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Cross-sectoral coordination in the implementation of agroforestry in Malawi

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Introduction: Agroforestry's integration into policies and strategic frameworks is increasing globally, reflecting its critical role in sustainable land-use management. However, realizing the full potential of these policies depends on effective implementation, which necessitates coordination among actors with overlapping responsibilities and siloed approaches. Despite its importance, research on coordination during agroforestry implementation is limited. This study aims to fill this gap by examining coordination in Malawi, particularly among actors from different sectors.

Methods: The study utilizes a qualitative approach based on coordination theories to examine the implementation of agroforestry activities in Malawi. Data was collected through semi-structured interviews with high-level actors involved in agroforestry. Thematic analysis identified key factors influencing coordination.

Results: The results indicates that several key factors, which include clear institutional arrangements, trust adequate resources, and political supportive as crucial in facilitating cross-sectoral collaboration. Weak institutional frameworks and fragmented governance hinder coordination efforts.

Discussion: The findings suggest that coordination is vital for the successful implementation of agroforestry. However, relying on social capital and historical relationships to form partnerships limits broader participation and reduces the diversity of perspectives in agroforestry. Furthermore, coordination supports the survival of various actors by allowing them to pool resources, share risks, and access knowledge and markets that would be challenging to secure independently.

Conclusion: In conclusion, the success of agroforestry success depends not only on well-defined policies, but effective implementation, and robust coordination among diverse stakeholders. Closing policy gaps and building trust-based partnerships are crucial for unlocking its full benefits. Through understanding and optimizing different factors, policy implementors can develop more inclusive, well-resourced, and context-aware coordination strategies.

KEYWORDS

policy implementation, coordination, Southern African Development Community, trust building and communication, street level bureaucracy

1 Introduction

Agroforestry is broadly defined as the integration of agriculture and forestry practices on a single landholding (Sheppard et al., 2020). Globally, it has elicited significant policy interest and there is a growing recognition of its potential to address challenges such as climate change, food insecurity, and poverty (Rubio-Delgado et al., 2023; Yirga et al., 2024; Mbow et al., 2014; Muthuri et al., 2023; Waldén et al., 2024; Herder et al., 2016). This framing of agroforestry as a developmental approach has not only raised optimism, but also influenced how it is advanced and implemented in several countries (Benjamin and Sauer, 2018; Santiago-Freijanes et al., 2018; Mosquera-Losada et al., 2018). Policymakers and government agencies in fields such as sustainable development, forestry, and agriculture are increasingly integrating agroforestry into their policies and programs, (Minang et al., 2014; Schuenemann et al., 2018). Across countries in the Southern African region (SADC), this interest is also reflected by a growing number of adopted policies that integrate agroforestry (Rosenstock et al., 2019; Toth et al., 2017).

Although it is remarkable to observe the growing inclusion of agroforestry in a wide array of public documents, these policies can only be effective if they are successfully implemented (Place and Dewees, 1999; Hudson et al., 2019). Studies show that the adoption and implementation of agroforestry practices continues to face numerous challenges stemming from a combination of biophysical, socio-economic, policy, and institutional factors (Kabwe et al., 2016; Jha et al., 2021; Houndjo Kpoviwanou et al., 2024, Pokwana et al., 2021; Mosquera-Losada et al., 2018). Furthermore, the actual process of implementation is complex and challenging. It encompasses not only the technical integration of trees and crops on the same land, but also the need to reconcile and address the socioeconomic, political, cultural, and institutional issues for any context (Ajayi and Kwesiga, 2003; Swallow et al., 2006; Lillesø et al., 2018; FAO, 2019).

This paper tackles one significant implementation challenge: the coordination process among actors at horizontal governance levels who are involved in the execution of agroforestry activities. Coordination is innate because, as a concept, agroforestry cannot be clustered within single institutional boundaries (Ollinaho and Kröger, 2021). It sits between a number of policy fields and administrative borders that consist of multiple actors with diverse needs and values who sometimes might have overlapping responsibilities and conflicting viewpoints. Research has shown that some of these different sectors work in silos and remain governed by different policies that do not necessarily share common goals, agendas, or resources (Ndlovu and Borrass, 2021). These institutional dispositions have implications for the success of agroforestry coordination, and consequently, its effective implementation.

Although extensive research has been conducted on the topic of coordination, there is no single, universally accepted definition of the term (Christensen et al., 2019). Its meaning varies based on context, as well as the theoretical and philosophical orientation of the researchers (Alexander, 2013). Broadly, coordination arises because different actors depend on each other and they must interact to achieve their goals (Metcalfe, 1994; Malone and Crowston, 1994; Peters, 2018). This interdependency necessitates a collective effort among various actors to align their actions and work together to achieve their objectives (Lindblom, 1965; Painter, 1981; Metcalfe, 1994; Comfort, 2007; Peters, 2018). Thus, coordination can be understood both as the degree to which actors interact and the extent to which they share common objectives (Castañer and Oliveira, 2020).

Cross-sectorial coordination of activities is crucial for the effective implementation of agroforestry. It facilitates necessary dialogue and agreement among stakeholders, ensuring they align with shared rules and objectives (Darmanto, 2023). By engaging diverse policy actors, coordination enhances the collective knowledge base and increases the likelihood of identifying "win–win" opportunities during project execution. Additionally, coordination facilitates the optimization in the use and exchange of resources, and expertise among institutions (Peters, 2018).

Although coordination is essential for policy implementation, it is fraught with numerous challenges, and costly in terms of time, effort, and attention (Roberts, 2011). Several contextual factors—including the policy environment, administrative structures, international pressures, and economic conditions—affect the efficacy and success of coordination efforts (Beuselinck, 2008; Cerna, 2013). These factors limit each actor's capacity to act during the implementation of activities. While such challenges are substantial within a single government agency, they are more complex in cross-sectoral activities such as agroforestry.

Numerous studies across diverse fields of research have examined the complexities and challenges associated with coordination (Peters, 2018; Bouckaert et al., 2010; Lim, 2019; Lindblom, 1965). However, there remains a significant gap in the literature concerning how coordination is approached within the specific context of agroforestry implementation. There is a paucity of knowledge about how different stakeholders navigate and manage the interdependencies that emerge during implementation of agroforestry projects. Hence, the objective of this research is to fill the knowledge gap in literature regarding coordination within the context of agroforestry implementation.

Effective coordination among actors is essential for the successful execution of agroforestry policies; however, this coordination is frequently impeded by various structural, administrative, and contextual challenges that hinder the ability of stakeholders to collaborate effectively. This article aligns with the notion that the effectiveness of agroforestry coordination is determined by the interplay of policy content, institutional arrangements, equity and stakeholder relations, resource availability, and knowledge management (Catacutan et al., 2018). These factors shape the coordination approaches chosen by actors and ultimately influence the success or failure of agroforestry initiatives. Through understanding and optimizing these factors, policy implementors can develop more inclusive, well-resourced, and context-aware coordination strategies, thereby increasing the likelihood of long-term success in agroforestry programs. Against this background, this study examines the mechanisms and processes through which coordination occurs among actors who are engaged in agroforestry in Malawi. To achieve this, two key research questions are examined: (1) What are the specific coordination challenges that actors encounter during the implementation of agroforestry activities? (2) What factors or conditions facilitate the effective management of interdependencies among actors to ensure successful coordination?

1.1 Theoretical overview of coordination

Coordination can manifest formally or informally, and it occurs both within and across organizational boundaries (Henry, 2011). It is

often categorized into vertical and horizontal dimensions (Lim, 2019). Vertical coordination is characterized by a hierarchical, top-down structure with centralized authority and decision-making. Conversely, horizontal coordination is collaborative and decentralized, typical of networked organizations where decision-making is based on consensus, negotiation, and shared responsibilities without dominance by any single authority (Bouckaert et al., 2010; Christensen et al., 2015).

In theoretical terms, coordination is supported by mechanisms, which act as frameworks or systems that regulate interactions among individuals or organizations (Beuselinck, 2008; Danken, 2017). Kornai (1992, p. 91) defines coordination mechanisms as "a subsystem of the social system that coordinates the activities of persons or organizations within it." These mechanisms vary; some are imposed through hierarchical structures, while others naturally emerge from individual interactions and negotiations (Peters, 2018). Researchers have described these mechanisms using terms such as "barriers to coordination" (Jennings and Krane, 1994), "sources of coordination" (Peters, 2003), and "coordination resources" (Beuselinck, 2008). Commonly, they are shaped by contextual factors including policies, socio-economic conditions, institutional frameworks, the characteristics of actors involved, and available resources (Bolleyer and Börzel, 2010). Examples of these mechanisms encompass collaboration, networks, and hierarchical structures (Peters, 2018).

While these mechanisms are often analyzed separately, they frequently overlap in practical scenarios. Each mechanism has its distinct strengths and limitations, and its utility depends on the specific issue at hand as well as its capacity to achieve coordination outcomes. Therefore, selecting the most suitable mechanism(s) requires careful consideration of the issue's complexity and the anticipated effectiveness of each mechanism (Bolleyer and Börzel, 2010).

1.1.1 Analyzing coordination

In examining coordination, there are typically two distinct analytical approaches: process-oriented and outcome-oriented strands (Lim, 2019). Outcome-oriented research evaluates the effectiveness of coordination by examining tangible results such as conflict resolution, enhanced efficiency, or improved resource allocation. In contrast, process-oriented studies aim to understand how coordination occurs, exploring the internal dynamics by scrutinizing the activities, interactions, and mechanisms involved. These studies prioritize the analysis of coordination processes, emphasizing the roles of actors and the relationships that shape coordination efforts. This study aims to contribute to the process-oriented perspective of coordination research, emphasizing cross-sectoral coordination among actors interacting at a horizontal central governance level. The emphasis is placed on understanding how these actors interact and manage interdependencies during the coordination process. Furthermore, the research seeks to identify the challenges actors experience in ensuring effective coordination throughout agroforestry implementation.

2 Materials and methods

The research utilized a case study approach (Crowe et al., 2011) and focused exclusively on Malawi. Malawi serves as an ideal case due to its extensive history of agroforestry implementation, that dates to the 1980s when the SADC-ICRAF Agroforestry Project was launched. Since then, numerous agroforestry projects involving diverse actors, have been executed at both national and sub-national levels; though with varying degrees of success. Agriculture accounts for about 30% of its GDP and employs 85% of its workforce (Araya et al., 2023). Maize, the primary crop, is cultivated by over 90% of farmers but has a low average yield (FAOSTAT, 2012). One reason is that extensive land use and deforestation have led to soil degradation, reduced agricultural land, and consequently, decreased productivity over time (Sanchez, 2002; Ngwira and Watanabe, 2019). Against this background, agroforestry presents a promising solution for tackling Malawi's interconnected challenges (Munthali et al., 2019; Araya et al., 2023). While this study focuses specifically on Malawi, the insights generated may offer valuable lessons applicable to other contexts facing similar challenges.

2.1 Agroforestry coordination landscape in Malawi

The nature of agroforestry coordination in Malawi is shaped by a plurality of state and non-state actors,[1] each operating in areas that include policy development, advocacy, research, and extension services, see Figure 1. On the government side, a hierarchical coordination structure is evident, with agroforestry falling under the jurisdiction of the Ministry of Agriculture (MoA). Within this ministry, the Department of Land Resources Conservation (DLRC) is the designated lead agency, responsible for overseeing the nationwide implementation of agroforestry programs. Additionally, several other MoA departments play key roles—the Department of Agriculture Extension Services (DAES) coordinates on-the-ground activities with farmers, whilst the Department of Agriculture Research Services (DARS) focuses on research and provides technical expertise to support decision-making in agroforestry. Beyond the MoA, broader inter-ministerial coordination efforts at the central government level exist. These include the Ministry of Finance, the Ministry of Lands as well as the Ministry of Natural Resources and Climate Change. This latter ministry oversees the Department of Forestry and the Environmental Affairs Department, both of which are actively involved in agroforestry implementation.

Complementing the government efforts are NGOs, particularly international organizations such as the World Agroforestry (ICRAF), World Vision, and the Food and Agriculture Organisation (UN-FAO). These International NGOs often support with resources such as funding, technical assistance, and capacity development. Coordination is facilitated through formal agreements, such as memoranda of understanding (MoUs) with the government. At the grassroots level, there are local NGOs, who bridge the gap between the government and local communities. They collaborate with local councils and communities to address agroforestry needs. Such local NGOs are often represented by umbrella organizations, which enhance their collective impact and serve as platforms for coordination, information exchange, advocacy and collaboration. For

1 In this context the term "actor(s)" refer to any individual or group that is directly or indirectly, formally or informally, involved in agroforestry.

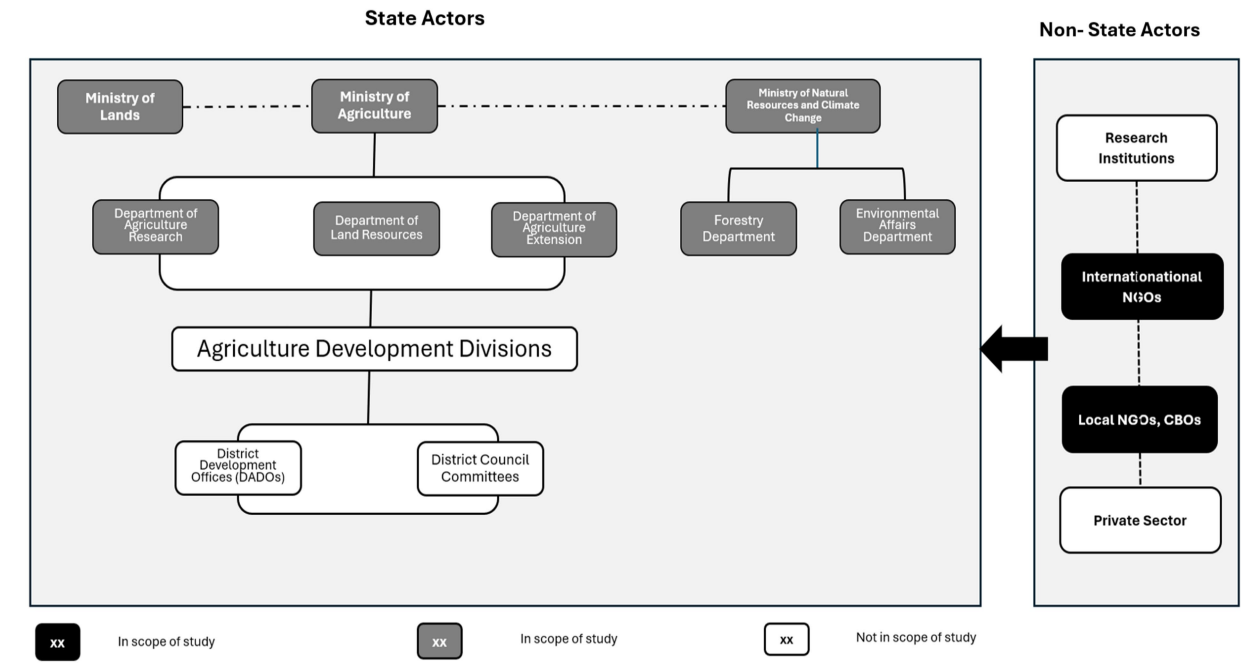

FIGURE 1
The different actor types in Malawi's agroforestry sector.

instance, CISONEC and CISANET are examples of these organizations.

2.2 Data collection

Most of the data reported in this study is of a qualitative nature and was primarily collected through semi-structured interviews. Prior to the interviews, a desktop study of policy documents as well as gray literature was undertaken. This desktop review was the starting point for the selection of expert the most suitable interview participants, hence complementary to the overall study.

2.2.1 Desktop study review: policy document analysis

The aim of the desktop review was to determine the prominence of agroforestry and its coordination landscape in Malawi based on document analysis. To gather these documents, an internet search of publicly available national policies and strategy documents was performed using keywords like "agroforestry," "policy," and "Malawi," to expand the search and locate more documents. Each obtained document was carefully reviewed to find and access other related documents. For easier analysis, the final selection of documents included only those that explicitly mentioned agroforestry. To provide a more current view of agroforestry, the review focused on documents from the year 2000 to 2023. A total of 14 documents explicitly mentioning agroforestry were obtained. The analysis of these documents identified two key issues: (1) How agroforestry is presented or perceived in the documents and (2) Which actors, ministries, and sectors are involved in implementing agroforestry.

2.2.2 Actor selection and interviews

As previously outlined in this section, the coordination of agroforestry activities occurs across multiple levels and involves a diverse set of stakeholders. This study specifically concentrated on actors engaged in horizontal coordination at the central government level, as well as non-state actors involved in agroforestry initiatives at the central government level. Given the complexity of agroforestry governance and the involvement of multiple institutions, the identification of relevant actors was not immediately apparent. Consequently, a snowball sampling approach was employed to ensure a comprehensive and representative selection of key informants.

The snowball sampling process began with an initial set of key stakeholders who were identified based on their expertise and active participation in agroforestry coordination. These initial respondents then provided recommendations for additional participants, allowing the study to capture a broader spectrum of perspectives and experiences. To ensure the credibility and relevance of the selected interviewees, a set of inclusion criteria was established. Participants were required to have at least 3 years of professional experience in the agroforestry sector in Malawi and to hold managerial or decision-making roles within their respective organizations. These criteria ensured that respondents possessed sufficient knowledge and expertise to provide meaningful insights into the coordination dynamics within the sector.

In total, 16 experts were interviewed, comprising 10 government officials and 6 representatives from non-governmental organizations (NGOs). Government participants were drawn from various ministries and agencies responsible for agroforestry, environmental conservation, and land use management. NGO representatives included individuals from both local and international organizations actively engaged in agroforestry projects and policy advocacy. Most of

the interviewees (70%) held director level positions and the rest also held senior positions.

For the data collection, a semi-structured interview approach was followed. The interview process was based on an interview guide that had been developed and centered on key themes, such as the participants' experiences and challenges in implementing agroforestry projects. The aim of organizing the interviews around themes rather than standardized questions was to avoid researcher bias and to allow for the emergence of unexpected answers during the interviews. By organizing the interviews around themes rather than standardized questions, the aim was to minimize the potential for undue influence on the respondents and to allow for the emergence of unexpected answers during the interviews. This approach aligns with the recommendations put forth by Flyvbjerg (2006) and Kvale (1996), emphasizing the importance of using thematic frameworks to facilitate open and authentic dialogue with respondents. Eleven interviews were conducted virtually, while the remaining interviews were conducted in person with the stakeholders in Malawi. With their consent, all responses were recorded in audio format and subsequently transcribed to facilitate comprehensive data analysis.

2.3 Data analysis

The recorded interviews were then transcribed to produce a comprehensive text corpus, with transcription conducted using MAXQDA 2020 software. This software was also instrumental in analyzing the transcribed text by facilitating the organization of data into various thematic categories. The analysis process began with a line-by-line reading of the transcripts, enabling themes to emerge directly from the data. Each relevant passage from the interviews was assigned a thematic code corresponding to its content. Recurring ideas and patterns across interviews were grouped under the same thematic categories, allowing for consistency in theme identification.

In addition to the organically emerging themes, pre-established themes—derived from the research questions and the conceptual framework—were also applied throughout the analysis. This hybrid coding strategy, which combined both deductive and inductive approaches, enriched the analytical process. By blending these approaches, the study was able to capture both anticipated themes and unexpected insights, leading to a deeper comprehension of the key issues and challenges mentioned by the interviewees. Ultimately, this process allowed for the identification of dominant themes that effectively encapsulated the core findings of the collected data, enhancing the overall robustness of the analysis.

3 Results

3.1 Policy landscape for agroforestry in Malawi

Amongst the reviewed documents, 14 explicitly reference agroforestry. These policy and strategic documents span several sectors, including Climate Change, Agriculture, and Forestry. Each governmental entity interprets agroforestry through its specific objectives. For example, agricultural policies highlight agroforestry's role in enhancing soil fertility and improving food security. Conversely, the forestry and conservation sectors emphasize agroforestry's importance in combating deforestation and addressing energy challenges, especially since over 97% of households rely on fuelwood as their primary energy source. These varied perspectives underscore the necessity for coordinated implementation to achieve each sector's goals. Notably, 71% of the reviewed documents highlight the importance of coordination in executing agroforestry and related activities. An example is the Food Security Policy of 2006 which states that;

> *"If we are to guarantee the implementation of the policies and programmes of food security, it is necessary to guarantee the coordination, not only of government institutions but also of all actors involved in the food economy"* (Republic of Malawi, 2006).

Interestingly, 70% of the interviewees observed that, despite the documents' emphasis on coordination, there is a notable deficit between the structured mechanisms and supporting regulations to facilitate and guide the coordination among various actors involved in implementation. This gap often resulted in ad-hoc coordination efforts between state agents, rather than systematic and organized approaches. Furthermore, they noted that existing sector-specific policies and action plans were often not coherent across sectors and frequently lacked clarity, especially in defining roles and responsibilities. This lack of clarity made it challenging for the different agroforestry actors to comprehend and agree on their own and others' roles during the implementation of agroforestry initiatives.

These policy challenges were attributed to a reactive policy-making process, often driven by external agendas and funding opportunities, rather than a comprehensive consideration of practical implementation needs. To resolve these issues, most respondents recommended suggested the development and adoption of a dedicated agroforestry policy or strategy. They argued that such a standalone policy could enhance coordination across sectors and address the limitations of the current multi-sectoral approach. As one interviewee noted,

> *"The problem we have is that we do not have a specific policy on agroforestry in Malawi. We have agroforestry mentioned as an intervention in the National Forest Programme and some policies related to land resources. There is no clear guidance and a lack of a clear policy direction on how we want to go on agroforestry issues. Because of this, there is no clear jurisdiction on how agroforestry must be coordinated. We need a clear policy for agroforestry"* (Government Expert 5).

3.2 How are agroforestry activities coordinated by the different actors

The choice and extent of these mechanisms are influenced by factors such as the specific roles of the actors, the strength of their relationships, and the scope of activities being coordinated. Generally, non-state institutions such as NGOs favor network-based and collaborative approaches that emphasize cooperation and decentralized decision-making. Although characterized by a hierarchical and more formalized structure, the coordination mechanisms employed by state institutions can vary depending on the

context and the actors they are working with. As a result, some government entities also engage in collaborative and network-based coordination approaches. Thus, there are distinct interactions among the actors. To make it easier for comprehension, these are described below; (A), coordination between government actors and (B), coordination between government and non-state actors.

3.2.1 Coordination between government actors

Although the central government operates within a hierarchical structure, horizontal coordination between government departments typically relies on a combination of formal and informal mechanisms. These mechanisms facilitate both intra- and interdepartmental collaboration. A prominent example of formal coordination is the establishment of task forces and committees dedicated to specific policy issues. These task forces comprise experts from various departments or ministries who work collaboratively to address implementation challenges. Their efforts encompass joint planning, resource sharing, and serving as focal points for mobilizing political and financial support. However, despite the existence of a structured coordination framework, interview findings revealed significant challenges in multi-departmental collaboration. Departments often operate with distinct priorities, mandates, and budgetary constraints, which hinder the alignment of objectives and impede effective coordination.

Furthermore, competition for scarce resources, including financial support and technical expertise, emerged as a significant barrier to effective coordination. A recurring theme among government interviewees was interdepartmental competition, which fosters a siloed working environment wherein departments function independently rather than collaboratively. Several interviewees emphasized this issue, with one noting that such competition reinforces institutional isolation, thereby impeding efforts to foster interdepartmental synergy. This fragmented approach ultimately undermines the overarching objectives of coordination, diminishing the collective capacity to address complex, cross-sectoral challenges such as agroforestry implementation. One government expert stated that;

> *"…working in silos is also a challenge among government departments. This is because of the issue of resources. Each department wants to make sure the resources it gets are promoting a particular intervention. Within the parliament, they want to control the narratives and promote their own political agendas."* (Government Expert 4).

3.2.2 Coordination between government and non-state actors

Coordination of agroforestry activities between the government and non-state actors is primarily achieved through collaborations and networks. A key factor driving this approach is the reliance of agroforestry initiatives on external funding, which is often accompanied by specific conditions regarding stakeholder participation. Consequently, the state's role in hierarchical governance is relatively constrained. External donors, who frequently finance agroforestry projects, impose conditions that shape coordination dynamics among participating entities. While the state may exert limited control over financial resources, it contributes other critical assets, including access to information, technical expertise, and a well-established extension service network. Local NGOs play a pivotal role in bridging the gap between larger international NGOs and government agencies, thereby facilitating localized implementation and ensuring the effective execution of agroforestry projects at the community level.

To demonstrate effective collaborative coordination between state and non-state actors, interviewees pointed to the success of the "Agroforestry Food Security Program," a project implemented jointly by the government and the ICRAF. This program aimed to support farmers by providing essential resources like tree seeds, nursery materials, and extension services, to promote agroforestry adoption by farmers in Malawi. In this collaboration, power dynamics were well-balanced, with the government contributing its knowledge, expertise, and outreach capabilities, while ICRAF provided financial and technical support.

3.3 What relational factors are important for effective coordination

The interviewees were also queried on the different factors that they view as important for coordination. Factors which include trust, shared knowledge, and communication were highlighted by most of the respondents.

3.3.1 Trust

The majority of respondents (80%) underscored the critical role of trust in facilitating effective coordination, identifying it as a fundamental indicator of robust inter-organizational relationships and mutual understanding among stakeholders. Trust was perceived as a pivotal determinant of coordination efficacy, as it enhances legitimacy, fosters commitment, and strengthens cooperative engagement during project implementation. Notably, all the organizations interviewed reported longstanding collaborative engagements, having cooperated on multiple initiatives over an extended period. Some organizations were embedded within the same network structures, while others held key positions across various committees and coordination platforms. This sustained history of institutional collaboration has contributed to frequent interactions, thereby reinforcing trust-building processes and promoting more cohesive coordination mechanisms among actors.

As a result of this sustained engagement and mutual trust, interviewees highlighted the presence of strong and positive working relationships. NGOs noted that government departments had become more open to including them in processes such as policy discussions and implementation, which had been more difficult in the previous years. There has been a shift toward a more inclusive approach, with the government increasingly involving non-state actors in the review of policy documents and the development of implementation strategies. Government officials also acknowledged the critical role of NGOs in disseminating policy information, providing resources and supporting implementation within farming communities.

However, instances of mistrust were also reported, particularly regarding transparency and the sharing of essential information and resources. State representatives expressed concerns that some partners were reluctant to share certain data and resist monitoring of their activities. They also noted that some organizations bypassed existing structures and failed to consult or communicate with government authorities. This lack of cooperation had, in some cases, undermined

trust and led to project failures, as well as the emergence of parallel coordination structures.

3.3.2 Communication

Closely linked to the concept of trust is the significance of communication. Respondents underscored that timely, accurate, and continuous communication among actors is essential for effective coordination in agroforestry. They asserted that communication is pivotal for aligning activities and resource allocation, thereby preventing redundancy and promoting efficient utilization of resources. Furthermore, effective communication sustains stakeholder engagement and commitment, facilitates the exchange of knowledge and expertise, and enhances transparency, which in turn fosters coordination. Interviewees reported having easy access to one another, primarily through emails, phone calls, and direct meetings, which facilitate interaction and dialogue. Many actors are also part of similar networks or working groups, further enhancing collaborative communication.

However, reluctance to share information and resources can arise from various factors, including fears of losing competitive advantage, concerns regarding data privacy, or previous negative experiences. When organizations fail to adhere to established protocols or engage in transparent communication, it undermines the collective efforts necessary for successful project implementation. Such lapses can lead to resource wastage, unfulfilled objectives, and strained relationships among stakeholders.

A notable example shared by interviewees involved certain actors introducing the tree species *Acacia mearnsii* (black wattle) into specific regions of Malawi for agroforestry without prior notification to relevant government authorities. This lack of communication resulted in the species becoming invasive and continues to pose control challenges.

> *"We have examples of invasive species that were introduced in the name of agroforestry, for instance, black wattle. They are planted in villages as agroforestry trees, but after some time, they end up becoming a problem. My department plays a key role in the promotion of various technologies, ranging from agroforestry to all sorts of technologies in agriculture, but we were not consulted."* (Government Expert 3)

Interviewees emphasized the critical need for precise and relevant information to be shared promptly and made accessible for effective and informed decision-making during implementation. However, achieving this goal is hampered by inadequate coordination in the processes of collecting, analyzing, and disseminating agroforestry information. Research findings often fail to reach the various stakeholders due to weak linkages between policy and research, coupled with researchers often operating in isolation. Furthermore, research outputs are rarely translated or communicated into formats that are easily accessible and digestible by non-scientists. This disconnect severely limits the potential for research to influence implementation effectively.

3.3.3 Shared understanding of different approaches

The interviewees also mentioned that achieving coordinated efforts in agroforestry is also difficult due to a lack of shared understanding among the involved groups. This is because the involved actors sometimes have differing views about the goals, and work approaches during implementation. These varying perspectives can lead to mismatched objectives, conflicting priorities, and ultimately, hinder collaboration. These differing approaches are closely linked to the source of their power for each actor. For instance, national policies and political motivations determine how government institutions engage with other actors. In the case of NGOs, the engagement is influenced by the donor organizations who have their own ideological and resource terms. Donors may bring in new elements that might be contrary to national policies and what other institutions are pursuing. This, therefore, makes it hard for organizations to work together and coordinate different activities. One respondent mentioned that.

> *"The biggest challenge that we have is the differences in the way that we do our business based on the organisation that we are coming from. As organisations, we need to deliver towards the expectations of our donors, and sometimes, our donors have their expectations, which to a certain extent differ from one donor to another and, as a result, give rise to challenges we have when implementing projects."* (Non-Government Expert 1).

3.3.4 Capacity for joint action

The interviews indicated that the effective coordination of agroforestry activities is contingent upon assembling a capable team with the appropriate skills and strong leadership. Respondents emphasized that a well-rounded team, possessing diverse expertise, is essential for navigating coordination challenges and achieving project objectives. Moreover, the need for ongoing training and capacity-building initiatives was underscored as critical for addressing these challenges and improving the overall effectiveness of agroforestry efforts. However, limited funding remains a significant barrier to developing and attracting the necessary capacities.

This problem is also exacerbated by the prioritization of other agricultural programs which consumes a substantial portion of the sector's allocated budget. For instance, in the 2021/2022 fiscal year, the Malawian government allocated 14.3 percent of the total budget to the Ministry of Agriculture (Government of Malawi, 2006). Notably, half of this funding—amounting to K142.0 billion—was designated for subsidizing inorganic fertilizers and maize seeds provided to smallholder farmers as inputs for agricultural production. This budgetary imbalance results in very limited resources available for agroforestry initiatives, thereby hindering their widespread implementation. Respondents indicated that without adequate resources for the coordination of agroforestry activities, they often forego implementation altogether, opting instead to focus on issues that have received sufficient funding. Expressing these challenges, one interviewee mentioned that.

> *"Under research, we have downscaled; we are not doing much in agroforestry. This has come about because of the poor funding that we have been experiencing over the last decade. As a result of this, we have tended to deviate and look into the areas that at least are attracting resources so that the scientists can remain operational. We need to work together with NGOs to conduct research and share important information"* (Government Expert 8).

The investigation revealed that most resources supporting agroforestry initiatives are acquired through bilateral or multilateral donor arrangements and from international NGOs. However, these funding sources are often limited and tied to specific objectives. Government officials interviewed expressed concerns regarding the challenges associated with relying solely on NGO resources for agroforestry activities. They noted that NGOs typically have short funding cycles, which can result in a focus on short-term outputs rather than long-term sustainability. Additionally, the geographic scope of NGO operations is often limited, restricting their ability to effectively reach a broader farmer base and promote agroforestry practices on a larger scale.

Furthermore, competition for donor funding in the agroforestry sector poses significant challenges for both local NGOs and government entities. One interviewee highlighted that government institutions sometimes perceive themselves to be in competition for funding allocated to agroforestry projects. Moreover, both state and civil society that were interviewed mentioned that this competitive dynamic may lead institutions to intentionally overlook or undermine each other's authority, resulting in conflicts that often impede collaboration.

3.3.5 Political interference

Political decision-making can severely impede the coordination of agroforestry initiatives, particularly when political elites prioritize short-term benefits over long-term sustainability. Interviewees noted that political leaders frequently make unilateral decisions to pursue projects aimed at delivering immediate advantages, even when these decisions conflict with established agroforestry strategies. Such initiatives, often framed as pro-poor development programs, may not resonate with local priorities. Additionally, local coordination bodies, such as District Councils, are frequently marginalized and lack the authority to contest these top-down directives.

The provision of subsidized fertilizers and seeds exemplifies these politically motivated policies. Although fertilizers are essential for agricultural production, the substantial budget allocated to these subsidies often limits funding available for other initiatives, including agroforestry. This dynamic can discourage farmers from adopting agroforestry practices, especially given the resources necessary for their successful implementation. As one interviewee aptly stated,

> *"The fertilizer subsidy is a political tool that does not support long-term sustainable development. …when a farmer is told that if you get inorganic fertiliser for a small prize to become food secure, it will not make sense to him to grow agroforestry trees, rather they will think that those trees are taking up a lot of space for their farming process because they have fertilisers. Most of the farmers' landholding size is too small, so if they are given the two bags of fertiliser, they are sure that they will be home and dry and get good yields."* (Non-Government Expert 3)

It was also mentioned that political interference leads to less engagement among state and non-state institutions, particularly donors, who might feel that their objectives cannot be addressed through such activities. Consequently, they change their focus or stop supporting government entities that need the resources for agroforestry activities.

4 Discussion

The study aimed to explore how cross-sectoral coordination unfolds in the implementation of agroforestry and to identify the factors that shape coordination among different actors at a horizontal governance level. The findings reveal that agroforestry, often encounters policy gaps, with incoherent policies posing significant coordination challenges. Literature indicates that conflicting policies can hinder implementation by leading to duplicated efforts or misaligned actions, resulting in wasted time and resources (Alden, 2015; Kalaba et al., 2014). These challenges are intensified when policies remain confined within individual sectors, creating "policy silos." In such cases, government departments or expert communities operate in isolation, each prioritizing its own objectives without considering the interconnected nature of agroforestry. This siloed approach leaves agroforestry in a regulatory gray zone, lacking clear roles, responsibilities, and accountability, which fragments efforts and reduces resource efficiency (Sarkki et al., 2020; Zinngrebe et al., 2020).

Additionally, the study highlights that some challenges often arise when policies are developed in response to international pressures or donor demands. In these situations, policies tend to overlook practical implementation factors, as their creation does not involve the intended beneficiaries and the implementers (Ajulor, 2018; Dialoke et al., 2021; Mwase et al., 2015). Literature further suggests that when public policy objectives remain unmet, there is frequent a push for more policies as a means of addressing the shortcomings (Sevä, 2015). This tendency, often driven by politicians' need to demonstrate accountability to voters, can lead to a proliferation of policies that add institutional complexity and makes coordination even more difficult (Koppenjan and Klijn, 2004). Increasing the number of policies does not necessarily improve implementation, but negatively impacts on coordination of activities (Lipsky, 2010; Boswell and Smith, 2017). A lot of policies can lead to selective enforcement by bureaucrats, who may prioritize certain policies over others, resulting in inconsistent application and exacerbating policy implementation challenges.

From the results relationships among actors significantly shape the nature of coordination and effectively the implementation of agroforestry activities. In general, historical good relations also promote interaction (Ostrom, 1999; Pierre and Peters, 2005). They are more likely to adopt each other's viewpoints and quickly reach a consensus, supporting efficient knowledge and resource transfer (Bodin and Crona, 2009; Newman and Dale, 2005; Prell et al., 2009). Positive attitudes and a sense of interdependence with other organizations increase the likelihood of collaboration (Alexander, 2013). This is also clear from the results where strong relationships and coordination activities exist.

In the Southern African Development Community (SADC) region, several agroforestry initiatives have demonstrated significant success, with actor coordination playing a critical role in their implementation. A notable example is the Agroforestry Food Security Project (AFSP) in Malawi, implemented by the World Agroforestry Centre (ICRAF) with financial support from Irish Aid between 2007 and 2011. The project aimed to establish robust partnerships to reach 200,000 farming households across 11 districts. According to Beedy et al. (2013), the collaboration between ICRAF, the Land Resources Conservation Department, and Extension Services was instrumental in ensuring the project's extensive outreach and impact.

Comparable successes have been documented in Zambia and Zimbabwe, where networking and institutional cooperation have been central to agroforestry initiatives. In Zambia, the establishment of the National Steering Committee on Agroforestry in 1987 facilitated the institutionalization of agroforestry practices by integrating key stakeholders from government ministries, universities, and non-governmental organizations (NGOs). This committee played a crucial role in advancing agroforestry through research, extension services, and knowledge dissemination (Kabwe, 2010). Moreover, in collaboration with ICRAF, these institutions provided farmers with direct training and initial tree seed distribution, further reinforcing the adoption of agroforestry practices (Ajayi, 2006).

Despite the effectiveness of these multi-stakeholder platforms, their long-term viability has been largely contingent upon sustained donor funding. The withdrawal of financial support has often led to the weakening or collapse of these initiatives, underscoring a fundamental challenge in ensuring the continuity of agroforestry programs. The cessation of donor funding has resulted in diminished resources, a reduction in institutional capacity for coordination, and a subsequent loss of project momentum. This highlights the need for sustainable financing mechanisms and institutional frameworks that can support the long-term integration of agroforestry within national agricultural and environmental policies.

In addition to sustainable financing mechanisms, it is critical to highlight that empowering all stakeholders through inclusive participation not only enhances coordination but also ensures that the coordination process remains equitable and politically feasible. Organizational structures that promote bottom-up approaches and decentralization, coupled with efficient bureaucracies, can significantly improve the coordination and implementation of agroforestry initiatives. Empirical evidence supports this assertion: in Niger, farmer-managed natural regeneration (FMNR) initiatives demonstrated how empowering farmers to take the lead in regenerating trees on their farmland, without top-down government intervention, resulted in the restoration of over 5 million hectares of degraded land and substantial improvements in food security (Reij et al., 2009; Pye-Smith, 2013). Similarly, in Laos, participatory land use planning (PLUP) initiatives have directly involved villagers in mapping and managing land use, including agroforestry systems, leading to greater respect for land use plans and improved environmental outcomes (Schilling et al., 2023). These examples illustrate how bottom-up planning not only strengthens coordination between communities and governments but also enhances the long-term sustainability and legitimacy of agroforestry projects.

While historical relationships significantly influence collaboration choices, social capital is another factor determining relationships among actors (Montgomery, 2001; Savioli and Patuelli, 2016). Social capital encompasses pre-existing connections that encourage future collaborations and underpin key social dynamics such as trust, resource dependency, and structural equivalence (Berardo and Scholz, 2010). Government agencies, for instance, often prefer partners who offer critical resources needed to achieve their objectives who present lower transaction costs and collaboration risks (Jung et al., 2022; Auer et al., 2020), or who occupy strategically important positions within the network (Ingold and Leifeld, 2016; Six et al., 2015).

However, relying on social capital and historical relations to shape partnerships poses certain—challenges for implementation of activities (Jung, 2022). Established networks may inadvertently exclude other potential actors, thereby limiting wider participation in project execution. This selective inclusion can reduce the diversity of perspectives and innovative potential that newer or less connected actors might contribute. For example, Tenhunen-Lunkka and Honkanen (2024) highlight that in coordinating initiatives like Horizon 2020 within the EU, a consortium must have confidence that each partner can deliver on time, meet quality standards, and stay within budget. Partners lacking the required capacities are generally not included in these collaborations, which, while practical, tends to restrict the entry of new participants. Such limitations can have negative implications for fostering broader involvement in large-scale projects, potentially stifling the diversity and innovation that new entrants could offer. It is therefore important to understand that coordination is of survival of various actors in cross-sectoral agroforestry initiatives because it enables them to pool resources, share risks, and access knowledge and markets that would be difficult to secure independently.

5 Conclusion

This study's aim was to understand the cross-sectorial coordination issues that arise during the implementation of policies targeting agroforestry in Malawi. Agroforestry, a concept that has garnered significant global attention and is considered a viable solution for addressing various socio-economic and climate change-related challenges. Despite its prominence in multiple policies across different sectors, coordination challenges persist. Enhanced coordination at multi-level and cross-sectoral levels could potentially unlock the envisioned benefits of agroforestry, leading to increased adoption and scalability. Critical factors such as trust, resources, and participation play a pivotal role in driving inclusive and informed agroforestry initiatives.

It is essential to note that this study does not claim that understanding and addressing coordination issues alone will resolve all challenges associated with agroforestry implementation. The study's findings are based on the perspectives of respondents from higher levels within governance structures, both state and non-state actors. Consequently, the views of other actors, who could provide a broader understanding of implementation issues, were not included. Furthermore, coordination is not solely the result of policies and formal structures; it also occurs informally among actors; significantly impacting on agroforestry implementation. Therefore, future research should focus on these informal coordination mechanisms, especially given the growing emphasis on agroforestry approaches such as Farmer Managed Natural Regeneration and other nature-based solutions. Improved formal and informal coordination at multiple levels could facilitate greater uptake and implementation of agroforestry. Additionally, research should integrate the perspectives of 'street-level bureaucrats,' who are responsible for the day-to-day implementation of policies. As Lipsky (1980, p. 83) asserts, "the decisions of street-level bureaucrats, the routines they establish, and the devices they invent to cope with uncertainties and work pressures effectively become the public policies they carry out." These actors possess insights, concerns, and an understanding of the challenges in coordination, which are essential for enhancing agroforestry initiatives.

Data availability statement

Data is available only on request and will be provided inline with data privacy regulations.

Author contributions

NN: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Annex 1: Interview guide

Background about the research

Over the last decade, there has been a growing interest in agroforestry from a policy perspective. In a number of countries, national agencies are developing objectives and strategies that integrate agroforestry into their policies and programs. Despite this high-level recognition of agroforestry, a number of studies claim that these agroforestry goals are still sectorally siloed, scattered, and uncoordinated with limited institutional capacity and support. This is also based on the assertion that agroforestry is a concept that sits between a number of policy fields and administrative borders (esp. between agriculture, forests, climate change, and environment ministries or agencies). Therefore, no single institution can implement the proposed agroforestry programs without the help from other sectors. As a result, healthy coordination and collaboration among sectors is considered to be a critical process to achieve some of the agroforestry targets. However, there is little knowledge on how this policy rhetoric is translated into action. In this research, we assess this notion and pursue to uncover/learn how different sectors are coordinating and collaborating agroforestry activities.

Questions

1. Date/Name of Organization/Position in Organization
2. What do you think about agroforestry?/What are the main potentials of AF and which systems you particularly interested in?
3. Your policy (name the policy depending on the interview eg. With someone from the agriculture department, you can say "the National Agriculture policy) includes agroforestry as on of the strategies. In your own view, what role does your organization play in advancing agroforestry in your country?
4. Are there any efforts targeted at achieving these agroforestry goals. Please explain some of the undertakings. For instance, what institutional structures have been developed to co-ordinate and implement agroforestry,
5. In terms of planning and financing, how are agroforestry activities financed? How do you access farmers and what other agroforestry promotional activities do you carry out?
6. Research, development and continuous learning: Can you explain how your sector invests in agroforestry research, extension services and capacity building. How is information and knowledge related to agroforestry managed?
7. What challenges have you observed in coordinating agroforestry related activities?
8. How do you coordinate and collaborate with other sectors when implementing agroforestry activities?
9. Do you think it is necessary for different sectors to come together and co-ordinate in unison, the different agroforestry activities/or it is better for one sector to work on the own plans? What are your views on the co-ordination and collaboration of agroforestry activities. What are the positive things and what challenges have you encountered? What are the weaknesses or challenges that these organizations bring? What strengths?
10. Equity, Participation and Political Feasibility: How can agroforestry be better coordinated? How can other stakeholders participate better? How can you resolve the differences and tensions between different departments, sectors, and institutions involved? Which processes are needed?