The Governance of Subsidized LPG: Global Perspective from Systematic Review

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Abstract

This study aims to investigate the governance of subsidized liquid petroleum gas (LPG) distribution on a global scale by conducting a systematic review of the existing literature. It is meant to find the major determinants of effective LPG subsidy programs and bring out difficulties and prospects that face equitable accessibility to clean cooking fuel. The researchers carried out a systematic literature review, according to the PRISMA guidelines, to collect and assess empirical studies regarding LPG subsidy programs. It consist of 58 publications that were released from 2009 to 2024 and were chosen for their importance in collaborative governance. Starting conditions and institutional design were found to be essential for the success of LPG subsidy programs. The conclusion is that power imbalances and trust problems among stakeholders must be addressed to foster the collaboration effectiveness. Leadership also plays a key role in navigating the complex stakeholder dynamics and ensuring the sustainability of these programs. This study provide a better understanding of the factors that improve or hinder the effectiveness of LPG subsidy programs. This study also provides valuable guidance to policymakers and stakeholders involved in energy subsidies by synthesizing global findings.

Keywords: *Collaborative Governance, Institutional Design, Leadership, Systematic Review, LPG Subsidy.*

A. INTRODUCTION

The global energy industry is concerned with the supply and distribution of subsidized liquefied petroleum gas (LPG). The importance of subsidized LPG is growing as the world realizes the need for cleaner cooking fuels. This transition is vital for public health, energy access, and environmental sustainability (Couharde & Mouhoud, 2020; Schunder & Bagchi-Sen, 2019). However, subsidized LPG distribution and management are complicated by costs, availability, and fairness (Kumar et al., 2017). Government policies enable the supply and acceptance of LPG. These regulations aim to replace biomass fuels, such as wood and charcoal with cleaner LPG (Alananga & Igangula, 2022). Traditional biomass fuels cause indoor pollution, deforestation, and energy inefficiencies. LPG is efficient and environmentally friendly and can improve health and reduce environmental impacts.

Many nations have implemented LPG promotion programs. In 2007, Indonesia launched a national LPG cooking fuel switch for kerosene (Abu Bakar & Hashim, 2011). This program reflects policy shifts toward healthier cooking energies. In Cameroon, Northern Ghana, and Tanzania, national action plans provide LPG cylinders and infrastructures for increasing access (Bruce et al., 2018; Dalaba et al., 2018). The Pradhan Mantri Ujjwala Yojana (PMUY) and "Give It Up!" campaigns in India use financial incentives and macro-social marketing to encourage cleaner

cooking fuels (Jagadale & Kemper, 2022; Pelz et al., 2021). To increase access to clean fossil fuels, such as LPG, the Indian government has implemented digital welfare measures, such as kitchen gas cash transfers (Pillarisetti et al., 2019; Yerramsetti, 2021).

Government policies, regulations, and mechanisms govern subsidized LPG pricing, distribution, and subsidies. Subsidies can be redirected to the eligible and this shift towards LPG as a cleaner fuel may require good governance. Indonesia's Mega Conversion and India's PMUY are examples of succesful government-led LPG infrastructures and subsidy programs in developing countries (Kumar et al., 2022; Thoday et al., 2018). Government subsidies have made inexpensive LPG available for cooking to over 90% of Ecuadorian households (Gould et al., 2018, 2020). Under the Fondo de Inclusión Social Energético (FISE) LPG program in Peru, targeted consumers receive subsidized LPG through vouchers (Nuño Martínez et al., 2020; Pollard et al., 2018). The Indian government has created an ICT-based LPG supply and distribution chain using the Direct Benefit Transfer (DBT) program, a banking technology based on the Aadhar identity card (Agarwal et al., 2021).

Despite these efforts, several challenges remain to be overcome. Many countries are concerned about subsidy leakage because subsidies do not reach their intended recipients. Previous research has highlighted the difficulties in administering targeted subsidies to reach the intended population and prevent leakage to non-targeted groups (Pollard et al., 2018). India provides direct subsidies for LPG use, but it faces challenges in its consistent and sustainable use (Yerramsetti et al., 2022). These issues raise questions about the efficacy and fairness of poverty subsidies and their affordability (Jagadale & Kemper, 2022). Despite substantial subsidies, many rural Ecuadorian households stack wood fuel using LPG and induction stoves (Gould et al., 2018; Perros et al., 2023). This prevents the complete switch to LPG as the primary cooking fuel.

Several studies have discussed Indonesia's distribution system failures and fraud (Arifin, 2021). Pricing, speculation, and targeting issues limit the effectiveness of subsidy programmes. Many studies have examined the impact of policy changes on India's LPG supply chain, particularly the cutting of subsidies for legitimate consumers to reduce government spending (Mittal et al., 2018). The use of direct benefit transfers and digitalises welfare systems has been discussed in India as mechanisms through which subsidy distribution can be improved, with a well defined focus on promoting renewable energy (Chatterjee & Pal, 2021; Schaffitzel et al., 2020; Yerramsetti et al., 2022). The subsidised LPG must distributed properly through the framework for efficient governance where an in-kind subsidy needs to move towards the targeted as needed during the energy transition.

Because of these challenges in the distribution system, particularly inefficiencies in subsidy allocation, collective governance systems have become increasingly important. Governments, producers, distributors, and consumers must work together in collaborative governance frameworks (Agarwal et al., 2021). Research on value creation and LPG supply chain policy interventions in India also emphasizes stakeholder collaboration (Mittal et al., 2018). Effective collaborative

governance allows joint decision-making, problem-solving, and improves LPG distribution networks (Budya & Yasir Arofat, 2011; Pollard et al., 2018).

This study examines the collaborative governance of subsidized LPG distribution to advance knowledge. A systematic literature review identified the main topics, challenges, and successes, and recommended future research to improve governance practices.

B. LITERATURE REVIEW

Complex policy issues require collaborative governance (Donahue & Zeckhauser, 2011; Leary & Amsler, 2017). It is the framework for making and managing public policy decisions that constructively engages people from government agencies, levels of government, and the public, commercial, and civic sectors to achieve a common goal (Ansell & Gash, 2008). This method is useful for LPG distribution because government agencies, private companies, and consumers are involved.

This starting condition is crucial for collaborative governance, by providing the context and environment for collaborative governance (Fig. 1). Existing relationships strongly impact stakeholder collaboration, trust, network power and resource distribution (Ansell & Gash, 2008). Transaction cost theory and the resource-based firm view explain initial supply chain conditions (Gereffi, 2019; Gereffi et al., 2005; Horner, 2017). According to Alkire et al. (2023) and Zheng et al. (2021), balancing economic rationality with altruism can lead to a sustainable supply chain collaboration. Starting conditions can greatly impact the success of subsidy LPG programmes.

Collaborative governance requires institutional design, which include governance structures, decision-making processes, accountability and transparency. These organizations represent and voice all stakeholders (Ansell & Gash, 2008). Supply chain stakeholders must coordinate and connect to collaborate in organizational networks, which is essential for governance (Gereffi, 2019; Gereffi et al., 2005; Horner, 2017). In India's LPG distribution system, ICT improves transparency and efficiency through coordination and cooperation (Mittal et al., 2018).

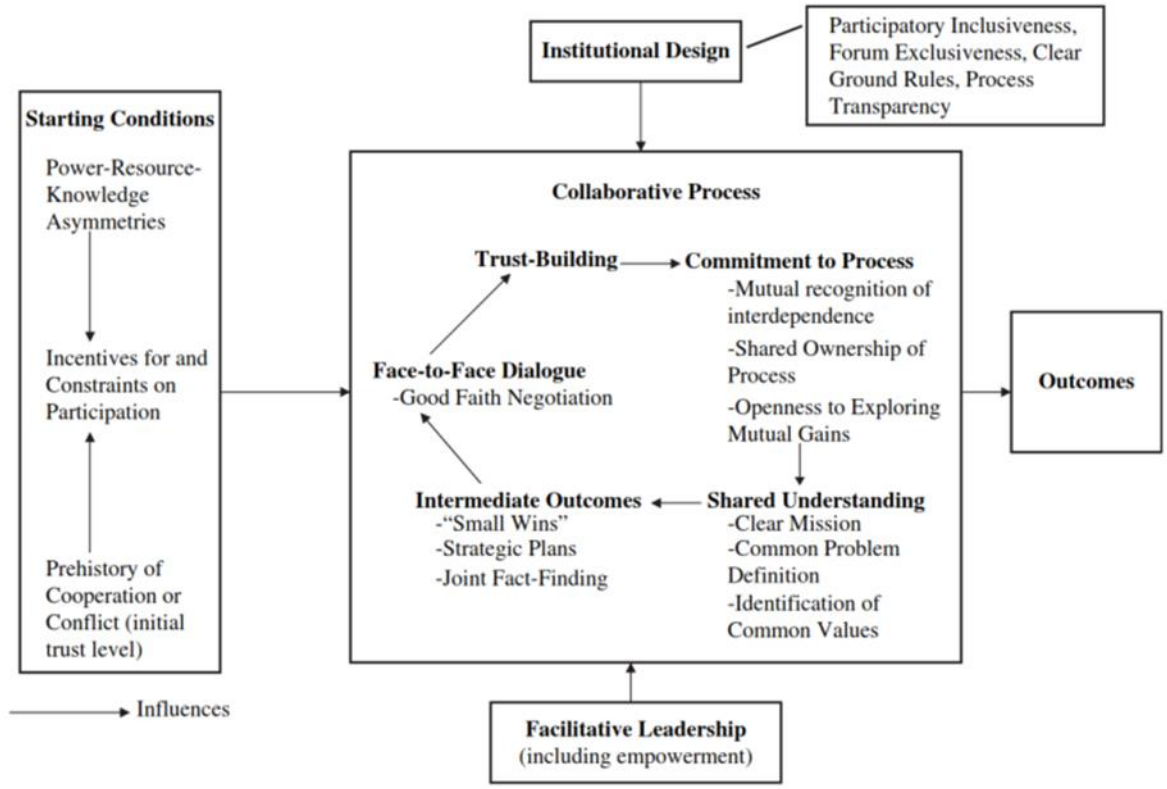

Figure 1. The Model of Collaborative Governance

Leadership is the key to collaborative governance. Effective leaders build trust, solve problems and guide partners towards common goals. Leadership includes both formal and informal persuasion, which are essential for collaborative progress and success (Ansell & Gash, 2008). In the academic literature, supply chain and network leadership styles have been classified as transactional and transformational. Transformational leadership emphasises innovation, whereas transactional leadership emphasises economic transactions and penalties (Chen et al., 2021). Government officials and policy makers play an important role in reforming LPG distribution policies and sustainable energy practices (Calvo-Gonzalez et al., 2017).

Achieving a common goal requires collaboration and trust among stakeholders. This approach focuses on personal interaction, group engagement and mutual understanding (Larsson & Sjöqvist, 2022). Groups can gain momentum and strengthen their long-term goals by achieving small successes in the near term (Ansell & Gash, 2008). Successful collaborative processes require effective communication, trust, commitment, shared understanding, and short-term goals (Crosby et al., 2017). Building trust and encouraging communication are important for advancing LPG adoption and overcoming cultural barriers (Nuño Martínez et al., 2020; Pollard et al., 2018).

Political decisions, program implementation, new norms and stakeholder relationships are examples of the outcomes of collaborative processes. Successful collaborative governance achieve short-term goals and enhances future collaboration (Ansell & Gash, 2008). The expansion of LPG joint access to the PMUY program in India demonstrates the importance of these factors (Jagadale & Kemper, 2022).

C. METHOD

A systematic literature review examined subsidized LPG distribution governance. Because of its rigorous approach to identifying, evaluating, and integrating case studies, this study used a systematic literature review (Xiao & Watson, 2019). This method provides a comprehensive assessment of current knowledge and gaps, laying the groundwork for future research.

The review process began with relevant studies. This was performed using Scopus, which covers peer-reviewed literature from many fields. A wide range of LPG subsidy studies was found by searching for *subsidy*, *subsidized*, *LPG*, and *liquefied petroleum gas*. We avoided using *governance* because it is a field term, to avoid removing articles that do not use it. Papers published between 2009 and 2024 were searched to prioritize the latest and most relevant findings.

To narrow the search, qualitative and quantitative empirical studies, that provided practical and data-driven insights into subsidized LPG distribution, were included. Peer-reviewed international journals are required to conduct high-quality research. Language constraints limited the review to English language studies. Conceptual literature reviews and normative studies were excluded to emphasize the empirical findings.

The initial search yielded 981 studies (Fig. 2). A four-phase flow diagram was used to manage the selection process, including identification, screening, eligibility, and inclusion, according to PRISMA guidelines (Moher et al., 2010). During the identification phase, duplicates were removed, yielding 712 studies. The screening phase excluded studies on unrelated topics, such as electricity, biomass, climate change, or renewable energy sources by reviewing the titles and abstracts. In this step, the pool size was reduced to 141 studies.

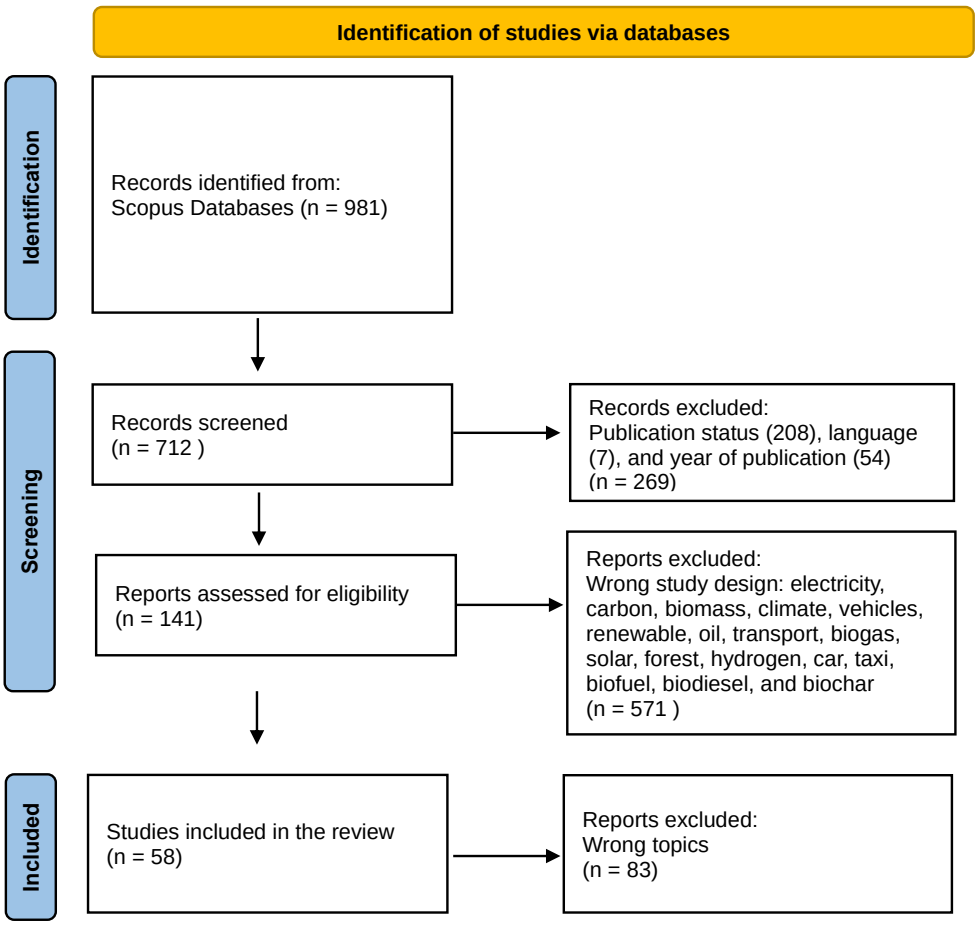

Figure 2. PRISMA Flowchart: Process of Study Selection

The remaining studies were full-text assessed to ensure their relevance to the collaborative governance of subsidized LPG distribution. Studies that did not address the collaborative process or LPG distribution governance were excluded, leaving 58 studies. These studies were analyzed to extract relevant data on authors, publication year, journal title, research settings, and collaborative governance variables, such as starting conditions, institutional design, collaborative processes, facilitative leadership, and outcomes (Kang et al., 2022).

Data extraction followed Ansell and Gash's framework (Ansell & Gash, 2008). This framework divides collaborative governance into the following categories: starting conditions, institutional design, leadership, collaborative processes, and outcomes. How these elements were addressed and their impact on LPG distribution governance were examined in each study. VOSviewer was used to visualize and identify patterns to create bibliometric networks based on author keywords and term co-occurrences. This analysis identifies themes and overarching relationships in the literature that characterize convergence (agreement in findings) and divergence (development in findings) from diffferent studies. This systematic literature review method can reveal many aspects of governance, especially regarding the governance of the subsidized LPG distribution. This research combines rigorous selection criteria

with advanced bibliometric analysis tools to better understand the latest research in the field. These findings provide directions for future research.

Table 1. List of publications based on categories

Categories	Quantity of publications
Location:	
India	27
Indonesia	6
Peru	5
Ghana	4
Ecuador	3
Cameroon	2
Kenya	2
Tanzania	1
El Salvador	1
South Africa	1
Senegal	1
Brazil	1
Mali	1
Bangladesh	1
Mixed countries	2
Variables:	
Starting Condition	30
Institutional Design	56
Facilitative Leadership	46
Collaborative Process	47
Outcomes	56

D. RESULTS AND DISCUSSION

This systematic literature review includes 58 studies on subsidized LPG governance. These publications reveal the countries that are researching this topic the most. The top origins are India, Indonesia, Ghana, Peru, and Kenya. Indonesia has 6, Ghana 4, Ecuador 3, Cameroon 2, and Kenya 2 publications (Table 1). India has 27. The mixed countries are African, American, Asian, and European (Couharde & Mouhoud, 2020; Schunder & Bagchi-Sen, 2019). Geographic distribution highlights global interest and various approaches to subsidized LPG governance, especially in developing regions where energy access and sustainability are critical.

Overall, this systematic literature review shows that subsidized LPG governance research focuses on institutional design (56) and outcomes (56) Scholars focused on institution design and program outcomes from LPG distribution to subsidy. Some studies have emphasized facilitative leadership (46) and collaborative governance (47). Only half (30) of these studies have addressed the starting conditions of collaborative governance.

Additionally, VOSviewer helped identify key areas for future research to improve the governance and distribution of subsidized LPG by revealing the literature's main themes and relationships (van Eck & Waltman, 2014). Following Bortoluzzi's methodology, the authors' co-occurrence map keywords revealed several key themes and clusters when each keyword had at least two occurrences (Bortoluzzi et al., 2021). *Energy access*, *clean cooking*, and *energy poverty* were the most popular keywords (Fig. 3). The *energy access* cluster showed links to *India*, *Indonesia*, *collective action*, *energy subsidy*, and *energy policy* indicating a focus on policy interventions and collaboration in these countries. The selected keywords from the *clean cooking* cluster included *household air pollution*, *clean fuels*, *adoption*, and *affordability* emphasizing the health and economic of LPG adoption. The *energy poverty* cluster is linked to *biomass*, *fuelwood*, and *fuel stacking* highlighting the difficulties in switching to cleaner biomass fuels.

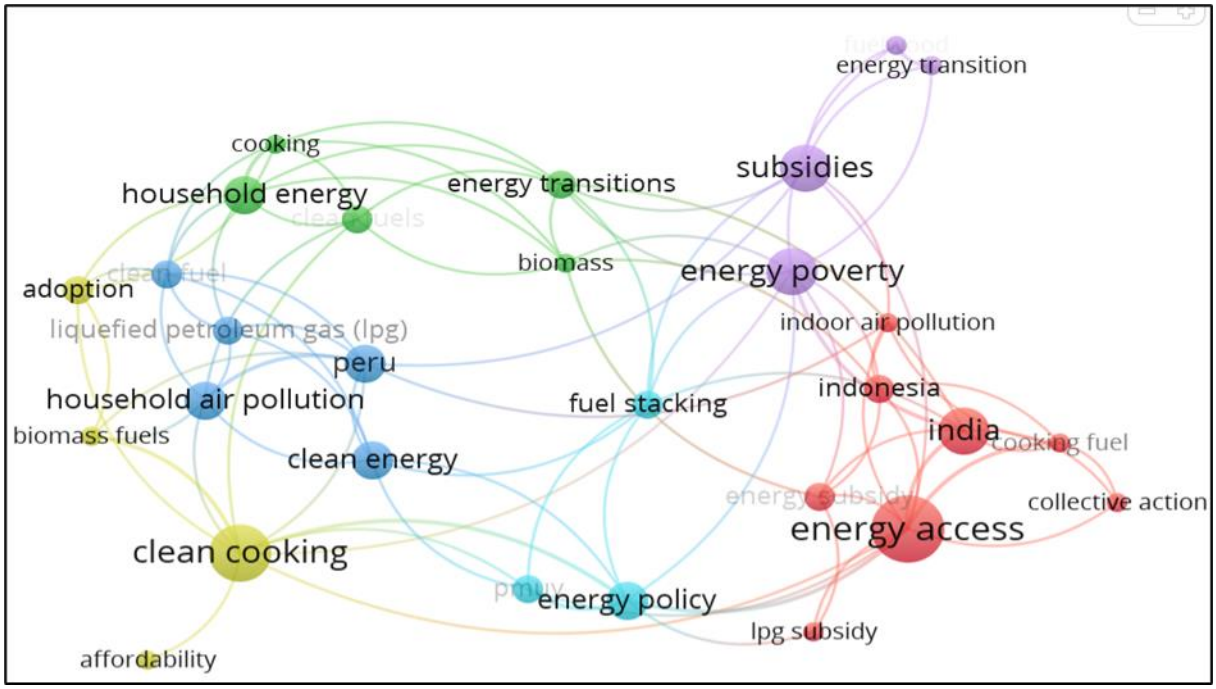

Figure 3. Keyword of Authors Co-occurrences map

The title and abstract text term co-occurrence map showed three main clusters (Fig. 4). The first cluster, *subsidy* includes terms such as *affordability*, *person*, and *biomass* suggesting that studies examine LPG's affordability and role of LPG in replacing biomass fuels. The second cluster, *liquefied petroleum gas* included terms such as *health*, *kerosene*, and *firewood* indicating studies on replacing kerosene and firewood with LPG to improve health. The third cluster, *rural households* was plagued by *beneficiary* and *household air pollution* reflecting rural implementation issues.

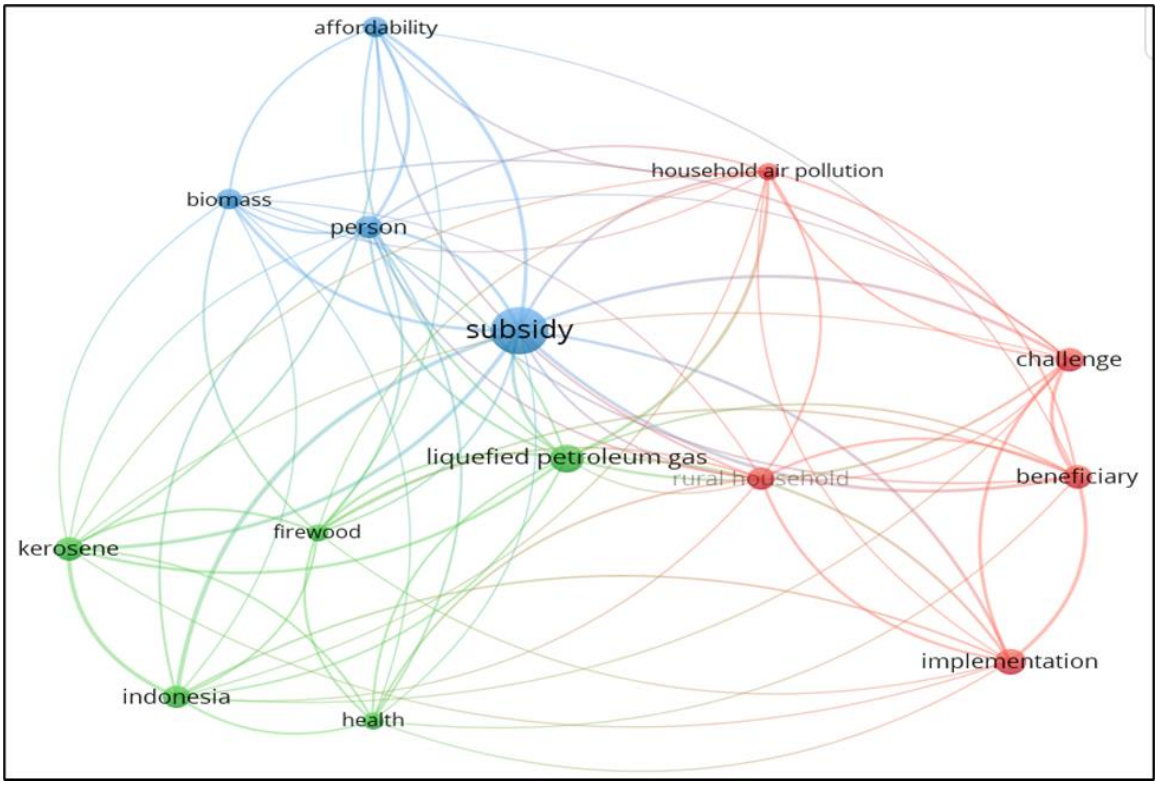

Figure 4. Term Co-occurrence map based on title and abstract

5.1 Key Governance Themes

This section reviews the key governance themes discussed in subsidized LPG literature. The section commences with an exposition of the primary participants engaged in various distribution networks and utilization of subsidized LPG.

5.1.1 Actors

Different actors are critical to the success and sustainability of the subsidised LPG programme. These actors include the government, private sector and end-users (Reddy & Srinivas, 2009). Government agencies design subsidy policies, set regulations, and provide funding. The Ministry of Petroleum and Natural Gas in India launched the PMUY to provide LPG connections for low-income people, including women from households below the poverty line (Rao et al., 2020). Indonesia's Ministry of Energy and Mineral Resources initiated the conversion of kerosene to LPG (Abu Bakar & Hashim, 2011).

Private sector LPG suppliers and distributors are critical to the operation of the subsidy program (Sulistio et al., 2016). They produce, transport and distribute LPG to consumers. Government and private sector collaboration is also important for improving the efficiency of the supply and distribution chain (Dalaba et al., 2018). The government also advocates marginalised communities, educates people about the benefits, regulates and supervises distribution, and implements policies and interventions to improve LPG supply chain transparency and (Adjei-Mantey & Takeuchi, 2022; Pollard et al., 2018).

End-users, especially households in rural and low-income areas, benefit from these programmes. Subsidies depend on LPG adoption and usage (Astuti et al., 2019; Gould & Urpelainen, 2018). Achieving widespread LPG adoption requires understanding socio-cultural dynamics and overcoming barriers, such as affordability and accessibility (Gould et al., 2018; Nuño Martínez et al., 2020; Stanistreet et al., 2019).

5.1.2 Starting Conditions

The starting conditions are the context and environment in which the LPG subsidy programme is implemented. These factors significantly influence stakeholder collaboration (Ansell & Gash, 2008). Trust, misinformation, confidence among actors, the distribution of resources, and the history of energy use are critical starting points. The continued use of traditional fuels alongside LPG in some areas suggests that more than just availability is required (Gazull et al., 2019; Nayak et al., 2015; Sankhyayan & Dasgupta, 2019).

Many developing countries struggle to switch to LPG from wood and charcoal owing to cultural and economic barriers (Pollard et al., 2018). Despite the health risks of indoor air pollution, biomass is widely used in India owing to its availability and low cost (Raynes-Greenow et al., 2020). The creation of good starting conditions requires resolving economic and cultural barriers through financial incentives and education campaigns (Astuti et al., 2019; Williams et al., 2020). Cash transfers also motivate stakeholders to reform subsidies (Fall et al., 2008; Jain, 2018).

Infrastructures should be provided to support strong production, storage and distribution chain for LPG distribution (Dalaba et al., 2018). Capacity building should be initiated in areas that lack infrastructures (Sankhyayan & Dasgupta, 2019). In India, the PMUY requires significant investment to expand the LPG distribution network in rural areas (Patil et al., 2021).

5.1.3 Institutional Design

Institutional design includes formal and informal rules, norms and procedures for stakeholder interaction in subsidized LPG programs. Effective institutional design makes such interactions structured, transparent and accountable, thus facilitating collaboration and policy implementation (Ansell & Gash, 2008).

A clear governance structure that defines the roles and responsibilities of actors is essential for institutional design. In Indonesia's kerosene-to-LPG conversion program, the government established a framework involving ministries, local governments and the private sector (Budya & Yasir Arofat, 2011). India's LPG supply chain system, involves manufacturers, distributors, retailers and end users to safely supply, distribute and deliver LPG to eligible households (Agarwal et al., 2021). This clear definition of roles simplifies implementation and coordination.

Institutional design also includes transparency and accountability. These include the monitoring and evaluation frameworks, complaint-handling systems and stakeholder feedback channels. The DBT system for LPG subsidies in India uses Aadhar cards to

reduce leaks, increase accountability, and ensure that beneficiaries receive subsidies (Khera, 2017). The ntegration of ICT systems and processes across organizational boundaries has improved stakeholder coordination and collaboration, detected and prevented ineligible connections or multiple users, and increased efficiency and productivity (Mittal et al., 2018). Such a system could enhance stakeholder confidence and subsidy effectiveness.

5.1.4 Facilitative Leadership

Leadership is essential in collaborative governance, especially in complex multi-stakeholder initiatives, such as LPG subsidy governance. Facilitative leadership involves guiding collaboration, building stakeholder trust, managing conflict and sustaining efforts focussed on common goals (Ansell & Gash, 2008).

Government agencies often lead LPG subsidy program, but leadership can also come from the civil society and private sector. The Ministry of Petroleum and Natural Gas led the PMUY program in India, securing funding and coordinating with state governments and private LPG distributors (Sharma & Dash, 2022). Leaders must facilitate stakeholder dialogue, address their concerns, and encourage collaboration. Strong leadership capable of communicating the benefits of LPG, encouraging local community engagement, and overcoming logistical challenges has made the kerosene to LPG conversion program successful in Indonesia (Astuti et al., 2019). Leadership can also raise public awareness about the benefits of LPG cooking fuel with its subsidised price advantage (Adjei-Mantey et al., 2021; Kalli et al., 2022; Nayak et al., 2015).

5.1.5 Collaboration Process

As stakeholders collaborate to achieve the subsidy LPG program goals, the process becomes dynamic. Stakeholder trust is essential to collaboration. Transparency, shared decision-making, and short-term success reinforce long-term goals and build trust (Ansell & Gash, 2008).

LPG subsidy programs may involve local community consultations, private sector discussions, and government agency coordination meetings (Fujita-Conrads et al., 2023; Herington et al., 2016; Kimemia & Annegarn, 2016). Collaboration also requires negotiation. Negotiations help stakeholders resolve conflicting priorities and interests. Negotiations between the government and LPG distributors in Peru and India have helped target subsidies and support distribution networks (Calzada & Sanz, 2018; Patil et al., 2021).

Implementation requires coordinated stakeholder efforts, clear communication, and effective resource management to transform policies and strategies into actions. This stage requires continuous monitoring and feedback to keep the program on track and to address issues.

5.1.6 Outcomes

Health, productivity, sustainability, and social equity can be improved through the LPG subsidy programs. Successful programs benefit end-users and advance energy security and poverty reduction (Asante et al., 2018; Coelho et al., 2018; Shupler et al., 2021).

Public health is one of the most significant benefits of LPG subsidy. LPG cooking fuel reduces indoor air pollution, which is a major health risk associated with the use of biomass fuels. Studies have shown that LPG households have lower incidence of respiratory illnesses and other health issues (Aggarwal et al., 2013; Calzada & Sanz, 2018). The PMUY program in India has improved the health of women and children, who are most affected by indoor air pollution (Kumar et al., 2016). Thus, economic productivity is important. For women who cook, clean and efficient fuel can save time and labour (Soni & Chatterjee, 2023). Timesavings can be used for other productive tasks, increasing household income and economic growth (Malakar & Day, 2020).

Sustainability and environmental benefits are important. LPG reduces biomass fuel harvesting, deforestation and greenhouse gas emissions (Sharma & Dash, 2022). Indonesia's kerosene-to-LPG conversion has reduced kerosene use and promoted cleaner energy (Astuti et al., 2019). An LPG subsidy program that target low-income and marginalized households improves social equity and makes clean energy accessible to all. Indian LPG distribution is more equitable and efficient because of the DBT system, which delivers subsidies directly to beneficiaries (Yerramsetti et al., 2022).

5.2 Key Findings

5.2.1 Starting Condition and Institutional Design

The literature discusses how efforts should be made to redress power inequalities and build mutual trust between parties involved in the distribution of subsidised LPG. A number of studies emphasise the importance of cross-sector cooperation, but often overlook the power dynamics that can affect its success (Raynes-Greenow et al., 2020; Stanistreet et al., 2019). Recent research has further demonstrated the importance of trust and collaboration in the effective use of cleaner kitchen fuels. It has been suggested that establishing a good rapport is crucial for making progress in the adoption of clean fuels (Patil et al., 2021; Thoday et al., 2018). Therefore, if policies do not adequately address the needs of all parties involved, they will create a power imbalance that will hinder productive collaboration and potentially undermine the effectiveness of the programs.

In addition, the starting conditions require trust. Stakeholders may not trust the organisation due to corruption, inefficiency or broken promises. To address these trust issues, transparent and consistent communication, leader engagement, and the demonstration of tangible early benefits, such as building social capital, can significantly increase the uptake of LPG (Bruce et al., 2018; Mittal et al., 2018).

Effective institutions should allow for equal participation, transparent decision-making and accountability. Distributors and retailers consider trust and social capital when building their institutional designs. The distribution and adoption of these

configurations often relies on community co-operation. Digital technologies, such as India's DBT system for LPG subsidies have increased transparency and accountability by reducing leakages and ensuring subsidy reach the poor (Yerramsetti et al., 2022). Creating trust and working towards mutual benefit in these relationships can improve program effectiveness and sustainability. Understanding collaborative governance frameworks based on starting conditions and institutional design requires complex transactions and arrangements involving all parties (Gereffi et al., 2005).

5.2.2 Facilitative Leadership

Facilitative leadership in subsidy LPG programs helps navigate multi-stakeholder collaboration. However, the literature often focuses too narrowly on broad interactions rather than detailing influential leaders' nuanced skills and traits that empower success (Kalli et al., 2022; Kimemia & Annegarn, 2016; Thoday et al., 2018). Community leaders, elected officials, and private stakeholders are integral to the survival of such initiatives. In India's PMUY, visionary leaders have rallied funding, coordinated cross-purpose efforts, and energized grassroots support through empathy, integrity and resilience (Kalli et al., 2022; Mittal et al., 2018). They strategically communicate, mediate conflicts and cultivate trust in diverse groups.

Understanding the psychology of empowering leaders can optimize the reach of LPG distribution. Leaders who listen to marginalized communities' concerns with compassion ensure that no one is left behind. Leaders must weather challenges and adapt solutions to maintain momentum toward a shared goal. Leaders of integrity build faith in the program's purpose. This insight into exemplary and effective leadership skills can aid in the selection and training of future leaders to magnify positive outcomes for all.

5.2.3 Collaboration Process and Outcomes

The success of an LPG subsidy programs depends on collaboration. This requires dynamic stakeholder interactions between the government, private, and local communities. Cycles of collaboration to maintain momentum and quickly address emerging challenges are the key findings.

Face-to-face dialogue, trust-building, commitment, and shared understanding increase positive feedback loops and growth. Regular community meetings and feedback sessions help India's PMUY address its concerns, correct its courses, and reinforce its goals (Goswami et al., 2023; Mittal et al., 2018). Indonesia's kerosene-to-LPG conversion program benefits from local governments and community involvement, which improves acceptance and implementation (Budya & Yasir Arofat, 2011). When stakeholders participate in decision-making and implementation, they are more committed to program success.

Negative feedback loops indicate resistance to change owing to mistrust, poor communication, and unresolved stakeholder conflicts. In Mali, mistrust between communities and government agencies has prevented the implementation of energy

transition initiatives, resulting in poor cooperation and suboptimal results (Gazull et al., 2019).

E. CONCLUSION

The governance of subsidized LPG has complex issues, such as distribution inefficiency, affordability and equity. This review of the systematic literature highlights that collaborative governance is necessary to resolve these issues. Starting conditions, such as economic incentives or resource availability exert a significant influence on the course of action in the LPG subsidy space. Hence, adoption largely depends on LPG affordability and household income levels.

Transparent institutional arrangements and stakeholders engagement enhance the credibility of LPG distribution systems. Success in the form of reduced leakages and better targeting has been achieved through government interventions, such as direct benefit transfers and ICT integration. This implies that something more than just availability is at play, as traditional fuels are used persistently in some regions. This nuanced landscape demands cooperation among all these government, private and local influences to create change. For example, future research could examine the impact of power and trust on stakeholders. Consequently, identifying and understanding how factors such as these impact the motivation and participation of stakeholders in decision making will be necessary to develop governance processes that work better for most if not all. There is also a need to examine how digital technologies support more efficient and transparent delivery of subsidies. Further investigation into how these technologies might enhance institutional design is crucial in the context of both diverse poverty alleviation efforts and national LPG subsidy programs.

The most effective strategies for socioeconomic and cultural leadership attributes need to be implemented. This will likely lead to a more effective LPG subsidy program that is not only sustainable, but also sheds light on how leaders innovatively use power dynamics and social capital. Future studies must explore novel means of trust-building and methods for stakeholder communication to break positive feedback cycles.

In conclusion, there are opportunities and challenges in achieving efficient, equitable, and subsidized LPG governance. These conclusions highlight the necessity for collaborative governance at the global level. It is through innovation, leadership and inclusive participation that we sow the seeds for a sustainable yet just future. This study on subsidized LPG governance demonstrate how collaboration governance can change for good and be possible even in a complex policy situation.

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