategy, where POs engage in agreements with buyers to secure stable prices and ensure product quality (Yu et al., 2023; Beverland, 2007). Together, these market approaches empower POs to enhance their market position, improve member livelihoods, and achieve greater sustainability. However, limited research has been done on developing climate-resilient systems, digital innovations, and mobilizing internal finance in POs. Koutsou and Sergaki (2020) suggested that POs perform more effectively when managing short supply chains. By adopting such models, POs can reduce transaction costs, minimize transportation-related emissions, and lower energy consumption. Hill et al. (2021) emphasized that cash-on-delivery and real-time sales information enhance the market orientation of POs. A recent report by Núñez del Prado Nieto (2024) showed how trust matters in upscaling internal financial access for FFPOs. According to Ma et al. (2024), e-commerce and digital platforms have the potential to connect producers to larger markets, boosting both revenue and market exposure. In their recent study, Ganesh et al. (2024) highlighted the positive impact of DigiTech applications on the resilience of agri-food supply chains and farm performance. Addressing these gaps will foster the resilience and market performance of such organizations.

*Membership impact on rural livelihoods*. Smallholder commercialization is key to regional development and rural economy. By playing collectively, smallholder producers can better cope with market challenges, leading to sustainable livelihoods (Mwambi et al., 2020). It is well documented that smallholders, through collective action, have increased their benefits. For instance, studies led by Alho (2015), Sultana et al. (2020), Ofolsha et al. (2022), and Gurung et al. (2023) demonstrated that membership in POs had a significant positive impact on smallholders' access to resources and technology. The role of POs in strengthening the bargaining capacity of smallholders was exemplified by Bernard et al. (2021), Di Marcantonio et al. (2022), Tabe-Ojong (2023), and Gurung & Choubey (2023) in their studies. The positive impact of PO membership on credit acquisition was documented by Mwambi et al. (2020; 2021), Ofolsha et al. (2022), and Gurung et al. (2023). Apart from these, collective organizations have helped smallholders by reducing high transaction costs (Markelova et al., 2009; Trebbin, 2014). According to Grashuis and Skevas (2023), POs have the capacity to mitigate risks that cause fluctuations in the incomes of their members. POs are vital in terms of skill development of women farmers (Lyon et al., 2010; Mwambi et al., 2021). Reardon et al. (2009) highlighted the potential of POs in addressing the challenges posed by modern markets, such as certification, standards, and procurement procedures. Bizikova et al. (2020) outlined the role of POs in minimizing market gaps and other extension services. Figure 5 summarizes the effect of PO membership on rural livelihood components. Indeed, agricultural commercialization enables households to increase their incomes by producing agricultural products with higher returns on land and labor (Cheyo et al., 2024). With participation in POs, farmers add value to their produce and subsequently pursue rewarding prices (Pant et al., 2024). On the other hand, the increased bargaining power helps reduce the effect of delay costs in supply chain negotiations (Gago-Rodríguez et al., 2021), whereas delay costs cause long-term stress for traditional cooperatives. Moreover, access to agricultural credit expands rural development by allowing producers to execute profit-maximizing investments that contribute to productivity as well as income (Benson and Faguet, 2023). Regardless of the organizational structure, the advantages to farmers from membership are typically realized through reduced transaction costs and the realization of economies of scale. This is achieved by sharing vital equipment and transportation, as well as by producing in bulk, which helps lower input costs (Alho, 2015; Mwambi et al., 2021). However, the impact of PO membership is largely influenced by factors including farm size, membership

volume, and region (Grashuis and Skevas, 2023). Kakati and Roy (2022) demonstrated that the financial performance of POs strongly depends on the membership volume and efficiency.

### Sustainability and POs

Sustainable development goals are designed to improve the lives of the underprivileged and marginalized. Some of the sub-goals aim to double agricultural productivity and the economic well-being of smallholder producers. POs are identified as a critical platform for achieving these goals (Coppola and Ianuario, 2017). POs offer various economic advantages to farmers by reducing the information gap and mitigating market uncertainties. Farmers' participation in producer cooperatives is often motivated by the opportunity to access better markets and resources (Trebbin, 2014; Pröll et al., 2022; Yu et al., 2023). By acquiring different labels (e.g., organic, fairtrade) and PO brands, farmers can potentially tap into high-value export markets and improve the quality of their production (Ruggeri and Corsi, 2019; Pietrangeli et al., 2023).

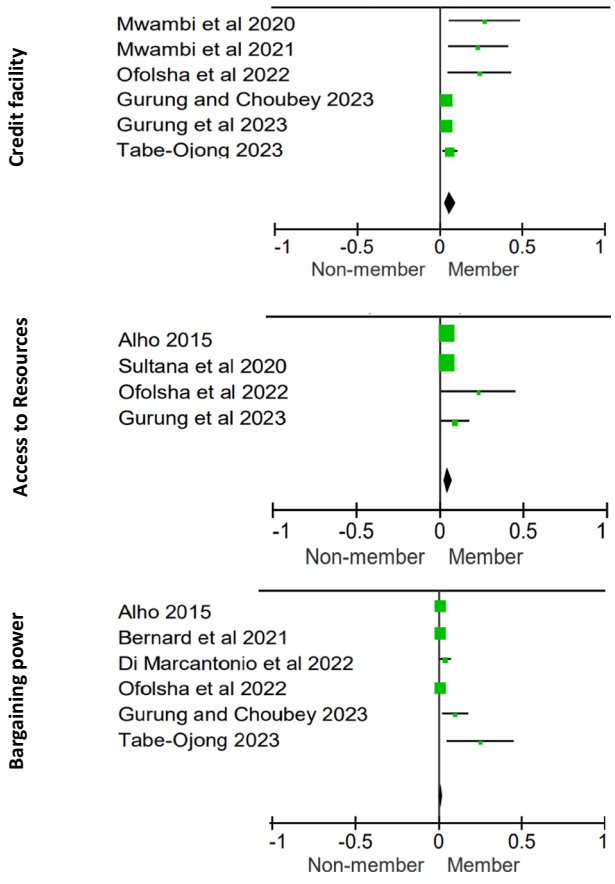


**Fig. 5** Impact of POs in strengthening rural livelihoods. (Author's compilation).

The key mechanism behind this is that POs help farmers address market imperfections, thereby improving their economic outcomes (Candemir et al., 2021). However, the dynamics of POs differ across regions. In high-income countries, particularly in Europe, the role of POs may differ significantly from that in developing countries. For example, in the EU, cereal, sugar, and pig meat cooperatives are oriented more towards market power via cost reduction than value creation (Höhler, Kühl, 2018). However, there are different aspects of POs to society found in the literature. The positive impact of co-operative membership on farm employment Michalek et al. (2018) highlighted in their study. Mwambi et al. (2021) assess the benefits of PO membership on the income and livelihoods of women farmers in Kenya. Lyon et al. (2017) show that, in Mexico, women enhanced their negotiation skills and decision-making abilities through co-operative participation. Additionally, Tirivayi et al. (2018) demonstrate the role of forest producer organizations in providing social protection. However, the role of POs in promoting environmental sustainability remains underexplored. A study led by Tabe-Ojong (2023) shows that PO membership increases the likelihood of investing in organic amendments. Similarly, Ma, Abdulai (2016) highlight the role of producer cooperatives in integrated pest management. Furthermore, Macqueen (2024) explains the importance of organizations of smallholders and indigenous peoples in advancing agrobiodiversity.

The present study examines the sustainability potential of traditional and producer companies, as displayed in Table 3. Understanding the structure of POs and their alignment with specific SDGs is crucial for fostering collaboration and partnerships aimed at advancing sustainable development. Our findings reveal that, compared to traditional cooperatives, producer companies cover five additional SDGs, namely: SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), SDG 10 (Reduced Inequalities), SDG 16 (Peace, Justice, and Strong Institutions), and SDG 17 (Partnerships for the Goals). This underscores the significant potential for increased collaboration between POs and other stakeholders, including governments, NGOs, and the private sector (Lafont et al., 2023). Further research conducted by Mourya and Mehta (2021) found economy, infrastructure, and inequality are the priority areas for producer companies, alongside SDGs 1 (No Poverty), 2 (Zero Hunger), and 12 (Responsible Consumption and Production). Additionally, Grashuis and Cook (2018) suggest that such organizational models can expand the scope of SDGs, particularly by supporting SDG 3 (Good Health and Well-being) and SDG 16. This comprehensive understanding provides valuable insights for policymakers and strategic advisors, enabling them to design interventions that are specifically tailored to the needs and strengths of producer organizations. Such approaches can enhance the effectiveness and popularity of these organizations in promoting sustainable development goals. Furthermore, this research can serve as a guiding framework for implementing future agribusiness ventures, as well as inform the corporate

**Table 3 PO types and linked SDGs.**

| Organization type | SDGs | Reference |
|---|---|---|
| Producer company | SDG 1; SDG 2; SDG 5; SDG 8; SDG 9; SDG 10; SDG 12; SDG 15; SDG 16; SDG 17 | Lyon et al. (2010); Lyon et al. (2017); Mourya and Mehta (2021); Harrington et al. (2023) |
| Producer co-operative | SDG 1; SDG 2; SDG 5; SDG 12; SDG 15 | Covey et al. (2021); Pröll et al. (2022); Tabe-Ojong (2023) |
| Rural producer groups | SDG 8, SDG 10 | Siwale (2018); Benson and Faguet (2023) |

SDG 1—No Poverty; SDG 2—Zero Hunger; SDG 5—Gender Equality; SDG 8—Decent work and Economic Growth; SDG 9—Industry, Innovation and Infrastructure; SDG 10—Reduced Inequalities; SDG 12—Responsible Consumption and Production; SDG 15—Life on Land; SDG 16—Peace, Justice and Strong Institution; SDG 17—Partnership for the Goals

social responsibility strategies of established businesses, helping to align their initiatives with global sustainability objectives.

## Conclusions

Collective organizations have long been recognized for their contribution to wealth creation and inclusive smallholder development in emerging economies. Over the past few decades, various forms of collective organizations have emerged, particularly in developing countries, where governments have often played a central role in promoting these organizations to advance socio-economic development in rural communities. Despite their growing significance, different organizational forms and their role in achieving specific Sustainable Development Goals remain underexplored. In fact, to succeed in modern markets and stay competitive in a rapidly changing external environment, collective organizations adopt different enabling organizational attributes. The present study offers a comprehensive bibliometric analysis and meta-review of producer organizations in the context of sustainable rural growth.

Our findings highlight that POs have gained momentum since 2018 with the introduction of the FFF and GAFSP programs, reflecting their increasing importance in agri-food systems and smallholder empowerment. The analysis revealed three major areas of focus in the literature: organizational structure, market linkages, and membership impact on rural livelihoods. Firstly, the emergence of producer companies, marks a shift towards more market-oriented, autonomous, and financially robust organizational models, offering enhanced equity shares, market access, and borrowing power. Secondly, the study identifies several challenges, including a lack of strategies for building climate-resilient supply systems, inadequate mechanisms for information sharing and financial aid, and the absence of competitive marketing models hindering the growth of traditional cooperatives as sustainable business entities. However, the third cluster demonstrates that POs have a clear positive effect on rural livelihoods, particularly in terms of access to resources, credit facilities, and bargaining power. It is important to note that by analyzing and comparing the organizational and sustainability attributes of producer collectives, the present study contributes to the body of knowledge on collective action theory. The study highlights that while traditional cooperatives have significant benefits, producer companies offer broader support across more SDGs, particularly in areas like economic growth, reduced inequalities, and partnerships and strong institutions. The advantages of producer companies stem from their ability to enhance market access, reduce information gaps, and help farmers adopt new technologies and sustainable practices. These findings will inform policymakers on formulating relevant policies to identify, promote and develop efficient and effective collective organizations in the rapidly changing environment.

Despite the progress made, there are still notable research gaps. First, the environmental impacts of POs remain largely unexplored. Second, the potential role of POs in reinforcing gender equity and inclusivity has received limited attention. Third, there is a lack of effective policies to tackle the issue of 'fake' POs. Future research should focus on closing these gaps, particularly by enhancing financial literacy among producer members, as this is vital for the sustainability and success of these organizations.

## Limitations of the research

The findings presented in this paper are primarily based on articles published between 1998 and 2023 in English, which may limit the scope and diversity of perspectives included. Additionally, our research is largely focused on rural agricultural producer organizations, meaning the findings may differ in other contexts. As such, future research could expand the scope by exploring cross-country or sectoral comparisons of PO models, which would help deepen our understanding of their varied impacts and sustainability approaches.

## Data availability

All data analyzed in this article are available in the public domain.

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## Author contributions

SB: methodology, investigation, writing—original draft preparation; PKS: conceptualization, validation, supervision, writing—reviewing and editing.

## Competing interests

The authors declare no competing interests.

## Ethical approval

Ethical approval was not required as the study did not involve humans/animals.

## Informed consent

Informed consent was not required as the study did not involve human participants.

## Additional information

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**Correspondence** and requests for materials should be addressed to Piyush Kumar Singh.