

REVIEW OF SOCIAL CAPITAL IN THE SUSTAINABLE FOREST MANAGEMENT

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REVIEW OF SOCIAL CAPITAL IN THE SUSTAINABLE FOREST MANAGEMENT. Social knowledge is a key ingredient in sustainably managing forest resources. It offers an understanding of how people living in forested areas can coexist. Social capital has become a type of community knowledge as far as the matter of community forest management is concerned. Research should be carried out on social capital, which is central role to community-based forest management. This research aims to grasp the theory of social capital, specifically its relevance to communities building a shared identity and engagement to change their managed forests into common "public" spaces, both for the residents and the forest manager. This study uses the literature review method. The findings provide a general understanding of forest management through social capital. The following concepts provide a basic understanding of forest management linked with social capital: 1. Social capital in forest management. 2. Social capital plays an important role in forest management. 3. Social capital expresses itself in forest management. 4. Social capital in action for the forest. 5. Obstacles and challenges to developing social capital in forest management. 6. The measurement of social capital is applied as a management context. 7. Research on social capital in forest management includes managerial implications. 8. The opportunity and challenge of integrating social capital into forest governance. The conclusion is that social capital is the crucial pillar of the sustainable forest management framework.

Keywords: Social capital, sustainable forest management, collaboration, local communities

TINJAUAN MODAL SOSIAL DALAM PENGELOLAAN HUTAN LESTARI. Pengetahuan sosial merupakan unsur utama dalam pengelolaan sumber daya hutan secara berkelanjutan. Pengetahuan sosial menawarkan pemahaman tentang bagaimana masyarakat di kawasan hutan dapat hidup berdampingan. Modal sosial menjadi salah satu pandangan masyarakat dalam kaitannya dengan pengelolaan hutan. Penelitian mengenai modal sosial yang memainkan peran sentral dalam pengelolaan hutan berbasis masyarakat harus dilakukan. Tujuan dari studi literatur ini adalah untuk memahami teori modal sosial, khususnya relevansinya dengan komunitas yang membangun identitas dan keterlibatan bersama untuk mengubah hutan yang mereka kelola menjadi ruang "publik" bersama baik bagi warga maupun pengelola hutan. Penulisan ini menggunakan metode tinjauan pustaka. Temuan literatur menguraikan pemahaman umum mengenai pengelolaan hutan melalui modal sosial dengan pengertian dasar pengelolaan hutan dengan modal sosial: 1. Modal sosial dalam pengelolaan hutan. 2. Modal sosial berperan penting dalam pengelolaan hutan. 3. Modal sosial terwujud dalam pengelolaan hutan. 4. Modal sosial dalam aksi untuk hutan. 5. Hambatan dan tantangan pengembangan modal sosial dalam pengelolaan hutan. 6. Pengukuran modal sosial sebagai konteks manajemen diterapkan. 7. Penelitian mengenai modal sosial dalam pengelolaan hutan mencakup implikasi manajerial. 8. Peluang dan tantangan pengintegrasian modal sosial dalam tata kelola kebutuhan. Kesimpulannya adalah modal sosial merupakan pilar penting dalam kerangka pengelolaan hutan lestari.

Kata kunci: Modal sosial, manajemen hutan berkelanjutan, kolaborasi, komunitas lokal

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I. INTRODUCTION

Forest management uses a community-based approach, with the primary focus on community involvement and the development of social relationships. However, problems persist, such as deforestation, ineffective collaboration, and limited resource management. Social capital is a fundamental element of modern sustainable forest management (Puspita, Qurniati, & Febryano, 2020). Researching the topic of social capital is critical as this helps address these problems and fosters cooperation. Social capital refers to the trust, networks, and shared norms within a society, facilitating cooperation and collaboration among community members (Putnam, Leonardi, & Nanetti, 1992; Baggio et al. 2016). Social capital is one of the most significant factors in both notifying society about the environment and provoking changes in human views on protecting the environment. Communities and forest managers can use social capital to enhance environmental awareness and protection efforts. This collaboration strengthens relationships, minimizes costs and enhances efficiency (Savari & Khaleghi, 2023; Lee, Rianti, & Park, 2017).

In addition, specific actions within forest management that focus on social capital can foster innovation how people view and interact with the environment in cost-effectively (Mavhura & Mushure, 2019). Such mechanisms show that if social capital is used, it will grow community capacity and help to change practices related to unsustainable forest management such that they become more sustainable (Marizu, Ayiti, & Raufu, 2024).

Reinforcing strong family and friendship ties is a process that eventually produces multiple benefits. If the collaboration between forest-land managers and local communities is undertaken correctly, the outcomes will have positive consequences. Subsequently, this would lead to more reliable information transfer, easier communication, and a higher teamwork success rate. Facilitating the development of effective relationships between communities

and forest managers could be achieved by identifying the related issues and addressing them appropriately (Dassir & Mas'ud, 2020). This requires a clear identification of the issues and sustained efforts to address them.

Deforestation remains one of the most pressing threats to forest management. The forest environment has suffered from the dire threat of deforestation. Social capital is one of the major resources to mitigate these ill effects. We should promote stakeholder participation and cut costs to prevent deforestation from becoming a dangerous problem. According to Savari and Khaleghi (2023), social capital works as a defense against damage to the forest.

Recognition of the role played by social capital in natural resources management has increased over time. This awareness can be proved by the escalation of the components of social capital (Bouma et al., 2020). To affect this, forest managers must understand that social capital plays a significant role in forest management and strive to build good social connections with people in the region (Arts et al., 2021). The appropriate use of social capital in community-based forest management is critical in enhancing sustainability and profitability. In the context of sustainable development, cooperatives and social programs play essential roles in enhancing community welfare by supporting economic activities and promoting practices that protect the environment (Liu et al., 2014).

A literature review article on social capital is needed because it would assist in compiling research findings related to the effects of social capital. These include trust, social networks, and collective norms, and they cover different spheres, including resource management, sustainability, and environmental conservation. In managing forests and other natural resources, social capital has the critical function of enhancing cooperation between communities and managerial bodies; this, in turn, develops better sustainability-related practices (Snyder, 2019; Pretty, 2020).

This paper explores in depth the reasons why social capital affects forestry management. The review begins by creating a basic definition of social capital within forest management systems. Second, it classifies different elements of social capital present in forest communities to understand their functions in promoting efficient management practices. The paper analyzes multiple case studies to reveal practical approaches for implementing social capital in actual forest management practices. The review presents the problems and barriers that forest communities encounter when boosting their social capital. The review explores different assessment methods used to measure social capital for forest management purposes and examines how they evaluate effectiveness and practical constraints. The paper studies how social capital research outcomes influence policy choices through decision processes in forestry management. This paper explores the obstacles and opportunities shaping forest management practices when integrating social capital over the upcoming years. Finally, this review explores comprehensively the association between social capital and forest management to determine its capability to maintain forestry operations.

II. MATERIAL AND METHOD

The first step of writing a review article on the role of social capital in natural forest management was to conduct a thorough literature search and analysis. This involved using multiple academic search engines such as ScienceDirect (through the site: www.sciencedirect.com), Google Scholar (<https://scholar.google.com/>), Scopus (<https://www.scopus.com>), Jstor (<https://www.jstor.org>), ResearchGate (<https://www.researchgate.net/>), and Taylor & Francis (<https://www.tandfonline>). The following search keywords were employed: "understanding social capital in the context of forest management," "the importance and function of social capital in forest management," "the construction of social capital in forest management," "realistic

examples of social capital application in forestry management plans," "challenges and obstacles to the integration of social capital in forest management," and "implications for policymaking".

The study topic was defined early in the process, with a clear focus on social capital within the framework of forest management. The inclusion criteria required studies to be peer-reviewed, published between 2000 and 2024, written in English or Indonesian, and directly addressed the intersection of social capital and forest management. Studies were excluded if they lacked relevance to the forest sector, focused solely on unrelated social theories, or were inaccessible in full text. After screening 199 relevant publications, 80 studies were selected for their contribution to the thematic categories of the review. These studies examined different dimensions of social capital, including its forms, applications, and impact on forest governance. A thematic coding process was applied to classify the content into eight core themes, using an inductive approach based on recurring patterns in the literature. This coding enabled a structured synthesis of the findings. The review integrates interdisciplinary insights from social sciences to improve the implementation of sustainable forest management in local community contexts.

III. RESULT AND DISCUSSION

This study focuses on the integration of social capital into forest management across eight primary themes: the demystification of social capital, social capital in action, classification of social capital, case perspectives, issues in development, quantifying social capital, repercussions of social capital, and looking into the future. Based on our review of 199 publications, we chose 80 articles representing these themes, as outlined in Table 1.

Table 1 presents a comprehensive summary of the key themes and authors contributing to understanding social capital in forest management. **Each of the eight themes is addressed in a dedicated review section,**

combining theoretical foundations with empirical evidence. The analysis includes various expressions and applications of social capital, **evaluates the challenges of integration, explores measurement strategies, discusses the implications for governance, and outlines prospective trends.** This systematic structure enables a holistic view of how social capital contributes to sustainable forestry, thus serving as a foundation for future academic inquiry and policy development.

1. Understanding Social Capital in Forest Management

Social capital consists of three elements: an economic community tied to trade, rules, and trust. However, theoretical frameworks reveal that social capital operates within structured social spaces where different actors compete for forest resources and recognition. The deeply ingrained practices of forest-

dependent communities, formed through historical experiences, shape how they perceive and interact with forest resources (Putnam, Leonardi, & Nanetti, 1992). Specifically, social cohesion, social control, and social trust are considered the building blocks of a community (Bourdieu, 2018; Aldrich & Meyer, 2015). Additionally, institutional analysis frameworks reveal that social capital becomes both an input to and output of well-designed institutions, particularly when communities possess clearly defined resource boundaries and appropriate collective choice arrangements (Arts et al., 2021). Consequently, social capital drives community unification and goal achievement (Lee, Rianti, & Park, 2017). Furthermore, social capital stands out in forest management as an indispensable component of the whole process through stakeholder collaboration and a reduction in transaction costs.

Table 1. Summary of Research Across Eight Key Journal Discussions Topics

THEME	AUTHOR	TOPIC
1. Understanding Social Capital in Forest Management	(Bourdieu,2018)	Social capital strengthens community bonds.
	(Aldrich & Meyer,2015)	Social ties enhance community resilience.
	(Górriz-Mifsud, Secco, & Pisani, 2016)	Social capital facilitates forest governance.
	(Baynes et al., 2015)	Community forestry enhances social capital & Social capital fosters ecological problem-solving.
	(Wehi & Lord, 2017)	Cultural practices support ecological restoration.
	(Situmorang 2018)	Social capital strengthens forest management.
	(Lee, Rianti, & Park, 2017)	Social capital enhances collaborative decision-making & Social capital fosters community recovery.
	(Savari & Khaleghi, 2023)	Social capital reduces damage from deforestation.
	(Castaneda et al., 2015)	Social capital addresses environmental challenges.
	(Newton et al., 2016)	Forest communities rely on collaboration
	(Ambio, 2023)	Social interaction strengthens forest resilience.
	(Puspita, Qurniati, & Febryano, I. 2020)	Social capital supports forestry collaboration.
	(Musavengana & Kloppers, 2020)	Social capital fosters local collaboration.
2. The Role of Social Capital in Forest Management	(Lee, Rianti, & Park, 2017)	Social capital enhances collaborative decision-making.
	(Savari & Khaleghi, 2023)	Social capital reduces damage from deforestation.
	(Kim, 2018)	Social capital enhances collective action.
	(Mavhura & Mushure, 2019)	Indigenous knowledge aids resource conservation.
	(Baynes et al., 2015)	Social capital fosters forest conservation.
	(Ido, 2019)	Social capital enhances conflict resolution.
(Polach et al., 2015)	Social capital supports resource management.	

Tabel 1. Continued

THEME	AUTHOR	TOPIC
3. Types of Social Capital in Forest Management	(Woolcock & Narayan, 2020)	Social capital strengthens social ties.
	(Górriz-Mífsud, Secco, & Pisani, 2016)	Social networks enhance forest governance.
	(Kleef, Gelfand, & Jetten, 2019)	Collaborative networks enhance forest management.
	(Ihemezie et al., 2021)	Social norms shape conservation behavior.
	(Rousseau et al., 2018)	Human values shape conservation behaviors.
	(Castañer & Oliveira, 2020)	Trust enables effective collaborative management.
	(Roslinda, Ekyastuti, & Kartikawati, 2017)	Social capital supports forest management.
	(Putnam, Leonardi, & Nanetti, 1992)	Social capital enhances civic engagement.
	(Coleman, 1986)	Social capital facilitates cooperative action.
	(Musavengane & Simatele, 2017)	Social capital fosters resource collaboration.
4. Case Studies: Integrating Social Capital into Forest Management	(Colavito, 2017)	Social capital enhances adaptive governance.
	(Vainio, Paloniemi, and Hujala, 2018)	Social networks enhance the success of conservation.
	(Savari & Khaleghi, 2023)	Social capital fosters collective conservation.
	(Dassir and Mas'ud, 2020)	Social capital boosts forest conservation.
	(Fischer et al., 2023)	Community governance enhances forest resilience.
5. Challenges and Obstacles in Developing Social Capital in Forest Management	(Barnes et al., 2017)	Social networks strengthen environmental outcomes.
	(Sterling et al., 2017)	Stakeholder engagement improves biodiversity conservation.
	(Toda, Hashiguchi, & Hiratsuka, 2023)	Human resources enhance forest management.
	(Poteete & Ostrom, 2015)	Conflict limits collective action strategies.
	(Stern & Coleman, 2015)	Trust fosters collaborative resource management.
	(De Vente et al., 2016)	Trust enhances participatory decision outcomes.
	(Lutter, Dayer, & Larkin, 2019)	Trust boosts the persistence of conservation programs.
	(Shirk et al., 2018)	Effective communication fosters community participation.
	(Montoya, Vizuete, & Marcu 2023)	Communication enhances growth in the forestry sector.
	(Borg, Toikka, & Primmer, 2015)	Social capital strengthens collaborative governance.
	(Sténs et al., 2016)	Shared goals strengthen forest governance.
	(Vítková, Dhuháin, & Pommerening, 2016)	Training reduces uncertainty in forestry management.
6. Measuring Social Capital in Forest Management	(Ido, 2019)	Social capital drives collective action.
	(Lestari, Kotani, & Kakinaka, 2015)	Surveys assess social capital participation.
	(Hwang, & Stewart, 2017)	Interviews uncover levels of social capital.
	(Santosa, Setyowati, & Wibowo, 2023)	FGDs enhance social capital dialogue.
	(Cottafava, & Corazza, 2020)	Participatory mapping strengthens stakeholder collaboration.
	(Damstuti & Groot, 2018)	Participatory mapping strengthens stakeholder relationships.
	(Leppin et al., 2014)	Social network analysis strengthens collaboration.
	(Chan, 2018)	Social network analysis enhances relationships.

Tabel 1. Continued

THEME	AUTHOR	TOPIC
7. Policy Implications of Social Capital Research in Forest Management	(Puspita, Qurniati, & Febryano, 2020)	CBFM promotes sustainable forest management.
	(Duguma et al., 2018)	CBFM fosters sustainable development practices.
	(Musavengane and Simatele, 2016)	Social capital supports collaborative management.
	(Bennett, Ravikumar, & Cronkleton, 2018)	Balanced power distribution improves forest management.
	(Laktić, Žibera, Kogovsek, & Malovrh, 2020)	Participatory processes enhance the growth of social capital.
	(Tang et al., 2021)	Collaborative processes boost perceived outcomes.
	(Musavengane & Kloppers, 2020)	Social capital fosters community resilience.
	(Vítková, Dhubháin, & Pommerening, 2016)	Resource provision enhances social capital.
	(Musavengane & Simatele, 2017)	Resource provision strengthens collaborative management.
	(Young et al., 2016)	Trust resolves conservation conflict effectively.
8. Future Challenges and Opportunities in Integrating Social Capital into Forest Management	(Puspita, 2019)	Social relations benefit forest management.
	(Neal, 2015)	Social capital bridges diverse communities.
	(Thuesen, 2017)	Linguistic diversity influences social capital.
	(Moon, 2016)	Inclusive management fosters diverse work behaviors.
	(Rahman, 2017)	Power imbalance hinders community participation.
	(Pierce et al., 2013)	Social capital aids climate adaptation.
	(Yoo & Lee, 2016)	Flexibility supports social capital management.
	(Gavilanes, Castillo, & Marcu, 2023)	Technology enhances social capital interaction.
	(Amini, Nasrabadi, & Heydari, 2015)	Education enhances social capital development.
	(Fatimatuzzahroh, Hadi, and Purnaweni, 2021)	Local involvement builds social capital.
(Pairunan, Dassir, & Paembonan, 2021)	Social capital supports sustainable forestry development.	
(Deepak, Wisner, and Benton, 2016)	Technology enhances social capital development.	

Building social capital is essential for the implementation of sustainable forest management plans. Indeed, an eco-effective social capital formation technique can be considered an effective strategy for accepting forest management practices that correspond to environmentally friendly principles. The power of social capital is substantial in shaping individual visions regarding forest conservation. This explains why local participation in sustainable forest management is crucial (Górriz-Mifsud, Secco, & Pisani, 2016). Such sustainable forest management has tremendous social and ecological effects.

For instance, Community-Based Forest Management (CBFM) can improve social

capital through participation at the individual and community levels in decision-making about forest resources (Baynes et al., 2015). CBFM succeeds by not merely building networks but also restructuring power relations within governance systems, giving communities greater control, and simultaneously building on existing traditional practices and knowledge systems (Wehi & Lord, 2017; Situmorang, 2018). Furthermore, Culturally, CBFM help restore cultural traditions and make landscapes sustainable for future natural resource conservation (Wehi & Lord, 2017) To achieve this, collaboration between forest manager and with the local community should be enhanced. Growing social connections yields elevated

trust, better communication, and the formation of collaboration networks (Situmorang, 2018). Social capital ties could be used to structure a more succinct framework of sustainable forest management (Lee, Rianti, & Park, 2017).

Developing social capital not only reduces deforestation. In fact research proves that employing social capital can significantly reduce damage through deforestation (Savari & Khaleghi, 2023) by generating communal action and cost-effectiveness in addressing deforestation. This occurs through collective action mechanisms, where communities with strong internal cohesion, cross-group connections, and links to formal institutions can more effectively monitor forest resources and enforce rules (Ido, 2019). Moreover, research consistently demonstrates social capital's effectiveness in addressing societal challenges (Castaneda et al., 2015). For example, in sustainable forest management, social capital enables communities to coordinate decision-making, disseminate information, and collaborate to address ecological problems (Newton et al., 2016).

Social capital has become a central focus for natural resource manager. This highlights the importance of forest managers acknowledging the enormous role of social capital in safeguarding sustainable forest management (Baynes et al., 2015). This involves placing greater value on the social interaction within and between communities surrounding forest (Ambio, 2023).

Over time, the growing emphasis on social capital reflects its increasing value in forestry processes. Through collaboration, cooperation builds an environmental management system that is optionally adaptable and a prolonged sustainable forest management plan (Puspita, Qurniati, & Febryano, 2020). Engaging in social capital is a process that seeks to rebuild trust, create communication channels, and ultimately make a wider group of citizens participate. As forest management becomes more comprehensive, managers have increasingly attempted to develop social capital, helping to

establish relationships with locals (Musavengana & Kloppers, 2020).

2. The Role of Social Capital in Forest Management

Social capital is a key factor that contributes to forest governance systems. Through frameworks of social-ecological systems, social capital functions as a connecting mechanism enabling effective governance across multiple scales, from local forest user groups to regional policy networks (Bouma et al., 2020; Arts et al., 2021). In this context, it has different roles in forest conservation, such as bonding, bridging, and linking social capital. We found that bonding social capital is highly important in dealing with conflicts and strengthening cohesion within a close-knit group in forest management. However, institutional research reveals that internal cohesion alone is insufficient; it must be complemented by connections across diverse groups and links to formal institutions, aligning with polycentric governance in which multiple authorities interact to manage common-pool resources. Bridging social capital mobilizes different and distinct groups for broader cooperation, while linking social capital encourages cooperation between a certain community and other bodies, including governments or NGOs. Community management of resources reduces resource inefficiency (Lee, Rianti, & Park, 2017).

1. The existence of social capital is likely to improve the chances of forest conservation initiatives. Its effectiveness depends on institutional design principles, including clearly defined boundaries, congruence between rules and local conditions, collective choice arrangements, monitoring systems, graduated sanctions, conflict-resolution mechanisms, recognition of organizing rights, and nested enterprises (Musavengana & Simatele, 2017). Bonding social capital, constructed through familial and reciprocally obligatory relations, facilitates the organization of collectivized action for solving crimes in the forest, such as timber

thefts, unlawful hunting. Local communities that share strong social relationships can report illegality cases, such as illegal logging or hunting endangered species, enabling the authorities to take the necessary action. Recent research confirms that a sustainable approach to forest management is essential (Savari & Khaleghi, 2023; Mavhura & Mushure, 2019; Kim, 2018)

2. Social capital enables common interests among stakeholders to be managed. This reflects insights about shared mental models and trust in collective action. However, attention must be directed to power dynamics and potential elite capture, whereby more powerful actors appropriate collective benefits (Ido, 2019; Polach et al., 2015). Bridging social capital supports the interchange of contacts, information, and resources between forest managers, local people, and other related communities to accommodate a common goal. Actors of the forestry sector include forest managers, local residents, and other related bodies (Baynes et al., 2015).
3. Social capital can de-escalate conflict. Research emphasizes that social capital provides a relational foundation for conflict-

resolution mechanisms, but institutional design determines whether conflicts are resolved constructively through accessible, low-cost forums for addressing disputes (Young et al., 2016; De Vente et al., 2016). Through connections with external institutions, linking social capital supports conflict mediation and enhances resource management practices.

4. The appreciation of social capital in forestry management by forest managers has increased in recent years (Ido, 2019).

Social capital ranks high in building synergy among stakeholders, lowering the expenses associated with business transactions, and making it easier to initiate joint action in forest governance. Social capital gathers groups interested in reaching a common purpose, as depicted in Figure 1.

3. Types of Social Capital in Forest Management

The research by Woolcock and Narayan (2020) indicated that social capital is essentially aimed at developing social ties. The integration of capital theory reveals that social capital interacts with economic capital (financial resources), cultural capital (knowledge and

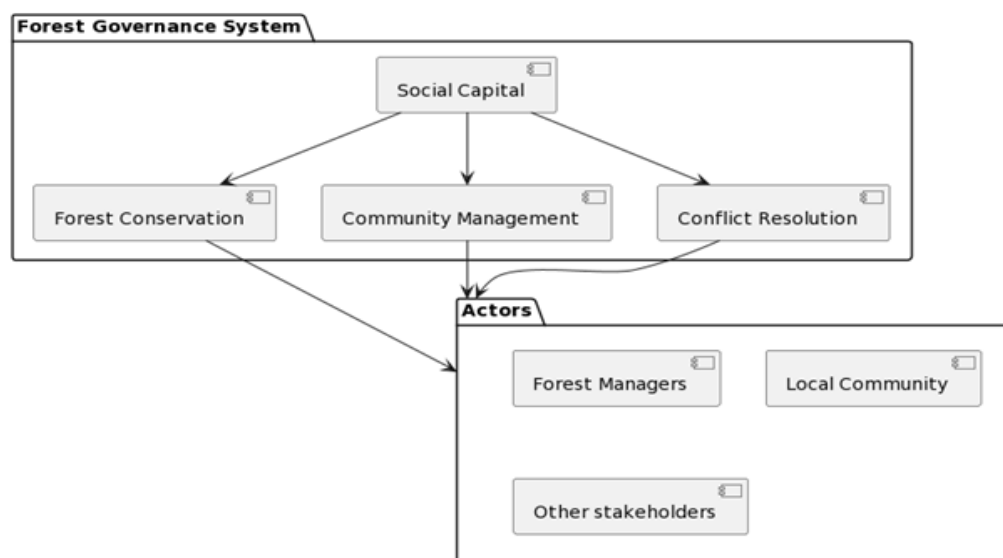


Figure 1. Role of Social Capital in Forest Management (Adapted from: Baynes et al., 2015; Ido, 2019; Lee et al., 2017)

skills), and symbolic capital (recognition and legitimacy) in specific institutional contexts (Bourdieu, 2018). These ties are characterized by durable, resilient bonds that create a strong foundation for trust and cooperation. Having strong social ties is not an end in itself but a bond that can lead to the formation of strong connections and alliances. Social capital is the facilitator of interaction among individuals belonging to a social entity, which makes possible collective activities and coordination of the system (Coleman, 1986). Social capital can be developed implicitly, through informal networks and trust, and explicitly, through organized efforts and formal agreements.

1. Social Networks: Górriz-Mifsud et al. (2016) identified social networks as the complex interconnections of individual and community group members. An established network provides an urgent basis for forest governance. However, their effectiveness depends on institutional arrangements that support information flow and collective action within polycentric governance frameworks that span multiple scales and connect different types of actors (Kleef, Gelfand, & Jetten, 2019). Such networks empower rapid and smooth interaction, encouraging the sharing of critical information and coordination. Social networks grant even forest managers the chance to foster more substantial congruence in the local communities. Social networks are the next steps in furnishing forest management with more effective and efficient methods (Henriksen et al., 2023).
2. Social Norms: Social norms are unwritten codes and behaviors that individuals in groups or society should follow (Kleef, Gelfand, & Jetten, 2019). Research reveals that norms function as informal institutions but must be supported by formal rules and enforcement mechanisms, with their effectiveness depending on their congruence with formal rules and alignment with community values (Ihemezie et al., 2021; Rousseau et al., 2018). Their character may form social norms concerning an individual's attitude toward forest conservation and their tendency to get involved in forest management. The rise of stringent social norms and conservation by community members leads to more caring and active sustainable forest management practices (Ihemezie et al., 2021).
3. Trust: Trust is the confidence that a person has in the predictability and truth of another person's actions (Rousseau et al., 2018). Analysis suggests that trust emerges through repeated interactions under well-designed institutional arrangements that provide information about the behavior of others and create incentives for cooperation (Lutter, Dayer, & Larkin, 2019). This factor is paramount in determining whether forests are managed sustainably, since it brings about cooperation and collaboration between many different entities. Effective collaboration between forestry managers and locals can only be achieved by nurturing mutual trust and partnerships. Trust commonly enables cooperation in strategy planning to effectively manage forests and ecosystems (McIntyre and Schultz, 2020).
4. Cooperation: Cooperation means collective work by individuals or groups who move formally and orderly to perform the same things to reach their mutual goals (Castañer & Oliveira, 2020). The role of collaboration in forest management is striking because it can be a game changer for the efficacy and resilience of forest management methods and the livelihoods, well-being, and sustainability of stakeholders. For example, consultation between forest agents and people living in the vicinity of the forest is needed when both parties are involved in drafting forestry strategies, with everyone's needs and interests taken into consideration. Social capital may be an umbrella term that involves relationships, institutions, social norms, trust, and cooperation. Field analysis

reveals how power relations influence the distribution and effectiveness of different forms of capital, while institutional analysis shows how rules and norms shape incentives for collective action (Bourdieu, 2018). These different types of social capital are some of the eminent features of development management as they support dialogue, the communication of information, synergy and the establishment of better decision-making techniques (Roslinda, Ekyastuti & Kartikawati, 2017; Putnam, Leonardi & Nanetti, 1992; Coleman, 1986). Understanding all these different types of capital and how they impact the management process is essential before any significant effort is made in that particular direction. Social capital is, therefore, a key to the welfare of both people and natural resources (Musavengane & Simatele, 2017).

4. Case Studies: Integrating Social Capital into Forest Management

Social capital must be supported by any forest management intervention where communities are actively engaged. In such cases, the primary role of social capital is its capability to enhance the level of cooperation and trust between the direct actors. Analysis through institutional design frameworks reveals how social capital development occurs within specific power structures and governance arrangements (Colavito, 2017; Fischer et al., 2023). Here are some case studies from various countries that report the practice through some good examples of how social capital plays a role in forest management.

1. The United States, particularly in western states such as Arizona, Colorado, New Mexico, and California, emphasizes social capital as a critical determinant of effective collaborative forest rehabilitation. These programs illustrate polycentric governance principles by creating institutional arrangements that connect multiple scales of governance while addressing power imbalances within forest management systems, which include federal agencies, local communities, environmental groups, and industry actors (Colavito, 2017). Such programs emphasize the importance of stakeholder engagement; mutual understanding; cooperation between federal agencies, communities of interest, and other stakeholders; and the regulation of the social system. Social capital improves adaptive governance through people's networking and ensuring that pertinent scientific knowledge is incorporated into the decision-making processes. Continuously sustained, face-to-face contact is crucial for these kinds of relationships to overcome tasks such as schedule discrepancies and allow the direct translation of scientific knowledge into the context of forest management (Colavito, 2017).
2. In Finland, the Collaborative Forest Landscape Restoration Program (CFLRP), a successful case of forest conservation, is discussed by having a look at the forest owners' personal goals and their social circles. The case demonstrates how social capital operates within existing institutional frameworks, whereby the behavior of forest owners depends on not only personal motivations but also their position within social networks and access to different forms of capital. The final result is that having clear, robust conservation objectives and qualified social capital positively predicts the level of conservation management. Social networks are essential for information provision, collaboration, and support in tackling conservation challenges. The study shows that these motivational aspects matter for successful conservation, as does the access of social capital forest owners have in forest conservation networks (Vainio, Paloniemi, and Hujala (2018).
3. Research being carried out in Brazil proves the role social capital plays in organizations that aim to conserve forests. The case illustrates how social capital addresses problems related to collective action in

deforestation control. However, analysis reveals that effectiveness depends on broader institutional reforms that address how the positions of different actors within governance systems influence their ability to benefit from social capital development. Deforestation management was discussed in this critique as something that can be successful through a form of social capital that causes collective action and, simultaneously, reduces administrative costs (Savari & Khaleghi, 2023).

4. A case study in Indonesia demonstrates that social capital significantly impacts individual involvement in forest conservation efforts. The case shows how traditional governance systems can be strengthened through institutional innovations that build on existing social capital, with effectiveness depending on addressing conflicts between traditional and formal governance systems while respecting community cultural practices. As social capital has built-in family and group norms and beliefs that promote community engagement in and individual contributions to the conservation of forests, social capital is one of the main reasons for this type of participation (Dassir and Mas'ud, 2020).
5. The Community Forest Governance program described by Fischer et al. (2023) is dedicated to India's tropical forests and demonstrates that indigenous and rural people can actively participate in forest resource management. The case illustrates institutional design principles: communities develop clear boundaries around forest resources, create rules matching local conditions, establish collective choice arrangements, implement monitoring systems, and connect to broader governance networks. This linkage is associated with results in enhanced carbon storage, biodiversity, and rural income generation. In addition to the ecosystem improvement, the program empowers forest management

associations and local rule-makers to improve the socio-economic returns. The review shows that enhanced community decentralisation in the use of forests ensures better forest and ecosystem resilience.

These cases reveal that social capital development is most effective when it occurs within institutional frameworks that address power imbalances, provide multiple pathways for participation, and create mechanisms for adaptive management. The main thing is that associated social capital development will lead to sustainable development; this comes down to forest management. Forests are the primary source of goods and services for local communities, and they impact the preservation of our overall global environment. It has been found that one of the factors behind this impact is social capital resonance. Consequently, social capital makes the simultaneous implementation of sustainability and forest utilization initiatives possible. Social capital helps fulfill the reliable functioning of forest management activities without violating a community's ecological, social-economic, and environmental belonging. The key to addressing the demands of climate change is the improvement of social capital, in terms of engaging local communities, promoting environmental education, and involving all stakeholders to come up with new, resilient ideas. Social capital allows conservation and forest utilization management approaches to be implemented in alternative and synchronized ways.

5. Challenges and Obstacles in Developing Social Capital in Forest Management

Creating a solid rapport between the authorities responsible for forest governance and the community is key to accomplishing the right forest conservation practices. Understanding these challenges requires institutional analysis that reveals how structural constraints limit collective action possibilities, from individual relationships to broader political systems shaping forest governance (Sterling et al., 2017). Equally, however, there

are several difficulties in using collaborative management to reinforce social relations. Some of the obstacles that arise during efforts to increase social capital in the context of forest management include:

1. Creating reliable social capital that affects dispute situations is challenging in problematic groups. Building trust occurs within systems that are characterized by power imbalances and historical conflicts, where external interventions can undermine efforts when they fail to recognize local knowledge systems. The trust and social connections that are very important between forest managers and communities cannot be built in one night (Poteete & Ostrom, 2015).
2. Obstacles that conflict with key stakeholders, including stakeholders' contrasting interests, may be a major challenge to creating sustainable social capital and implementing a sustainable forest management strategy. Analysis suggests that conflicts often arise from poorly designed institutions that create perverse incentives or fail to align rules with local conditions (Toda, Hashiguchi, & Hiratsuka, 2023). Through the empirical studies by Sterling et al. (2017), we will find out how these conflicts can occur due to the differing perspectives of local people toward the forest and the approaches taken by forestry management.
3. Structures like governance and human resources are essential pillars in building social capital. Research emphasizes that effective collective action requires social capital, technical knowledge, financial resources, and organizational capabilities. Human resources are important in developing strategies for effective forest management. In many low-income countries, limited financial capacity leads to a shortage of skilled human resources, which hinders the development of robust forest management strategies (Toda, Hashiguchi, & Hiratsuka, 2023).
4. Mental barriers like misgivings and

inadequate awareness could also obstruct social solidarity development. These often reflect rational responses to institutional failures and power imbalances, where communities resist interventions due to their previous negative experiences. The management strategies of the woodland of such communities are highly limited by the prevailing conflict and distrust in the community (Poteete & Ostrom, 2015).

5. Another issue in the constitution of social capital may be that local communities do not take an active role. Limited participation often results from institutional barriers that exclude certain groups, with analysis revealing how different forms of capital influence the ability of communities to participate effectively in forest governance (Bourdieu, 2018). Limited participation will reduce the likelihood of attaining sustainable forest management goals. Underrepresentation may result in negligible exposure to information, while a shortage of resources can also be the cause (Toda, Hashiguchi, & Hiratsuka, 2023).

Forest managers employ different strategies to mitigate issues through which these challenges can be addressed. These strategies must focus on institutional reforms that support social capital development while addressing structural constraints. In these situations, the management method consists of several stages:

1. Strengthen trust: Several investigations indicate that developing trust is imperative in the relationship formation between forest managers and local units (Stern & Coleman, 2015; de Vente et al., 2016; Lutter, Dayer & Larkin, 2019).
2. Improve communication: Establish effective communication places between forest managers and local communities. The emphasis is on increasing the standing of the forestry sector and fostering its growth by holding effective communication and regular meetings. Regularizing meetings supplies information and education, as well

as actively incorporates people into their understanding and forest management processes (Shirk et al., 2018; Montoya, Vizuete, & Marcu 2023).

3. Common goal: Boost social capital and encourage proper forest management rules. Stakeholders are requested to put into practice all their different points of view. Mutual agreement may occur by settling on shared goals and making joint efforts to find solutions that benefit everyone (Borg, Toikka, & Primmer, 2015; Sténs et al., 2016).
4. Provision of resources: To deliver this message, specialists stress that offering the necessary resources, like training and technical assistance, can prevent structural barriers, creating the possibility of good forest management (Vítková, Dhubhain, & Pommerening, 2016).

Social capital plays a prominent in promoting sustainable forest management and ensuring that both nature. Social capital is the capacity to build and maintain durable and successful forestry schemes

6. Measuring Social Capital in Forest Management

It is important to assess social capital to capture its significance in forest management and design effective processes for increasing that capital (Ido, 2019). Measuring social capital requires methodological approaches that capture both structural and cognitive dimensions while recognizing the institutional contexts that shape the effectiveness of social capital (Lestari, Kotani, & Kakinaka, 2015; Hwang & Stewart, 2017). An outline of the methodologies and tools used to assess social capital in the field of forest management is as follows:

1. Surveys: Forest supervisors use surveys to assess and describe social capital. However, their effectiveness depends on these officers' understanding of local contexts and power relations, with institutional analysis suggesting that questions should examine not only trust and networks but also institutional

arrangements that support collective action. Surveys are used to gain information about social networks, perceptions, and social norms (Lestari, Kotani, & Kakinaka, 2015).

2. Interviews: Interviews are done to unearth different levels of social capital. Semi-structured interviews can explore how social capital operates in specific institutional contexts, examining the experiences of community members regarding collective action and their understanding of formal and informal rules. These help develop good coordination between local communities and give managers a way of knowing (Hwang & Stewart, 2017).
3. Focus Group Discussion (FGD): A FGD is considered the most efficient to understand various aspects of social capital. FGDs provide opportunities to observe social capital dynamics while examining how power relations, cultural norms, and institutional arrangements shape group interactions and collective decision-making. It is an excellent tool for stakeholders to conduct decision-oriented interactive dialogue. It is a place where an open and trusting atmosphere can be created. The purpose is to try to bypass barriers and distrust (Santosa, Setyowati, & Wibowo, 2023)
4. Participatory Mapping: This tool ensures the active participation of local community groups in conceptualizing social networks and other forms of social capital. The process can reveal how stakeholders perceive resource boundaries, use patterns, and management responsibilities while building social capital by creating a shared understanding (Cottafava & Corazza, 2020). This method is useful in understanding complex, reciprocal relationships among stakeholders (Damstuti & Groot, 2018).
5. Social Network Analysis (SNA): The use of SNA enables the examination of social relationships to enhance and strengthen those relationships. However, analysis must be interpreted within institutional contexts

that shape network formation, examining how formal and informal institutions influence network development and how power relations affect the positions of different actors. Social networks tend to be made visible as the various process as the various forms of social relationships are examined and parties with key roles are identified (Leppin et al., 2014; Chan, 2018).

Effective measurement requires combining multiple methods within theoretical frameworks that recognize the extent to which social capital is embedded in institutional and power structures. Exploring social capital in forest management is pertinent to realizing its essence in forest management and defining what characterizes successful results that increase social capital. Common research methods such as polls, interviews, FGDs, and participatory mapping are examples of tools used to evaluate social capital in forest management. Forest managers should use the proper way to develop closeness and link community members to their area of work.

7. Policy Implications of Social Capital Research in Forest Management

Active community participation in managing forests can strengthen social capital. The benefits of this positively impact forests, ecosystems, and human life. Policy implications must be grounded in institutional analysis that addresses both opportunities for and constraints on collective action, as well as an understanding of how different institutional arrangements support or undermine social capital development (Duguma et al., 2018). Strategies have been developed to ensure the development of different items of social capital. The following policies involve the integration of social capital:

1. **Advocating Community-Based Forest Management (CBFM):** CBFM can bridge a social gap. CBFM policies must incorporate institutional design principles while addressing power imbalances, requiring clearly defined resource boundaries and

genuine collective choice arrangements rather than consultation opportunities that maintain existing power structures. The integration of CBFM into the current practices can be accomplished by stimulating sustainable forest management practices (Duguma et al., 2018). The level of the country's social capital would be raised with the proper implementation of strategies like CBFM in Indonesia. A well-developed and well-implemented CBFM policy draws positive attention to entire society and the ecosystem (Musavengane and Simatele, 2016).

2. **Balancing power distribution:** Studies on social capital show that power disproportionality can hinder capital formation. Policies must recognize how different forms of capital influence the ability of communities to participate effectively, requiring genuine power redistribution that involves the transfer of real authority rather than superficial consultation processes. This imbalance results in complications when implementing efficient forest management strategies. Policies are designed to reduce power disparities. The gaps are related to management authority and resource distribution. The equal distribution of power can contribute to more equitable and effective forest management (Bennett, Ravikumar, & Cronkleton, 2018).

3. **Supporting participatory decisions:** Scientists have shown that when people take part in conflict resolution aimed at finding agreement, the social capital within the community grows. Effective participation requires institutional innovations that enable meaningful engagement rather than stakeholder meetings, with success depending on building social capital through repeated positive interactions. The active involvement of people determines the formulation and implementation of forestry policy (Laktić, Žiberna, Kogovsek, & Malovrh, 2020). Policies that empower joint decision-making processes can strengthen

- society to grow socially and even boost positive outcomes. These improvements, which affect individuals and the environment around them, will happen (Tang et al., 2021).
4. Providing adequate resources: Social capital studies prove that community improvement is often achieved by providing resources to the community. Resource provision must address both immediate capacity needs and longer-term institutional development, with financial and technical support strengthening existing community institutions instead of creating parallel structures. Identifying these resources requires offering various forms of education, such as technical assistance. This way of doing things truly has an essential meaning in building social capital. Policies that provide the local populace with resources such as forest management and credit will better promote social capital. Investment in social capital brings positive gains to society and the environment (Vítková, Dhubbáin, & Pommerening, 2016); Musavengane & Simatele, 2017).
 5. Resolving conflicts of interest: Social capital studies also indicate that conflicts of interest between stakeholders can hinder forming social capital, so policies should

be designed to defuse conflict. Effective conflict resolution requires accessible forums that provide legitimate pathways for addressing grievances. However, sustainable resolution also requires the underlying power imbalances and institutional arrangements that create conflicts to be addressed. Once a conflict is resolved, the fair distribution of resources is possible (Young et al., 2016).

Polycentric governance frameworks provide the overarching policy approach for integrating social capital development with effective forest management, recognizing that forest governance occurs at multiple scales and requires coordination among different institutions. Puspita (2019) highlighted that the findings of social capital studies have important policy implications in forest management. Forest officials need to be capable of having tight connections with people in the community and impress people practically about rational forest management. Social relations not only generate profits for the community and managers but also provide long-term environmental benefits. The policies implemented need to focus on spurring the growth of social capital, as presented in Figure 2.

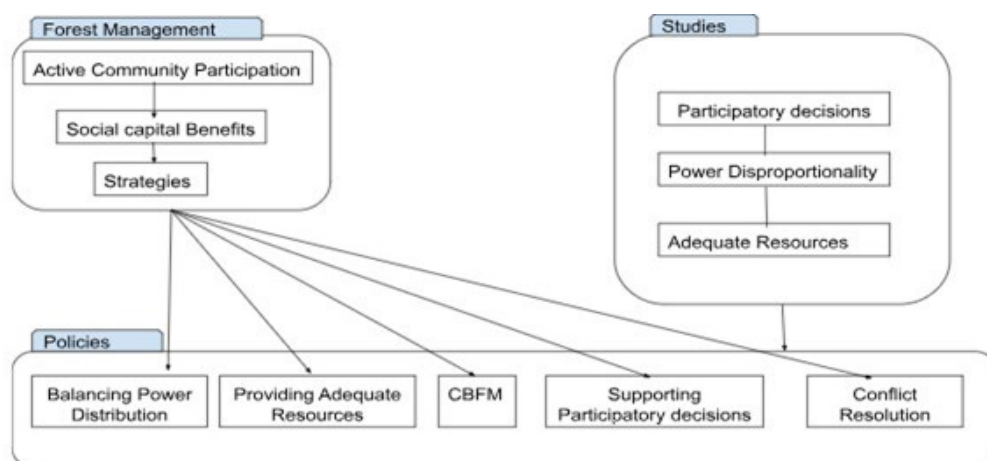


Figure 2. Policy Implications of Social Capital Research in Forest Management (Adapted from: Puspita, Qurniati, & Febryano, 2020; Duguma et al., 2018; Bennett, Ravikumar, & Cronkleton, 2018; Laktić et al., 2020; Tang et al., 2021; Musavengane & Kloppers, 2020; Vítková, Dhubbáin, & Pommerening, 2016; Musavengane & Simatele, 2017; Young et al., 2016)

8. Future Challenges and Opportunities in Integrating Social Capital into Forest Management

8.1. Challenges

1. Forming social capital in a diverse society is a challenging and important task. Diversity reflects broader social changes that create both opportunities and challenges, with analysis suggesting that diversity can not only enhance collective action through complementary skills but also create coordination challenges. First of all, individuals of different generations have similar factors. For example, variations in lifestyle, culture, and values exist in society (Neal, 2015). It will be crucial to develop policy measures backed up by the ideas, symbols, and sentiments of a range of diverse perspectives (Thuesen, 2017; Moon, 2016).
2. The issue of power imbalance is a paramount constraint in creating mutual aid networks and developing forest management strategies (Adhikari, Kingi & Ganesh, 2016). Power imbalances represent fundamental structural challenges that constrain social capital development, with field analysis revealing how the positions of different actors in broader political and economic systems influence their forest governance participation. Defeating poverty in such conditions demands policy reform implementation and commitment to change from policymakers (Rahman, 2017).
3. Climate change, social upheaval, and geographic shifts are new and interesting challenges in the formation and management of social capital. These create challenges requiring adaptive institutional arrangements and enhanced collective action capacity, whereby social capital can facilitate adaptive management but uncertainty can undermine it by making stable expectations difficult. Flexibility remains the pivotal trait of an effective strategy that can promptly respond to circumstances that change frequently (Pierce et al., 2013; Yoo & Lee, 2016).
- 4.

5. Long-term stability depends on directing resources and efforts into building social wealth that will be the foundation of future development and empowerment. This requires institutional arrangements that maintain social capital across generations while adapting to changing conditions, thus balancing continuity with adaptation. Sustainable social wealth depends on social capital existence (Yoo & Lee, 2016). Continuous urgency and hard work are required on the part of forest managers to achieve the organization and durability of social bonds between the managers and local communities.

8.2. Opportunities

1. Technology is one of the major factors that can be tapped to affect social capital construction and maintenance in forest management. Technology creates opportunities for social capital development, but its effectiveness depends on institutional arrangements ensuring equitable access and appropriate use, with digital platforms potentially connecting dispersed communities; nevertheless, digital divides still require attention (Gavilanes, Castillo, & Marcu, 2023). Social media platforms also play a crucial role in this process. Social media enables interaction and collaboration among geographically distant communities with a common interest in environmental management.
2. Education and awareness promotions can also be undertaken by stakeholders in the process of developing social capital. Educational initiatives should focus on developing practical skills while building social capital in different community groups, requiring participatory approaches that augment existing knowledge while creating opportunities for collective learning. Such an ongoing process would benefit communities lacking information about forest management methods (Amini, Nasrabadi, & Heydari, 2015).
3. Supporting local involvement may result in developing social capital and organizations

that can cope better with the challenges of forest management. Local engagement strategies can build social capital by creating meaningful participation opportunities while addressing structural barriers, which requires long-term commitment and genuine power sharing (Fatimatuzzahroh, Hadi, and Purnaweni, 2021). One way of enabling engagement is the application of incentives such as cash awards or character recognition.

4. Methodological advancement: Future work should include qualitative research approaches and quantitative support for analyses, which would enable examinations of social networks, trust dynamics, and collaborative processes (Hwang & Stewart, 2017; Lestari, Kotani, & Kakinaka, 2015). By relying mainly on qualitative-led methodology, this approach can explore the deep cultural meanings behind social capital. At the same time, the use of numerical data would allow results to be validated and applied across diverse forest management contexts (Santosa, Setyowati, & Wibowo, 2023).

The undeniable fact is that social capital is vital for forest management to facilitate the development of sustainable communities and enhance both human and environmental wellness (Pairunan, Dassir, & Paembonan, 2021). Integrating social capital into forest management represents both significant opportunities and complex challenges, necessitating sophisticated institutional analysis and innovative governance arrangements. Even though the development of social capital is impeded by various barriers, there are still plenty of possibilities to utilize technology, education, and awareness promotion, stimulation and engagement, as well as the creation of partnerships, to develop and preserve social capital (Deepak, Wisner, & Benton, 2016).

IV. CONCLUSION

A multidimensional concept encompassing trust, networks, norms, and community participation, social capital serves as a crucial

pillar in sustainable forest management. This study of 80 research projects covering eight themes has demonstrated that social capital positively supports forest conservation by bringing different community members together for joint activities. The findings demonstrate that social capital operates through multiple mechanisms: facilitating community participation in governance, reducing transaction costs, strengthening conflict-resolution processes, and building adaptive capacity. Case studies from various countries consistently show that successful initiatives depend on strong social capital that is supported by appropriate institutional arrangements. Trust must be built, differences in influence are often present, insufficient resources are rarely provided, and stakeholders may have different interests. To resolve these challenges, forests need to be managed with CBFM, participatory ideas, and a fairer distribution of power among participants. Policy implications emphasize the importance of institutional design principles that address power imbalances while ensuring genuine collective choice arrangements rather than superficial consultation processes. Several techniques are available for accessing information about social capital in forest communities, such as interviews, surveys, focus group discussions, participatory mapping, and social network analysis. In the years ahead, it will be important to adopt new technologies to include the community more effectively, provide better educational programs, and manage the obstacles caused by growing diversity and climate change. Both the building and use of social capital are important aspects of successful forest governance.

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