

Learning from Community-Based Natural Resource Management (CBNRM) in Ghana and Zambia: Lessons for integrated landscape approaches

S. ADEYANJU^a, A. O'CONNOR^a, T. ADDOAH^b, E. BAYALA^c, H. DJOUDI^d, K. MOOMBE^e, J. REED^{d,f}, M. ROS-TONEN^g, F. SIANGULUBE^c, A. SIKANWE^h and T. SUNDERLAND^{a,d}

^aFaculty of Forestry, University of British Columbia, Vancouver, Canada

^bSNV, Netherlands Development Organisation, Accra, Ghana

^cAmsterdam Institute for Social Science Research (AISSR), University of Amsterdam, the Netherlands

^dCentre for International Forestry Research, Bogor, Indonesia

^eCentre for International Forestry Research, Lusaka, Zambia

^fUniversity of Cambridge Conservation Research Institute, Cambridge, UK

^gDepartment of Geography, Planning and International Development Studies and Centre for Sustainable Development Studies, University of Amsterdam, the Netherlands

^hZambia Community Based Natural Resource Management (CBNRM) Forum, Lusaka, Zambia

Email: samueloadeyanju@gmail.com, alida.a.oconnor@gmail.com, addoahthomas@gmail.com, bayalaeric2@gmail.com, H.Djoudi@cgiar.org, K.Moombe@cgiar.org, J.Reed@cgiar.org, M.A.F.Ros-Tonen@uva.nl, sayifs@yahoo.com, asikanwe.zcbrnm@gmail.com, terry.sunderland@ubc.ca

HIGHLIGHTS

- Inclusive, equitable multi-actor collaboration and sustainability are key to CBNRM.
- In practice, donors, government agencies, NGOs and community elites often control decision-making.
- Ongoing collaboration across actors and scales requires long-term support and engagement.
- Integrated Landscape Approaches (ILAs) are promising for improved natural resource management.
- Learning from CBNRM and documenting ILA processes is needed for adaptive management.

SUMMARY

Land use in much of sub-Saharan Africa is dominated by legislative frameworks based on a strong colonial legacy, focusing strongly on state control and minimal devolution of management responsibilities to local communities. However, attempts to reconcile conservation and socio-economic development by increasing stakeholder engagement in community-based natural resource management (CBNRM) have been undertaken since the late 1980s. Based on a review of published literature on historical land-use trajectories, the evolution of CBNRM, and key respondent interviews with NRM experts in Ghana and Zambia, this paper asks: What lessons can be learned from CBNRM to inform integrated landscape approaches for more equitable social and ecological outcomes? The paper discusses the positive characteristics and persistent challenges arising from CBNRM initiatives in both countries. The former being, improved rights and resource access, an established institutional structure at the local level, and a conservation approach tailored to the local context. The latter include the absence of multi-scale collaboration, inadequate inclusive and equitable local participation, and limited sustainability of CBNRM initiatives beyond short-term project funding timelines. The paper argues that integrated landscape approaches can address these challenges and improve natural resource management in Ghana and Zambia. We urge landscape practitioners to consider how the lessons learned from CBNRM are being addressed in practice, as they represent both challenges and opportunities for landscape approaches to improve natural resource management.

Keywords: community-based natural resource management, integrated landscape approaches, Ghana, Zambia, historical land-use trajectories

Leçons tirées de la Gestion de ressources naturelles à base communautaire (CBNRM) au Ghana et en Zambie: comment parvenir à des approches intégrant le paysage

S. ADEYANJU, A. O'CONNOR, T. ADDOAH, E. BAYALA, H. DJOUDI, K. MOOMBE, J. REED, M. ROS-TONEN, F. SIANGULUBE, A. SIKANWE et T. SUNDERLAND

L'usage du sol dans la majorité de l'Afrique subsaharienne est dominé par des cadres législatifs basés sur un fort héritage colonial, se concentrant puissamment sur le contrôle d'état, une dévolution minimale des responsabilités de gestion étant accordée aux communautés locales. Cependant, des essais à réconcilier la conservation et le développement socio-économique, en augmentant l'engagement des parties-prenantes

dans la gestion des ressources naturelles à base communautaire (CBNRM) ont été entrepris depuis la fin des années 80. En se basant sur un examen de la littérature quant aux trajectoires de l'utilisation historique du sol, à l'évolution de la CBNRM, et aux interviews de personnalités expertes-clé de la NRM au Ghana et en Zambie, ce papier pose la question : quelles leçons peuvent être tirées de la CBNRM pour informer les approches intégrant le paysage afin de parvenir à des résultats plus équitables sociologiquement et écologiquement? Ce papier examine les caractéristiques positives et les défis persistants émanant des initiatives de la CBNRM dans les deux pays. Les caractéristiques positives sont des droits et une approche améliorés, une structure institutionnelle établie au niveau local, ainsi qu'une approche de conservation adaptée au contexte local. Les défis persistants comprennent l'absence d'une collaboration pluridimensionnelle, une participation locale inclusive et équitable inadéquate, et une durabilité des initiatives de CBNRM au-delà des limites temporelles de fonds accordés aux projets court-terme. Cet article démontre que les approches intégrant le paysage peuvent faire face à ces défis, et améliorer la gestion des ressources naturelles en Zambie et au Ghana. Nous faisons appel au praticiens paysagistes de considérer la façon dont les leçons tirées de la CBNRM sont appliquées dans la pratique, celles-ci présentant des défis, mais aussi de opportunités aux approches paysagistes dans l'amélioration de la gestion des ressources naturelles.

Aprender de la gestión comunitaria de los recursos naturales (GCRN) en Ghana y Zambia: lecciones sobre enfoques paisajísticos integrados

S. ADEYANJU, A. O'CONNOR, T. ADDOAH, E. BAYALA, H. DJOUDI, K. MOOMBE, J. REED, M. ROS-TONEN, F. SIANGULUBE, A. SIKANWE y T. SUNDERLAND

El uso de la tierra en gran parte del África subsahariana está dominado por marcos legislativos basados en un fuerte legado colonial, centrados en gran medida en el control estatal y en una mínima devolución de las responsabilidades de gestión a las comunidades locales. Sin embargo, desde finales de la década de 1980 se ha intentado conciliar la conservación y el desarrollo socioeconómico mediante el aumento de la participación de las partes interesadas en la gestión comunitaria de los recursos naturales (GCRN). A partir de una revisión de la literatura publicada sobre las trayectorias históricas del uso de la tierra, la evolución de la GCRN y entrevistas con expertos en la GRN de Ghana y Zambia, en este artículo se pregunta: ¿Qué lecciones se pueden aprender de la GCRN para informar los enfoques paisajísticos integrados con el fin de obtener resultados sociales y ecológicos más equitativos? Este artículo debate sobre las características positivas y los retos persistentes que surgen de las iniciativas de GCRN en ambos países. Entre las primeras están la mejora de los derechos y el acceso a los recursos, estructuras institucionales establecidas a nivel local y un enfoque de conservación adaptado al contexto local. Entre los últimos se encuentran la ausencia de colaboración a múltiples escalas, una inadecuada participación local inclusiva y equitativa, y la limitada sostenibilidad de las iniciativas de GCRN más allá de los plazos de financiación de proyectos a corto plazo. El artículo sostiene que los enfoques paisajísticos integrados pueden abordar estos retos y mejorar la gestión de los recursos naturales en Ghana y Zambia. Se insta a los profesionales de la gestión del paisaje a que consideren cómo se están abordando en la práctica las lecciones aprendidas de la GCRN, ya que representan tanto desafíos como oportunidades para los enfoques del paisaje en cuanto a mejorar la gestión de los recursos naturales.

INTRODUCTION

Community-based natural resource management (CBNRM) aims to empower communities to sustainably manage biodiversity and natural resources through participation and decentralisation (Dressler *et al.* 2010). This approach has been implemented worldwide to reconcile biodiversity conservation and poverty reduction while putting local communities at the centre of natural resource governance (Clay 2016, Ouko 2018). The CBNRM paradigm emerged in the 1980s in response to calls for more participatory natural resource management and contrasted with the prevailing “fortress conservation” model inherited from the colonial period. Fortress conservation is primarily based on the belief that biodiversity protection is best achieved in isolation from people (Brockington 2002, Mace 2014, Miller *et al.* 2014, Terborgh *et al.* 2002). This approach resulted in the forced relocation of local people, increased state control, and enforcement of reduced or no access to land and natural resources (West *et al.* 2006). Conversely, CBNRM represents a more just and inclusive approach to conservation, placing

people at the centre of natural resource management to increase equity through increased participation and empowerment of local communities (Wali *et al.* 2017).

Nevertheless, there are critics of community-based conservation, particularly questioning its ability to address both environmental and socio-economic concerns (Büscher *et al.* 2012, Dressler *et al.* 2010, West *et al.* 2006), often resulting in trade-offs between competing priorities (Hajjar *et al.* 2021). Recent global analysis suggests many CBNRM initiatives underperform in terms of the access and tenure rights given to communities, thus falling short in one of CBNRM's major objectives (Hajjar *et al.* 2021). Meanwhile, environmental and socio-economic outcomes improved after CBNRM creation (reported in over 50% of cases) (Hajjar *et al.* 2021). Many conservation initiatives, including CBNRM programmes, are driven or overseen externally by government, international donors, or for-profit or not-for-profit organisations (Baruah 2015). These entities often come with limited, short-term project funding and strict timelines, and often have pre-determined project objectives and indicators that can eclipse community perceptions and priorities (Baruah 2015, Igoe and Brockington 2007, Lyons 2013). Furthermore, access and

benefit-sharing are core components of CBNRM. Benefits (financial and in-kind) generated from CBNRM initiatives are designed to flow back to the community and incentivise continued participation and sustainable management. However, some believe that equitable benefit distribution is unlikely without acknowledging and addressing variables such as class, governance, and gender roles that vary from one community to another (Agrawal and Gibson 1999, West *et al.* 2006).

This paper contributes to an ongoing initiative that seeks to operationalise landscape approaches in three tropical countries, including Ghana and Zambia.¹ Landscape approaches are broadly defined as a strategy to integrate research, policy and practice for multiple land uses within a given area to enhance equitability and sustainability (Reed *et al.* 2015). The approach is not a “win-win” solution *per se*. Instead, it provides tools for multiple stakeholders and rights-holders within a landscape to negotiate trade-offs and synergies to ‘win more and lose less’ (Reed *et al.* 2017, 2020a, Ros-Tonen *et al.* 2018, Sayer *et al.* 2015). A robust understanding of the status and experiences of CBNRM in each country will offer valuable insights into whether CBNRM offers potential entry points for the implementation of landscape approaches (see e.g. Foli *et al.* 2018) and how CBNRM experiences can inform such application.

To understand how CBNRM evolved in Ghana and Zambia, we first examine land use from the colonial period to independence. Next, we explore how historical land uses have influenced conservation approaches and the role of CBNRM today. A review of past and present CBNRM initiatives revealed important positive characteristics and persistent challenges consistent across both countries. We discuss these findings in relation to the current call for more integrated landscape approaches to play a role in sustainable land management.

METHODS

We explore the concept of CBNRM and its ability to address socio-economic and ecological needs in Ghana and Zambia, based on an extensive literature review that uses iterative steps of the Grounded Theory Literature Review Method developed by Wolfswinkel *et al.* (2013). First, we defined the inclusion and exclusion criteria. Inclusion criteria include: Must be written in English, must be a peer-reviewed journal article, conference paper, or book chapters; must be in the field of natural resource management, forestry, land management, and agriculture or mineral resources. Literature that reported case studies in Africa and other continents were only included in the review if they reported specific results related to Ghana or Zambia. Second, we used the following search terms to collect papers on the historical dynamics of land use

and land-use change in Ghana and Zambia and CBNRM uptake and experiences in both countries: (“community-based natural resource management” OR CBNRM OR “land use” OR “land-use change” OR “historical land use” OR conservation) AND (Ghana OR Zambia). The search terms were applied to the Web of Science and Google Scholar. Third, backward and forward snowballing was used to identify additional relevant literature by screening the bibliographies of relevant articles and examining new papers citing the paper after multiple rounds of iterations (Wohlin 2014). Finally, the selected papers from the literature search formed the basis of the analysis of our research and the themes discussed in this paper. Further, we interviewed key stakeholders in both Ghana and Zambia (two NRM practitioners in each country) on the strength and challenges of CBNRM and potential for landscape scale initiatives in their respective countries. Interviews were semi-structured and conducted online through Zoom² and lasted between 45 mins to 90mins. The themes from the interviews were triangulated with findings of our extensive literature review. This paper also benefited from the collective knowledge and resources of the authors’ network on CBNRM initiatives in both countries.

HISTORICAL LAND USE IN GHANA AND ZAMBIA FROM COLONIALISM TO THE PRESENT DAY

Development trajectories in both countries have been driven by colonial precedents, leading to the exploitation and subsequent depletion of natural resources. The sections below illustrate how this has led to the erosion of the power of traditional authorities, displacement of local people and their exclusion from resource use.

Historical land use and land tenure in Ghana

In pre-colonial Africa, local people cleared forests, grasslands, and other lands in the landscape to establish permanent settlements and farms (Boateng 2017). Subsistence agriculture involving planting food crops using family labour and traditional tools were common practices among different tribes in Ghana. Rapid population increase due to immigration and natural births in some areas led to subsequent agricultural expansion and resettlement (Boateng 2017). In the 1840s, Ghana’s commercial agriculture for export trade began, with cocoa, palm oil, rubber and coffee as major export commodities. Crop production consisted of a mix of small and large-scale plantations worked by small farmers and migrants, either on African or European plantations (Sutton 1983). Once used for staple food farming, uninhabited lands surrounding communities were converted by ‘pseudo-capitalist farmers’ to cultivate cash crops such as cotton, tobacco, and rice (Boateng 2017).

¹ This study is part of an on-going project (COLANDS) funded by the German Government, aiming at operationalising landscape approaches in Ghana, Zambia and Indonesia (<https://www2.cifor.org/colands/>). Zambia CBNRM Forum is a partner in the COLANDS initiative.

² Zoom is a cloud-based video communications app. <https://zoom.us/about>

Timber harvesting and trade began in Ghana – then still referred to as Gold Coast – in the late 19th century. About 3,000 cubic metres of African mahogany (*Khaya* spp. and *Entandrophragma* spp.) were exported in 1891 alone (Oduro *et al.* 2011). In the early 20th century, the forest area of Ghana covered around 34% of the total land area (Boakye and Baffoe 2006). In common with many British colonies in West Africa, Ghana's natural resources, including forests, agricultural produce, gold and other mineral resources (Boateng 2017, Hilson 2002a, Sutton 1983), were exploited to meet the needs for raw material inputs in British industries and generate financial resources to run the affairs of colonial government and the wider Empire (Oduro *et al.* 2011, Wardell and Lund 2006, Yaro *et al.* 2018). In 1909, the first Conservator of Forests was appointed to oversee the establishment of the Forestry Department (now: Forestry Commission) in the Gold Coast (Wardell 2020) and lead the process of forest reservation (Boateng 2017, Wardell 2005). In common with most West Africa nations, land management and tenure systems in Ghana have their roots in colonial policy. The British colonial administration conferred on the state centralised control and authority over all unregistered or common lands (Binot *et al.* 2009, Kasanga and Kotey 2001).

In the 1890s, the colonial governments expanded into the hinterlands of West Africa. In the Gold Coast Colony, George Ekem Ferguson, a Fanti official of the Crown, was responsible for negotiating Treaties of Friendship and Trade with several customary chiefs in what became the Protectorate of the Northern Territories (henceforth NTs) and later Haute Volta (Wardell and Fold 2013). After almost two decades of forceful resistance to the colonial administration's earlier attempts to pass land and forest legislation, the Forest Ordinance (Cap 157) was eventually adopted in March 1927 (Oduro *et al.* 2011, Wardell 2005, 2020). The process led to the demarcation of numerous forest reserves, covering 11% of the country's total land area (Boakye and Baffoe 2006).

The forest reservation policy in the Gold Coast Colony (1927–1939) was strongly motivated by the high timber value of forests in Southern Ghana and the need to safeguard water supplies, and the micro-climatic conditions favourable for cocoa production (Wardell 2005, 2020). In contrast, forest policies in the NTs were motivated by protecting headwaters, soil and water conservation, and bush burning control (Wardell 2020). In the NTs, an evident lack of timber (or other economic resources) led to neglect of the Protectorate by successive colonial administrations and subsequent delay in forest reservation, which later occurred between 1937 and 1959 (Wardell 2020). Although the NTs had a comparative advantage in cereals, livestock and vegetable production (Kuu-Ire 2009, Wardell 2005), they did not host any commodity of particular interest to the colonial power. Instead, the NTs acted as a source of cheap and available labour for economic development in Southern Ghana, and significantly fewer resources were spent to develop the Protectorate of the Northern Territories (Kuu-Ire 2009, Nyaaba and Bob-Milliar 2019).

Extensive tracts of tropical dry forests characterise the topography of the NTs. It is a savannah belt marked by vast arable but depleted land and narrow strips of fringing forest bordering the tributaries of the Volta River Basin. The settled areas host agroforestry parklands³ dominated by shea trees (*Vitellaria paradoxa*), African locust bean (*Parkia biglobosa*), neem (*Azadirachta indica*) and baobab trees (*Adansonia digitata*) (Wardell and Fold 2013, Nyaaba and Bob-Milliar 2019).

Generally, the colonial policy for British colonies in Africa hinged primarily on developing first those areas that had great potential to produce cash crops such as rubber, cocoa, oil palm, coffee, along with the mining of gold, bauxite and others (Kuu-Ire 2009). Furthermore, the Forestry Department in the high forest zone of Southern Ghana was well established and resourced compared to its counterpart in the NTs. In 1939, 214 forest reserves covering about 15,000 km² were established in Southern Ghana, contrasting a mere 160 km² in the NTs (Wardell 2005). The reservation process deprived traditional authorities of their right to negotiate timber concessions on customary lands under their jurisdiction and local inhabitants of their rights to use forest resources while leading to their displacement (Derkyi *et al.* 2014). The application of the reservation policy only began in earnest when Marshall's plan for *Forestry in the NTs of the Gold Coast* was adopted in 1945, resulting in increased responsibilities for the Forestry Department (Wardell 2020). A pan-territorial forest policy for the Gold Coast was only adopted in 1949 following the North Mamprusi Forest Conference held in 1947, which led to broader Land Planning Areas (LPAs) being established in the NTs (Wardell and Lund 2006, Wardell 2020).

The colonial authority did not change the status quo of local government systems in the NTs during the first three decades of the 20th century (Wardell and Lund 2006). However, in the early 1930s, a series of consultations between colonial commissioners and local leaders and their constituents resulted in the promulgation of three key Native Ordinances. These introduced a new system of local government – “indirect rule” – centred on a paramount chief and his traditional council of elders, called the “Native Authority” (Wardell and Lund 2006). Subsequently, in 1951, a new government dominated mainly by Africans passed the Local Government Ordinance No. 29, 1951 (Rathbone 2000). The Ordinance made provision for creating elected local councils and marked the end of “indirect rule”. In doing so, it cut back the powers and influence of the native authorities (Wardell and Lund 2006, Rathbone 2000). Several amendments of the earlier version eventually led to a new Local Government Act in 1961 (Wardell and Lund 2006). Following independence in 1957, land tenure and management became even more centralised under post-colonial governments (Binot *et al.* 2009, Wardell and Lund 2006, Yaro *et al.* 2018) with the passing of two Land Acts in 1962, namely: State Lands Act (No. 125, 1962) for public lands and the Administration of Lands Act (No. 123, 1962) for vested lands (Yaro *et al.* 2018).

³ See Lovett and Denzil-Philips (2018).

Historically, the customary leadership structures – the stool in southern Ghana and the skin in the north – carry out judicial, governance and land management functions over a particular ethnic group, clan or tribe, including land and natural resources (Asare *et al.* 2013, Kasanga and Kotey 2001, Wardell and Lund 2006). Despite the centralised authority vested in state law, more than 80% of the undeveloped land in Ghana is held by traditional authorities (often hereditary chiefs), and tenancy is dominated by sharecropping and other customary rent-based systems (Kasanga and Kotey 2001).

A pluralistic land management system – co-existence of both customary and statutory tenurial laws – has emerged due to a lack of coordination, weak implementation and enforcement of government’s centralisation laws (Binot *et al.* 2009, Kasanga and Kotey 2001). This has created a multifaceted land tenure system riddled with tensions and conflicts (Murray *et al.* 2019). However, on its return to democratic rule in 1992, Ghana adopted a more centralised land management system (Wardell and Lund 2006). This was reflected in a new national forest and wildlife policy adopted in 1994, which recognised the need for effective engagement of resource owners and local communities in forest management (Binot *et al.* 2009, Boakye and Baffoe 2006).

Insecure tenure associated with sharecropping and leaseholding discourages long-term investment, tree planting, and land conservation (Damnyag 2012, Asaaga *et al.* 2020). Particularly problematic for sustainable landscape management and conservation is the separation of land and tree ownership, with naturally occurring trees on farmland belonging to the State (i.e. the Forestry Commission). Farmers are confronted with timber operators licensed to cut these trees without adequate benefit-sharing and compensation for logging damage to crops and waterways. In this way they are incentivised to destroy seedlings and saplings of naturally regenerating trees on their land or sell them to illegal chainsaw millers for a better deal (Marfo 2006, Ros-Tonen and Derkyi 2018, Asaaga *et al.* 2020). Hence, sustainable land management calls for reforms in Ghana’s tenure systems (Owubah *et al.* 2001, Damnyag 2012). Two policy documents commissioned by the Forestry Commission (FC) are important first steps in driving the much-needed reform, namely the 2012 Tree Tenure and Benefit Sharing Policy and the 2016 Tree Tenure and Benefit Sharing Framework (Antwi *et al.* 2018).

Present-day land use in Ghana

Three drivers of land use stand out in post-colonial Ghana: the expansion of tree crops (notably cocoa and later oil palm), mining and urbanisation. ‘Ghana is cocoa and cocoa is Ghana’ goes the saying, and the crop is indeed the primary export earner and source of income for an estimated 800,000 or 60% of rural families (Rethman and Kim 2015). The expansion of cocoa has been the main driver of forest loss in Ghana (Benefoh *et al.* 2018), followed by the establishment of oil palm (Asubonteng *et al.* 2018).

In northern Ghana, forest reserves and agroforestry parklands have been considerably degraded, posing enormous

threats to forest conservation and local livelihoods (Braithorn 2005, Lovett and Denzil-Philips 2018, Shoyama *et al.* 2018, Dumenu and Bandoh 2016). Factors include demographic pressure, urbanisation, agricultural intensification, unsustainable farming practices, fires, erosion of customary institutions, and overexploitation. The latter occurs due to the global demand for shea nuts and shea butter, timber (specifically *Pterocarpus erinaceus*-African Rosewood) and biofuels (notably *Jatropha curcas*); growing local demand for cereals, legumes, yam, cotton, firewood, bricks, and charcoal; overgrazing; and illegal small-scale mining (*galamsey*) (Marchetta 2011, Shoyama *et al.* 2018, World Bank 2009). An estimated 1,184 million ha of land are under the control of 20 commercial plantation companies to establish large-scale feedstock plantations (Schoneveld *et al.* 2011). Although such large-scale commercial plantations may provide some rural development opportunities, monoculture plantations often result in the displacement of smallholder farming and threaten local livelihoods and biodiversity (Schoneveld *et al.* 2011). In addition, the current high demand for African Rosewood in Asia—particularly China—has led to the overexploitation of the indigenous tree in the savanna zone of Ghana, which hitherto was locally used for firewood and charcoal (Dumenu and Bandoh 2016). In 2014, Ghana was ranked second to Nigeria as one of the top exporters of rosewood logs by volume to China (Treanor 2015, Dumenu and Bandoh 2016). Currently, the government has imposed a ban on the export of rosewood. Some of the current shortcomings in Northern Ghana are arguably rooted in the marginalisation of the NTs by colonial powers (Kuu-Ire 2009, Wardell 2020).

Mineral exploitation has substantially contributed to land-use and land-cover change in Ghana which is known globally for its rich deposits of gold and other minerals such as diamonds, manganese and bauxite, which are mined on a large scale (Hilson 2002b). Mining in Ghana occurs by actors at two scales: large-scale mining companies and the more numerous small-scale mining operations locally referred to as *galamsey*, pidgin for “gather and sell” (Hilson 2017, Ros-Tonen *et al.* 2021). Concerns about the destructive history of mining companies in forest areas, rivers and fish populations in Ghana led to opposition to mining in Ghana’s forest reserves (Hilson and Nyame 2006). Further, pollution of water bodies with heavy metals and loss of farming land remains a major impact of especially alluvial and surface mining, which has become the prominent *modus operandi* in recent decades (Hirons 2013, Schueler *et al.* 2011, Ros-Tonen *et al.* 2021). Most mining activities are located in the forest-rich zones of Ghana. Small-scale mining activities frequently overlap with forested areas, given the presence of alluvial deposits around river bodies protected by forests (Hirons 2013). In Western Ghana, land use for surface mining resulted in deforestation and loss of farmland within mining concessions, generating a massive spillover effect, which led relocated farmers to expand their farmland into forests (Schueler *et al.* 2011).

A rapid transition to urban land uses in Ghana has occurred over the past four decades (Kleemann *et al.* 2017) due to a growing population and rural-urban migration (Addae

and Oppelt 2019, Kleemann *et al.* 2017, Yeboah *et al.* 2017). Ghana's urban population increased from 20% in 1960 to 51% in 2013 and has maintained an upward trend (Twum and Ayer 2017). Several studies in the Greater Accra Metropolitan Area (GAMA) found increases in urban areas of up to 277% between 1991 and 2015, at the expense of forests, agricultural land and water bodies (Addae and Oppelt 2019, Yeboah *et al.* 2017). This trend aligns with projections of a burgeoning urban population in each of the major regions of the developing world by 2030, signalling a global urban population of about 5 billion and an increase in urban land cover to 1.2 million km² (Seto *et al.* 2013, Barbose 2020). However, some argue that urbanisation contributes only a small fraction of less than 10% to global forest loss (Curtis *et al.* 2018, Hosonuma *et al.* 2012).

In addition to expanding large cities such as Accra, Kumasi and Tamale, rural urbanisation has also been a major, but often neglected, driver of land-use changes in agricultural landscapes (Asubonteng *et al.* 2020, Somuah *et al.* 2021). For example, in the north of the country, urbanisation is one of the causes of the reduction of pastoral areas and transhumance corridors favouring housing and agribusiness (Kuusaana and Bukari 2015, Soeters *et al.* 2017).

Ghana's Medium-Term National Development Policy Framework (2018–2021) seeks to address challenges of infrastructure development and restore the economy (NDPC 2017). The policy framework acknowledges the need to reconcile conservation and development needs and highlights restoring degraded land, improving land administration and management, expanding protected areas, and increasing resilience to climate change as focus areas (NDPC 2017, O'Connor *et al.* 2021a).

Conservation approaches: protected areas and other forms of land use in Ghana

Over 16% of the land surface area in Ghana has been set aside for the conservation of representative samples of natural ecosystems through a system of protected area networks and traditional conservation systems (UICN/PACO 2010, MESTI 2016). Ghana's protected area system can be traced back to the wildlife and forest reservation policy of the colonial administration in the early 1900s (Kasanga and Kotey 2001, Binot *et al.* 2009). Today, protected areas – notably forest reserves, national parks, wildlife conservation areas, and Ramsar sites – represent the bulk of Ghana's in-situ conservation. Currently, over 280 forest reserves are distributed over all ecological zones of the country, covering a total area of around 2,372,900 ha, or 11% of Ghana's total land area (Attuquaywfi and Fobil 2005, MESTI 2016). Moreover, 21 legally constituted wildlife conservation areas cover around 1,347,600 ha or 5.6% of the total land surface. Similarly, there are six wetlands (all designated as Ramsar sites) and two newly proposed wildlife conservation areas (UICN/PACO 2010, MESTI 2016).

In addition to the forest reserves and wildlife conservation areas, Ghana has a national REDD+ strategy to reduce emissions from deforestation and forest degradation and stimulate

conservation, sustainable management of forests and the enhancement of forest carbon stocks. Although the global context for REDD+ is no longer conducive to effective land-based climate change mitigation, national and international organisations (governmental and non-governmental) continue implementing REDD+ on the ground (den Besten *et al.* 2019).

Aside from formal conservation approaches, traditional religious and cultural belief systems regulate the relationship between humans and their immediate environment (Aniah and Yelfaanibe 2016, Attuquaywfi and Fobil 2005). In Ghana, an estimated 3,200 sacred groves are spread across the country, with nearly 80% of these found in the southern half of Ghana (Attuquaywfi and Fobil 2005, Nganso *et al.* 2012). In most sacred groves, animal hunting and tree felling are strictly prohibited. Out of fear of the gods, illegal access to the grove is prohibited. The entire community, including chiefs and villagers, perform a watchdog role to guard against illegal access either by its members or outsiders who might desecrate such sites (Aniah and Yelfaanibe 2016). Additionally, several clans and ethnic groups designate some plants and animals as so-called totem species that cannot be harvested, hunted, or eaten. In most rural and even in some urban areas, taboo days for farming, fishing and hunting are still widely observed, with many water bodies being worshipped as deities (Attuquaywfi and Fobil 2005). Such traditional practices have been effective in biodiversity conservation by preserving forests and watercourses and act as an important refuge for rare and useful local flora and fauna species (Nganso *et al.* 2012).

Historical land use in Zambia

Unlike Ghana, Zambia was a settler colony, meaning colonialists intended to stay permanently and had interests beyond immediate exploitation of the economy and natural resources (Odukoya 2018). Settler colonialism perpetuated a struggle for land, power over local people, and a new political order to replace indigenous institutions (Odukoya 2018). At the behest of the British Authorities, Cecil Rhodes and the British South Africa (BSA) Company were placed in charge of Northern Rhodesia, present-day Zambia, in 1894 (Chenoweth *et al.* 1995, Roth *et al.* 1995, Vail 1977). With BSA's interest in commercial agriculture, European farmers with the knowledge, skills, and capital for modern agricultural practices were encouraged to migrate to Zambia. By 1921, 714 European settlers were engaged in commercial agriculture in the area (Chenoweth *et al.* 1995). Large expanses of productive land were reserved for the exclusive use of European farmers for commercial agricultural production (Chenoweth *et al.* 1995). Similarly, BSA displaced and resettled indigenous people from their ancestral lands to reserve lands (Chenoweth *et al.* 1995, Vail 1977). Soon after, the 1928 Northern Rhodesia Order in Council legally established areas of crown land to be reserved for white settlement (Roth *et al.* 1995, Sitko and Chamberlin 2016).

In addition to agricultural land, colonial authorities allocated vast tracts of land as protected areas, relocating

entire villages in the process (Gibson 1999, Mwima 2001). For example, Zambia's first national park in 1924, Kafue National Park, displaced several villages and restricted access to natural resources (Mwima 2001). Further, colonial settlers used the traditional knowledge of local people to identify areas rich in copper and established the first commercial copper mines (Larmer 2010, Sikamo *et al.* 2016, Werner 2016). Local people were encouraged to give up their traditional livelihoods to support colonial objectives. For instance, the Bemba people in Northern Zambia who practice chitemene (shifting cultivation in miombo woodlands) were advised to forgo their traditional chitemene system to produce cash crops or work in copper mines (Chidumayo 1987, German *et al.* 2011, Kakeya *et al.* 2006). Forest resources, such as Zambezi teak, were exploited to construct railway lines to transport mining resources for the BSA (Deweese 1994). This led to the enactment of the first forest protection order in Barotseland, western Zambia (now Western Province) in 1936.

The Barotse Forest Order (BFO) is considered the first law to protect natural resources in Zambia (and parts of Namibia and Botswana) (Deweese 1994). Although the BFO was approved by the Litunga (African King of Barotseland), it alienated local people whose access to natural resources was prohibited without written permission from the Litunga and BSA officials (Deweese 1994). Subsequent laws and regulations on forests, wildlife and water, were built on this historical narrative and continued restricting access to local communities. The BFO was later replaced with the Forest Act of 1973, which still largely restricted access to forest resources (Kalaba *et al.* 2014). This 'fortress' model was the norm until the National Conservation Strategy (1985) recognised the need for policy reform that met the basic needs of communities (Deweese 1994, Lyons 2013).

Present-day land use in Zambia

In common with Ghana, the establishment of colonial rule in Zambia ushered in the co-existence of dual legal systems (statutory and customary laws). Although colonial laws and legislations largely suppressed customary law in many areas, most Zambians still adhered to customary law (Roth *et al.* 1995). After independence in 1964, the pluralistic legal system of land administration continued, with crown land simply renamed "state land" (Roth *et al.* 1995, Sitko and Chamberlin 2016). In 1995, a new Land Act was legislated, which merged indigenous reserves and trusts into "customary land" and created procedures for individuals and companies to transfer customary land to leasehold title (Sitko and Chamberlin 2016). Customary land is managed by chiefs, who have the legal authority to lease land on behalf of the community to local and foreign investors (Sambo *et al.* 2015). Traditional leaders are required to consult with the community to ensure the land was not used for other purposes and investor interests do not conflict with community needs (Sambo *et al.* 2015). However, there is no formal regulatory mechanism in place to oversee consultation, leaving it to the discretion of traditional leaders and investors.

In some cases, consultation does not occur, and land transfers are made between "elites" such as government officers, traditional leaders, and wealthy investors (Chilombo 2021, Sambo *et al.* 2015). The dual legal framework (state and customary) is known to be inefficient and slow to process title deeds when following the proper protocol. An ongoing review of the Land Policy, and Lands and Deeds Act seeks to streamline land allocation to encourage investment and development (MNDP 2017).

Today, land use is shaped by the demand for food, biomass energy and other ecosystem services in expanding urban and peri-urban areas, coupled with the demand for large tracts of land by foreign investors (Nolte 2014). Thus, expanding agriculture and settlements remain the most significant driver of land-cover changes, accounting for 60.78% and 36.05% of forest-cover loss, respectively, between 2000 and 2014 (Shakachite *et al.* 2016). These losses will only intensify with a business as usual approach to land allocation and management. Large-scale land-use investments are increasing in Zambia with significant investment in mining, manufacturing, energy, tourism, transport, and agriculture (German *et al.* 2013, Sambo *et al.* 2015).

The promotion of block farming is an example of the recent push to attract large-scale investments. The Farm Block Development Programme aims to expand the commercial development of cash crops and attract foreign direct investment. The government acquires vast tracts of customary land and makes them available to investors. In 2002, the government decreed the establishment of nine farm blocks (Chilombo 2021). Each block has a large-scale core farm of 10,000 ha and several smaller blocks (Dalupan *et al.* 2015). Smallholder farmers work the smaller blocks under production contracts with large-scale enterprises (Dalupan *et al.* 2015, Sambo *et al.* 2015). Under this system, farmers receive a crop price guarantee, access to inputs such as fertilizer and seeds, and infrastructure development like roads and irrigation (Sambo *et al.* 2015). To date, the socio-economic benefits of this model have been variable. Smallholders and communities receive more benefits when there is a producer association to help leverage farmers' collective bargaining (Sambo *et al.* 2015).

Large-scale investments, such as farm blocks, have the potential to stimulate development in rural areas. However, a lack of social and environmental safeguards threaten livelihoods and the environment (Sambo *et al.* 2015, Samboko *et al.* 2019). The conversion of customary land to large-scale commercial investment requires community consultation, negotiation of co-benefits, and agreed-upon compensation in instances of resettlement. Yet, in many cases, this does not occur (Sambo *et al.* 2015, Samboko *et al.* 2019). Similarly, environmental oversight of large-scale land use investments is managed by environmental institutions with limited capacity (Sambo *et al.* 2015).

Despite Zambia's effort to scale up sectors such as agriculture and tourism, it remains an important producer of strategic minerals in sub-Saharan Africa (Larmer 2010). It is the second-largest copper producer in Africa, after the DRC, and the eighth largest globally (Werner 2016). In 2012, the

mining industry accounted for 86% of foreign direct investment in Zambia and 80% of the country's export earnings (Sikamo *et al.* 2016). However, Zambia's heavy reliance on agriculture and mineral extraction has made the economy vulnerable to market fluctuations and crop failure. Moreover, the sectoral focus of development objectives, such as agricultural expansion, has failed to account for impacts on other sectors and objectives, such as deforestation and environmental commitments (Kalaba *et al.* 2014). Zambia's Seventh National Development Plan (2017–2021) seeks to establish a diverse economy, more resilient and adaptable to external shocks. The plan is the first of the country's development plans to explicitly seek diversification through multi-sectoral integration and policy coherence across sectors (O'Connor *et al.* 2020, O'Connor *et al.* 2021b, MNDP 2017).

Conservation approaches: protected areas and other forms of land use in Zambia

In Zambia, the conservation of biodiversity and natural resources falls into six broad categories, including national forests, local forest reserves, community forests, national parks, game management areas and wetlands. These protected areas are predominantly state-managed, but recent regulatory reforms recognise private sector participation and roles of traditional governance structures (e.g. Zambia Wildlife Act of 2015 and Forest Act of 2015). Investment in Participatory Forest Management (PFM) is supported under the existing conducive policy and legal framework (Bradley *et al.* 2019). Furthermore, Zambia finalised a National REDD+ Strategy in 2015, focusing on decreasing drivers of deforestation in forestry and other key sectors like agriculture, energy, mining, etc (Matakala *et al.* 2015).

However, these state-led initiatives have faced increasing pressure in recent years. Between 2006 and 2016, Zambia's population rapidly grew from 11.8 million to 15.9 million (MNDP 2017). Informal settlements and search for agricultural land have led to the encroachment of game management areas, national parks, and forest reserves (Government of the Republic of Zambia (GRZ) 2006, GRZ 2015a, Lindsey *et al.* 2014, Mabeta *et al.* 2018). By 2011, over half of the National Forest Estate had been encroached to some degree (GRZ 2015a). In some cases, forest reserves have been formally degazetted for residential areas, farm plots, and other development projects (Lindsey *et al.* 2014, Mabeta *et al.* 2018). This underscores the importance of sustainable natural resource management approaches inside and outside protected areas that also consider local livelihoods. In some places, this is already occurring as a result of traditional land management practices. Religious belief systems also influence natural resource use. For example, the Gonde Malende forest shrine, found in Monze District, is the burial site of prominent Tonga chiefs and is managed by rules and rituals unique to the sacred site (Kanene Kennedy 2015). However, recent work suggests these are also facing degradation (Gumbo and Moombe 2020).

Another conservation approach outside of protected areas is conservation agriculture, in Zambia commonly known as

conservation farming. Conservation farming seeks to improve agricultural productivity and ecological sustainability through minimum soil disturbance, permanent organic soil cover, crop rotation, and intercropping (Arslan *et al.* 2014). In response to low agricultural productivity and degraded soils, seven of Zambia's ten provinces have received active support for conservation farming since the 1980s (Arslan *et al.* 2014, Baudron *et al.* 2007). Despite its widespread promotion, adoption is still limited due to high opportunity costs, labour constraints, and limited potential to grow cover crops during the dry season (Arslan *et al.* 2014, Baudron *et al.* 2007, Haggblade and Tembo 2003).

Realities of historical conservation approaches and the birth of CBNRM

The colonial legacy of restricting access to natural resources and separating people from the environment has led to a development trajectory that fails to integrate social and ecological concerns. Ghana and Zambia face similar challenges with a growing population and urbanisation leading to increasing demand for forest land and resources for agriculture, settlements and mineral exploitation. Pluralistic land tenure systems further complicate this, slowing land allocation and fostering uncertainty around secure tenure. Consequently, high dependence on natural resource extraction and poorly regulated land use and allocation have led to deforestation, water contamination and soil degradation (Acheampong and Ibrahim 2016, MESTI 2016, NDPC 2017, MNDP 2017).

In both Ghana and Zambia, we see various conservation approaches ranging from strictly regulated national parks to locally managed sacred forests. Growing populations and encroachment of state-protected areas signal a need to focus on conservation approaches that consider sustainable use of natural resources outside protected areas such as traditional agroecosystems (Lewis *et al.* 1990, Halladay and Gilmour 1995). Failing to address livelihood needs and natural resource management outside protected areas will only increase pressure on the remaining national parks and forest reserves (Lewis *et al.* 1990, Halladay and Gilmour 1995, Muhumuza and Balkwill 2013), which only occupy an estimated 15% of the global terrestrial area (UNEP-WCMC and IUCN 2016). The CBNRM framework provides balanced considerations for both socio-economic and environmental needs, making it a seemingly ideal conservation approach for achieving each country's sustainable development objectives. Both Ghana and Zambia have a history with CBNRM, which we explore more in-depth in the following section.

THE INTRODUCTION OF CBNRM

In the 1980s, widespread support for community-based natural resource management emerged as a counternarrative to the colonial legacy of centralised control over land and natural resources that largely excluded local people from participating in decision-making (Roe and Nelson 2009).

Evolution of CBNRM in Ghana⁴

The Wildlife Division of the Ghanaian Forestry Commission launched the Community Resource Management Area (CREMA) concept in 2000 (Agyare *et al.* 2015a, Murray *et al.* 2019). This and other initiatives, such as the Social Responsibility Agreements (SRAs) in timber operations and reforestation schemes co-managed with local communities (the modified taungya system), aligned with the spirit of the 1994 Forest and Wildlife policy to put more emphasis on public participation and benefit-sharing in natural resource management (Asare *et al.* 2013, Baruah 2017, Foli *et al.* 2018, Murray *et al.* 2019). Established under the Collaborative Community Based Wildlife Management policy of 2000 (Binot *et al.* 2009), CREMAs initially focused on protecting and managing wildlife exploitation outside protected areas. Simultaneously, they aimed to promote community engagement in natural resource management and contribute to food security and poverty reduction by creating natural resource-based income-generating opportunities (Baruah 2017, Foli *et al.* 2018). CREMAs have since evolved into a community-based governance strategy that encourages communities, landowners and land users to communally manage their natural resources for economic and livelihood benefits (Asare *et al.* 2013, Baruah *et al.* 2016). Moreover, since the complicated land tenure systems impeded the further establishment of state-run protected areas, CREMAs are framed as conservation initiatives to meet the Aichi Biodiversity Targets (Murray *et al.* 2019).

In 2017, there were 32 CREMAs located across 26 districts in seven administrative regions of Ghana. Of these, 24 are fully operational, and the remaining eight are at various stages of establishment (IUCN 2017, Murray *et al.* 2019). On average, CREMAs cover an area of 12,431 ha, varying between 2,046 to 40,000 ha, and include two or more communities or settlements (Asare *et al.* 2013). The establishment process usually takes at least 3–5 years until the inauguration, and the reasons and motivation for establishing CREMAs vary from one community to the other (Asare *et al.* 2013). These include eco-tourism, wildlife conservation, sustainable production of traditional medicine and bushmeat, agroforestry, landscape restoration, and on-farm, tree-based diversification (Agyare *et al.* 2015a, Baruah *et al.* 2016, Murray *et al.* 2019). More recently, CREMAs have shown potential for climate change mitigation given their broad community-based structure and process, deemed essential for operationalising REDD+ programmes (Asare *et al.* 2013, IUCN 2017).

Institutionally, CREMAs are community-based organisations based on customary governance, with an executive body and a constitution guiding the activities and setting the rules and regulations for all participating stakeholders (Foli *et al.* 2018, IUCN 2017). CREMAs have two distinct operational

structures: the CREMA Executive Committee (CEC) and the Community Resource Management Committees (CRMCs), in which traditional authorities and individual farmers and landholders from the involved communities participate. The CEC is the leading management body that oversees the daily operations and decision-making for the CREMA, and its powers are determined in the CREMA constitution (Asare *et al.* 2013, Foli *et al.* 2018, IUCN 2017). The CRMC members are elected or nominated during a village-wide meeting in each participating CREMA community or a cluster of communities. The CRMCs decide over CREMA implementation and act as the principal liaison between the CEC and each participating community (Foli *et al.* 2018, IUCN 2017, Murray *et al.* 2019).

Efficacy of CREMAs in Ghana

CREMAs have recorded mixed success regarding their desired and perceived outcomes in participating communities over the past 20 years of CREMA implementation in Ghana (Agyare *et al.* 2015a, 2015b, Baruah 2017). Generally, most CREMAs depend on external actors to provide financial, technical, administrative, and logistical support during and after CREMA establishment (Ahmed and Gasparatos 2020, Asare *et al.* 2013, Baruah *et al.* 2016, Bempah *et al.* 2019). As such, the sustainability of CREMAs depends on the long-term technical and financial independence of CREMA management (Baruah *et al.* 2016). However, many CREMAs lack financial resources beyond the end of typically temporary and short-term external donor funding (Agyare *et al.* 2015a, Baruah *et al.* 2016). The variety of activities and costs needed to keep CREMAs operational include weekly village assemblies and costs associated with communication and transportation (Baruah *et al.* 2016, Bempah *et al.* 2019). This calls for sustained local sources of support and incentive mechanisms (financial and otherwise) to maintain CREMA functionality and sustainability (Milder *et al.* 2014, Baruah *et al.* 2016).

In general, CREMAs have recorded better socio-economic and conservation outcomes where implementing NGOs, supported by donors, have devoted considerable time and resources to ensure their success (Agyare *et al.* 2015a). For instance, the Wechiau CREMA in the Upper West Region received long-term (over ten years) external technical, financial, and logistical support from the Nature Conservation Research Centre (NCRC) and the Calgary Zoo. This enabled Wechiau to meet its desired outcomes – local capacity development and employment opportunities, educational scholarship, tourism and social infrastructure development (Agyare *et al.* 2015a). Meanwhile, CREMAs with irregular and short-term external support have been less successful in achieving socio-economic outcomes (Agyare *et al.* 2015a). Hence, it is vital for external actors providing short-term support to have

⁴ This and the following section focus on the CREMA as the main form of CBNRM in Ghana. The modified taungya system is primarily a co-management scheme with the Forestry Commission setting the rules, while the Social Responsibility Agreements in the timber sector excludes communities from decision-making (Acheampong *et al.* 2016, Foli *et al.* 2018, Ros-Tonen and Derkyi 2018). Other forms of CBNRM are mainly isolated projects of limited project duration.

clear exit strategies (Baruah *et al.* 2016). These could include creating alternative sustainable livelihood programmes for local communities as part of their exit strategy or as independent projects – although the limited economic feasibility of such ‘alternative livelihood’ projects has been questioned (Hilson and Banchirigah 2009, Roe *et al.* 2015, Ros-Tonen *et al.* 2013, Wicander and Coad 2019). Rather than making financial independence an afterthought, external actors should develop a strategy to progressively wean CREMAs off total reliance on external support from inception (Baruah *et al.* 2016).

Building local capacity is essential for sustainable results, both during project implementation and at the end of project funding. In Ghana, stakeholders identified a lack of capacity of CREMA executives as a major reason behind the failure of some CREMAs when the implementing/funding organisations exit the community after project closure (IUCN 2018). Meanwhile, corruption among local implementing NGOs and local leaders have led to the abrupt end of some CREMA projects and activities (Baruah 2017). Heads of local communities and participating individuals need the requisite managerial, organisational, financial and technical capacity to undertake the various activities related to CREMA creation and management to engender community ownership of the project (Agyare *et al.* 2015a, Baruah 2015). A dual capacity-building mechanism combining formal and informal training and forums can enhance CREMA creation and sustainability while guiding against challenges posed by elite capture, manipulation and dependency on a few individuals.

Furthermore, in some CREMA communities, ordinary villagers were denied access to information related to the CREMA project, with only select actors included in CREMA village-level activities (Baruah 2017), resulting in elite capture (Ahmed and Gasparatos 2020).

On the other hand, Murray *et al.* (2019) suggest that local people perceive the governance of CREMAs to be of relatively high quality in terms of improving transparency and free participation in decision-making. Where a significant majority (75%) of the community members fully supported the CREMA programme during the initial stages, their interest and participation declined after some time, primarily due to a lack of community ownership of the programme and the absence of long-term sustainable benefits (Bempah *et al.* 2019). In some instances, community members who supported CREMA establishment did not adequately understand the programme from the outset (Bempah *et al.* 2019), even though the villagers and local communities provided land for CREMA establishment (Ahmed and Gasparatos 2020). This suggests that external actors (NGOs and governmental and funding agencies) might have imposed their agenda on communities without adequate input from the local people

or regard for their interests (Agyare *et al.* 2015, Ahmed and Gasparatos 2020, Songorwa 1999).

Funding and implementing agencies of CREMAs often mention complexity, resource intensiveness and strict project ‘timelines and objectives’ as major barriers to robust democratic engagement of multiple user groups and traditional authorities (Baruah 2017). However, community participation in project implementation should go beyond informing, consultation and meeting attendance and instead embark on active participation in decision-making, partnership and delegated power (Arnstein 1969). Similarly, facilitating agencies should not assume that CREMA communities are homogeneous (Agyare *et al.* 2015a, 2015b). Instead, they should pay attention to the different interest groups, varied needs and unique cultural norms across social-ecological systems, gender, ethnicity, and social class when establishing CREMAs and better encourage community ownership, commitment and equity (Baruah *et al.* 2016).

The inclusion of the various groups in benefit-sharing is essential for effective devolution of authority. Failure to achieve this may result in less successful outcomes from the CBNRM initiatives (Ahmed and Gasparatos 2020). In Ghana, CREMA authorities and communities internally formulate their own benefit-sharing arrangements based on CREMA stakeholders’ values, perceptions of equity, and needs (Asare *et al.* 2013). However, a lack of clarity on the benefit-sharing mechanism in the CREMA policy has resulted in the exclusion of communities or specific groups within the communities from benefit-sharing, while others receive a disproportionate share (Agyare *et al.* 2015a, Baruah *et al.* 2016, Baruah 2017). For instance, in the Avu Lagoon CREMA in the Volta Region, the local community received only 25% of the revenue generated from ecotourism activities, while the remaining 75% went to the private partner (Ahmed and Gasparatos 2020). In the Murugu-Mognori CREMA, a shea nut certification project improving market access favoured specifically women (Gilli *et al.* 2020).

Moreover, imbalanced power relations between local chiefs /elites, external organisations and local communities pose a challenge to equal participation of local stakeholders (Ahmed and Gasparatos 2020, Baruah 2015, 2017). Actors⁵ in CREMA establishment pursue distinct and sometimes conflicting goals. The Wildlife Division of the Ghanaian Forestry Commission is the State agency behind the initiative, working together with the Forest Services Division (FSD) of the Forestry Commission and District Assemblies (DAs). For the past two decades, local, national and international non-governmental organisations (NGOs)⁶ play an essential role in implementing, funding, providing technical support and assistance to CREMAs (Asare *et al.* 2013, Baruah 2015). Funding for many CREMAs is provided by external donors⁷,

⁵ See Schusser *et al.* (2016) for a theoretical classification of actors involved in community forestry.

⁶ NGOs include Care International, the International Union for Conservation of Nature (IUCN), A Rocha, the Nature Conservation Research Centre (NCRC), and Agroforestry and Rural Development (Baruah 2015, Agyare *et al.* 2015a)

⁷ UNDP Global Environment Fund – Small Grants Programme (SGP) supported by the French Government, the European Commission, the Dutch Government.

usually over a short-term period (Baruah 2015). The pluralistic nature of natural resource management in Ghana (Asare *et al.* 2013, Gilli *et al.* 2020) warranted the incorporation of traditional chiefs into CREMA governance structures (e.g. formally in the CEC or as an ‘outside’ intermediary). The latter allows them to play a neutral role in decision-making and CREMA administration (Baruah 2017, Murray *et al.* 2019).

Achieving robust local community stakeholder participation can be challenging since a few local chiefs and elites typically engage with external actors promoting the initiatives (Baruah 2015, 2017). Traditional chiefs are highly respected as the head and representative of the people in rural communities across Africa. The decisions made by the chiefs on behalf of the entire community are binding on all community members (Agyare *et al.* 2015a, Murray *et al.* 2019), often obstructing broad participation of community stakeholders. In northern Ghana, such risk of exclusion is persistent for Fulani herders, who are categorically excluded from natural resource governance processes (Bayala *et al.* 2020). Also, the exclusion of women has been documented (e.g. Ahmed and Gasparatos 2020). In many cases, the – male – traditional heads and elderly wield power to either accept or reject the establishment of a CREMA in their communities without regard for women and other vulnerable residents (Gilli *et al.* 2020). The rejection of CREMA development in Kaden resulted in the exclusion of women from the better-paid certified shea market, operational in neighbouring CREMA communities (Gilli *et al.* 2020). Even though women may be nominated into the community resource management committee (CRMC) (Asare *et al.* 2013), only in a few instances have CREMAs shown potential to combat gender inequality and improve women’s participation in natural resources management. For instance, shea land formalisation through the establishment of the Murugu-Mognori CREMA in Northern Ghana allowed women to participate more fully in the collective management of their natural resources (Gilli *et al.* 2020). In contrast, in communities with a large immigrant population such as the Bontori CREMA, traditional elites and elderly influential males still exercise management control over the decision-making processes at a local level, excluding “ethnic outsiders” (Baruah 2015). Few cases of private sector involvement in CREMA have been documented. One such example highlights a partnership between CREMA communities with a certified shea trading company in the Murugu-Mognori CREMA (Gilli *et al.* 2020).

Unclear roles and responsibilities of government agencies lead to complexity and overlapping claims, sometimes stalling collaboration in project execution (Armah *et al.* 2014). Two successive decentralisation waves (post-1951 and post-1997) contributed to this ambiguity (Wardell and Lund 2006). The first wave decentralised decision-making power to lower levels of government by creating District Assemblies (DAs) (Kasanga and Kotey 2001, Wardell and Lund 2006, Murray *et al.* 2019). However due to a lack of fiscal decentralisation, DAs hold limited political and fiscal autonomy in reality and depend on central government and external funding for their budgets (Wardell and Lund 2006). This creates an imbalance

with externally funded NGOs, CSOs, and faith-based organisations in budgetary terms. Although DAs are responsible for providing technical assistance to CREMAs, such as infrastructure development (Baruah 2017), they receive no funds specifically for CREMA support (Murray *et al.* 2019).

The second decentralisation wave has led to a “proliferation of actors” and institutional fragmentation (Wardell and Lund 2006). The deconcentrated regional and district forest offices are constrained by limited autonomy while working in isolation from local government bodies such as the DAs (Wardell and Lund 2006). This institutional fragmentation and the weak ‘horizontal’ linkages between the DA departments (e.g. Departments of Food and Agriculture, Social Development, Trade and Industry, and Health) and CREMAs (Murray *et al.* 2019) restrict the provision of essential services and technical support towards achieving CREMA’s dual objectives of biodiversity conservation and socioeconomic development (Ahmed and Gasparatos 2020, Murray *et al.* 2019). For instance, the Department of Food and Agriculture could provide extension services and other technical expertise to boost agriculture, which is a major livelihood activity in most CREMA communities. Likewise, the Department of Trade and Industry could help promote tourism, the Department of Social Development could facilitate community care services and social welfare, and the Department of Health could provide reproductive health education and allied services to help address population growth (Murray *et al.* 2019).

Evolution of CBNRM in Zambia

In Zambia, the earliest CBNRM initiatives were established in 1983 and 1988, respectively. These were the Administrative Management Design for Game Management Areas (ADMAGE) implemented by the National Parks and Wildlife Service’s (NPWS) (Gibson 1999) and the Luangwa Integrated Resource Development Project (LIRDP) funded by the Norwegian Agency for Development Co-operation (NORAD). Both programmes sought to conserve wildlife by integrating the participation of residents in wildlife management (Gibson 1999). These programmes were devised in response to rapidly declining wildlife populations due to poaching and the need to invest in communities in the postcolonial period. This was based on the premise that giving communities the right to benefit from wildlife (via safari hunting, tourism, meat, etc.) would incentivise sustainable management (Child and Dalal-Clayton 2004).

ADMAGE was established with full government support through the NPWS and became the prevailing strategy for community development and conservation in Zambia’s Game Management Areas (GMAs) (Milupi *et al.* 2020). Originally designed to be a national programme, ADMAGE focused mainly on the Luangwa Valley (Child 2003). Under the ADMAGE programme, the government retained half (50%) of the revenues from wildlife, with the remaining half allocated to the NPWS (12.5%), wildlife management (20%), and community projects (17.5%) (Child 2003). As these numbers illustrate, the community-level benefits under ADMAGE were sparse compared to the revenue absorbed by

the government. Furthermore, the revenues for community projects were typically spent on infrastructure projects perceived to be a priority for the government but failing to address the basic needs of rural households (Lyons 2013). For this reason, ADMADE faced criticism for not being truly community-based and failing to both fiscally and democratically empower communities (Child 2003, Lyons 2013). However, ADMADE was commended for its village scout monitoring programme. Co-managed by the chiefs and the wildlife agency, the programme directly engaged community members by training and employing scouts to carry out field patrols, accompany hunters, conduct game counts, quota setting, and other management tasks (Child and Barnes 2010). The participatory nature of the scout monitoring programme may explain its success.

The second CBNRM programme, LIRDP, was initiated in the Lupande Game Management Area, bordering South Luangwa National Park. The objective was to reduce poaching through rural development (Child 2004). The trajectory of the LIRDP programme can be divided into two phases. The first phase (1988–1995) draws parallels to ADMADE’s top-down structure. The main mechanism for interaction between project managers and communities were meetings with the chiefs, who decided how to spend project revenues (Child and Dalal-Clayton 2004). Approximately 40% of wildlife income was returned to communities through community projects chosen by chiefs – often public works projects of which communities had little to no knowledge (Child 2003, Child and Dalal-Clayton 2004, Wainwright and Wehrmeyer 1998).

The second phase of the project (from 1996 onwards) marked a shift to decentralisation. The new CBNRM policy defined village action groups (VAGs) as the primary decision-makers (Child 2003, Child and Dalal-Clayton 2004). VAGs consisted of ten people elected by the community to implement decisions made by the community and report quarterly to the whole community on all programme activities, particularly finances (Child and Dalal-Clayton 2004). Within this new participatory structure, 80% of wildlife revenues were controlled by communities (Child 2003). By 1998, community members reported feeling a sense of ownership over wildlife, knew the price of hunting licenses, and were investing in community projects (Child and Dalal-Clayton 2004).

This change to a bottom-up approach was not without challenges. Tensions developed between the project and chiefs, some of whom felt the change undermined their traditional authority (Child and Dalal-Clayton 2004). A lengthy process was required to build managerial capacity at the local level and renegotiate revenue distribution to chiefs and communities (Child 2003, Child and Dalal-Clayton 2004). Nevertheless, equitable benefit distribution and transparent decision-making processes were the strengths of LIRDP’s second phase and required ongoing efforts to maintain and adapt as needed. Further, NORAD began streamlining the project budget, increasing pressure for LIRDP to become self-sufficient (Child and Dalal-Clayton 2004).

External funding for both LIRDP and ADMADE concluded around 2002, ultimately leading to the end of the programmes

(Milupi *et al.* 2020). These inaugural CBNRM initiatives shaped Zambia’s present CBNRM landscape. A key takeaway from LIRDP and ADMADE is the power of participatory democracy. Both LIRDP and ADMADE began with an organisational structure focused on representation, electing or (in the case of a chief) pre-determining an individual to make decisions on behalf of the community (Child 2003). Under this structure, meaningful (i.e. inclusive and equitable) engagement with the broader community was missing in both programmes. In the second phase of LIRDP, the emphasis shifted from representation to participation. Communities were driving decision-making via the person they elected to the Village Action Groups (VAGs) and informing the VAG how to act on their behalf (Child 2003). In this scenario, there was downward accountability: the committee was accountable to its constituents, and more revenue and decision-making power flowed back to the community level. Agrawal and Ribot (1999) reported similar findings in a study analysing four CBNRM initiatives in Asia and Africa. They found the presumed benefits of decentralisation were only realised when empowered local actors were downwardly accountable (Agrawal and Ribot 1999).

Contemporary CBNRM in Zambia

Today, CBNRM is still very much promoted as a natural resource management strategy throughout the country. However, since the days of LIRDP and ADMADE, there have been several pivotal changes. First, the updated Forest Act (2015) has launched a new era of possibilities for CBNRM in Zambia. Historically, CBNRM has focused on wildlife, with legislation never fully devolving rights to communities. The Forest Act decentralises forest management through Community Forest Management (CFM) and Joint Forest Management (JFM) schemes (GRZ 2015b), legally backing community forestry for the first time. Establishing a Community Forest Management Group secures community rights over forests and benefits from forest products (Davis *et al.* 2020, Nelson *et al.* 2020). Community forestry initiatives emerging across the country include timber, honey, mushrooms, and carbon credits produced through REDD+ (Davis *et al.* 2020). In the Eastern Province, large-scale initiatives are being undertaken by BioCarbon Partners and Community Markets for Conservation (COMACO) in partnership with the Forestry Department, Department of National Parks and Wildlife, and communities to develop community forestry management across one million hectares of forest (Davis *et al.* 2020, Nelson *et al.* 2020).

While the Forest Act does not issue rights over wildlife, it can be used to improve the sustainable management of wildlife habitat in multi-use Game Management Areas (Nelson *et al.* 2020). However, there have been recent policy developments regarding community rights and wildlife. The recent 2018 Wildlife Policy clearly states intent to devolve rights, costs, benefits, and wildlife management to communities. It also details the importance for improved departmental collaboration (Davis *et al.* 2020). These amendments are encouraging but have yet to be implemented.

Another significant development is the Zambia Community Based Natural Resources Management Forum (ZCBNRMF). The ZCBNRMF serves as an umbrella organisation for donors, NGOs, CBOs, and the private and public sector with a stake in CBNRM (ZCBNRM 2020). The ZCBNRMF was established in 2005 by the former Ministry of Tourism, Environment, and Natural Resources with support from the World Wildlife Fund. Today, the forum is supported by the Government of the Republic of Zambia (GRZ) and national and international donors. Funding is either short-term (12 months) or long-term (up to five years) (Key Respondent, personal communication, June 30 2021). The forum is also financed through membership fees, paid for by over 100 organisations and individuals ranging from NGOs, Faith Based Organisations, private sector, traditional authorities, and academic and research institutions (ZCBNRM 2020). The forum's focus is "creating secure livelihoods for communities in Zambia through sustainable utilisation of natural resources that includes forestry, fisheries, water, agriculture, land, and wildlife" (ZCBNRM 2020).

The forum has the following thematic working groups: policy and legislation, management-oriented monitoring systems, performance monitoring and evaluation, community-based enterprise development, capacity building, and CBNRM training (ZCBNRM 2020). These groups provide support to all facets of CBNRM initiatives. For example, helping communities engage with existing policies (such as the Forest Act) they may not be aware of or lack the capacity to do so. A recent example of a ZCBNRM Forum initiative (with additional support from the UNDP small grants office) is the Indigenous and Local Community Conservation Territories and Areas (ICCAs) in Zambia. ICCAs are indigenous-managed territories that conserve nature and livelihoods through traditional knowledge and practices. Supporting ICCAs strengthens indigenous community institutions and sustains natural resources outside of formal protected areas (ICCA-GSI 2017).

Having a coordinating body, like the ZCBNRM Forum, is a critical step in creating sustainable CBNRM initiatives. The ZCBNRM Forum helps create linkages between stakeholders such as communities, donors, government, and NGOs, ensuring that stakeholder expectations are negotiated and understood from the outset and multi-stakeholder relationships are maintained (O'Connor *et al.* 2021b). Too often, well-intended projects follow narrowly defined and pre-determined objectives required by donors or logframe-style project management and tend to disappear when funding ends (Lyons 2013, Sayer and Wells 2004). This structure fails to account for local objectives and perceptions of project success or failure, and thus, lessons learned are not often applied in future project implementation. A second-generation CBNRM project in Zambia highlights these challenges.

The Community Based Natural Resource Management and Sustainable Agriculture (CONASA) project operated from 2001–2004 (pre-ZCBNRM Forum) (Lyons 2013). The project ended when the donor wanted to take a different approach, and the three NGOs running CONASA could not agree on a path forward or access alternative funding (Lyons

2013). An analysis evaluating whether the project failed or was failed by its allies (NGOs and donors) shows this is a circular question. The more fundamental question is how to maintain relationships in CBNRM projects, particularly beyond project funding (Lyons 2013). CBNRM projects engage multiple stakeholders at multiple levels. As we saw with the second phase of LIRDP, transparent decision-making processes required ongoing effort and re-evaluation as needs evolved. The ZCBNRM Forum acts as a bridging organisation and helps facilitate ongoing processes of negotiation and monitoring and evaluation to prevent project collapse, like in the case of CONASA.

FROM CBNRM TO INTEGRATED LANDSCAPE APPROACHES: LESSONS LEARNED TO GUIDE THE FUTURE

A review of Ghana and Zambia's past and present experiences with CBNRM reveals both positive characteristics and persistent challenges. Here we summarise these and identify potential options to help move towards more integrated landscape-scale interventions and finally, highlight outstanding needs.

Positive characteristics

Although CBNRM initiatives in Ghana and Zambia have had variable outcomes, in some cases they have improved rights/access to natural resources, improved local livelihoods and enhanced biodiversity conservation. Importantly, this was achieved through a model that recognises livelihoods and biodiversity conservation are inextricably linked. For decades, formally recognised conservation strategies (i.e. state law) have been rooted in colonial policies restricting access to natural resources. Furthermore, most of the world's biodiversity exists outside PAs, in complex, multi-functional landscapes (Kremen and Merenlender 2018). Therefore, it is critical to focus on conservation strategies within these complex landscapes and CBNRM provides a pathway to do so. Each generation of CBNRM initiatives in Ghana and Zambia have helped shape new policies that carry forward the positive traits of CBNRM and attempt to amend and adapt to evolving challenges.

The key positive attributes of CBNRM relate to having a well-established and functional institutional structure at the community level with clearly recognised decision-making authority. Our review shows that these structures work best when implemented within a participatory, democratic process with initiatives tailored to local needs. Similarly, bridging organisations, such as the ZCBNRM Forum in Zambia, play an important role in facilitating multi-stakeholder collaboration beyond the community scale. We also identified important characteristics that influence CBNRM outcomes. For example, it is suggested that when sustainable livelihood programmes are embedded within CBNRM design, it can lead to enhanced economic diversification and infrastructure development. Finally, several authors highlight fully devolving rights to communities as necessary for effective CBNRM.

Challenges

While an established institutional structure was rightly acknowledged as a positive characteristic, this structure was often embedded within a broader, fragmented institutional framework with weak horizontal and vertical linkages. Although CBNRM is an approach centred around one stakeholder group – the community – it requires multi-scale collaboration both within the landscape and with other stakeholders influencing the landscape (i.e. government departments, neighbouring communities, travelling herders, private companies, etc.). Moreover, communities are not homogeneous; they come with their own power structures and social dynamics. With this said, consensus among stakeholders within the community and clear communication between community representatives and their constituents are key to CBNRM. Formally recognised FPIC will enhance community participation through inclusive decision-making that does not cause negative impacts on more vulnerable members and discourages elite capture of benefits. Through FPIC, communities can table their concerns, preferences, and priorities at project inception, and then as an ongoing process, instead of agreeing to pre-determined project goals and ideas imposed by external actors (Springer *et al.* 2011). Moving beyond the community, leveraging potential CBNRM opportunities demands collaboration across actors and scales (e.g. between NGO and community, state and community, across state departments). Collaboration between these actors is necessary for communities and supporting agents to engage with policies that support potential CBNRM opportunities, like joint forest management or conservation agriculture. On the other hand, weak institutional collaboration across departments such as Forestry, Agriculture, and Social Development results in missed opportunities to support CBNRM objectives through extension services and technical expertise.

We identify several other related governance challenges constraining CBNRM that can be categorized within two common themes. Firstly, a lack of inclusive and equitable local participation risks reinforcing top-down structures, with external forces (i.e. donors, NGOs or government) and community elites driving project objectives and decision-making. In doing so, CBNRM can perpetuate business-as-usual approaches by not fundamentally addressing imbalanced vertical and horizontal power relations and skewed community rights. Secondly, challenges achieving long-term sustainability constitute an overarching theme in both countries. A failure to build local capacity and a sense of ownership inhibits long-term sustainability. Furthermore, the establishment of many CBNRM initiatives is externally driven, with NGOs and donors providing logistics, technical and financial support. Although this support is invaluable for setting up, it is often short-term, leaving communities with little capacity to maintain activities once external support ends. Finally, a lack of attention to the intersection between local realities and supra-landscape dynamics has resulted in poor collaboration across scales of governance, particularly with government departments and/or the private sector. The lack of such collaboration renders CBNRM initiatives vulnerable to broader influential political-economic forces.

Overcoming challenges/moving ahead

Strengthening CBNRM to move towards more integrated, inclusive, and sustainable landscape-scale governance requires greater attention to the interlinked challenges that characterise current initiatives in Ghana and Zambia. Learning from both the positive and negative recent experiences highlighted here will undoubtedly help. Beyond this, we suggest that learning from the broader literature on environmental governance can further elevate CBNRM progress. In particular, principles for, and tools and strategies employed by integrated landscape approaches offer potential (see Table 1).

Integrated landscape approaches are predicated on negotiation between multiple stakeholders representing multiple scales and focused on addressing issues of common concern (Sayer *et al.* 2013). ILAs act as an organising framework for disentangling the complex nature of landscapes. This approach creates a space for actors with a vested interest in a landscape to come together and discuss potential pathways forward (Sayer *et al.* 2015). Enabling these types of negotiations are invaluable for identifying potential synergies and trade-offs across stakeholder groups and scales of governance (Ros-Tonen *et al.* 2018). This is particularly useful for creating feedback loops between policy and practice relevant to local socio-economic and environmental contexts (Reed *et al.* 2015, 2020a).

To enable such dialogue, ILAs typically utilise multi-stakeholder platforms and bridging organisations that can navigate the spaces between practice, research, policy, and commercial entities (Reed *et al.* 2019)—which would help alleviate two of the key challenges above related to multi-scale collaboration and inclusive participation. ILA experience in Uganda showed increased stakeholder capacity as a result of creating a multi-stakeholder platform for residents within the landscape (Omoding *et al.* 2020). Of course, these alone will not suffice, but ILAs further rely on a range of tools and methods that can also help. For example, ILAs advocate using a range of established methods to improve diagnosis, decision-making and monitoring and evaluation (Reed *et al.* 2020b). Perhaps most pertinent amongst these for strengthening CBNRM in Ghana and Zambia is the combined use of historical trends analysis and scenario building to support the development of participatory theories of change that outline a shared vision and management plan for the future of the landscape of concern. Such methods can be further complemented with the use of capacity needs assessment to identify actions required to build capacity for improved landscape governance and natural resource management.

ILAs are meant to be flexible, adapted to specific landscapes and aligned with locally defined goals and realities. Recent advances have also identified methods to better monitor and evaluate the process of multi-stakeholder negotiations (Kusters *et al.* 2018) and the influence of power dynamics within such processes (Morrison *et al.* 2019). Time and resources must be allocated to building acceptance and capacity of underrepresented and marginalized stakeholders (i.e. women, Fulani herders, migrants, etc.). A “critical mass” (at least 30%) of women can strengthen women’s bargaining power in decision making processes and platforms (Agarwal

TABLE 1 *Moving beyond CBNRM to Integrated Landscape Approaches*

Positive CBNRM Characteristics in Theory	CBNRM Challenges in Practice	ILA principles (based on Sayer <i>et al.</i> 2013)	ILA Strategies and Tools	Recommendations	Recommended Reading
Inclusive and equitable participation and multi-stakeholder collaboration; participatory democracy	Limited governance capacity; corruption among local NGOs; exclusion of marginalized groups; inter- and intra-community power imbalances; elite capture; lack of sense of ownership	<ul style="list-style-type: none"> - Multiple stakeholders - Common concern entry point - Negotiated and transparent change logic - Multiple scales - Clarification of rights and responsibilities - Capacity building - Multifunctionality 	Negotiation, dialogue and multi-stakeholder collaboration in Multi-stakeholder Platform (MSP); joint development of a Theory of Change based on common concern entry points; capacity building; joint learning; transdisciplinary research	<ul style="list-style-type: none"> - Democratically elected representatives - Co-created or community-defined objectives - Iterative stakeholder engagement - Facilitating social learning activities to build capacity of underrepresented and marginalized groups such as women, long-settled migrants and Fulani herders (Cronkleton <i>et al.</i> 2021). - A minimum of 30% women representation on committees, at meetings, CBNRM membership (Agarwal 2001) - Formally recognised FPIC helps communities table their concerns, preferences, and priorities at project inception, and then as an ongoing process (Springer <i>et al.</i> 2011). 	Agarwal 2001; Agrawal and Ribot 1999; Cronkleton <i>et al.</i> 2021; Ribot 2002; Sarmiento Barletti <i>et al.</i> 2020; Springer <i>et al.</i> 2011
Established institutional structure	Fragmented broader institutional framework; lack of multi-stakeholder collaboration	<ul style="list-style-type: none"> - Multiple scales - Multiple stakeholders - Clarification of rights and responsibilities 	Brokerage; improve horizontal/vertical linkages through MSPs and bridging actors and organisations; enhance collaboration with the government; develop a supportive institutional framework	<ul style="list-style-type: none"> - Creating multi-stakeholder platforms for joint learning and negotiation - Umbrella/bridging organisations (such as the ZCBNRM Forum) - Securing political partners 	Kusters <i>et al.</i> 2018; Omoding <i>et al.</i> 2020; Ros-Tonen <i>et al.</i> 2018
Tailored to the local context	Lack of intersection between local realities and supra-landscape dynamics	<ul style="list-style-type: none"> - Common concern entry point - Participatory and user-friendly monitoring - Adaptive management 	Methods (e.g. historical trends, scenario building)	<ul style="list-style-type: none"> - Co-created objectives - Iterative stakeholder engagement via multi-stakeholder platform, bridging organisation, ongoing monitoring and evaluation 	Kusters <i>et al.</i> 2018; Reed <i>et al.</i> 2020b; van Ewijk and Ros-Tonen 2021; Sayer <i>et al.</i> 2015
Devolved rights	Lack of clarity on programme objectives and benefit-sharing	<ul style="list-style-type: none"> - Clarification of rights and responsibilities - Common concern entry point - Negotiated and transparent change logic 	-Clear rights and responsibilities; enabling legal framework	<ul style="list-style-type: none"> - Co-created objectives - Negotiated and agreed upon benefit distribution plan (cash and in-kind) - Supportive policies recognising community rights 	Campese <i>et al.</i> 2009; Dalupan <i>et al.</i> 2015; Ribot 2002

TABLE 1 Continued

Positive CBNRM Characteristics in Theory	CBNRM Challenges in Practice	ILA principles (based on Sayer et al. 2013)	ILA Strategies and Tools	Recommendations	Recommended Reading
Sustainable and long-term process	<ul style="list-style-type: none"> - Lack of long-term funding; donor dependency; lack of sense of ownership - Lack of local capacity for CBNRM implementation and maintenance 	<ul style="list-style-type: none"> - Resilience - Multiple stakeholders - Capacity building - Participatory monitoring and evaluation - Adaptive management 	<ul style="list-style-type: none"> - Identify locally embedded entry points; involve the private sector 	<ul style="list-style-type: none"> - Supportive policies/legal backing - Identify locally embedded entry points for implementation, such as NRM schemes, private-sector-led certification and sustainable sourcing schemes, etc. - Work with umbrella/bridging organisations (such as ZCBNRM Forum) - Develop local capacity in entrepreneurship - Conceptual framework/ToC to analyse process/outcomes - Engage the private sector 	Chia and Sufo 2015; Nelson et al. 2020; Reed et al. 2020a; Ros-Tonen et al. 2018

2001). Recent work has shown social learning, a process of “iterative reflection” that occurs when experiences, ideas and environments are shared with others can improve the influence of underrepresented groups (Cronkleton et al. 2021). Social learning can be cultivated through participatory methods (i.e. facilitated knowledge exchange, auto-appraisal, and participatory action research) repeated over time, to build trust and confidence (Cronkleton et al. 2021). Applying such methods to CBNRM initiatives can enhance transparency and inclusion in decision-making processes, strengthen capacity, and clarify roles and responsibilities. In doing so, trust can be built, and collective action motivated (Omoding et al. 2020, Acheampong et al. 2020, Asubonteng et al. 2020).

Emerging challenges and opportunities for Integrated Landscape Approaches

It is said that landscape-scale interventions are being implemented worldwide (Estrada-Carmona et al. 2014, Milder et al. 2014, García-Martín et al. 2016, Zanzanaini et al. 2017, Reed et al. 2017, 2020a). As such, they are frequently promoted as implementing pathways to meet climate, environment and restoration goals (Chazdon et al. 2009, Boyd et al. 2018, Ros-Tonen et al. 2018, Stickler et al. 2018, Mansourian and Sgard 2019, Reed et al. 2020a).

Lack of evidence of landscape approaches in practice

While landscape approaches are conceptually appealing and may in theory address the shortcomings of CBNRM, the extent to which they can be readily translated into practice remains largely untested (Reed et al. 2017, 2020a, Vermunt et al. 2020). For example, having a multi-stakeholder platform

in place does not guarantee meaningful participation and collaboration. Some stakeholders may be omitted, others may choose not to attend, and existing power dynamics can influence levels of trust, negotiations, and decision-making (Kusters et al. 2018, Sayer et al. 2013, 2016, Sessin-Dilascio et al. 2015). The influence and legitimacy of multi-stakeholder platforms have also come under question. Multi-stakeholder platforms designed to satisfy donors or meet a project requirement may not have real power to influence change or effectively engage stakeholders, deterring participation (Larson and Sarmiento Barletti 2020). While many studies on integrated landscape approaches claim successful outcomes, they are often not supported with robust evidence that explains process and outcomes (Reed et al. 2016). Moreover, as with other multi-stakeholder partnerships, failures and hard lessons learned are seldom reported, impeding learning (Schut et al. 2016, van Ewijk and Ros-Tonen 2021).

ILA Sustainability and Private Sector Engagement

The effective transition towards integrated landscape approaches requires time, resources, and commitment from a broad constituency (Garcia-Barrios et al. 2020, Omoding et al. 2020, Acheampong et al. 2020). How ILA (and CBNRM) initiatives confront these challenges is an ongoing concern. Sustaining ILAs requires moving from short-term project timelines to long-term processes (Sayer et al. 2016, Sunderland et al. 2020). ILA experiences from Africa and South America have clearly shown the benefit of long-term engagement and support (Sayer et al. 2016, Garcia-barrios et al. 2020, Nelson et al. 2020). However, securing long-term financing and sustaining stakeholder motivation for continued

engagement will likely be an ongoing challenge for many initiatives in Ghana and Zambia. Therefore, identifying locally embedded entry points for ILA implementation (Ros-Tonen *et al.* 2018) and additional and diverse support mechanisms will be necessary, and moving towards increased local ownership is likely preferable.

Government can provide additional financial support (if available) for capacity building. If funding is not available, the government can address the challenge of ILA sustainability by establishing an enabling institutional framework. As the review has highlighted, policies that transfer decision-making power and revenues from natural resource management back to the community foster an increased sense of ownership and better outcomes. Similarly, ILA experience from Ghana showed that government support and, crucially, a willingness to embrace participatory approaches was fundamental to success (Ros-Tonen *et al.* 2014).

In addition to policies that devolve rights and responsibilities over natural resource management, government support via policies that encourage private sector engagement in ILA/CBNRM initiatives would be beneficial. Collaborating with the private sector is an opportunity for capacity building and diversifying sources of support. However, such collaborative processes require careful planning and facilitation to ensure that representation is indeed inclusive and fair. Moreover, early experience from ongoing ILAs in Ghana, Zambia and Indonesia suggest a reluctance from the private sector to engage in collaborative decision-making (Reed *et al.* 2020a). In contrast, Ros-Tonen *et al.* (2018) identified several cases where the private sector had a prominent and even dominant role in what they termed integrated landscape-level initiatives (ILLIs). These are not full-fledged integrated ILAs but target actors and sustainability issues at the landscape level, often at the interface of global value chains and sourcing areas in tropical landscapes. However, scepticism persists about the role and actual motivation of private sector actors in environmental governance (Reed *et al.* 2020a, Ros-Tonen *et al.* 2018) given their continued unsustainable exploitation of global resources.

Wardell *et al.* (2021) explain how over the past couple decades, the private sector has defined their own corporate responsibility criteria and evaluated their own sustainability performance using internal criteria and certification standards. Oftentimes the private sector will defer to Voluntary Sustainability Standards (VSS), such as certification schemes, however these risks excluding smallholder actors. For example, smaller companies may not have the capital or resources to comply with certification standards, dissuading them from pursuing certification. On the other end, smallholder producers may not be able to upgrade their production systems to meet the certification standards necessary for working with larger companies (Wardell *et al.* 2021). A combination of policies and regulations such as tax incentives, social and environmental standards, and a monitored FPIC process could encourage private sector participation in ILA initiatives. Establishing how to effectively engage or otherwise assess private sector activities and objectives will be crucial to the success of CBNRM and help ILAs moving forward.

CONCLUSION

Our review of the historical land-use trajectories of Ghana and Zambia and the subsequent emergence of CBNRM reveals similar experiences across both countries. In Ghana and Zambia, colonial authorities exploited the abundant natural resources for their own economic and political interests, allocating little resources for the subsistence needs of local people. Years of colonial dominance dwindled customary leadership institutions creating a pluralistic land management system characterised by tension and conflict. Colonial power and forestry policies vested lands in the State, leaving many local people landless, displaced and/or excluded from their historical lands, thus perpetuating the “fortress conservation” model of national park establishment and forest reservation.

Successive post-colonial governments in Ghana and Zambia retained the colonial structure and further centralised control over land and natural resources. However, decades of colonial and post-colonial exclusion of local communities from decision-making and benefit sharing, coupled with growing criticism of the inherent failures of the protected area network resulted in the emergence of community-based natural resource management (CBNRM). Our paper found that the benefits of CBNRM in Ghana and Zambia have been variable. In some cases, CBNRM has improved rights and resource access, established a democratic institutional structure at the local level, and is a conservation approach that can be tailored to the local context. Persistent CBNRM challenges across both countries include multi-scale collaboration, inclusive and equitable local participation, and long-term sustainability due to a lack of local capacity and exit of external support at the end of project funding.

Despite these challenges, CBNRM is a step in the right direction, but for CBNRM to work, it requires cooperation from landscape actors beyond the community, making ILA frameworks conceptually appealing. Integrated landscape approaches show potential to address this challenge, as they are predicated on meaningful and inclusive participation and collaboration between stakeholders to sustainably manage multi-functional landscapes. As this paper has highlighted, CBNRM’s positive traits underpin the ILA concept, making them an excellent starting point for scaling up to landscape scale initiatives. Despite their ubiquity in development discourse, there is still limited evidence of landscape approaches in practice. We urge landscape practitioners to consider how the lessons learned from CBNRM are being addressed in practice, as they represent both challenges and opportunities for landscape approaches to improve natural resource management.

In addition to the overarching need for more empirical evidence of ILAs in practice, we suggest further research is needed to better understand what conditions must be in place for equitable and integrated landscape governance, and if increased collaboration between landscape actors results in more sustainable land use. Future efforts need to address ways to shift from short-term project funding to locally embedded long-term support processes for ILA initiatives, and conservation and development initiatives in general.

Relatedly, further investigation of potential policies and regulations to incentivise private sector engagement in natural resource management has potential to build local capacity and improve funding support for communities. Finally, there is much to be learned on the opportunities and constraints of using existing CBNRM initiatives as entry points for ILAs.

ACKNOWLEDGEMENTS

This study is part of the CGIAR Research Program on Forests, Trees and Agroforestry (CRP-FTA). This collaborative programme aims to enhance the management and use of forests, agroforestry and tree genetic resources across the landscape from forests to farms. CIFOR leads CRP-FTA in partnership with Bioversity International, CATIE, CIRAD and the International Center for Tropical Agriculture and the World Agroforestry Centre. Funding for this study was provided by the International Climate Initiative (IKI) of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) grant 18_IV_084 and the United States Agency for International Development (USAID) Forest and Biodiversity Office. The authors are grateful to the anonymous reviewers for their constructive and helpful comments.

REFERENCES

- ACHEAMPONG, E., INSAIDOO, T.F.G., and ROS-TONEN, M.A.F. 2016. Management of Ghana's modified taungya system: Challenges and strategies for improvement. *Agroforestry Systems* **90**: 659–674.
- ACHEAMPONG, E.O., SAYER, J., MACGREGOR, C., and SLOAN, S. 2020. Application of landscape approach principles motivates forest fringe farmers to reforest Ghana's degraded reserves. *Forests* **11**(4): 411.
- ACHEAMPONG, R.A., and IBRAHIM, A. 2016. One nation, two planning systems? Spatial planning and multi-level policy integration in Ghana: mechanisms, challenges and the way forward. *Urban Forum* **27**(1): 1–18.
- ADDAE, B., and OPPELT, N. 2019. Land-use/land-cover change analysis and urban growth modelling in the Greater Accra Metropolitan Area (GAMA), Ghana. *Urban Science* **3**(1): 26.
- AGARWAL, B. 2001. Participatory exclusions, community forestry, and gender: An analysis for South Asia and a conceptual framework. *World Development* **29**(10): 1623–1648.
- AGRAWAL, A., and GIBSON, C.C. 1999. Enchantment and disenchantment: the role of community in natural resource conservation. *World Development* **27**(4): 629–649.
- AGRAWAL, A., and RIBOT, J. 1999. Accountability in decentralization: A framework with South Asian and West African cases. *The Journal of Developing Areas* **33**(4): 473–502.
- AGYARE, A. MURRAY, G., DEARDEN, P., and ROLLINS, R. 2015a. Conservation in context: Variability in desired and perceived outcomes of community based natural resources governance in Ghana. *Society and Natural Resources* **28**(9): 975–994.
- AGYARE, A. MURRAY, G., DEARDEN, P., and ROLLINS, R. 2015b. Understanding inter-community performance assessments in community-based resource management at Avu Lagoon, Ghana. *Environment, Development and Sustainability* **17**(6): 1493–1508.
- AHMED, A., and GASPARATOS, A. 2020. Reconfiguration of land politics in community resource management areas in Ghana: Insights from the Avu Lagoon CREMA. *Land Use Policy* **97**: 12.
- ANIAH, P., and YELFAANIBE, A. 2016. Learning from the past: the role of sacred groves and shrines in environmental management in the Bongo District of Ghana. *Environmental Earth Sciences* **75**(75): 916.
- ANTWI, Y., ROTH, M., and O'SULLIVAN, R. 2018. *Tree tenure and benefit sharing in cocoa growing areas of Ghana: Improving tenure security to support sustainable cocoa pilot*. USAID Tenure and Global Climate Change Program, Washington, DC, USA.
- ARMAH, F.A., LUGINAAH, I., YENGOH, G.T., TAABAZUING, J., and YAWSON, D.O. 2014. Management of natural resources in a conflicting environment in Ghana: Unmasking a messy policy problem. *Journal of Environmental Planning and Management* **57**(11): 1724–1745.
- ARNSTEIN S. 1969. A ladder of citizen participation. *Journal of the American Institute of Planners* **35**: 216–224.
- ARSLAN, A., MCCARTHY, N., LIPPER, L., ASFAW, S., and CATTANEO, A. 2014. Adoption and intensity of adoption of conservation farming practices in Zambia. *Agriculture, Ecosystems and Environment* **187**: 72–86.
- ASAAGA, F.A., HIRONS, M.A., and MALHI, Y. 2020. Questioning the link between tenure security and sustainable land management in cocoa landscapes in Ghana. *World Development* **130**: 104913.
- ASARE, R.A., KYEI, A., and MASON, J.J. 2013. The community resource management area mechanism: a strategy to manage African forest resources for REDD+. *Philosophical Transactions of the Royal Society B: Biological Sciences* **368**(1625): 1–9.
- ASUBONTENG, K., PFEFFER, K., ROS-TONEN, M., VERBESSELT, J., and BAUD, I. 2018. Effects of tree-crop farming on land-cover transitions in a mosaic landscape in the Eastern Region of Ghana. *Environmental Management* **62**(3): 529–547.
- ASUBONTENG, K.O., ROS-TONEN, M.A., BAUD, I., and PFEFFER, K. 2020. Envisioning the future of mosaic landscapes: Actor perceptions in a mixed cocoa/oil-palm area in Ghana. *Environmental management* **62**(1): 1–19.
- ATTUQUAYWFIIO, D.K., and FOBIL, J.N. 2005. An overview of biodiversity conservation in Ghana: Challenges and prospects. *West African Journal of Applied Ecology* **7**: 1–18.
- BARBOSE, P. (ed.). 2020. *Urban Ecology: Its Nature and Challenges*. CAB International, Wallingford Oxfordshire; Boston, MA.

- BARUAH, M. 2015. *Effect of institutional choices on representation in a community resource management area in Ghana*. (No. RFGI Working Paper No. 22). CODESRIA, Dakar, Senegal.
- BARUAH, M., BOBTOYA, S., MBILE, P., and WALTERS, G. 2016. Governance of restoration and institutions: Working with Ghana's community resource management areas. *World Development Perspectives* 3: 28–41.
- BARUAH, M. 2017. Facipulation and elite formation: Community resource management in Southwestern Ghana. *Conservation and Society* 15(4): 371–383.
- BAUDRON, F., MWANZA, H., TRIOMPHE, B., and BWALYA, M. 2007. *Conservation agriculture in Zambia: A case study of Southern Province*. African Conservation Tillage Network, Centre de Coopération Internationale de Recherche Agronomique pour le Développement, Food and Agriculture Organization of the United Nations.
- BAYALA, E.R.C., DJOUDI, H., ROS-TONEN., and ZIDA, M. 2020. Context for landscape approach implementation in the Western Wildlife Corridor Landscape (Northern Ghana). In: REED, J., ROS-TONEN, M.A.F., and SUNDERLAND, T. (2020). *Operationalizing integrated landscape approaches in the tropics*. Center for International Forestry Research (CIFOR), Bogor, Indonesia. 126–147pp.
- BEMPAH, G., DAKWA, K.B., and MONNEY, K.A. 2019. Evaluation of the community resources management area (CREMA) programme around Ankasa conservation area, Ghana. *Cogent Environmental Science* 5(1): 1–13.
- BENEFOH, D.T., VILLAMOR, G.B., VAN NOORDWIJK, M., BORGEMEISTER, C., ASANTE, W.A., and ASU-BONTENG, K.O. 2018. Assessing land-use typologies and change intensities in a structurally complex Ghanaian cocoa landscape. *Applied Geography* 99: 109–119.
- BINOT, A., BLOMLEY, T., COAD, L., NELSON, F., ROE, D., and SANDBROOK, C. 2009. Community involvement in natural resources management in Africa – regional overviews. In ROE, D., NELSON, F., and SANDBROOK, C. (eds.), *Community management of natural resources in Africa: Impacts, experiences and future directions*. *Natural Resource Issues No. 18*. International Institute for Environment and Development, London, UK.
- BOAKYE, K.A., and BAFFOE, K.A. 2006. Trends in forest ownership, forest resource tenure and institutional arrangements: A case study from Ghana. Kumasi, Ghana.
- BOATENG, P.K. 2017. Land access, agricultural land use changes and narratives about land degradation in the savannahs of northeast Ghana during the pre-colonial and colonial periods. *Social Sciences* 6(1): 1–26.
- BOYD, W.I., STICKLER, C.L., DUCHELLE, A.E., SEYMOUR, F.R., NEPSTAD, D.A., BAHAR, N.H., and RODRIGUEZ-WARD, D.A. 2018. *Jurisdictional approaches to REDD+ and low emissions development: Progress and prospects*. World Resources Institute Working Paper, Washington, DC, USA.
- BRADLEY, A., MICKELS-KOKWE, G., and MOOMBE, K.B. 2019. *Scaling up community participation in forest management through REDD+ in Zambia*. FAO, Rome.
- BRAIMOH, A.K. 2006. Random and systematic land-cover transitions in northern Ghana. *Agriculture, ecosystems and environment* 113(1–4): 254–263.
- BROCKINGTON, D. 2002. *Fortress conservation: the preservation of the Mkomazi Game Reserve, Tanzania*. Indiana University Press, Bloomington, USA.
- BÜSCHER, B., SULLIVAN, S., NEVES, K., IGOE, J., and BROCKINGTON, D. 2012. Towards a synthesized critique of neoliberal biodiversity conservation. *Capitalism Nature Socialism* 23(2): 4–30.
- CAMPESE, J., SUNDERLAND, T., GREIBER, T., and OVIEDO, G. (eds.) 2009. *Rights-based approaches: Exploring issues and opportunities for conservation*. CIFOR and IUCN. Bogor, Indonesia.
- CHAZDON, R.L., HARVEY, C.A., KOMAR, O., GRIFFITH, D.M., FERGUSON, B.G., MARTÍNEZ-RAMOS, M., MORALES, H., NIGH, R., SOTO-PINTO, L., VAN BREUGEL, M., and PHILPOTT, S.M. 2009. Beyond reserves: A research agenda for conserving biodiversity in human-modified tropical landscapes. *Biotropica* 41(2): 142–153.
- CHENOWETH, F., KNOWLES, J., and NGENDA, G. 1995. Settlement programs. In ROTH, M., and SMITH, S.G. (eds.), *Tenure, Land Markets and Institutional Transformation in Zambia*. Land Tenure Center, University of Wisconsin Madison, Madison, USA.
- CHIA, E.L., and SUFO, R.K. 2016. A situational analysis of Cameroon's Technical Operation Units (TOUs) in the context of the landscape approach: critical issues and perspectives. *Environment, Development and Sustainability* 18(4): 951–964.
- CHIDUMAYO, E.N. 1987. A shifting cultivation land use system under population pressure in Zambia. *Agroforestry Systems* 5(1): 15–25.
- CHILD, B. 2003. *Origins and efficacy of modern community based natural resources management (CBNRM) practices in the southern African region*. IUCN Publication.
- CHILD, B. 2004. The Luangwa integrated rural development project, Zambia. In FABRICIUS, C., KOCH, E., TURNER, S., and MAGOME, H. (eds). *Rights, resources and rural development. Community-based natural resource management in Southern Africa*. 1st edition, Earthscan, London, UK.
- CHILD, B., and BARNES, G. 2010. The conceptual evolution and practice of community-based natural resource management in southern Africa: Past, present and future. *Environmental Conservation* 37(3): 283–295.
- CHILD, B., and DALAL-CLAYTON, B. 2004. Transforming approaches to CBNRM: Learning from the Luangwa experience in Zambia. In MCSHANE, T., and WELLS, M. (eds.). *Getting biodiversity projects to work: Towards more effective conservation and development*. Columbia University Press, New York, USA
- CHILOMBO, A. 2021. Multilevel governance of large-scale land acquisitions: a case study of the institutional politics of scale of the farm block program in Zambia. *Land Use Policy* 107: 105518.

- CLAY, N. 2016. Producing hybrid forests in the Congo Basin: A political ecology of the landscape approach to conservation. *Geoforum* **76**: 130–141.
- CRONKLETON, P., EVANS, K., ADDOAH, T., SMITH DUMONT, E., ZIDA, M., and DJOUDI, H. 2021. Using Participatory Approaches to Enhance Women's Engagement in Natural Resource Management in Northern Ghana. *Sustainability* **13**(13): 7072.
- CURTIS, P.G., SLAY, C.M., HARRIS, N.L., TYUKAVINA, A., and HANSEN, M.C. 2018. Classifying drivers of global forest loss. *Science* **361**(6407): 1108–1111.
- DALUPAN, M.C.G., HAYWOOD, C., WARDELL, D.A., CORDONNIER-SEGGER, M.C., and KIBUGI, R. 2015. *Building enabling legal frameworks for sustainable land-use investments in Zambia, Tanzania and Mozambique: A synthesis*. Occasional Paper 140. CIFOR, Bogor, Indonesia.
- DAMNYAG, L., SAASTAMOINEN, O., APPIAH, M., and PAPPINEN, A. 2012. Role of tenure insecurity in deforestation in Ghana's high forest zone. *Forest Policy and Economics* **14**(1): 90–98.
- DAVIS, A.L., BLOMLEY, T., HOMER, G., SOMMERVILLE, M., and NELSON, F. 2020. *Community-based natural resource management in Zambia: A review of institutional reforms and lessons from the field*. Maliasili, ILRG and The Nature Conservancy, Lusaka, Zambia.
- DEN BESTEN, J.W., ARTS, B., and BEHAGEL, J. 2019. Spiders in the web: Understanding the evolution of REDD+ in southwest Ghana. *Forests* **10**(2): 117.
- DERKYI, M., ROS-TONEN, M.A., KYEREH, B., and DIETZ, T. 2014. Fighting over forest: toward a shared analysis of livelihood conflicts and conflict management in Ghana. *Society and Natural Resources* **27**(3): 281–298.
- DEWEES, P.A. 1994. *Social and economic aspects of miombo woodland management in southern Africa: Options and opportunities for research*. Occasional Paper No.2. CIFOR, Bogor, Indonesia.
- DRESSLER, W., BÜSCHER, B., SCHOON, M., BROCKINGTON, D., HAYES, T., KULL, C.A., MCCARTHY, J., and SHRESTHA, K. 2010. From hope to crisis and back again? A critical history of the global CBNRM narrative. *Environmental conservation* **37**(1): 5–15.
- DUMENU, W.K., and BANDO, W.N. 2016. Exploitation of African rosewood (*Pterocarpus erinaceus*) in Ghana: A situation analysis. *Ghana Journal of Forestry* **32**: 1–15.
- ESTRADA-CARMONA, N., HART, A.K., DECLERCK, F.A., HARVEY, C.A., and MILDER, J.C. 2014. Integrated landscape management for agriculture, rural livelihoods, and ecosystem conservation: An assessment of experience from Latin America and the Caribbean. *Landscape and Urban Planning* **129**: 1–11.
- FOLI, S., ROS-TONEN, M.A.F., REED, J., and SUNDERLAND, T. 2018. Natural Resource Management Schemes as Entry Points for Integrated Landscape Approaches: Evidence from Ghana and Burkina Faso. *Environmental Management* **62**(1): 82–97.
- GARCÍA-BARRIOS, L., CRUZ-MORALES, J., BRAASCH, M., DECHNIK-VÁZQUEZ, Y., GUTIÉRREZ-NAVARRO, A., MEZA-JIMÉNEZ, A., RIVERA-NÚÑEZ, T., SPEELMAN, E., TRUJILLO-DÍAZ, G., VALENCIA, V., and ZABALA, A. 2020. Challenges for rural livelihoods, participatory agroforestry, and biodiversity conservation in a neotropical biosphere reserve in Mexico. In Baldauf C. (eds) *Participatory Biodiversity Conservation* (pp. 69–89). Springer, Cham, Denmark.
- GARCÍA-MARTÍN, M., BIELING, C., HART, A., and PLIENINGER, T. 2016. Integrated landscape initiatives in Europe: Multi-sector collaboration in multi-functional landscapes. *Land Use Policy* **58**: 43–53.
- GERMAN, L., SCHONEVELD, G.C., and GUMBO, D. 2011. The local social and environmental impacts of smallholder-based biofuel investments in Zambia. *Ecology and Society* **16**(4): 1–16.
- GERMAN, L., GUMBO, D., and SCHONEVELD, G. 2013. Large-scale investments in chitemene farmland: exploring the marginal lands narrative in Zambia's Northern Province. The Fourteenth Biennial Conference of the International Association for the Study of the Commons. Mt. Fuji, Japan. 18pp.
- GIBSON, C.C. 1999. *Politicians and poachers: The political economy of wildlife policy in Africa*. Cambridge University Press, Cambridge, UK.
- GILLI, M., CÔTE, M., and WALTERS, G. 2020. Gatekeeping access: Shea land formalization and the distribution of market-based conservation benefits in Ghana's Crema. *Land* **9**(10): 1–15.
- GRZ 2006. Government of the Republic of Zambia. Republic of Zambia: *Vision 2030*. Lusaka, Zambia.
- GRZ 2015a. Government of the Republic of Zambia. *Second National Biodiversity Strategy and Action Plan (NBSAP2). 2015–2025*. Ministry of Lands, Natural Resources and Environmental Protection. Lusaka, Zambia.
- GRZ 2015b. Government of the Republic of Zambia. *Forests Act 2015*.
- GUMBO, D., and MOOMBE, K. 2020. Reflection on landscape challenges and opportunities in Kalomo. *Forest News*, CIFOR, Bogor, Indonesia. <https://forestsnews.cifor.org/66240/reflections-on-landscape-challenges-and-opportunities-in-kalomo?fnl=en> (Accessed August 1, 2020).
- HAGGBLADE, S., and TEMBO, G. 2003. *Conservation farming in Zambia*. EPTD Discussion Paper No. 108, IFPRI: International Food Policy Research Institute, Washington, DC, USA.
- HAJJAR, R., OLDEKOP, J.A., CRONKLETON, P., NEWTON, P., RUSSELL, A.J.M., and ZHOU, W. 2021. A global analysis of the social and environmental outcomes of community forests. *Nature Sustainability* **4**: 216–224.
- HALLADAY, P., and GILMOUR, D.A. (eds.) 1995. *Conserving Biodiversity Outside Protected Areas. The role of traditional agro-ecosystems*. IUCN, Gland, Switzerland, and Cambridge, UK.
- HILSON, G. 2002a. Harvesting mineral riches: 1000 years of gold mining in Ghana. *Resources Policy* **28**: 13–26.
- HILSON, G. 2002b. Land use competition between small and large-scale miners: A case study of Ghana. *Land Use Policy* **19**(2): 149–156.

- HILSON, G., and NYAME, F. 2006. Gold mining in Ghana's forest reserves: A report on the current debate. *Area* **38**: 175–185.
- HILSON, G., and BANCHIRIGAH, S.M. 2009. Are alternative livelihood projects alleviating poverty in mining communities? Experiences from Ghana. *The Journal of Development Studies* **45**(2): 172–196.
- HILSON, G. 2017. Shootings and burning excavators: Some rapid reflections on the government of Ghana handling of the informal galamsey mining 'menace'. *Resources Policy* **54**: 109–116.
- HIRONS, M. 2013. Mining in Ghana's Forests: Cross-sectoral linkages and the prospects for REDD. *International Development Planning Review* **35**: 283–302.
- HOSONUMA N., HEROLD, M., DE SY, V., DE FRIES, R.S., BROCKHAUS, M., VERCHOT, L., ANGELSEN, A., and ROMIJN, E. 2012. An assessment of deforestation and forest degradation drivers in developing countries. *Environmental Research Letters* **7**: 044009
- Global Support Initiative to Indigenous Peoples and Community-Conserved Territories and Areas (ICCA-GSI) 2017. Zambia Community Based Natural Resources Management Forum. Supporting indigenous and local community conservation territories and areas (ICCAs) in Zambia: Setting cornerstones project. ICCA National Workshop Report, 31st March 2017, Protea Hotel Lusaka, Zambia. <https://sgp.undp.org/resources-155/our-stories/486-supporting-indigenous-and-local-community-conservation-territories-and-areas-iccas-in-zambia-setting-cornerstones.html> (Accessed August 1, 2020)
- IGOE, J., and BROCKINGTON, D. 2007. Neoliberal conservation: a brief introduction. *Conservation and Society* **5**(4): 432.
- IUCN. 2017. Upscaling community resource management areas as a delivery mechanism for REDD+ implementation in Ghana. Accra.
- IUCN. 2018. Empowering and strengthening community participation in natural resource management in Ghana. <https://www.iucn.org/news/west-and-central-africa/201810/empowering-and-strengthening-community-participation-natural-resource-management-ghana> (Accessed August 1, 2020).
- KALABA, F.K., QUINN, C.H., and DOUGILL, A.J. 2014. Policy coherence and interplay between Zambia's forest, energy, agricultural and climate change policies and multilateral environmental agreements. *International Environmental Agreements: Politics, Law and Economics* **14**(2): 181–198.
- KAKEYA, M., SUGIYAMA, Y., and OYAMA, S. 2006. The Citemene system, social leveling mechanism, and agrarian changes in the Bemba villages of northern Zambia: An overview of 23 years of "fixed-point" research. *African Study Monographs* **27**(1): 27–38.
- KANENE KENNEDY, M. 2015. The environmentality of shrines: Case of Gonde Malende (Shrine) of the Tonga people of southern Zambia. *Asian Journal of Social Sciences and Humanities* **4**(2): 154–160.
- KASANGA, K., and KOTEY, N.A. 2001. *Land Management in Ghana: Building on Tradition and Modernity*. International Institute for Environment and Development, London, UK.
- KLEEMANN, J., INKOOM, N., THIEL, M., SHANKAR, S., LAUTENBACH, S., and FÜRST, C. 2017. Peri-urban land use pattern and its relation to land use planning in Ghana, West Africa. *Landscape and Urban Planning* **165**: 280–294.
- KREMEN, C., and MERENLENDER, A.M. 2018. Landscapes that work for biodiversity and people. *Science* **362**(6412).
- KUSTERS, K., BUCK, L., DE GRAAF, M., MINANG, P., VAN OOSTEN, C., and ZAGT, R. 2018. Participatory planning, monitoring and evaluation of multi-stakeholder platforms in integrated landscape initiatives. *Environmental management* **62**(1): 170–181.
- KUU-IRE, S. 2009. Poverty reduction in northern Ghana: A review of colonial and post-independence development strategies. *Ghana Journal of Development Studies* **6**(1): 175–203.
- KUUSAANA, E.D., and BUKARI, K.N. 2015. Land conflicts between smallholders and Fulani pastoralists in Ghana: Evidence from the Asante Akim North District (AAND). *Journal of Rural Studies* **42**: 52–62.
- LARMER, M. 2010. Historical perspectives on Zambia's mining booms and busts. In FRASER A., and LARMER, M. (eds.), *Zambia, Mining, and Neoliberalism*. 1st edition, Palgrave Macmillan, New York, USA.
- LARSON, A.M., and SARMIENTO BARLETTI, J.P. 2020. *Designing for engagement: Insights for more equitable and resilient multi-stakeholder forums*. Infobrief No.280. CIFOR, Bogor, Indonesia.
- LEWIS, D., KAWECHE, G.B., and MWENYA.A. 1990. Wildlife Conservation Outside Protected Areas—Lessons from an Experiment in Zambia. *Conservation Biology* **4**(2): 171–180.
- LOVETT, P., and DENZIL-PHILIPS, L. 2018. Agroforestry shea parklands of sub-Saharan Africa – Threats and Solutions. PROFOR, IBRD, Washington.
- LINDSEY, P.A., NYIRENDA, V.R., BARNES, J.I., BECKER, M.S., MCROBB, R., TAMBLING, C.J., TAYLOR, W.A., WATSON, F.G., and T'SAS-ROLFES, M. 2014. Underperformance of African protected area networks and the case for new conservation models: insights from Zambia. *PLoS one* **9**(5): e94109.
- LYONS, A. 2013. The rise and fall of a second-generation CBNRM project in Zambia: insights from a project perspective. *Environmental management* **51**(2): 365–378.
- MABETA, J., MWEEMBA, B., and MWITWA, J. 2018. *Zambia policy brief #3: Key drivers of biodiversity loss in Zambia*. Biodiversity Finance Initiative (BIOFIN) 1–8.
- MACE, G.M. 2014. Whose conservation? *Science* **345**(6204): 1558–1560.
- MANSOURIAN, S., and SGARD, A. 2019. Diverse interpretations of governance and their relevance to forest landscape restoration. *Land Use Policy* 104011.

- MARCHETTA F. 2011. On the move: livelihood strategies in Northern Ghana. *Working Papers halshs-00591137*, HAL.
- MARFO, E. 2006. *Powerful relations: the role of actor-empowerment in the management of natural resource conflict: a case of forest conflicts in Ghana*. Doctor of Philosophy Dissertation, Wageningen University, Wageningen, The Netherlands.
- MATAKALA, P.W., KOKWE, M., and STATZ, J. 2015. *Zambia National Strategy to Reduce Emissions from Deforestation and Forest Degradation*. Ministry of Lands, Natural Resources and Environmental Protection and Zambia Forestry Department. UN-REDD Programme.
- MESTI. 2016. Ministry of Environment, Science, Technology and Innovation. *National Biodiversity Strategy and Action Plan (NBSAP)*. Government of Ghana, Accra.
- MILDER, J.C., HART, A.K., DOBIE, P., MINAI, J., and ZALESKI, C. 2014. Integrated landscape initiatives for African agriculture, development, and conservation: A region-wide assessment. *World Development* **54**: 68–80.
- MILLER, B., SOULE, M.E., and TERBORGH, J. 2014. ‘New conservation’ or surrender to development. *Animal Conservation* **17**(6): 509–515.
- MILUPI, I.D., SOMERS, M.J., and FERGUSON, W. 2020. Inadequate community engagement hampers sustainable wildlife resource management in Zambia. *African Journal of Ecology* **58**(1): 112–122.
- MNDP. 2017. Ministry of National Development Planning, *The Seventh National Development Plan (7NDP) 2017–2021*. Republic of Zambia, Lusaka, Zambia.
- MORRISON, T.H., ADGER, W.N., BROWN, K., LEMOS, M.C., HUITEMA, D., PHELPS, J., ... and HUGHES, T.P. 2019. The black box of power in polycentric environmental governance. *Global Environmental Change* **57**: 101934.
- MUHUMUZA, M., and BALKWILL, K. 2013. Factors affecting the success of conserving biodiversity in national parks: A review of case studies from Africa. *International Journal of Biodiversity* **2013**: 1–20.
- MURRAY, G., AGYARE, A., DEARDEN, P., and ROLLINS, R. 2019. Devolution, coordination, and community-based natural resource management in Ghana’s community resource management areas. *African Geographical Review* **38**(4): 296–309.
- MWIMA, H.K. 2001. A brief history of Kafue national park, Zambia. *Koedoe* **44**(1): 57–72.
- NDPC. 2017. National Development Planning Commission. Medium-Term National Development Policy Framework (MTDP). *An Agenda for Jobs: Creating prosperity and equal opportunity for all, 2018–2021*. Policy Framework. Government of Ghana.
- NELSON, F., MUYAMWA-MUPETA, P., MUYENGWA, S., SULLE, E., and KAELO, D. 2020. Progress or regression? Institutional evolutions of community-based conservation in eastern and southern Africa. *Conservation Science and Practice* **3**: e302.
- NGANSO, T.B., KYEREMATEN, R., and OBENG-OFORI, D. 2012. Review of biodiversity in sacred groves in Ghana and implications on conservation. *Current Trends in Ecology* **3**: 1–10.
- NOLTE, K. 2014. Large-scale agricultural investments under poor land governance in Zambia. *Land use policy* **38**: 698–706.
- NYAABA, A.Y., and BOB-MILLIAR, G.M. 2019. The Economic Potentials of Northern Ghana: The Ambivalence of the Colonial and Post-Colonial States to Develop the North. *African Economic History* **47**(2): 45–67.
- O’CONNOR, A., DJOUDI, H., MOELIONO, M., MOOMBE, K.B., and SIANGULUBE, F.S. 2020. Potential for integration? An assessment of national environment and development policies. Operationalizing integrated landscape approaches in the tropics. In REED, J., ROSTONEN, M., and SUNDERLAND, T. (eds.) *Operationalizing integrated landscape approaches in the tropics*. Center for International Forestry Research (CIFOR), Bogor, Indonesia. 112–125pp.
- O’CONNOR, A., DJOUDI, H., and ZIDA, M. 2021a. Potential for integrated landscape approaches A review of Ghana’s national environment and development policies. Infobrief No.320. CIFOR, Bogor, Indonesia.
- O’CONNOR, A., GUMBO, D., MOOMBE, K. 2021b. Potential for integrated landscape approaches: A review of Zambia’s national environment and development policies. Infobrief No.321. CIFOR, Bogor, Indonesia.
- ODUKOYA, A.O. 2018. Settler and Non-settler Colonialism in Africa. In OLORUNTOBA, S.O., and FALOLA, T. (eds.) *The Palgrave Handbook of African Politics, Governance and Development* (pp. 173–186). Palgrave Macmillan, New York, USA.
- ODURO, K.A., MARFO, E., AGYEMAN, V.K., and GYAN, K. 2011. One hundred years of forestry in Ghana: a review of policy and regulatory discourses on timber legality. *Ghana Journal of Forestry* **27**(3): 15–32.
- OMODING, J., WALTERS, G., CARVALHO, S., CRACCO, M., LANGOYA, C.D., KIYINGI, K.G., KUMAR, C., REINHARD, F., SSENIONJO, E., and TWINOMUHANG, L. 2020. Implementing a landscape approach in the Agoro – agu region of Uganda. *Parks* **26**(1): 99–110.
- OUKO, E.M. 2018. Contextualising integrated conservation and development projects: Restoring the lost ‘harambee’ link in Kenya. *Geoforum* **92**: 81–91.
- OWUBAH, C.E., LE MASTER, D.C., BOWKER, J.M., and LEE, J.G. 2001. Forest tenure systems and sustainable forest management: the case of Ghana. *Forest Ecology and Management* **149**(1–3): 253–264.
- RATHBONE, R. 2000. Native courts, local courts, chieftaincy and the CPP in Ghana in the 1950s. *Journal of African Cultural Studies* **13**(1): 125–139.
- REED, J., DEAKIN, L., and SUNDERLAND, T. 2015. What are ‘Integrated Landscape Approaches’ and how effectively have they been implemented in the tropics: a systematic map protocol. *Environmental Evidence* **4**(1): 1–7.
- REED, J., VAN VIANEN, J., DEAKIN, E.L., BARLOW, J., and SUNDERLAND, T. 2016. Integrated landscape approaches to managing social and environmental issues in the tropics: learning from the past to guide the future. *Global Change Biology* **22**(7): 2540–2554.

- REED, J., VAN VIANEN, J., BARLOW, J., and SUNDERLAND, T. 2017. Have integrated landscape approaches reconciled societal and environmental issues in the tropics? *Land Use Policy* **63**: 481–492.
- REED, J., BARLOW, J., CARMENTA, R., VAN VIANEN, J., and SUNDERLAND, T. 2019. Engaging multiple stakeholders to reconcile climate, conservation and development objectives in tropical landscapes. *Biological Conservation* **238**: 108229.
- REED, J., ICKOWITZ, A., CHERVIER, C., DJOUDI, H., MOOMBE, K., ROS-TONEN, M., ... SUNDERLAND, T. 2020a. Integrated landscape approaches in the tropics: A brief stock-take. *Land Use Policy* **99**: 104822.
- REED, J., BORAH, J.R., CHERVIER, C., LANGSTON, J., MOELIONO, M., O'CONNOR, A., ... and SUNDERLAND, T. 2020b. A methods toolbox for integrated landscape approaches. Operationalizing integrated landscape approaches in the tropics. In REED, J., ROS-TONEN, M., and SUNDERLAND, T. (eds.) *Operationalizing integrated landscape approaches in the tropics*. Center for International Forestry Research (CIFOR), Bogor, Indonesia. 89–111pp.
- RETHMAN, J., and KIM, J.H. 2015. A bivariate probit analysis of the determinants of a child's participation in school and labor in the native cocoa households of Ghana. *Journal of the Korean Association of African Studies* **45**: 37–78.
- RIBOT, J. 2002. *Democratic decentralization of natural resources: Institutionalizing popular participation*. Report, World Resources Institute, Washington, DC, USA.
- ROE, D., and NELSON, F. 2009. The origins and evolution of community-based natural resource management in Africa. In ROE, D. NELSON, F., and SANDBROOK, C. (eds.) *Community management of natural resources in Africa: Impacts, experiences and future directions*. Natural Resource Issues No. 18, International Institute for Environment and Development, London, UK.
- ROE, D., BOOKER, F., DAY, M., ZHOU, W., ALLEBONE-WEBB, S., HILL, N.A., ... and SUNDERLAND, T.C. 2015. Are alternative livelihood projects effective at reducing local threats to specified elements of biodiversity and/or improving or maintaining the conservation status of those elements? *Environmental Evidence* **4**(1): 1–22.
- ROS-TONEN, M.A., INSAIDOO, T.F., and ACHEAMPONG, E. 2013. Promising start, bleak outlook: The role of Ghana's modified taungya system as a social safeguard in timber legality processes. *Forest Policy and Economics* **32**: 57–67.
- ROS-TONEN, M.A., DERKYI, M., and INSAIDOO, T.F. 2014. From co-management to landscape governance: whither Ghana's modified taungya system? *Forests* **5**(12): 2996–3021.
- ROS-TONEN, M.A.F., and DERKYI, M. 2018. Conflict or cooperation? Social capital as a power resource and conflict mitigation strategy in timber operations in Ghana's off-reserve forest areas. *Ecology and Society* **23**(3): 44.
- ROS-TONEN, M.A.F., REED, J., and SUNDERLAND, T. 2018. From synergy to complexity: the trend toward integrated value chain and landscape governance. *Environmental Management* **62**(1): 1–14.
- ROS-TONEN, M.A.F., AGGREY, J.J., SOMUAH, D.P., and DERKYI, M. 2021. Human insecurities in gold mining: a systematic review of evidence from Ghana. *The Extractive Industries and Society* 100951.
- ROTH, M., KHAN, A.M., and ZULU, M.C. 1995. Legal Framework and Administration of Land Policy in Zambia. In ROTH, M., and Smith, S.G. (eds.), *Tenure, Land Markets and Institutional Transformation in Zambia*. Land Tenure Center, University of Wisconsin Madison, Madison, USA.
- SAMBO, P.T., HAYWOOD, C., WARDELL, D.A., KIBUGI, R., and SEGGER, M.C.C. 2015. *Enabling legal frameworks for sustainable land use investments in Zambia: Legal assessment report*. Occasional Paper 141. CIFOR, Bogor, Indonesia.
- SAMBOKO, P.C., KABISA, M., and HENLEY, G. 2019. Constraints to biofuel feedstock production expansion in Zambia. *Development Southern Africa* **36**(2): 198–212.
- SARMIENTO BARLETTI, J.P., LARSON, A.M., CISNEROS, N., HEISE, N., LISWANTI, N., MARIÑO, H., and TAMARA, A. 2020. How are we doing? A tool to reflect on the process, progress and priorities of your multistakeholder forum. CIFOR, Bogor, Indonesia.
- SAYER, J., and WELLS, M.P. 2004. The pathology of projects. In MCSHANE, T., and WELLS, M.P. (eds.) *Getting biodiversity projects to work: towards better conservation and development*. Columbia University Press, New York, USA.
- SAYER, J., SUNDERLAND, T., GHAZOUL, J., PFUND, J.L., SHEIL, D., MEIJAARD, E., VENTER, M., BOEDHIHARTONO, A.K., DAY, M., GARCIA, C., VAN OOSTEN, C., BUCK, L.E. 2013. Ten principles for a landscape approach to reconciling agriculture, conservation, and other competing land uses. *Proceedings of the National Academy of Sciences of the United States of America* **110** (21): 8349–8356.
- SAYER, J., MARGULES, C., BOEDHIHARTONO, A.K., DALE, A., SUNDERLAND, T., SUPRIATNA, J., and SARYANTHI, R. 2015. Landscape approaches: what are the pre-conditions for success? *Sustainability Science* **10**: 345–355.
- SAYER, J., ENDAMANA, D., BOEDHIHARTONO, A.K., RUIZ-PEREZ, M., and BREUER, T. 2016. Learning from change in the Sangha Tri-National landscape. *International Forestry Review* **18**(S1): 130–139.
- SCHUELER, V., KUEMMERLE, T., and SCHRÖDER, H. 2011. Impacts of surface gold mining on land use systems in western Ghana. *Ambio* **40**: 528–539.
- SCHONEVELD, G., GERMAN, L., and NUKATOR, E. 2011. Land-based investments for rural development? A grounded analysis of the local impacts of biofuel feedstock plantations in Ghana. *Ecology and Society* **16**(4): 10.

- SCHUSSER, C., KROTT, M., MOVUH, M.C.Y., LOGMANI, J., DEVKOTA, R.R., MARYUDI, A., and SALLA, M. 2016. Comparing community forestry actors in Cameroon, Indonesia, Namibia, Nepal and Germany. *Forest Policy and Economics* **68**: 81–87.
- SCHUT, M., KLERKX, L., SARTAS, M., LAMERS, D., CAMPBELL, M.M.C., OGBONNA, I., KAUSHIK, P., ATTA-KRAH, LEEUWIS, C. 2016. Innovation platforms: experiences with their institutional embedding in agricultural research for development. *Experimental Agriculture* **52**: 537–561.
- SESSIN-DILASCIO, K., PRAGER, K., IRVINE, K.N., and DE ALMEIDA SINISGALLI, P.A. 2015. The dynamics of co-management and social capital in protected area management – The Cardoso Island State Park in Brazil. *World Development* **67**: 475–489.
- SETO, K.C., GÜNERALP, B., and HUTYRA, L.R. 2012. Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools. *Proceedings of the National Academy of Sciences* **109**(40): 16083–16088.
- SHAKACHITE, O., CHUNGU, D., NG'ANDWE, P., SIAMPALE, A.M., CHENDAUKA, B., VESA, L., and ROBERTS, W.J. 2016. *Integrated Land Use Assessment Phase II – Report For Zambia*. The Food and Agriculture Organization of the United Nations and the Forestry Department, Ministry of Lands and Natural Resources, Lusaka, Zambia. 1–122.
- SHOYAMA, K., BRAIMOH, A.K., AVTAR, R., and SAITO, O. 2018. Land transition and intensity analysis of cropland expansion in Northern Ghana. *Environmental Management* **62**(5): 892–905.
- SIKAMO, J., MWANZA, A., and MWEEMBA, C. 2016. Copper mining in Zambia – history and future. *The Journal of the Southern African Institute of Mining and Metallurgy* **116**: 491–496.
- SITKO, N.J., and CHAMBERLIN, J. 2016. The geography of Zambia's customary land: Assessing the prospects for smallholder development. *Land Use Policy* **55**: 49–60.
- SOETERS, S., WEESIE, R., and ZOOMERS, A. 2017. Agricultural investments and farmer-Fulani pastoralist conflict in West African drylands: A northern Ghanaian case study. *Sustainability* **9**(11): 2063.
- SOMUAH, D.P., ROS-TONEN, M.A., and BAUD, I. 2021. Local spatialized knowledge of threats to forest conservation in Ghana's high forest zone. *Environmental Management* 1–17.
- SONGORWA, A.N. 1999. Community-Based Wildlife Management (CWM) in Tanzania: Are the communities interested? *World Development* **27**(12): 2061–2079.
- SPRINGER, J., CAMPESE, J., and PAINTER, M. 2011. *Conservation and human rights: Key issues and contexts*. Scoping Paper for the Conservation Initiative on Human Rights. World Wildlife Fund, Gland, Switzerland.
- STICKLER, C., DUCHELLE, A.E., NEPSTAD, D., and ARDILA, J.P. 2018. Subnational jurisdictional approaches. In ANGELSEN, A., MARTIUS, C., DE SY, V., DUCHELLE, A.E., LARSON, A.M., and PHAM, T.T. (eds.), *Transforming REDD+: Lessons and new directions*. Center for International Forestry Research (CIFOR), Bogor, Indonesia. 145–159pp.
- SUNDERLAND, T., REED, J., and ROS-TONEN, M. 2020. Conclusion and the way forward. In REED, J., ROS-TONEN, M., and SUNDERLAND, T. (eds.), *Operationalizing integrated landscape approaches in the tropics*. Center for International Forestry Research (CIFOR), Bogor, Indonesia. 205–211pp.
- SUTTON, I. 1983. Labour in commercial agriculture in Ghana in the late nineteenth and early twentieth. *The Journal of African History* **24**(4): 461–483.
- TERBORGH, J., VAN SCHAİK, C., DAVENPORT, L., and RAO, M. (eds.) 2002. *Making parks work: strategies for preserving tropical nature*. Island Press, Washington DC, USA.
- TREANOR, N.B. 2015. *China's Hongmu consumption boom: Analysis of the Chinese rosewood trade and links to illegal activity in Tropical Forested Countries*. Forest Trends Series-Forest trade and finance. Forest Trends Series and UKAid.
- TWUM, K.O., and AYER, J. 2017. Connecting the complex dots: A review of urban change complexities in Ghana. *Cogent Social Sciences* **5**(1): 1–21.
- UICN/PACO 2010. Parks and reserves of Ghana: Management effectiveness assessment of protected areas. UICN/PACO, Ouagadougou, Burkina Faso.
- UNEP-WCMC and IUCN 2016. Protected Planet Report 2016. UNEP-WCMC and IUCN: Cambridge UK and Gland, Switzerland.
- VAIL, L. 1977. Ecology and history: The example of eastern Zambia. *Journal of Southern African Studies* **3**(2): 129–155.
- VAN EWIJK, E., and ROS-TONEN 2021. The fruits of knowledge co-creation in agriculture and food-related multi-stakeholder platforms in sub-Saharan Africa – A systematic literature review. *Agricultural Systems* **186**: 102949.
- VERMUNT, D.A., VERWEIJ, P.A., and VERBURG, R.W. 2020. What hampers implementation of integrated landscape approaches in rural landscapes? *Current Landscape Ecology Reports* **5**: 99–115.
- WAINWRIGHT, C., and WEHRMEYER, W. 1998. Success in integrating conservation and development? A study from Zambia. *World Development* **26**(6): 933–944.
- WALI, A., ALVIRA, D., TALLMAN, P.S., RAVIKUMAR, A., and MACEDO, M.O. 2017. A new approach to conservation: using community empowerment for sustainable well-being. *Ecology and Society* **22**(4): 6.
- WARDELL, D.A. 2005. Moving the boundaries of forest and land use history: The case of upper east region in northern Ghana. In GAUSSET, Q., WHYTE, M.A., and BIRCHTHOMSEN, T. (eds.), *Beyond territory and scarcity exploring conflicts over natural resource management*. Nordiska Afrikainstitutet, Stockholm, Sweden: 168–194.
- WARDELL, D.A. 2020. Groundnuts and headwaters protection reserves. Tensions in colonial forest policy and practice in the Northern Territories of the Gold Coast. In: DAMODARAN, V., and D'SOUZA, R. (eds.) *Commonwealth Forest and Environmental History. Empire Forests*

- and Colonial Environments in Africa, the Caribbean, South Asia and New Zealand. Primus Books, Delhi: 357–401.
- WARDELL, D.A., and LUND, C. 2006. Governing access to forests in northern Ghana: Micro-politics and the rents of non-enforcement. *World Development* **34**(11): 1887–1906.
- WARDELL, A., and FOLD, N. 2013. Globalisations in a nutshell: Historical perspectives on the changing governance of the shea commodity chain in northern Ghana. *International Journal of the Commons* **7**(2): 367–405.
- WARDELL, D.A., PIKETTY, M.G., LESCUYER, G., and PACHECOP, P. 2021. Reviewing initiatives to promote sustainable supply chains: The case of forest-risk commodities. The CGIAR Research Program on Forest, Trees, and Agroforestry. Working Paper #8. 1–38pp.
- WERNER, K. 2016. Zambia: Governance and natural resources. *Revue Gouvernance* **13**(2): 32–52.
- WEST, P., IGOE, J., and BROCKINGTON, D. 2006. Parks and peoples: the social impact of protected areas. *Annual Review of Anthropology* **35**: 251–277
- WICANDER, S., and COAD, L. 2018. Can the provision of alternative livelihoods reduce the impact of wild meat hunting in West and Central Africa? *Conservation and Society* **16**(4): 441–458.
- WOHLIN, C. 2014. Guidelines for snowballing in systematic literature studies and a replication in software engineering. In *Proceedings of the 18th international conference on evaluation and assessment in software engineering* (EASE '14). Association for Computing Machinery, London, United Kingdom, 321–330.
- WOLFSWINKEL, J.F., FURTMUELLER, E., and WILDEROM, C.P. 2013. Using grounded theory as a method for rigorously reviewing literature. *European journal of information systems* **22**(1): 45–55.
- WORLD BANK. 2009. Implementation completion and results report of the Northern Savanna biodiversity conservation project. Washington, D.C., USA.
- YARO, J.A., TEYE, J.K., and TORVIKEY, G.D. 2018. Historical context of agricultural commercialisation in Ghana: Changes in land and labour relations. *Journal of Asian and African Studies* **53**(1): 49–63.
- YEBOAH, F., AWOTWI, A., FORKUO, E.K., and KUMI, M. 2017. Assessing the land use and land cover changes due to urban growth in Accra, Ghana. *Journal of Basic and Applied Research International* **22**(2): 43–50.
- ZANZANAINI, C., TRAN, B.T., SINGH, C., HART, A., MILDRE, J., and DECLERCK, F. 2017. Integrated landscape initiatives for agriculture, livelihoods and ecosystem conservation: An assessment of experiences from South and Southeast Asia. *Landscape and Urban Planning* **165**: 11–21.
- ZCBNRM. 2020. Zambia Community Based Natural Resources Management Forum. <http://www.zcbrnm.com/cbrnm/> (Accessed August 1, 2020).