

Review Article

Impact of forest decentralization on sustainable forest management and livelihoods in East Africa

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ABSTRACT

The paper examines how forest decentralization affects forest management and sustainable livelihoods in East Africa. For this review, Ethiopia, Kenya, Uganda, and Tanzania were chosen as case study nations, and study sites implementing decentralization. We used Google Scholar to find about 280 pieces of peer-reviewed scientific literature. Further, we used the Foucault's approach and the Policy analytical approach (PAA) to distill our review. Finally, we applied assessment indicators: forest conditions, species composition, forest cover, income level, food security status, wealth equality, and equity. Our review of the forest decentralization reforms process based on empowerment and accountability yields the following results: (1) intended to increase efficiency and ecological services are not being implemented properly, (2) forest policy reforms resulted in a net loss of forest area in East Africa, (3) forest status of some forests is stable, and the current decentralization reforms, with the exception of the Duru-Haitemba community-based forest management (Tanzania), do not address the sustainability of the forests. Understandings of the current institutional frameworks and power configurations are insufficient to devolve resources and rights to lower levels of government. This necessitates the development of new viable forest governance systems capable of deviating significantly from established modes of government. Our review suggests that decentralization forest governance and sustainable agricultural resources utilization rely on multilevel institutional architecture, actors' collaboration at all levels and with regional integration, complement each other to form successful systems within forest landscapes.

“When we plant trees, we plant the seeds of peace and hope.”
 – Wangari Maathai, The Nobel Peace Prize winner for 2004

1. Introduction

Forests and other tree-based ecosystems are a means for human beings' survival worldwide (Agrawal et al., 2008; Angelsen et al., 2014; Cheng et al., 2019; FAO, 2020; Maathai, 2003). Following forest degradation, deforestation, and resource depletion, governments around the world have implemented various forms of decentralization reform (Barr et al., 2006), and decentralization has gained prominence in poverty alleviation discourse (World Bank, 2004; FAO, 2010c). Many African, Asian, and Latin American developing countries have implemented some form of decentralized forest management (Agrawal et al., 2008; Agrawal and Ostrom, 2001; Larson, 2005; Tacconi, 2007; Faye, 2015).

Decentralization has been defined as any act by a central government in which it formally cedes authority to actors and institutions at lower levels of a political-administrative and geographical hierarchy (Adam and Eltayeb, 2016; Agrawal, 1999; World Bank, 2004; Larson, 2005). Decentralization has occurred in a variety of sectors, including infrastructure, education, health care, fiscal administration, and natural resource management. Decentralization is a mechanism for increasing central government efficiency, equity, and democracy in forest governance (Larson, 2005). It contributes to critical aspects of good governance, such as promoting citizen participation in economic, social, and political decision-making, contributing to citizens' capacities; and enhancing government responsiveness, transparency, and accountability (World Bank, 1997; UNDP, 1999). However, the fairness and democracy benefits (more control over livelihoods and a larger share of other natural resource benefits, are likely to be more relevant to the majority of indigenous people. As a result, decentralization improves the

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overall quality and efficacy of the governance system (UNDP, 1999). Reforms to the forestry sector's decentralization are conducted for a variety of reasons. Numerous factors, however, influence a government's decision, including the deterioration and depletion of forest resources (Bluffstone and Robinson, 2015), the exclusion of indigenous people from forest resources (Larson, 2005), and the accomplishment of forest management objectives. In most countries, these aims refer to sustainable forest management and improved economic outcomes, notably improved livelihoods. Sustainable forest management (SFM) is largely regarded as a desirable policy target for accomplishing both ecological and socioeconomic goals. Rural livelihood improvement is usually emphasized explicitly as a socioeconomic objective, particularly in developing nations (FAO, 2010a).

Forest management decentralization has a mixed impact on the lives of rural people (Resosudarmo, 2004a). A higher total budget, more opportunity for benefit sharing, access to short-term financial gains (Tokede et al., 2005), and decision-making on forest resource benefits are some of the favorable characteristics (Tokede et al., 2005; Barr et al., 2006). As studies, decentralization is rarely achieved: major decision-making authority, forest resources, and benefits remain centralized, and the local actors chosen to take on new responsibilities are typically neither representative nor accountable. Current policies are often detrimental to low-income residents. In practice, local governments rarely have significant, autonomous decision-making authority over forest resources. Because of the environment and natural resources, it also serves as a source of numerous tributes to numerous individuals at all levels of government; a surprising lack of knowledge, a lack of checks and balances at all levels of power and authority (Larson, 2005).

A considerable amount of literature has published on forest decentralization. These studies are either small-scale, a country-level, or other purpose; however, the regional level review is rarely available. Our study is comparison of forest decentralization effects on sustainable livelihood at the regional level. Thus, effective decentralization necessitates an understanding of a wide range of actors, political climates, and lessons learned from previous governance reforms (Zahabu et al., 2009; Ogada, 2012; Gatzweiler and Kelboro, 2014; Gelo and Alemu, 2014). Therefore, analyzing the effects of reforms strengthens future efforts toward sustainable forest management and livelihood improvement. This paper begins with a brief explanation of forest decentralization and then examines the process of forest decentralization in four East African countries using selected variables. To assess the reform process on forests and livelihoods, several forms of literature were analyzed; four East African countries, Ethiopia, Kenya, Uganda, and Tanzania were chosen as case studies. Conclusively, case study sites demonstrating

decentralization were chosen in each country. Finally, indicators were developed to evaluate the reform process and its influence on agricultural sustainability and rural living.

Therefore, our study aims to examine the impact of decentralization forest management and sustainable livelihoods in East Africa to achieve the following specific objectives: (1) to examine the process of forest decentralization in East Africa, (2) to evaluate the impact of forest decentralization on sustainable forest management and (3) to analyze the impact of forest decentralization on sustainable livelihoods.

2. Methodology

This review paper carried out in selected East African countries (i.e., Ethiopia, Kenya, Tanzania and Uganda) (see Fig. 1). These study countries are chosen arbitrary. These countries have rich forest biodiversity. Compare to all the four Ethiopia, has implemented its forest policy and governance earlier whereas Tanzania is well-known in forestry experts training in East Africa. We used Google Scholar to conduct a systematic review and collected approximately 280 peer-reviewed scientific papers. From the total scientific literature, approximately 150 papers from the Scopus database were chosen based on abundance. We used two approaches: (1) the Foucaultian's approach (context, policy, and keywords) and; (2) the policy analytical approach (PAA), which focuses on policy discourse analysis. As Ayana et al. (2018) (re)frame their analysis on the trends of NGO engagement in forest conservation in Ethiopia and how they played, they used an analytical tool that encompassed dynamic policy processes and the midway relation in the agency-structure continuum, and their PAA considers actors' day-to-day practices in the context of broader structural change. In our case, we primarily used policy discourse analysis based on the contents of collected papers, such as "forest (de)-centralization," "forest management policy discourses," "drivers of (de)forestation," "community-based forest management," "participatory forest management," "joint forest management," "forestry law"; "forest and food systems," "forest and wealth," "forest and income," "forest and livelihood," "forest and poverty," "forest and food". Then, we narrowed our focus from a general overview of developing and developed nations to "developing regions forest governance perspectives and selected countries forest governance and policy trends in East Africa: Ethiopia, Kenya, Uganda, and Tanzania. Further, for our review, we used approximately 65 scientific papers. Finally, we attempted to discuss forest governance discourses (i.e., decentralization) as well as four dimensions of assessment priority and their interlinkage, namely, forest conditions, species composition, forest cover, income level, food security status, wealth equality, and equity.

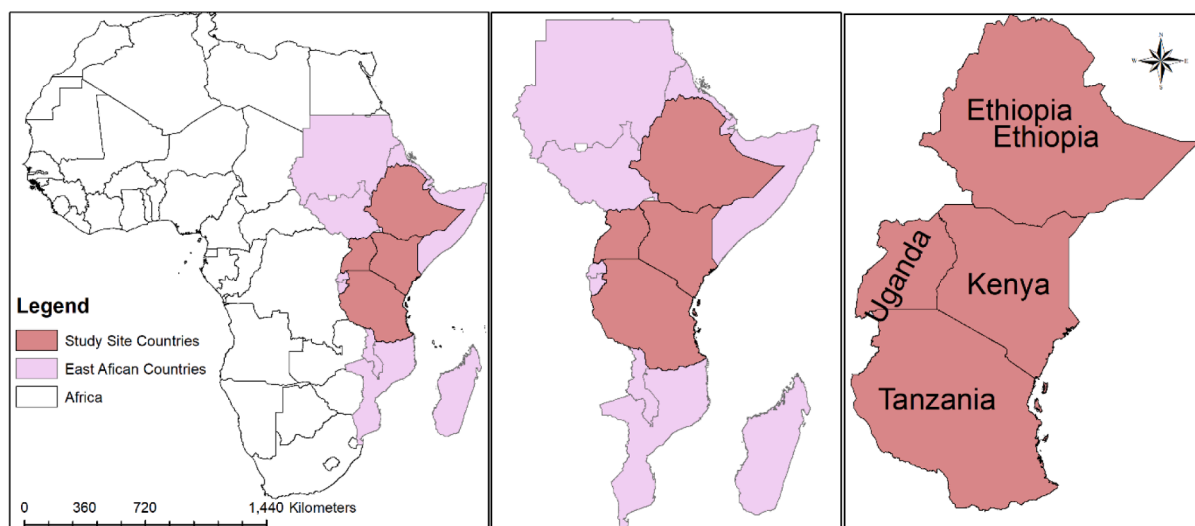


Fig. 1. Authors' construction map of study sites.

3. Impact of Forest Decentralization on Forest Management and Sustainable Livelihoods in East Africa

3.1. Process of Forest Decentralization in East Africa

Forest decentralization and institutional reforms in the forestry sector were implemented in east Africa in the mid-1980s to increase efficiency and ecosystem service flows (Zahabu et al., 2009; Ogada, 2012; Gatzweiler and Kelboro, 2014; Gelo and Alemu, 2014; Gatzweiler and Kelboro, 2014). The success or failure of decentralization in a given country is determined by the conditions under which decentralization policies are expected to be implemented (Agrawal and Ribot, 1999; Dubois and Fattore, 2009; Samoff, 1999; Treisman, 2007; Coleman and Fleischman, 2012). Given the diversity of decentralization efforts, any theory attempting to link outcomes to decentralization must take into account the substance of decentralization policies. Prior frameworks emphasized the importance of accountability and empowerment (Larson, 2003; Ribot, 2002; Ribot et al., 2006; Coleman and Fleischman, 2012; Mohammed and Inoue, 2013). They are used to assess the effectiveness of decentralization (Larson and Ribot, 2007). Accountability is defined in terms of control over the agencies charged with policy implementation (Ongugo et al., 2008), and it is distinguished in the context of decentralization by upward and downward accountability (Ribot et al., 2006).

Accountability on a downward scale refers to control by local principals, whereas accountability on an upward scale refers to control by principals at higher levels of government. Changes in decentralization can result in either upward or downward accountability, both upward and downward accountability, or none at all. Empowerment, on the other hand, is defined as local actors' ability to carry out the mandates of decentralization programs (Coleman and Fleischman, 2012). It's about the delegation of decision-making authority to lower-level actors (Samoff, 1990, 1999). There are four types of power: the ability to make decisions or set rules, execute and enforce new or changed rules, and resolve disputes (Agrawal and Ribot, 1999).

Decentralization projects frequently do not give local actors the autonomy they need to achieve decentralization goals (such as guaranteeing sustainable resource usage and improving rural livelihoods) (Andersson et al., 2004, 2006). Rather, by either failing to provide adequate funding to carry out these directives or failing to create an institutional environment in which local actors can generate such funding or create rules and make decisions on their own, decentralization frequently burdens local actors with additional responsibilities (Andersson et al., 2006). In forest decentralization, capital transfers and property rights are two essential components of empowerment (Agrawal and Ostrom, 2001; Mohammed and Inoue, 2013). As a result, a review of literature and policy documents obscures an examination of accountability (both upward and downward) and empowerment (rulemaking, decision-making, implementation and compliance, and the authority to adjudicate disputes) in selected East African countries (Ethiopia, Uganda, Kenya, and Tanzania). These countries were chosen because they have all undergone forest decentralization changes in the recent decade and represent a diverse range of regions, ages, and reform styles. With selected case studies, this article analyzes the historical decentralization of these countries and its impact on sustainable forest management and livelihoods.

3.1.1. Ethiopia

Ethiopia's forest policy has been greatly influenced by state structure expansion (Ayana et al., 2013), with a more structured and detailed state structure following World War II (Bahiru, 1991; Teshale, 1995). A complex interaction of structural components, including national political direction and (Angelsen et al., 2014) economic priorities, environmental calamities, and global forest-related discourses, affected the decentralization process (Ayana et al., 2013). Ethiopia's forest reforms, characterized by official efforts to reclaim forest sovereignty, combined

with a lack of capacity to implement legislation or restrict access to forests, caused institutional ambiguity, resulting in widespread forest degradation and deforestation (Mekonnen and Bluffstone 2015). Ayana et al. (2013) examined the evolution of Ethiopia's forest policy reforms and organization over four different historical periods: the imperial era, early socialism, late socialism, and the federal republic (Table 1). During the imperial and early socialist eras, the state-controlled the forest, with both regimes being authoritarian and governed by a centralized power structure (Ottaway, 1990).

Top-down command-and-control forest management choices were made with little room for accountability or free competition between various perspectives. The autonomous forest institution—Forest and Wildlife Conservation and Development Authority (FAWCDA) focuses on resource exploitation and modernization (Melaku, 2003). The power configuration during the late communist era and the transition was authoritarian command with a central authority, with considerable room for the struggle between different discursive coalitions. Regional state forests were identified. The Forestry Action Program and forest law, on the other hand, overstate the ecosystem function of forests (Teketay et al., 2010). While the authoritarian past remained, the Federal Democratic Republic saw a rise in the decentralized democratic system and non-state actors' participation (Melaku, 2008; Teketay et al., 2010). During the Federal Democratic Republic Period, certain local actors have given the right to use, manage, and benefit from the forest, but not full ownership. Participatory Forest Management (PFM), which dates back to the 1990s, attempted to find a balance between conservation and use by enlisting local participation and delegating management chores to community groups living in and around designated forest areas (MOA, 2012; Ayana et al., 2013; Gelo and Alemu, 2015). PFM is a method that allows local users to keep some forest benefits in exchange for taking responsibility for the good upkeep of the specified forest area (Gelo and Alemu, 2015; MOA 2012).

3.1.2. Kenya

Decentralization in Kenya began in 1983, with district focal points for the rural development system in charge of individual districts. On the other hand, the Forest Department's power configuration system was quite centralized. The residents of the area were not held accountable or given any power. Decisions on policy and regulation, as well as planning and finance, were heavily centralized (Omondi and Omosa, 2002; Ongugo and Njuguna, 2004). Because of the new Forest Act of 2005, which was driven by community engagement and community-based forest management (CBFM), the Forest Department was replaced by the Kenya Forest Service (KFS). The KFS was founded to delegate responsibility to private sectors, forest conservation committees, and community forest associations (CFAs). It is a semi-autonomous organization chaired by a board of representatives from central government departments (Ongugo et al., 2008). Local empowerment was achieved as a result of the KFS decentralization reform, although support from central forestry departments was limited. Local users now have property rights that they didn't have before the reform. The accountability and empowerment aspects of the decentralization changes, on the other hand, were similar: some mild empowerment through the introduction of previously unknown property rights, limited capital transfer to local forest user groups, and minimal downward accountability (Coleman and Fleischman, 2012).

3.1.3. Uganda

The history of Uganda's forest decentralization has been defined by policy reversals and instabilities (Jagger, 2009; Namubiru, 2008; Harter and Ryan, 2010). Following independence in 1962, Uganda established a two-tiered system of forest reserves. District government agencies controlled local forest reserves, which were often modest, non-commercial areas, for the benefit of locals. For the regional benefit, the forest department, which was larger and more commercially oriented, maintained core forest reserves. With the adoption of a new

Table 1
The evolution of forest policy arrangement over four historical periods.

Policy arrangement dimensions	Historical periods Imperial era (1941-1974)	Early socialist era (1975-1985)	Late socialist era and the transition period (1986-1994)	Federal Republic (1995- to present)
Dominant discourse coalition	Agricultural modernization: Imperial ruling elites (the landed class and the nobility)	Production Forestry: Classical foresters, FAO, UNDP, and SIDA	Environmental conservation: ecologists, soil scientists, agro-foresters, and biologists	Agricultural intensification: ruling party, private sector, and World Bank
Competing discourse coalition	Forest protection: forestry professionals (mostly expatriates)	Multi-functional forestry ecologists and conservation biologist	Production forestry: classical foresters, SIDA, and FAO	Economic forestry: forestry professionals
Power configuration	Absolute power in the hand of the emperor and the nobilities who owned most of the forest lands	Highly centralized power arrangement. Top-down flows of command and little or no room for open competition between different views	Authoritative power with the center, some room for competition between different discourse coalitions	Decentralized democratic system, continuation of the past authorial tradition, increasing role of non-state actors
Rules	The five years imperial government plans, the 1965 Forest Law, geared towards exploitation of resources and modernization	The 1975 Land Reform, State ownership of land and all-natural resources including forests, the 1980 Forest Law, enormous discretionary power to the state Forest Agency (FAWCDA)	The 1994 Ethiopian Forestry Action Program (EFAP), the 1994 forest law, overemphasis to the environmental role of forests, recognition of regional state forests (first time)	The 1995 constitution, the 2001 Rural Development policy and Strategy, and the 2007 Forest Policy, continuation of the State ownership of land and forests

Source: adapted and modified from Ayana et al. (2013).

republican constitution in 1967, local forest reserves were abolished, and control of all local woodlands was centralized (Namubiru, 2008; Turyahabwe and Banana, 2008). Decentralization initiatives were introduced after President Yoweri Museveni's election victory in 1986 (Boone, 2007). Then, in 1993, forest management was transferred to district administrations under a local government statute. Local governments, on the other hand, used the forest to generate revenue through forest harvesting, leading to yet another decentralization in 1995 and the subsequent implementation of a new forest strategy in 2001. (Turyahabwe and Banana, 2008). It explicitly recognized the rights and interests of both communities and individuals. In 2003, the Forest Department was restructured as a semi-autonomous National Forest Authority (NFA) with jurisdiction over central reserve forests

The District Forest Authority was established by the National Forest Act to manage the remaining forests. The forestry law was created to make communal forest management and land acquisition easier. However, due to a lack of funds, the District Forest Authority was rendered ineffectual (Jagger, 2009; Namubiru, 2008). Uganda's decentralization policy has resulted in some moderate empowerment for forest user groups by establishing minimal property rights, despite several revisions (Ostrom, 1990). Furthermore, it lacked downward and upward accountability for forest management (Coleman and Fleischman, 2012).

3.1.4. Tanzania

Tanzania's forestland tenure history can be split into three periods: pre-colonial (from the beginning of agriculture to colonialism), colonial (from the late 1880s to 1961), and post-independence (from 1961 to the present) (Lund and Treue, 2008; Zahabu et al., 2009). Traditional institutions, small populations, and limited use of forest resources defined pre-colonial forest management. People's overall impact on the environment was low since they lacked the technological competence and market to overexploit natural resources (Malimbwi and Munyanziza, 2004). On the other side, the local community has an impact on the forest through fire. For sustenance and spiritual activities, forest products were used for food, medicines, and clothes. Forest resources were administered and regulated by customary institutions, which included beliefs, taboos, and traditions (CFA, 2007).

The German (1891-1914) and British (1920-1961) colonial regimes plundering forest resources in Tanzania, and policies prohibiting indigenous peoples from profiting from natural resources were enacted (Misana et al., 1996). Forest encroachment was widespread throughout the First World War (1914–1920), and the British government's first task after reclaiming Tanganyika was to rehabilitate and preserve encroached woods. Traditional land-use practices were seen to be harmful to the ecosystem. The state created protected zones, depriving

indigenous people of access to the natural resources that they relied on for survival (Pendzich, 1994). During the German (1891-1914) and British (1920-1961) colonial eras in Tanzania, forest resources were plundered, and regulations prohibiting indigenous people from benefiting from natural resources were enacted (Misana et al., 1996). The First World War (1914–1920) resulted in widespread forest encroachment, and after regaining Tanganyika, the British government's first task was to restore and reserve encroached forests. Traditional land-use practices were found to be environmentally harmful. The state created protected zones, denying indigenous people access to the natural resources on which their livelihoods depended (Pendzich, 1994).

Tanzania has embarked on policy and institutional reforms aimed at recovering the country's economic growth since independence. Regardless, forest degradation has continued as a result of measures that prioritize economic growth over environmental conservation. The state's lack of regulatory ability to carry out sustainable forest management has accelerated forest degradation (Petersen and Sandhövel, 2001). Until the 1973 Villagisation Act, land for farming was either allocated by the "Chief" (i.e., traditional authorities generally responsible for each tribe's several villages) or delegated to the village's headman. This role has been handed to the village chairman as the village government's leader (Banyikwa, 1991). Tanzania's judicial institutions were unable to handle the dynamics of land disputes until the 1980s. Tanzania was forced to switch from command to market economy due to the crisis and global economic changes (Nhantumbo et al., 2003).

A growing interest in sustainable forest management was one of the problems of building a free market economy, among other things. As a result, regulatory improvements and a significant shift in thinking in favor of participatory natural resource management approaches were implemented. This has been commonly accompanied by political decentralization or devolution of tasks, as well as community participation in forest management (Petersen and Sandhövel, 2001). Forest tenure reforms cover a wide range of concepts that communities and government must grasp. Forest tenure reforms cover a wide range of ideas that communities and government must thoroughly comprehend. Understanding the implications of different forest tenure arrangements is crucial for governments and other stakeholders interested in improving and implementing policies that support community-based forest management (CBFM) (FAO, 2008). In Tanzania, two approaches dominate community participation in forest management: Joint Forest Management (JFM) and CBFM. JFM is owned by the government, but local communities share responsibility and benefits. In CBFM, local communities act as both owners and bearers of duty (i.e., owners, users,

and managers) (Kajembe et al., 2005).

3.2. Impact of Forest Decentralization on Sustainable Forest Management in East Africa

Decentralized forest management has had both beneficial and negative effects on East Africa's Forest resources over time. To determine if policies promote sustainable forest management, the perceived state of the forest can be used as an indicator (Coleman and Fleischman, 2012). The impact of decentralization arrangements on forests has been linked to land conversion and agricultural encroachment associated with high population density (Zahabu et al., 2009; Banana et al., 2014), exclusion of many local people from forest resource access, and promotion of commercial logging (Misana et al., 1996), decreased or absent local community accountability and empowerment, centralized property rights (Zahabu et al., 2009; Mohammed and Inoue, 2013; Banana et al., 2014). The literature indicates a net loss of forest area in East Africa during the phases of forest policy reform (Zahabu et al., 2009; Ayana et al., 2013; Gatzweiler and Kelboro, 2014; Mekonnen and Bluffstone, 2015).

One notable exception has been the Participatory Forest Management (PFM) program (Zahabu et al., 2009; Banana et al., 2014). Table 2 summarizes the evidence presented in this article. Confronted with recurrent forest loss and degradation challenges, these Ethiopian governments granted specified local actors the right to use, manage, and benefit from the forest but not complete ownership. Rather than that, governments retained a role in and control over forest usage by denying alienation rights and required compliance with forestry regulations to retain rights. The arrangements were reached through a process of negotiation and mediation. The devolution of some rights to use and manage forestlands establishes co-management regimes (MOA, 2012).

For example, decentralization of forest management to local communities in Chilimo, Ethiopia, demonstrated a prospective positive effect on forest condition. Between 2003 and 2012, the forest cover expanded by approximately 7% due to PFM deployment (Shumeta et al., 2012). The agreement alleviated resource demand promoted forest regeneration, and allowed wildlife populations to expand (Kassa et al., 2009). Additionally, PFM reduced forest conflict between participating communities and the state, and members expressed a stronger sense of ownership over the forest once the program began (Ameha et al., 2014b). The benefits of forest products for sustenance and commercial purposes provided incentives to conserve resources. Thus, decreased conflict serves as a barometer of forest devolution success. However, leaders' lack of accountability may jeopardize future forest devolution in Chilimo.

On the contrary, forest condition deteriorated and became unsustainable after implementing decentralized PFM in 1998 in Tanzania's Miombo forest (Zahabu et al., 2009). Due to poor governance, population pressure, a lack of political support at all levels, lawlessness, and corruption. Similarly, forest cover and quality have fallen and fragmented in central Uganda over the last decade to fifteen years. Numerous factors influence sustainable forest management (SFM) in Uganda, including high demand for construction timber and commercial fuelwood, conversion of forestland to agricultural use, corruption and political interference, regional and global forest-related processes, capacity building and technical assistance, and available research. Central Uganda indicates that efforts to curb illegal logging and other forest-related unlawful activities and promote legality in the reforms have been ineffective. This is most likely due to increased demand for timber due to the burgeoning construction industry, agricultural encroachment associated with high population density, and conflicting government goals. As a result, without eradicating corruption, establishing forest institutions to enforce forest rules and regulations, and increasing political will, SFM is unlikely to be achieved shortly and will remain elusive for the foreseeable future (Banana et al., 2014).

Additionally, forest management outcomes were not consistent

inside and across forest tenures. For instance, in Uganda, aggregate growth and density dropped, the landscape was severely damaged and encroached upon, while other areas were managed sustainably. Certain central forest reserves remained stable, while others deteriorated significantly. Parts of central forest reserves that were properly managed as nature reserves exhibited superior ecological conditions to those managed as exploitation forest reserves. Similarly, while some private forest owners were conservation-minded and maintained healthy forests, others removed their forests for agriculture (Banana et al., 2014). This proved the actors' lack of institutional enforcement capability and responsibility.

3.3. Impact of Forest Decentralization on Sustainable Livelihoods

For the global support of human populations, forests and other tree-based ecosystems are essential (Cheng et al., 2019; FAO, 2020; Raza-findratsima et al., 2021). In truth, forests provide food, energy, and other necessities for more than 90% of the world's poorest people (FAO, 2020). In populations that live in or near forests, on average, 27% of household income comes from the forests (Angelsen et al., 2014), who is marked by the poverty rates (Sunderlin et al., 2008). Agroforestry and tree cash crops, for example, provide a variety of products and services that help to alleviate poverty and improve overall human well-being (Castle et al., 2021; Kuyah et al., 2020; Miller and Hajjar, 2020). As a result, sustainable forest management, agroforestry, and other tree-based systems have the potential to contribute significantly to the achievement of the first UN 2030 Sustainable Development Goal (SDG) to "end poverty in all its forms everywhere" (United Nations General Assembly, 2015), as argued in a variety of contexts (Castle et al., 2021; Waldron et al., 2017). In this context, equity and wealth equality can be used to explain why local people's livelihoods are improving sustainably (Coleman and Fleischman, 2012; Gelo and Alemu, 2014). According to research, decentralization can either help or deteriorate a community's livelihoods (Coleman & Fleischman, 2012; Mohammed and Inoue, 2013). Decentralization of forest management can boost rural household income and alleviate poverty by enhancing forest output and providing marketing help to sellers (Coleman and Fleischman, 2012; Gelo and Alemu, 2014). The livelihoods of rural communities are inextricably linked to forest use and forest ecosystem services (Sunderlin et al., 2008). Similarly, forest governance decisions influence people's livelihood strategies (Mustalahti et al., 2012). Thus, deeply understanding local community livelihood options are very critical and income generation jobs should be given priority (see Fig. 2a and b). To underpin, the earlier statement, herein is one story:

In an Ethiopian rural community, "a wood seller" and a "charcoal seller" is an insult—just indicator of an individual living in absolute poverty. Selling non-timber forest products to market, such as falling leaves, dried wood logs, and branches, is a manifestation of rural Ethiopian communities living in extreme poverty. A person in absolute poverty is someone who makes a living by collecting secondary forest products from protected natural forests and privately owned forests. Legal frameworks, such as punishment, are less effective than cultural taboos and indicators of wealth status. As a result, decentralized policymaking must be integrated into a broader social, economic, and cultural context. Providing opportunities for the pro-poor community to improve their livelihoods is a viable option for long-term survival and healthy forest ecosystems. Furthermore, the newly established Ethiopian Forestry Enterprise, a state-owned enterprise, is in charge of identifying the timber and non-timber forest products of public forests for commercial use, as well as estimating the cost of compensatory payments for forest loss. Therefore, in order to improve rural lives and promote sustainable forest management, best practices from local communities, sociocultural and socioeconomic settings, as well as local values and norms, must be reconciled and integrated.

This story makes it very evident that in order for decentralized forest policy and forest governance to be successful, pro-poor (individuals

Table 2
Impact of Forest Decentralization on Sustainable Forest Management in East Africa.

Country	Case study	Reform process	Forest Impact	Evidence
Ethiopia	Chilmo PFM	Implemented in the devolution form of decentralization in the country. Local people have formed forest user groups (FUGs) that later became cooperatives. The FUGs signed agreements with woreda government representatives to protect, manage, and use the Chilimo forest.	Promising positive impact on forest condition. Forest cover from 2003 to 2012 had increased by about 7% after PFM implementation. By prohibiting livestock grazing in the forest, the agreement lowered pressure on resources improved forest regeneration, and allowed wildlife populations to increase. Decreased forest conflict between participating communities and the state, and create greater feelings of ownership over the forest. However, the lack of accountability of leaders could threaten forest devolution in Chilimo in the future.	Mohammed and Inoue (2013), Shumeta et al. (2012), Kassa et al. (2009), Ameha et al. (2014a)
	Jibat Forest Management	Managed through a delegation type of decentralized forest governance. Both of these forests were managed by their respective woreda agriculture and rural development offices.	Forest status-declined; no coppice, no regeneration, poor management, and survival of plantation	Mohammed and Inoue (2013)
	Bonga PFM	Employed PFM (joint approach) community – NGO (FARM Africa) –DOARD and forest-dependent households were selected as FUG. It was legally endorsed by local and District government	Improved forest conservation and management (Species composition and density improved, the forest is more stable, and that reproduction, regeneration, and growth of woody species are better) But poor legal and financial support	Gobeze et al. (2009)
Kenya	Forest user group	Under the Kenya Forest service, forests are managed by the participation of the local community	Did not have an impact on forest conditions	Coleman and Fleischman (2012)
Uganda	Central Forest Reserves in the Lake Victoria Crescent (lake-shore range)	Under the National Forest Agency management structure, they are managed on an ecosystem management approach basis under the authority of one range manager. A sector manager manages a group of neighboring forests	Highly degraded because this region of Uganda has a long history of human occupancy, cultivation, and selective felling of trees for timber, charcoal, and non-timber forest products (NTFPs) Many of the inhabitants rely on forests for their livelihood, which has created immense pressure on natural forestland in this region.	Banana et al. (2010) Banana et al. (2014)
	Forest user group	Forest decentralization under the National Forest Agency management structure	Forest conditions marginally negatively affected by decentralization (by user groups' perceptions of forest conditions)	Coleman and Fleischman (2012), Jagger (2009)
Tanzania	Duru-Haitemba CBFM	Community-based Forest management (CBFM) i.e., local communities are both owners and duty bearers	Positive impact on the resource base. The forest is healthier than before. The density of trees, seedlings, and saplings remarkably increased	Kajembe et al. (2005)
	Kwizu Forest Reserve	Joint Forest Management (JFM)- the government is the owner but shares duty and benefits with local communities	Forest exploitation has increased	Kajembe et al. (2005), Gelo, Muchapondwa, & Koch (2016).

depending on the forest) livelihoods must be given priority.

Forests in East Africa provide ecological products and services and are an integral part of the history and culture of the indigenous people (Gatzweiler and Kelboro, 2014). Poorer populations, in particular, who have been largely excluded from other sectors' remarkable regional economic growth rates, rely on forests for fuelwood and grazing (Gatzweiler and Kelboro, 2014). Table 3 summarizes the influence of decentralization on sustainable livelihoods in East Africa, as stated in this paper. The table highlights the impact of decentralization reforms on selected East Africa Forest management case studies across periods.

Decentralization in East Africa resulted in positive and negative results for communities' livelihoods (wealth and income). Income and wealth equity and equality improved in two Ethiopian case studies: Chilmo PFM (Mohammed and Inoue, 2013; Ameha et al., 2014b) and Bonga PFM (Gobeze et al., 2009); Duru-Haitemba forest management in Tanzania (Kajembe et al., 2005); and Central Forest Reserves in the Lake Victoria Crescent, Uganda (Banana et al., 2014; Banana et al., 2008; Banana et al., 2010). Although decentralization has increased income and wealth disparity in Kenya Forest User Group (Coleman and Fleischman, 2012) and Uganda Forest User Group (Coleman & Fleischman, 2012), no impact has been observed in Tanzania's Kwizu Forest Reserve (Kajembe et al., 2005). Jibat Forest Management boosted its income, yet the forest state remained unstable (Mohammed and Inoue, 2013).

4. Discussions

Following tropical forest deforestation and global climate change, policy measures such as RED and later REDD+ (Mustalahti and Rakkonjarvo, 2014), decentralization, and others were implemented to conserve forest biodiversity. Forest decentralization began in the 1980s, and policy intervention measures were put in place in the 1990s. According to scientific evidence, NGOs implemented forest decentralization, and equity (affirmative action) was one of its packages. In East Africa, forest decentralization was implemented during the post-colonization period with exception of Ethiopia. East African countries developed their own forest law and policy following decolonization in the late 1990s, whereas Ethiopia developed its own forest law and policy earlier than other East African nations (see Ayana et al., 2013; Ayana et al., 2018), and the number and impact of NGOs' support has increased since 1990, with a new forest policy being implemented in 2018. (e.g., see EFCCC, 2020). Furthermore, forest decentralization policy is a deforestation indicator. According to Geist and Lambin (2002) deforestation drivers are classified into two broad categories: (1) direct or proximate factors such as infrastructure expansion, agricultural expansion, wood extraction, and other factors; and (2) indirect or underlying factors such as demographic factors, economic factors, technological factors, cultural factors, and policy and institutional factors¹

¹ Detail elaboration and discussion available from a semantic paper by Geist and Lambin (2002)

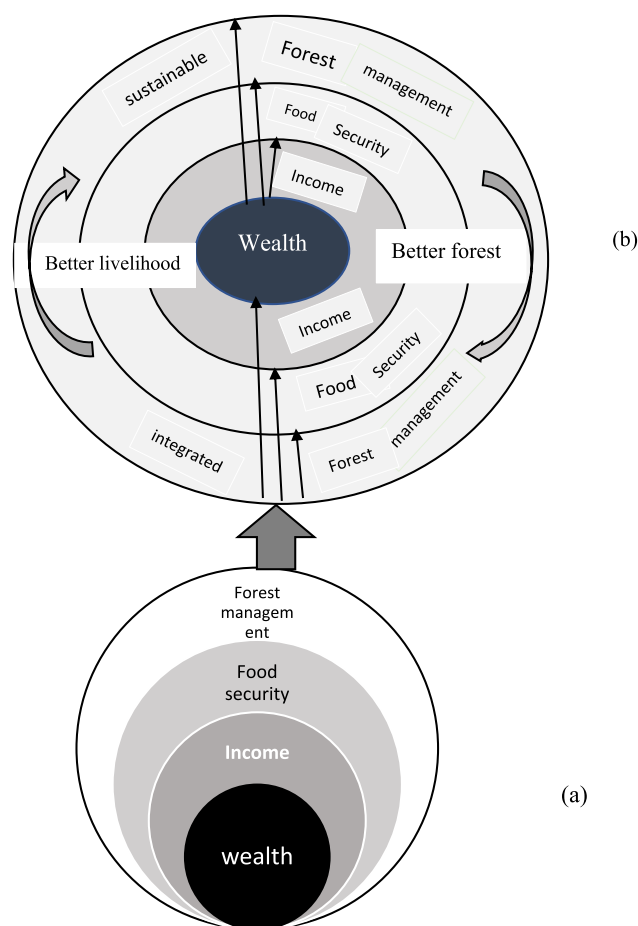


Fig. 2. Authors' conceptualization of the intertwine factors of SFM and priorities.

(see Geist and Lambin, 2002; for details see Fig. 3)

East Africa, the decentralization reform initiative has hit several bottlenecks and failures (Gatzweiler and Kelboro, 2014), resulting in policy instability and insufficient institutional preparations for reform implementation (Ostrom, 1990; Namubiru, 2008; Jagger, 2009; Coleman and Fleischman, 2012; Banana et al. 2013). The dynamics of global forest-related discourses, as well as national and international political orientations and economic priorities, affected countries' decentralization processes (Ayana et al., 2013). Forest resources were heavily exploited throughout the colonial periods in Tanzania and Kenya, while policies that excluded indigenous people from forest use prioritized conservation (Misana et al., 1996; Ogada, 2012), harming the economies of both nations. Since independence, governments have implemented legislative and institutional reforms to boost national economic growth (Petersen & Sandhøvel, 2001). Forest degradation has continued as a result of developments based on economic expansion. Policy changes were implemented without regard for the state's regulatory capacity to effectively implement and understand policies by communities and policymakers as a result of economic reforms centered on the free market economy (Petersen and Sandhøvel, 2001).

In this region, the forest decentralization process lacks accountability and empowerment. The central government owns property rights to forests and lands in all four countries except Duru-Haitemba community-based forest management site of Tanzania (Mohammed and Inoue, 2013). The government's unwillingness to empower and transfer forest property rights to local communities, as well as its lack of accountability, portend a significant drop in forest investment (Coleman and Fleischman, 2012). Local collective action and forest investment flourish when the tenure structure and financing are stable and/or available (Kajembe

et al., 2005; Coleman & Fleischman, 2012; Banana et al., 2014). In Tanzania, people-centered forest resource management necessitates precise definitions of rights, returns, and obligations, as well as appropriate incentives (Kajembe et al. 2005; Coleman & Fleischman, 2012), which explains why Duru-Haitemba was successful whereas Kwizu failed (Mbwambo et al., 2012; Kajembe et al., 2005). While, in all PFMs of Ethiopia, communities' forest sustainability may be jeopardized in the future due to leaders' lack of accountability to local communities' forests and insufficient legal and financial support (Mohammed and Inoue, 2013).

Increased income levels, wealth equity, and equality in diverse East African forest management systems imply that decentralization reforms with the full participation of local actors could result in sustainable livelihood outcomes (Kajembe et al., 2005). Inequality and imbalance in other areas were exacerbated, indicating that sustainable livelihood results would not be achieved (Coleman and Fleischman, 2012). This needs the creation of new viable forest governance systems that are capable of diverging dramatically from traditional forms of government. Forest and agricultural resources, as well as multilevel institutional design, complement each other to produce viable systems within forest landscapes. Forest management by itself will not assure ecosystem and livelihood sustainability until it is integrated into wider landscape structures and institutional frameworks (Gatzweiler and Kelboro, 2014).

5. Knowledge and Research Gaps

Given the pervasive decentralized forest management discourse, this review and synthesis article revealed four knowledge and research gaps: (1) there is a misunderstanding or mislead reporting between drivers of deforestation (causes) and decentralization of forest management (policy intervention or solution), (2) regional studies on (de)centralization forest management and integration are very scanty, (3) abundance of inadequate scientific literature on forest landscape, and ecosystem-based research at the East Africa regional level, and; (4) unclarity between level of political involvement and support for decentralization forest policy across and within regional bases. Thus, researchers and politicians must examine all of the possible outcomes of decentralization initiatives. Upstream and downstream responsibility approaches, as well as user empowerment, have been linked to more successful decentralization outcomes in numerous studies. It does, however, show that the influence of those processes varies depending on the national, regional, and local contexts. Researchers and politicians should define decentralization carefully when considering potential repercussions, and explore how policies labeled as decentralization effect accountability and empowerment in local contexts (Coleman and Fleischman, 2012). Second, more focus should be placed on how local institutions and user behaviors change and adapt in response to broad policy changes. The majority of forest decentralization research has been conducted in the United States. The majority of forest decentralization research has focused on macro-rule structure modifications (Agrawal and Ribot, 1999).

Therefore, the effects of decentralization on social (local livelihoods) and ecological (land use and cover) changes must be measured at numerous sites (Coleman and Fleischman, 2012; Ogada, 2012; Mohammed and Inoue, 2013). Third, while we recognize and encourage the development of theory concerning the implications of decentralization, this study highlighted the debates on forest (de)centralization and broaden the understandings (best practice) of sustainable forest management by existing limited theoretical evidence. There appears to be no shortage of theories addressing the expected results of decentralization policies. Unfortunately, quantitative research into these concepts typically relies on macro-level data and completely disregards localized consequences (Treisman, 2007). Our theoretical expectations concerning the consequences of decentralization was weakly confirmed by empirical or practical facts in several instances; this emphasizes the significance of revisiting theoretical expectations and establishing more

Table 3
Impact of Forest Decentralization on Sustainable Livelihoods in East Africa.

Country	Case studies	Reform process	Impact of reform on livelihood (indicators)	Evidence
Ethiopia	Chilmo PFM, West Shewa province	Implemented in the devolution form of decentralization in the country. Local people have formed forest user groups (FUGs) that later became cooperatives. The FUGs signed agreements with woreda government representatives to protect, manage, and use the Chilimo forest.	Increased income, forest conflicts between local communities and the state reduced, inequity in benefit-sharing particularly due to the lack of transparent management of plantation revenue, government reluctance to hand over forest management to the local community, top-down selection of FUG members likely marginalized some community residents, FUG members benefited from subsistence and commercial use of forest products, so they had incentives to exclude others and protect resources.	Ameha et al. (2014b), Mohammed and Inoue (2013).
	Jibat Forest Management	Managed through a delegation type of decentralized forest governance. Both of these forests were managed by their respective woreda agriculture and rural development offices.	Income generated and diversified, and job opportunities created for local people from protection, nurseries, pitting, maintenance, and planting although very small because local people are restricted from any de facto use right.	Mohammed and Inoue (2013)
	Bonga PFM	Employed PFM (joint approach) decentralization: community – NGO (FARM Africa) –DOARD. Forest-dependent households were selected as FUG. The PFM was legally endorsed by local and District government	Collect different forest products. Households' income level increased from the various livelihood activities (shifting product type from wood-based to non-wood and shifting income sources); Change in food security status of households: The majority of the respondents reported a reduction in vulnerability to food insecurity following the introduction of PFM. Improvement of livelihood asset base: The training and the credit facilities enabled households to diversify their income sources and increased household income level, improving resource accumulation. Brought gender and ethnic equity: Women and ethnic minorities participated equally in decision making, benefit-sharing, and forest and other development activities (about 74%, 78%, and 78%, respectively)	Gobeze et al. (2009)
Kenya	Forest user group	Under the Forest Department, forests are managed by the participation of the local community with the Kenya Forest Service	Wealth inequality is exacerbated by decentralization. While wealth distribution did not change very much	Coleman and Fleischman (2012)
Uganda	Central Forest Reserves in the Lake Victoria Crescent	Under the National Forest Agency management structure, they are managed on an ecosystem management approach. A sector manager manages a group of neighboring forests while individual forests are under a forest supervisor.	Provide forest products (from timber and NTFPs) and services for their livelihoods. Generate income by selling forest products (timber and NTFPs) These forests are a source of many streams that provide local communities with domestic water. Ecotourism, cultural and traditional significance	Banana et al. (2014), Banana et al. (2008). Banana et al. (2010).
	Forest user group	Forest decentralization under the National Forest Agency management structure	Wealth inequality is exacerbated by decentralization. While an unequal wealth distribution significantly increased by 0.26 ($p < 0.01$) in the user groups People's livelihoods improved. People are satisfied with the products they collect from the forests linked to ownership of resources and law enforcement.	Coleman and Fleischman (2012). Kajembe et al. (2005).
Tanzania	Duru-Haitemba	Community-based Forest management (CBFM), i.e., local communities are both owners and duty bearers	The impact has not yet been produced since illegal activities are rampant and forest exploitation has increased instead of decreasing.	Kajembe et al. (2005)
	Kwizu Forest Reserve	Joint forest management (JFM)- the government is the owner but shares duty and benefits with local communities		Kajembe et al. (2005)

comprehensive theoretical models that can be evaluated with localized data. Coleman and Fleischman (2012) underline the necessity of putting these theories to the test.

6. Conclusion

The term "decentralization" legally ceded power to individuals and institutions at the bottom of a political-administrative and geographical hierarchy. Our systematic review paper on four randomly selected East Africa countries figure out that decentralization was intentional implemented in forestry sector to boost public engagement in economic, social, and political decision-making, as well as to help citizens develop their skills and promote government responsiveness, transparency, and accountability. Consequently, examining the effects of reforms helps to strengthen future efforts toward sustainable forest management and improved livelihoods. In this paper, the impact of forest decentralization on sustainable forest management and livelihoods is examined in this research. In line with decentralized forest management, the dominant discourse coalition (land-use conversion and agricultural encroachment linked to high population density), economic growth reforms, lack of

accountability, no or minimal empowerment of local communities (centralized property rights), booming construction industry and competing government priorities, national and international political orientation and lack of support at all levels, lawlessness, corruption, and weak institutional enforcement ability are the major factors. Furthermore, each actor's power configurations, definitions of rights, returns, and responsibilities are ambiguous. These difficulties resulted in policy instability and a lack of institutional arrangements to enforce them. Although the forest condition of some forests is stable (e.g., Duru-Haitemba CBFM due to a better accountability and user empowerment), current decentralization reforms do not address the sustainability outcomes of most decentralized form PFM processes.

Generally speaking, this review paper highlights the need of establishing responsibility and empowerment for sustainable forest management by explicitly outlining each actor's rights, returns, and obligations. Even when certain potential hazards are present, decentralization reforms in forest management give products and services to promote rural community livelihood outcomes such as income generation, wealth equity, and food security for local people. Local agents, on the other hand, were unable to accomplish decentralization goals autonomously

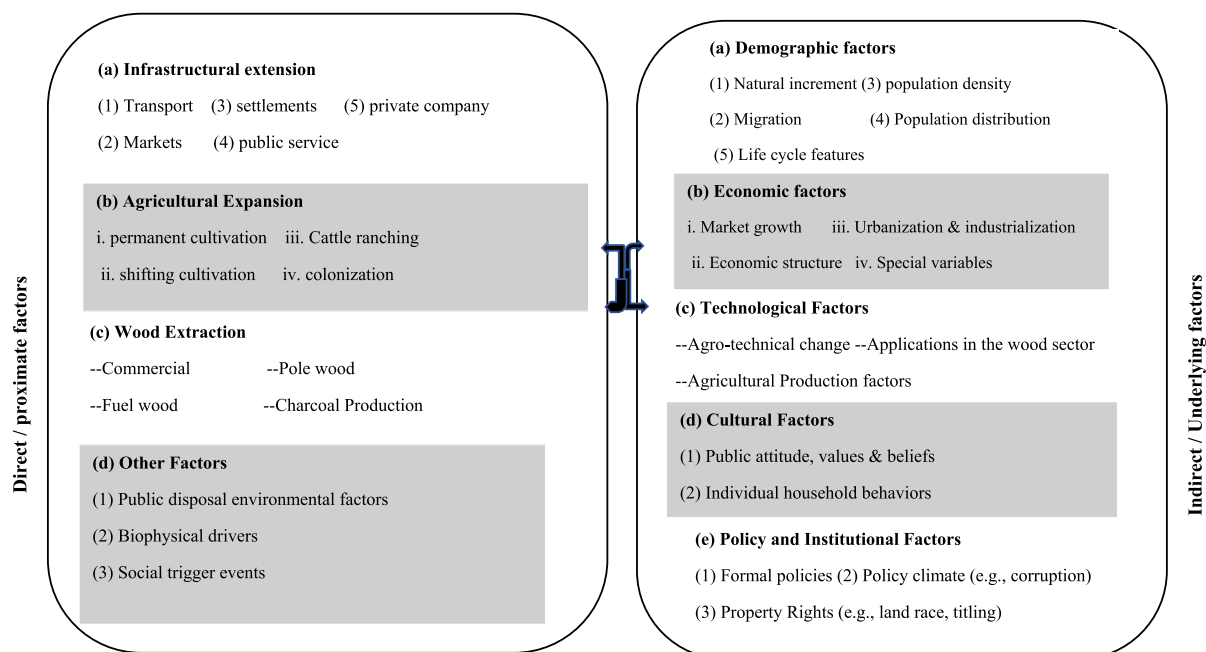


Fig. 3. The kidney of drivers of tropical deforestation adapted from Geist and Lambin (2002).

or completely as a result of reforms. Forest landscapes approaches are viable systems that integrate forestry and agricultural resources with multilevel institutional infrastructure. Forest management by itself only will not result in long-term ecological and livelihood sustainability unless it is incorporated into wider landscape structures and institutional designs. Further, we suggest the following directions: (1) Forests and forest policies require scientific knowledge as well as citizen science; (2) the current institutional mechanisms and power structures are insufficient for transferring resources and rights to lower levels of government; therefore, this necessitates the development of new viable forest governance systems that differ fundamentally from centralized and traditional governance models (3) rethinking regional political collaboration and scientific community integrations are needed to conduct regional-based and transboundary forest landscapes and ecosystem-based approach first-hand research.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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