

FARMER PRODUCER ORGANIZATIONS IN INDIA: A SYSTEMATIC REVIEW AND BIBLIOMETRIC ANALYSIS OF CONSTRAINTS, SOCIAL LINKAGES, AND SUSTAINABILITY

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ABSTRACT

A Farmer producer organization is a significant institutional tool for improving smallholder livelihoods and advancing sustainable agriculture. Research focusing on the limitations, social connections and sustainability aspects influencing FPO performance is still dispersed, despite their quick growth and robust regulatory support. To address these gaps this study employs a systematic literature review and bibliometric analysis to investigate research trends, key constraints, social linkages and sustainability surrounding FPOs. After applying predetermined inclusion and exclusion criteria, systematic searching of the Scopus database was carried in accordance with PRISMA guidelines, producing 72 peer-reviewed publications published between 2015 and 2025. Biblioshiny and VOS viewer were used for bibliometric analysis to evaluate thematic progression, country-wise research influence, collaboration networks and publishing patterns. The results showed that the research production increased significantly after 2020, with smallholder livelihoods, collective action and sustainability emerging as key research challenges. The main barriers to FPO performance were found to be financial, market, technical, management and institutional limitations. Strong institutional support and social ties were also found to greatly improve long-term sustainability, resource mobilization and market access. In order to ensure sustainable development of FPOs the study emphasizes the need for increased market and institutional networks, better managerial capabilities and stronger institutional support.

KEYWORDS: Bibliometric analysis; Farmer producer organization; Financial constraints; Institutional Constraints; Managerial Constraints; Technical Constraints

1. INTRODUCTION

A farming sector in India is currently facing many obstacles that prevent it from expanding and becoming sustainable. A major problem is the shrinking amount of agricultural land available per person, which is mostly caused by fragmentation of land holdings and a diminishing base of natural resources (1). Based on the suggestions of the Economist Y.K. Alagh Committee, the Indian Government adopted the Producer Companies Act in 2002 by amending the Indian Companies Act 1956. The Companies Act in 2013 structured a legal framework for facilitating the growth of FPO (2). An FPO is a collective of farmers formed under legal entity and it seeks to empower farmers, enhance the state of their economy and advance the sustainable agricultural methods (3). The primary goal of FPO is to provide farmers with increased revenue through their own organization. Small producers are unable to take advantage of economies of scale due to their lack of individual production and input volume, FPO are seen as growth engine for agriculture and rural development in India. Profits are shared among the members of an FPO (4). Farmer Producer Organization plays a major role in improving sustainability, profitability and productivity of farmers (5). The Farmer Producer Organizations was supported by Ministry of Agriculture and farmers welfare, Ministry of Food Processing, Small Farmers Agribusiness Consortium (SFAC), National Cooperative Development Cooperation (NCDC), National Agriculture Cooperative Federation (NACF) and National Bank for Agriculture and Rural Development (NABARD). A constraint is something that sets a limit restricts something or prevent something from happening (6) FPO have grown substantially in India, however a number of problems and difficulties must be resolved for proper expansion (7).

2. Objectives

- To evaluate key actors in co authorship networks and collaboration trends.
- To analyze the thematic developments using keyword co-occurrence analysis.
- To evaluate research influence by country wise and publishing trends in FPO.
- To determine the major constraints and affecting farmer producer organization and sustainability.

3. METHODOLOGY

This study used a systematic review of literature on multifaceted research on farmer producer organizations. By creating keyword combinations in the Scopus database, systematic search procedures and filters were carried out. These keywords include “farmer producer organization”, “fpo”, “constraints”, or “linkages”, “suggestions” or “strategies” or “interventions”. The search approach was redefined by combining terms using Boolean operators like “AND” and “OR”. The articles were gathered between 2015 and 2025. Only English-language reviewed publications have been incorporated in the study due to an English constraint. Additionally, 98 papers were examined following the inclusion and exclusion criteria, 72 articles were selected for the final study after the unrelated articles, keywords and titles were eliminated. Bibliometric mapping and data visualizations of the selected literature were done using R Studio, Biblioshiny, and VOS viewer. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analysis Standards) guidelines, which guarantee rigor and transparency in systematic reviews and describe the selection, screening and analysis, were adhered. For clarity, the PRISMA flowchart illustrates the procedure. Studies pertaining to the Indian farmer producer organizations were the main topic of the review. In order to strengthen the conceptual understanding of social linkage and sustainability several international research were cited as needed. The literature review and interpretation are still mostly focused on the Indian FPO context but the bibliometric results show that worldwide scientific landscape of FPO research.

4.RESULTS AND DISCUSSION

4.1 Co authorship Network Map

The collaboration relationships between researchers in the chosen literature are depicted in the co-authorship network map (Figure 2). It gives a summary of the connections between authors through collaborative networks. The degree of research cooperation in the field is reflected in the network's structure.

Dense collaborative patterns among the identified researchers indicate a highly integrated and interconnected research community, as revealed by the co-authorship network. As important intellectual anchors who frequently interact across thematic and institutional borders, central authors including Tsakalou, Maye, Chiswell, Loveluck, Adamson-Fiskovica, Noe and Kirwan occupy critical places in the network. They are positioned as significant contributors to the field's advancement and their centrality improves knowledge integration. Furthermore, by facilitating cross-cluster connections, bridging writers like Aubert, Vigani, Tisenkopfs, and Grivins enhance the network's structural coherence and foster interdisciplinary communication. The lack of isolated nodes highlights a strong collaborative culture and implies that research in this field is fueled by group efforts, frequently through multi-authored and international initiatives. All things considered, the network structure depicts a developed and well-organized academic sector where interrelated scholarly connections facilitate the growth and spread of common research agendas.

4.2 Co-occurrence Keyword Network Map

The relationships between key words used in the examined studies are depicted in the network map (Figure 3). It draws attention to the main themes and how they relate to one another. Common research interests are shown by the grouping of keywords.

The keyword co-occurrence network reveals the multifaceted character of current research on farmer producer organizations, co-operatives and small- scale agriculture by illuminating a varies yet intricately linked theme structure. A broad range of study issues, such as agriculture, agroecology, collective action and agricultural development are linked by the term “sustainability”, which emerges as the most prominent and central node. Research emphases relevant to a given location are highlighted by closely related clusters. Examples of these include studies on farmer producer groups in India, Latin America chains of commodities like coffee and European contexts that concentrate on organic farming and market circumstances. The emphasis on livelihood results and capacity-building methods within producer collectives is shown by the use of phrases such as income, smallholder farmers, farmers understanding, farm worker and social capital. In the meanwhile, the concentration on cooperatives, collective action and farmer- producer organizations indicates that academic research on institutional arrangements that boost smallholders access to markets and bargaining power will continue. All things considered, the network represents a rich and dynamic knowledge system in which producer collectives, governance frameworks and sustainability - focused changes come together as key pillars influencing the current conversation in agricultural growth.

4.3 Annual Scientific Production

The increasing trend of research results over the study period is depicted by the yearly scientific production trend. It gives an overview of how the volume of publications has changed over time in figure 4. Changes in academic involvement and research interest are reflected in variations in production. This trend analysis aids in comprehending the general evolution of the field's research activities.

A growing research climate over time is indicated by the annual scientific productivity, which has an overall rising tendency with some volatility. Publication output was comparatively low and erratic between 2015 and 2019; in 2019, it even fell to zero, marking the lowest point of the period. But starting in 2020, research productivity clearly and significantly increased, indicating better institutional support, collaboration, or participation. The number of articles keeps increasing, hitting significant highs in 2023 and 2025, with 15 articles published in 2025. The overall pattern shows a good development tendency and an increasingly mature and busy research scene, not withstanding a minor drop in 2024.

4.4 Key Thematic Focuses in the Literature

The most important topics addressed in the literature are shown in the thematic depiction. (figure 5). It shows the prevalence and significance of certain themes. Topics that are gaining more study interest are represented by larger blocks. The interpretation of thematic focus is supported by this summary. The predominant topic in the FPO are depicted in Fig.5 through the conceptual framework and frequency emphasis of keywords. With 8 instances, sustainability is the most common keywords, underscoring its crucial role in presenting FPOs as tools for long term rural and agricultural development. Smallholders, cooperatives and income (5 instances each) come next, suggesting a substantial study focus on livelihood development, collective institutional structures and smallholder involvement. The significance of collaboration and aggregation in enhancing farmer's economic outcomes is further reinforced by collective action and farmer producer organizations (4 instances each). A focus on sustainable production methods and organizational strengthening is evident in keywords like agroecology, organic farming, alternative agriculture, food production and capacity building (3 instances each). A increasing focus in market integration, institutional quality and the wider developmental impact of FPOs is indicated by emerging but less common themes such as food security, fair trade, marketing, exports, governance and resilience (2 instances each).

4.5 Most Cited Countries

A citation trend illustrates how various nations have evolved the body of the literature (figure 6) It shows differences in the worldwide influence of research. Stronger scholarly influence is reflected in nations with more citations. The interpretation of global research trends is supported by this picture.

A significant geographical area of research influence is evident in the citation distribution. With the most citations (200), the Netherlands is the highest count has made significant contributions to the discipline. India (62) and China (79) come next, indicating their expanding incorporation into international research networks and growing intellectual prominence. Citation performance is steady in European nations like Denmark (39), Germany (28) and Switzerland (25), indicating consistent output quality and relevance. The lower tier, which represents moderate but noteworthy contributions, is occupied by Poland (20), France (19), the USA (19) and Portugal (16). Overall, the trend shows that a few number of very powerful nations dominate the research scene, while a larger base of countries make incremental contributions to the field of knowledge.

4.6 Financial Constraints

Financial constraints are recognized as a significant impediment to FPO performance. This paper emphasizes that inadequate funding and restricted to financial resources are critical problems, particularly in the early years. In addition, FPOs deal with poor awareness of available finance facilities, high labor expenses, insufficient crop insurance and labor shortages during harvesting. Due to these financial limitations, FPO's operational stability is undermined and working capital availability is decreased (8). Members ability to invest in input and industrial activities is hampered by a lack of financing, primarily as a result of limited relationships to financial institutions (9). High rate of interest and repayment anxiety deter borrowing even when finance is available, which restricts the availability of working capital and investment in company growth (10). The majority of FPOs have relatively little paid-up capital, frequently less than rupees 10 lakh, which limits their capacity to expand operations, make infrastructure investments, and obtain bank credit. Credit access can be made worse by a lack of collateral and a lack of confidence from finance institutions (7). Tribal farmers who rely on quick earnings to cover home and farming needs have difficulties with liquidity due to administrative payment delays, even though the FPO offers higher pricing than local dealers, (11). Financial sustainability is further complicated by reliance on outside grants and subsidies, which makes it challenging for FPOs to function independently over time. FPO's overall performance and sustainable growth are hampered by these financial limitations as well as limit their capacity to extend market operations, acquire qualified personnel, & invest in value addition(6).

4.7 Marketing Constraints

FPO performance is further undermined by marketing-related limitations. The organization's inability to meet export criteria is the biggest problem, followed by the distance of markets (12). The most important limitation in marketing is the issue of pricing variability (2). Produce is perishable because of inadequate storage facilities, middlemen's exploitation, high transportation costs from far-off markets, low prices that result in distress sales, outdated market data, and rapid price swings. Farmer's revenue realization and confidence in FPO activities are directly impacted by these limitations (13). FPO must contend with low market orientation, constrained produce volumes, low bargaining power, and fierce competition from multinational corporation and well-established private traders. The majority of farmers are forced to rely on local or unofficial marketplace, where prices are lower and erratic, due to high transit costs and a lack of transportation options. Opportunities to generate income are greatly diminished by these limitations (14). Due to their lack of direct market access, many FPOs continue to rely on traditional markets that are controlled by middleman. Price realization is decreased by a lack of certain buyers, price volatility, inadequate branding and inadequate market knowledge. Farmer's share of the consumer money is diminished and income growth is restricted in the absence of robust market linkage and price certainty (15). The study emphasizes the close relationship between village traders and mandis, which prevented FPOs from effective competition in agricultural markets. Farmers preferred to sell products to village traders at the farmgate because there was no infrastructure for storage and transportation. FPOs functional performance was hampered by this market structure, which restricted their capacity to offer processing, storage and group marketing services (16).

4.8 Technical Constraints

The most significant technical constraints was the absence of processing and storage facilities (100%), followed by a lack of information and communication technology and a shortage of skilled labor (17). The absence or a poor placement of crop processing plants, along with insufficient godowns and storage facilities, constitutes the primary technical constraints (12). The lack of technical knowledge among office bearers and members, coupled with inadequate exposure to modern agricultural technologies, hinders the adoption of enhanced production practices and efficient operations. A deficient comprehension of quality standards restricts value addition and diminishes market competitiveness. Maintaining records, legal compliance, business decision making and strategic planning are all impacted by the lack of professionally qualified management. These deficiencies in technological and human resources lower productivity, restrict value addition and make FPOs less competitive in agriculture markets (6). The effective utilization of ICT services is limited by improper member needs identification, a lack of knowledge about grading and packaging procedures, insufficient technical assistance and low computer literacy (18). The productivity and dependability of FPC services are further impacted by the high frequency of pests, illness and crop failures, which impairs operational performance.

4.9 Institutional Constraints

The capacity of FPOs to expand operations, make infrastructure investments, and offer members a variety of services was hindered by insufficient funding, insufficient policy support, and a lack of consistent institutional handholding. Inspite their capacity as farmer-focused organizations, this limitation undermined the long-term viability of FPO (16). A limitation whereby organizations neglect to meet the real demands of their constituents, especially those of marginalized groups. Organizational legitimacy, trust and involvement are all diminished by inadequate governance procedures and a lack of responsiveness to member priorities (19). Inadequately managed FPCs struggle to handle company activities under the Companies Act's system and are unable to successfully mobilize members. Important limitations include institutional issues like low member involvement, poor leadership and inadequate farmer commitment (20).

The absence of processing infrastructure is a significant institutional obstacle that limits value addition and compels farmers to sell their produce at cheap rates. This infrastructure deficit restricts long-term business growth and lowers income possibilities. A significant institutional barrier is weak market linkage systems, which prevent farmers from accessing organized marketing channels and trustworthy buyers, leading to uncertainty and low price realization even in the face of successful production results (21)

4.10 Managerial Constraints

The main focus is on the differences in managerial skills among the FPO members, which in turn limits organizational performance. Many farmers have limited capability in crucial areas including recruiting, planning and controlling commercial activities, even though a portion of members have a high level of managerial ability. Efficient direction, communication and management of employees within FPOs are hampered by limited training experiences and insufficient expertise in operating collective companies (22). The main problem was member's lack of business knowledge, which was a reflection of their poor managerial and entrepreneurial abilities. Complex member needs, poor group involvement, accounting mistakes and a lack of accountability were further issues that impacted the effectiveness of the organization (17). Since they can't pay competitive compensation, producer

companies struggle to draw in and keep professional managers. In addition to limiting operational effectiveness and governance (23). The majority of directors lack professional experience in company administration, financial management, auditory and strategic decision-making and only have a primary or secondary education. This leads to ineffective risk management, inadequate use of grants and loans, a lack of long-term vision and a restricted capacity to scale operations. Organizational sustainability and efficiency are directly threatened by deficiencies in leadership and governance (10).

5. Social Linkages in FPO

Social networks have a significant impact on how well Farmer Producer Organizations (FPOs) operate by influencing their access to institutions, markets and methods for collective action. The degree to which FPOs are successfully integrated into the agricultural value chains and institutional ties is directly related to their performance in terms of long-term sustainability, revenue creation and value addition (24). Farmers could combine resources, coordinate productivity decisions and implement better farming techniques to internal social ties, all of which directly boost productivity and organizational effectiveness. The essay emphasizes the importance of connections between FPOs and market stakeholders, at the external level. By connecting local farmers with formal marketplaces, FPOs serve as intermediary organization that lessen the power of middlemen and enhance price realization. FPOs enable farmers access markets with high values and lower transaction and marketing costs through marketing to consumers directly, aggregation, sorting and value addition. This enhances the organizations and its members financial performance. The importance of institutional and social ties with government organizations, banking institutions, nonprofit organizations and extension systems. Access to high-quality inputs, cutting-edge technologies, insurance, loans, training and government assistance is made easier by the connecting social links. The long-term survival of FPO is strengthened by these support services, which improve farmer's technical capability and allow them to operate as professionally manages businesses rather than unofficial farmer groups (25). The authors contend that FPOs find it difficult to continue operating after the initial formation phase in the absence of a favorable environment that included technology assistance, favorable policies, access to finance, retail, market linkages, in addition to farmer participation, influence performance (26). According to the review, FPOs promote intangible advantages that indirectly but significantly assist organizational success and long-term sustainability, such as social cohesion, skill development, dispute resolution and entrepreneurial culture (27).

The social influences constitute a significant element in membership decisions, rather than only economic ones. Farmers rely on information shared through networks, advice from reliable individuals and observation of others experiences. Farmers are able to overcome the danger and uncertainty involved in implementing innovation because of this internal and social support (28). In terms of marketing results, organizations with substantial bridging social capital- that is active relationships with external actors who performed noticeably better than isolated groups. It has been demonstrated that external connections promote market access, information flow, capacity building efforts, high yielding input accessibility and institutional buyer ties, all of which boost sales performance. On the other hand, the study discovered that success could not be ensured by internal trust alone. Increased grain sales were not a direct result of the strong bonding social capital that most farmer organizations possessed, which was characterized by shared identity and trust. Rather, marketing effectiveness was much more dependent on external networks, suggesting that linking social capital is more important for improving farmer group's economic outcome (29). Effective communication with extension personnel and other information sources further improves information sharing and member engagement. In contrast, competition and conflict among members can weaken social relationships and limit collaboration within FPOs, whereas cooperation fosters stronger social linkages, enhances member participation and facilitates effective collective action. (30)

CONCLUSION

This review article concluded that FPO performance is influenced by various factors such as institutional bottlenecks, managerial capability gaps, insufficient market integration, technological and infrastructure problems and financial constraints. Among these, operational constraint and long-term sustainability are seriously threatened by financial limitations such as insufficient working capital, restricted access to formal credit and reliance on outside subsidies. According to the findings, strong social ties with markets, financial companies, extension structures and policy agencies are essential for enhancing organizational performance.

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Tables

Table 1: The combination of keywords used and total number of publications from database

Database	Search Terms	Number of Articles
Scopus	“farmer producer organisation” OR “fpo” OR “farmer producer organization” AND “constraints” OR “challenges” OR “economic impact” OR “value addition” OR “social networks” OR “linkages” OR “suggestion” OR “strategies” OR “interventions” OR “recommendations”	1,123

Table 2: The Inclusion and Exclusion criteria:

Criteria	Inclusion	Exclusion
Time Span	2015-2025	<2015
Subject area	Social Sciences, Agricultural and Biological sciences, Economics, Econometrics and Finance, Business, Management and Accounting	All other Subjects
Document type	Article	Conference paper, book chapters, review, editorial
Publication stage	Final	press
Source type	Journals	Trade Journals
Language	English	Other languages
Open access	All open access	Restricted access

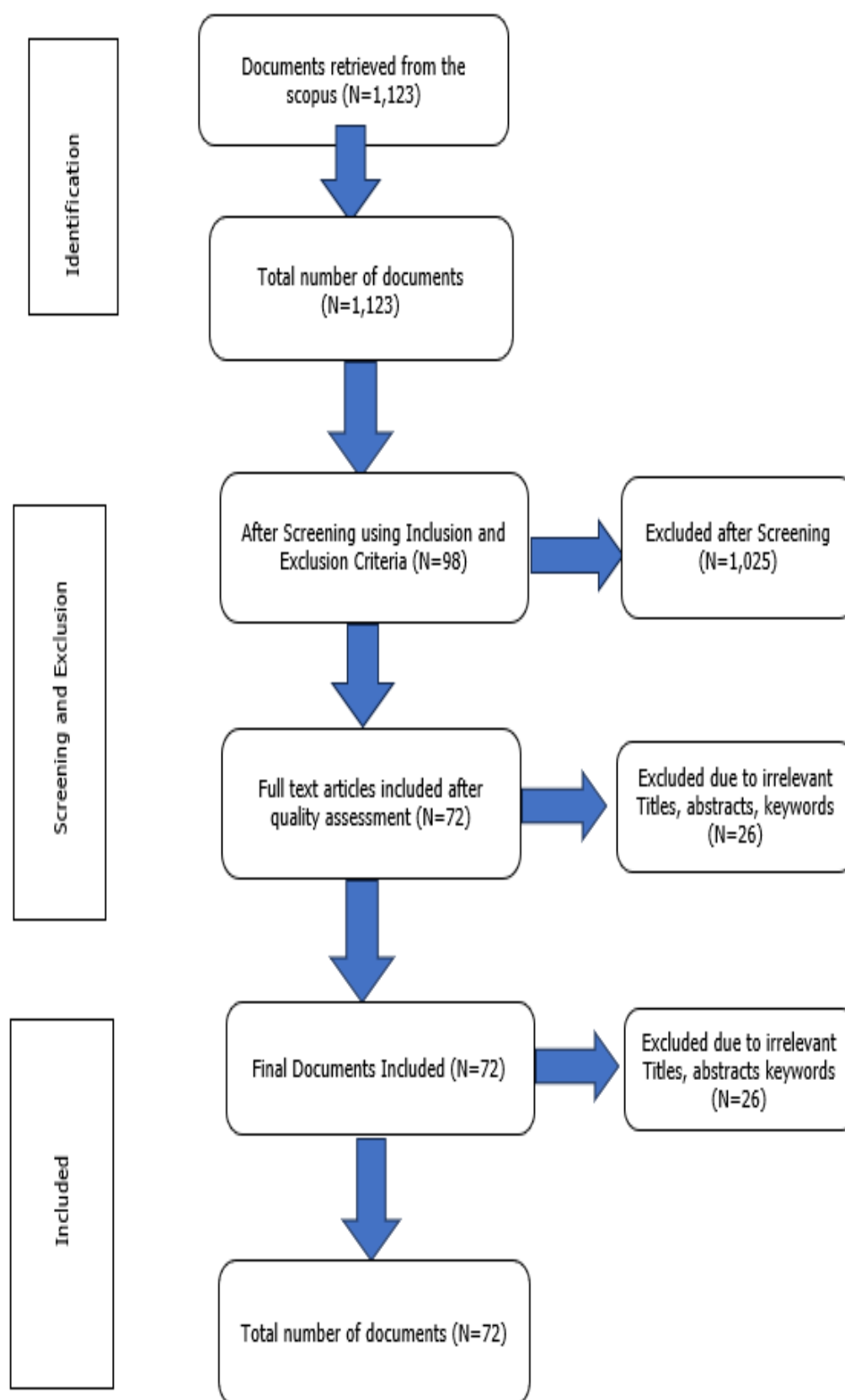


Figure 1: PRISMA flowchart depicting the search literature for a systematic review of performance and sustainability of FPO

Figures

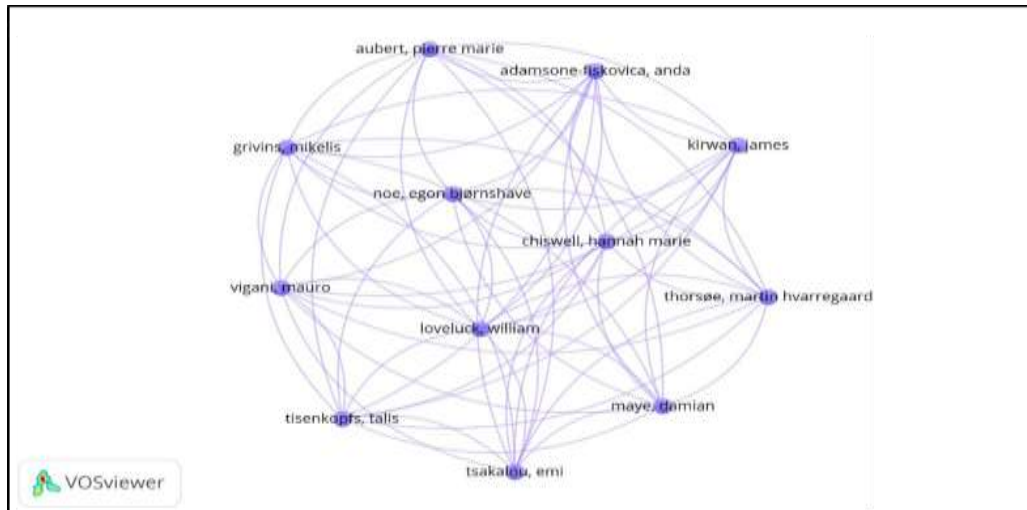


Figure 2: Co authorship Network Map

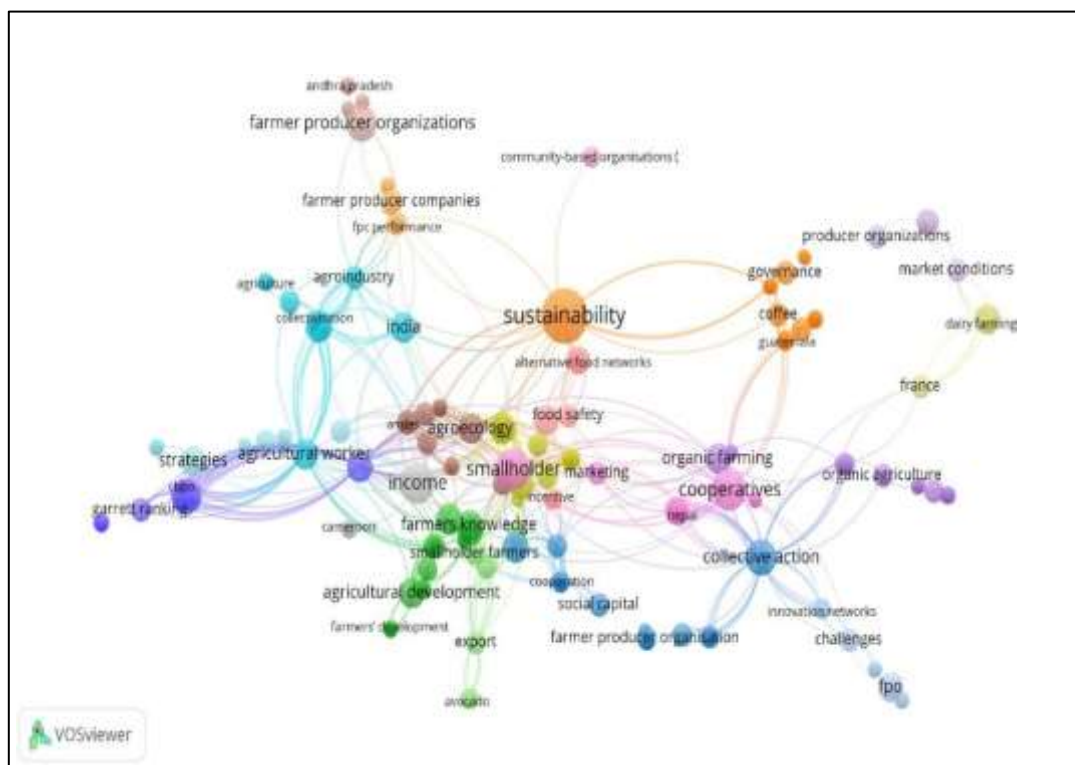


Figure 3: Co-occurrence Keyword Network Map

