Utilizing Sustainability Assessment Framework to Obtain a Social License to Operate in Renewable Energy Projects

The Case of Murchison Hydropower Project in Uganda

Smith I. Azubuike, Susan Nakanwagi, and Samuel C. Dike

Contents

Abstract

The Ugandan government has contracted Bonang Energy and Power Ltd. to construct a hydropower dam at Murchison waterfall to generate about 360 megawatts of electricity to address its energy needs. But this project faces opposition from stakeholders – environmental activists, tourism promoters and operators, and

S. I. Azubuike (✉)
School of Law, Queen's University Belfast, Belfast, Northern Ireland, UK
e-mail: s.azubuike@qub.ac.uk

S. Nakanwagi
Centre for Energy, Petroleum & Mineral Law and Policy, University of Dundee, Dundee, UK
e-mail: snakanwagi@dundee.ac.uk

S. C. Dike
Faculty of Law, Rivers State University, Port Harcourt, Nigeria
e-mail: samuel.dike@ust.edu.ng

© The Author(s), under exclusive licence to Springer Nature Switzerland AG 2022

G. Wood et al. (eds.), *The Palgrave Handbook of Social License to Operate and Energy Transitions*, Palgrave Studies in Energy Transitions,
https://doi.org/10.1007/978-3-030-74725-1_7-1

communities – who cite sustainability concerns and likely economic, social, and environmental impact of the project on the community. The opposition is an indication of the absence of a social license to operate (SLO). The project affects a broad spectrum of stakeholders, and their social acceptance of the project is crucial to its successful completion. This article shows how a sustainability assessment framework can apply to obtain SLO in hydropower projects and similar renewable energy projects (REPs). Sustainability dimensions – socioeconomic and environmental aspects – assist in examining the linkages between a REP and general livelihood and what strategy needs to be put in place to address any likely problem. To achieve its aim, this study examines the concept of SLO to understand its application in REPs and how the various dimensions of hydropower dams can affect local communities. We use the Hydropower Sustainability Assessment Protocol framework to evaluate the Murchison hydropower conflict and highlight how the Protocol can assist project developers in obtaining SLO. We note that consulting and engaging broad stakeholders and transparently conducting impact assessment to halt or avoid, minimize, mitigate project impacts, and pay compensation for damages can result in SLO. Furthermore, the Protocol offers a platform for social acceptance to thrive as it incorporates these values.

Keywords

Social license to operate · Hydropower · Uganda · Sustainability · Hydropower Sustainability Assessment Protocol · Community consultation and engagement

1 Introduction

In the bid to address energy access and poverty and transit to a low-carbon economy to reduce the impact of climate change on man and the ecosystem (Roeben and Azubuike 2020), several countries seek to mainstream renewable energy into their energy mix. Uganda is one of these countries looking to generate clean energy through hydropower to address its energy challenges. Hydropower is a significant source of renewable energy in the power sector, contributing over 16% of global electricity supply as of 2008 (Kumar et al. 2011), and is predicted to remain the world's primary source of low-carbon electricity generation, essential in the decarbonization process and improving system flexibility (International Energy Agency 2020a). As of 2019, it has an installed global capacity of 1308 gigawatts (GW), with power generation reaching a record 4306 terawatt-hours, the sole highest contribution from a non-fossil fuel source in history (International Hydrocarbon Association 2020).

In Africa, hydropower is the primary renewable energy resource with over 37 GW of installed capacity (ibid) and currently accounting for 17% of generated power, with the possibility of an increase in the future given the effort toward decarbonization and universal energy access in the region (International Energy Agency 2020b). As a secure and long-lasting technology (Arun Kumar et al. (n 2)), hydropower reduces dependence on fossil fuel; provides efficient, reliable

(Egre and Milewski 2002), relatively low-cost energy; and enhances non-energy services like flood control and irrigation (von Sperling 2012). However, its development presents sustainability challenges that often result in social conflict and community opposition. Hydropower dams interrupt the natural flow of rivers, harm biodiversity and forests, displace several people, and disrupt agriculture, food systems, and water quality of local communities (Morana et al. 2018).

As the government of Uganda plans to develop a hydropower dam at Murchison waterfall, stakeholders – tourist operators, nongovernmental organizations (NGOs), local communities, etc. – are in opposition to the siting of a dam at the waterfall. They raise sustainability (social, economic, and environmental) concerns that arise from hydropower projects. The interest is that a dam would prevent the free flow of water at the waterfall, thus reducing its tourist attraction, which will in turn impact tour operators' income. It will also impact the flora and fauna of the area, minimize straddling fish stocks, and impact their water quality and general livelihood (McCool 2020). These concerns inform the nonacceptance of the project, an indication that the social license to operate (SLO) from stakeholders is absent regarding the proposed Murchison hydropower project.

SLO is a concept prevalent in the extractive sector and has extended to renewable energy projects. It is an implied approval given by stakeholders, indicating their social acceptance for a project before or after the project developers have met all legal requirements to develop such a venture (Heffron et al. 2018). SLO emerged as a paradigm for addressing the adverse social and environmental impacts of mining operations and obtaining community acceptance for the projects by building public trust to avoid social conflict (Prno 2013). The major drivers of the term were the adverse impacts of the mining industry like tailing dam accidents, chemical spills, and disputes with local communities, especially the indigenous people, which all damaged the reputation of the projects and bred societal contempt. What then followed were direct attacks and social unrest from the communities toward the resource projects causing significant delays, financial loss, and even abandonment of projects. The need for good relationships between project-affected communities and extractive companies and the management of possible risks birthed the concept of SLO (Parsons et al. 2014; Wilson 2016).

Sustainable development of hydropower is fundamental in obtaining SLO. Sustainability promotes a green economy, and the latter encourages low-carbon emission, resource efficiency, social inclusiveness, and community participation in project decisions (United Nations Environment Programme, "Green Economy" https://www.unenvironment.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy accessed 20 June 2020). To contribute to sustainable energy, hydropower developers must consider the project's environmental, social, and economic implications on the local community, including its decommissioning. In addition, they must consider the consequences of damming a river, biodiversity loss, impact on the freshwater ecosystem, and climate change against energy benefits. One possible way of addressing local concerns to obtain SLO is by assessing the project's likely impacts by utilizing the Sustainability Assessment Protocol tool (Hydropower Sustainability Assessment Protocol, https://www.hydrosustainability.org/assessment-protocol, accessed 25 June 2020).

The Protocol Assessment framework uses early stage, preparation, implementation, and operation to evaluate the social, economic, and environmental implications of a hydropower project before, during, and through to the project lifespan. The framework of the Protocol allows for communication, community consultation (International Hydropower Association 2020a), broad stakeholder engagement, and participation in decision-making. It incorporates environmental and social impact assessments and management, expert reports, and feedback mechanisms in all the project stages. It also integrates options for halting, or avoiding, minimizing, and mitigating project damages and for payment of compensation to communities. It incorporates design options that will use less intrusive technologies to prevent river damming. This helps to meet both the energy need and allaying community concerns.

Broad stakeholder engagement, participation, and evidence of impact assessment – which provides avoidance, mitigation, reducing, and compensation mechanisms for local communities – build public trust and prevent social conflict. In addition, design options such as the instream turbine technology will appeal to tour operators as it will allow water to flow, thus retaining the aesthetics of the waterfall that is a significant tourist attraction and avoiding the need for resettlement and sundry social cost. These facts lead us to conclude that utilizing the Protocol framework will promote sustainability and drive social acceptance in hydropower projects.

The paper focuses on how the sustainability assessment protocol tool can be utilized to obtain SLO in hydropower projects. A case in point is the hydropower dam construction at Murchison in Uganda. To achieve this aim, we examine the concept of social license and its application in extractive and REPs to understand the rationale and need for social affirmation before the project execution. We discuss the idea of sustainability and highlight its relevance in hydropower projects and the need for alignment with the 2030 Sustainable Development Agenda of the UN. We further discuss the Murchison case study and apply the sustainability assessment tools to evaluate the possible social, economic, and environmental impacts on the ecosystem and local communities in the area and suggest ways to address the project's possible effects. We note that appropriate impact assessment and broad stakeholder engagement with options to avoid, minimize, mitigate, and compensate for damages and innovative hydropower design will result in social acceptance of a hydropower project. The Protocol Assessment provides the foundation for the application of these values, and this will enhance the fulfilment of corporate social responsibility (CSR) and ensure social acceptance in hydropower development.

2 Social License to Operate: A Conceptual Evaluation

2.1 Understanding the Meaning of Social License to Operate

The phrase "social license to operate" is deeply rooted in the mining industry, where it first gained traction in the 1990s (Prno (n 13)). It relates to an underlying need for social acceptance of a project by the communities and other stakeholders in the areas of operation before or after all set legal obligations are met (Heffron et al. (n 12)).

Thus, SLO emerged as a paradigm for addressing the adverse social and environmental impacts of mining operations and obtaining community acceptance for the projects by building public trust to avoid social conflict (Prno (n13). On SLO definitions in various contexts and sectors, *see* also generally Górski and Trenorden 2020).

The significant drivers of SLO were the adverse impacts of the mining industry like tailing dam accidents, chemical spills, and disputes with local communities, especially the indigenous people, which all damaged the reputation of the projects and bred societal contempt. What then followed were direct attacks and social unrest from the communities toward the resource projects causing significant delays, financial loss, and even abandonment of projects. It was then essential that good relationships between the host communities and extractive companies be established to manage the risks posed, hence the coining the SLO concept (Parsons et al. (n 14)).

SLO connotes the overall acceptance or approval by the local communities regarding operations in extractives, energy, or other natural resources in an area. Although not a formal agreement, it involves general credibility, reliability, and public acceptance of the projects (Kannan et al. 2014). It has since become a significant determinant of the success and sustainability of critical projects in the mining industry and of recent in the energy sector, including REPs (Hall et al. 2015).

A key determinant of SLO is positive community engagement. This determinant includes consultations, negotiations, compromises, and full disclosure of the risks and benefits of the projects between the project leaders, community, and sometimes the wider society. Instruments and guidelines also exist at the global level and prescribe some form of community engagement and assessment of environmental and social risks. They also use environmental and social management systems; free, prior, and informed consent; multi-stakeholder involvement; and the respect of human rights and the interests, cultures, and customs of communities affected by projects. These include the IFC Performance Standards, (International Finance Corporation 2012) the Equator Principles (The Equator Principles https://equator-principles.com/wp-content/uploads/2020/05/The-Equator-Principles-July-2020-v2.pdf, accessed 1 June 2020), and International Council on Mining and Metals (ICCM) Principles (International Council on Mining and Metals (ICMM) Principles https://www.icmm.com/en-gb/about-us/member-commitments/icmm-10-principles/icmm-principle-3, 01 June 2020).

Courts of law have also recognized the right to adequate consultation and engagement of communities, for example, in the Case of the Kichwa Indigenous People of Sarayaku, which involved the award of petroleum exploration and exploitation rights over territory occupied by the Kichwa (Inter-American Court of Human Rights, Case of the Kichwa Indigenous People of Sarayaku v. Ecuador, Judgment of 27 June 2012 (Merits and reparations)).

2.2 Social License to Operate in Extractive and Renewable Energy Projects

2.2.1 The Extractive Industry

In the mining industry, SLO presents itself in the form of community development agreements (CDAs), which are increasingly becoming encapsulated in the law. They can also be modeled as community contracts, impact benefit agreements in Canada, benefit-sharing agreements, investment agreements, shared responsibilities agreements, voluntary agreements, and participation agreements. CDAs are agreements between the investors and the communities in the locations of the projects and present commercial arrangements containing mutual obligations (Tinto 2016). They are hailed as one of the most effective ways to secure land access and community support for extractive ventures – the social license to operate (Loutit et al. 2016).

Many host states currently require that CDAs be reached before full project approval is granted as a means of ensuring that local and affected communities benefit from mining projects (Columbia Centre on Sustainable Investment 2015). The CDAs must be made in good faith, through fair representation and negotiations, mutual obligations, and inclusion of broader development objectives. They should be based on actual community needs, well planned and sustainable to ensure long-term benefits even after closure (Bocoum et al. 2012), while building the capacity of the communities to negotiate is important (Otto 2010).

2.2.2 Renewable Energy Projects (REPs)

Energy projects, in this case, encompass oil and gas as well as renewable energy law and do not distinguish the two sectors. However, petroleum is mostly extractive, while REPs are non-extractive (Heffron and Talus 2016). SLO generally relates to the level of acceptance and approval of a project by the local community and other multi-stakeholders. However, for REP impacting a critical natural resource, the whole nation may be involved. This is the case with developing a hydropower dam at the Murchison Falls National Park considered of great value to Uganda's national heritage and tourism industry (Alice McCool (n 11)).

SLO in energy law has come to be associated with "energy justice," which stipulates that there must be procedural justice, recognition justice, and distributive justice in all energy projects (McCauley et al. 2013). Procedural justice is concerned with multi-stakeholder engagement in energy matters and associated decision-making, while distributional justice is about balancing environmental benefits and associated risks with different groups in society. Recognition justice, moreover, stipulates that all people are accorded fair representation free from coercion (ibid). In essence, therefore, like later research found, energy justice in the transition question is concerned with fairness and equity and must consider major global concerns like income disparities, gender, economic livelihood, and impacts associated with REPs (McCauley and Heffron 2018).

2.3 The Necessity of Social License to Operate in Hydropower Projects

Social license to operate in REPs like hydropower requires the attainment of public support to foster sustainable development (Morana et al. (n 10)). Such endorsement is closely associated with the social and environmental justice systems embedded in the energy justice framework, whose main dimensions are procedural and distributional justice. Conflicts can arise from direct social impact like (1) displacement of people like in the case of Hongjiang and Wanmipo Hydropower Stations in China's Hunan Province (Zhao et al. 2020) or (2) loss of income from the tourism businesses – like in the case of the proposed Murchison dam project in Uganda (MacLean et al. 2016). Scholars note that upholding procedural justice (fair and participatory planning processes and distributional justice) and fair allocation of costs and benefits can increase social acceptance of REP (Bailey and Darkal 2018).

Therefore, obtaining the trust of masses through meaningful dialogue, public engagements in impact assessments, fostering local recognition, and carefully thought-out institutional structures are central in achieving perceived procedural justice, which directly transforms into social acceptance (Mercer-Mapstone et al. 2017). While achieving this appears simple, the developers of REPs should tackle the underlying issues, such as setting out the limits of the stakeholders and the level and timing of participation (Cuppen 2018). As already established, the stakeholders include the wider public, government officials, local populations, civil societies, and associated and affected businesses. On the other hand, distributional justice presupposes that humans are more likely to accept environmental development-related decisions where the associated costs do not outweigh the benefits. In REPs such as hydropower, the costs can be both monetary and nonmonetary, for example, the damage to the fauna and flora, which impacts other sectors like tourism. However, the projects present tangible and intangible benefits. The developers should thus explain them to the people in seeking the goodwill of the energy ventures (Dhillion 2019). These include increased electricity share, low-carbon energy supply, and job creation.

3 Sustainability Dimensions in Hydropower Projects

The concept of sustainability is connected to three core principles – environmental, social, and economic aspects of life. These core tenets form the basis for evaluating the role of hydropower dams in a bid to achieve clean and low-cost electricity. In addition, they assist in assessing the possible impact and changes needed to address the legitimate concerns of people living in areas where plans are underway to construct a dam.

3.1 Sustainability Dimensions

From an energy project context, sustainability relates to the processes and actions through which man prevents the reduction of natural resources, bearing in mind environmental, social, or economic dimensions, to maintain an ecological balance so that the quality of human life does not decline (Manzini et al. 2011). Sustainability encourages activities whose design is defined by social, human, and environmental dimensions for the long-term rather than on short-term gains. It incorporates a triple bottom approach, especially in REPs, and emphasizes the need to develop them sustainably (International Hydropower Association, "Sustainability" https://www.hydropower.org/sustainability-0 accessed 1 June 2020). Sustainable development is the development that meets the need of the present generation without compromising the ability of the future generation to meet their own needs (World Commission on Environment and Development 1987).

It is essential to recognize that sustainable development requires simultaneously meeting environmental, social, and economic concerns and how to balance these dimensions effectively (Asekomeh et al. 2020), thus negotiating a workable compromise that addresses social, economic, and ecological objectives of competing interest groups (Hartmann 2016). We discuss these dimensions of sustainability below and their linkages to hydropower.

3.1.1 Environmental Dimension

Hydropower is a developed technology that connects the energy moving from higher to lower elevations. It contributes to the direct generation of low-carbon energy and indirectly supports other intermittent renewable energy sources such as solar and wind power (Locher and Scanlon 2012). It can also deliver both water and energy solutions and, thus, facilitate social and economic development. Its development can take various scales suitable for several energy needs (Arun Kumar et al. (n 2)). However, hydropower could negatively impact land, forest, aquatic biodiversity, and ecosystem services that rivers provide to communities. It can result in loss of heritage and fisheries and cause erosion and reservoir sedimentation, and its construction can displace several people and affect the food system, agriculture, and water quality in the area in question.

From an environmental standpoint, sustainability requires the exercise of a duty of care to avoid, minimize, maximize benefits, and compensate for adverse ecological effects. Sustainability establishes ambitious objectives such as zero harm which calls for the offsetting of adverse environmental impacts. Sustainable energy development lies at the heart of SDG 7, the 2030 UN Sustainable Development Agenda and the Paris Agreement for inclusive communities and greater protections from, and resilience to, climate change (United Nations Sustainable Development Goals, "Energy" https://sustainabledevelopment.un.org/topics/energy accessed 3 June 2020), thus necessitating the need to put in place measures to avoid or reduce waste and environmental damage and adequately manage natural resources and the environment.

3.1.2 Economic Dimension

Hydropower offers positive economic benefits, given its low-cost operation as it does not burn fuel and is not prone to a rise in fuel prices. Low-cost activities have a favorable implication on the cost of power for consumers. Furthermore, hydropower can deliver valuable electricity and support services over some time (Hug-Glanzmann 2011). Some scholars advocate support for hydropower note that it can create employment and increase economic activities and tax revenue for the government of an area (Kline and Moretti 2014; Feyrer et al. 2017).

Conversely, hydropower has negative economic implications. High upfront capital cost, long-term investment financing, and various risks profile characterize hydropower projects. During the construction and commissioning phase, geotechnical risks are most concentrated, and a possibility of hydrological risk increasing with climate change (Hartmann (n 49) 400). Both groups of risks have high impacts on investment costs and cash flows, thus, leaving the burden of an uneconomic dam to fall on a country's population – a burden most developing nations can barely afford. Moreover, societal anticipation of a hydropower station could change over time, resulting in costly operations and difficulty in predicting the price for power services in the long term. Often, the financial support for hydropower projects in the form of subsidies, public funding, and access to the carbon market depends on sustainability perception (ibid). Hydropower is common in developing nations, and this could result in climate-risky energy supply, especially as several hydro-dependent countries have suffered drought-induced power cuts and energy rationing in recent years (International Rivers, "Economic Impacts of Dams" https://www.internationalrivers.org/economic-impacts-of-dams accessed 10 June 2020).

The concerns with hydropower have been with the distribution of costs and benefits, thus making the concept of benefit-sharing receive increasing focus regarding hydropower developments. In addition, hydropower projects impact the local capacity building, and sometimes its construction impacts economic livelihood as it reduces fishing sources (Leonardo da Silva Soito and Vasconcelos Freitas 2011), destroys agricultural lands and forests (Duflo and Pande 2007), displaces communities, and destroys food sources (Morana et al. (n 10)). These effects are contrary to the idea of sustainability, where hydropower does not allow locals to meet sustainable development objectives (Locher and Scanlon (n 50) 5).

3.1.3 Social Dimension

The social impact of hydropower projects is multidimensional: positive, negative, long term, and short term. Hydropower projects boost power generation, attract people into an ongoing construction area, and increase social relations. But with this come the issues about the project community's living standards and livelihood, economic, and physical displacement of community members and vulnerable groups, and it raises concerns about safety, public health, labor, and working conditions (de Faria et al. 2017). The influx of people seeking employment in a construction site put pressure on community housing and healthcare and could result in socially undesirable consequences and public health concerns (Soito and Freitas (n 58) 3168). Resettling people who live in reservoir areas and managing the intrusion by outsiders may lead to a decline in social cohesion (von Sperling 2012 (n 9)).

Most of these issues often arise when mitigation measures and community engagement are absent, and compensation is inadequate. Engaging with communities and obtaining their social acceptance for a project is essential in addressing some of these issues, which helps successful project development (Locher and Scanlon, (n 50) 6) and sustainable development. Sustainability consideration requires protecting stakeholders' interests, vulnerable groups, and individuals, principally to obtain social acceptance. Achieving an SLO also involves (1) the development of open, respectful ongoing relationships with community groups and stakeholders; (2) avoiding, reducing, and paying compensation for negative social impacts; and (3) identifying and pursuing possible positive social effects for communities to benefit from hydropower development (Hartmann, (n 49) 400).

3.2 The Murchison Hydropower Project

The government of Uganda plans to construct a hydropower dam at Murchison Falls to address its energy needs through renewable sources. Bonang Energy and Power Ltd., a South African company, is the contractor for the project, which is anticipated to generate about 360 megawatts of electricity to boost national energy capacity (Biryabarema 2019). The proposed project site is the Murchison waterfalls, a significant tourist attraction and home to many animal species (Alice McCool (n 11)). The waterfall sustains flora and fauna around the Kiryandongo and Nyonya districts in the northwest of Uganda. A beautiful sight to behold is the Nile River, which plunges 45 meters over a cliff at Murchison Falls, offering tourists an incomparable view and experience, boosting the local economy through tourism, and acting as a source of income for tour operators (Murchison Falls National Park, "Save Murchison Falls" https://www.murchisonfallsparkuganda.com/information/save-murchison-falls/ accessed 02 June 2020).

The waterfall is part of the larger Murchison Falls Conservation Area (MFCA), a 5594-square-kilometer protected area protected by a combination of woodlands and savanna, with numerous high mountains. Several small seasonal rivers drain the waterfall and an 80-kilometer stretch of the Nile. The MFCA has a great diversity of plant species and is home to elephants, hippos, chimpanzees, giraffes, black-and-white colobuses, and over 500 species of birds (Mongabay 2019). Several people who were displaced by war settled around the boundaries of the conservation area since mid-2000. A nongovernmental organization (NGO), Citizens' Concern Africa (CICOA), highlights the environmental and social implications of the park and the reserves' essential role in protecting watersheds and nutrients, regulating the local climate and storing carbon. A report puts the yearly worth of timber and other wood for fuel, honey, fruit, and bushmeat, plus tourism from the protected area at over 400 billion Ugandan shillings ($109 million) (National Environment Management Authority 2017).

An NGO, Action Coalition on Climate Change, noted that a dam at the Murchison waterfall would probably affect the flow of water and the natural progression of the site. And it could also affect how water flows downstream the River Nile to South Sudan, Sudan, and Egypt, possibly activating a diplomatic spat (Mongabay (n. 70). *See* also Articles 5 and 6 of the 1997 Convention on the Law of Non-Navigational Uses of International Watercourses, on the principle of equitable and reasonable use of international water courses by all riparian states http://legal.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf, and Art 5 of the Agreement on the Nile River Basin Cooperative Framework https://www.internationalwaterlaw.org/documents/regionaldocs/Nile_River_Basin_Cooperative_Framework_2010.pdf). Furthermore, the dam may limit the straddling of fishes and their breeding ground, thus affecting the fishing activities of neighboring communities and reducing their income from it. The value of Murchison waterfall to communities and the likely impact of a hydropower dam on the ecology of the national park drive stakeholders to oppose the project. These include environmental activists, tourism operators and promoters, and traditional authorities who raise sustainability concerns of the project on economic and social life and the biocultural and biological impact on the area's ecosystem. Civil society organizations note that constructing a dam in the area will threaten the richly biodiverse waterfall and the tourism sector, one of the country's primary foreign exchange earners (Muegrwa 2020). Tourism contributes about 10% of the country's gross domestic product and 24% of foreign exchange inflow (Murchison Falls National Park (n 69)).

Although there is a plan to carry out a feasibility study, stakeholders express less confidence in the process, especially as the company to carry out the assessment has no previous track record. There is no evidence of formal engagement with local communities except that the Electricity Regulatory Authority of Uganda had asked the public to make written submissions regarding the project (Mongabay (n 70)). There need to be free, prior, informed consent or consultation in projects with socioeconomic and environmental implications on communities. The engagement should go beyond public submissions (Blake 2015), and adequate impact assessment must be carried out to determine the project's likely effect around the area. Hydropower development requires sustainability evaluation measures that can stand independent scientific and public scrutiny. The Murchison hydropower project involves multiple stakeholders, and obtaining their social license to operate is crucial to the successful development of the hydropower dam. Apart from the three dimensions discussed, there exist technical and governance aspects in hydropower projects, but not relevant to our discussion.

3.3 Sustainability Assessment and SLO in Hydropower Projects

Practically, achieving sustainable development requires negotiations on workable compromises to address competing interest groups' economic, environmental, and social objectives. One of such methods is through the hydropower sustainability assessment that offers a benchmarking tool for hydropower projects (Assessment

Protocol (n 17)). The assessment supports the Brundtland perspective of sustainability. It establishes common values to the effect that sustainable development embodies poverty reduction, respect for human rights, sustainable patterns of production, the protection and management of natural resource base, and responsible environmental management. It also supports (1) consideration of synergies and trade-offs among socioeconomic and environmental values, (2) transparency and accountability, and (3) the sustainable development and management of hydropower for local, regional, and national benefits to achieving sustainable development goals (Hartmann (n 49) 399).

The Hydropower Sustainability Assessment Protocol (HSAP) is a tool for evaluating project sustainability across various environmental, social, economic, and technical bases. It shows how their sustainability implications are considered at every stage of a hydropower lifecycle: planning, preparation, implementation, and operation (International Hydropower Association 2020b). The assessment tools set out the essential sustainability considerations and allow the development of a sustainability profile for a hydropower project by assessing performance within critical sustainability topics.

These assessment tools – early stage, preparation, implementation, and operation – are designed as independent assessment tools that will apply at specific stages of the project lifespan, i.e., it is a continuous evaluation to the end of the project. The assessment tools are most effective where there are repeat applications to help guide ongoing improvement measures (Assessment Protocol (n 17)). We evaluate below each stage of the Protocol tool that is relevant in the contextual analysis.

3.3.1 The Early Stage Assessment Tool

This stage seeks to know the project risks and opportunities at the onset to identify the challenges and management actions to enable a detailed project investigation. In a sustainability context, it identifies regularities and conflicts relating to water and energy needs and opportunities. The assessment determines whether there is a strategic basis to proceed with a proposed project. It considers the following elements below.

Demonstrated Needs

This topic assesses the need that justifies infrastructural investments in water and energy as identified through widely accepted local and national policies. The essence is to support sustainable development goals at all government levels and avoid under- or overinvestment in water and energy, thus ensuring a balanced approach to water and energy management and needs that includes social, environmental, and economic considerations. The justification could be evidenced in a water or energy development plan, regional land use and infrastructure development plans, or an analysis of project fit with demonstrated needs.

Social Issues and Risks

This assessment identifies and analyzes at an early stage the social issues and risks that could influence investment decisions preparatory to a hydropower project under consideration. Thus, avoiding dangers and problems that may arise after significant investments have been made toward project preparation. Some of the risks and issues include possible water use and land conflicts, the composition of people from the affected project community, socioeconomic livelihoods, possible resettlement requirement, community safety, labor and workforce capacity, public health, cultural heritage, the potential of community acceptance, community consultation and communication, social upheaval, cumulative impacts, etc. The assessment should reveal that the project is likely to minimize and manage negative social consequences and deliver net benefits to project-affected communities. The evaluation evidence could be through expert opinion, area-specific analyses, or records of meetings with representatives from the government and all stakeholder groups.

Environmental Issues and Risks

This assessment identifies at an early stage and analyzes environmental issues and risks that could influence investment decisions preparatory to a hydropower project, thus avoiding risks after investment into project preparation. Project progression is a function of the assessment outcome that the project will possibly minimize and manage harmful environmental impacts. The environmental risks relate to greenhouse gas emissions from the reservoir, migration of aquatic species and wildlife, ecological degradation, water and air quality, erosion, legacy, critical habitats issues, etc. Evidence of this assessment can be through expert opinion, strategic environmental assessment, or records of meetings with representatives from the government and all stakeholder groups.

Economic Issues and Risks

Social issues and risks overlap with economic concerns, as most of these emanate from social impacts. This tool assesses whether there are risks of disruption of economic livelihood and how these risks can be avoided, minimized, and mitigated and compensation paid for possible damage to community livelihood. It considers how alternative options can be mainstreamed into the project to allow communities to sustain their livelihood in a less disruptive manner. Evidence of this assessment can be through a strategic management plan, expert opinion, alternative options to dam design, and siting or records of meetings with government representatives and all stakeholder groups on how to sustain the economic livelihood of the community.

3.3.2 Preparation Assessment Tool

The preparation assessment tool assesses the preparation stage of a hydropower project, during which the developers investigate, plan, and design all aspects of the project. An assessment at this stage enables an evaluation as to whether all preparatory necessities have been met, management plans are in place, and obligations are suitable and binding. This tool can be used before and form the basis of the decision to advance to project implementation. It involves a scoring assessment of the essential practice, and if gaps exist, it emphasizes what needs to be done to fill the gap. This assessment also informs the commencement of construction with relevant social and environmental considerations (ibid). Preparation assessment is done on a case-by-case basis. We consider the relevant aspects below.

Communications and Consultation

The focus of communications and consultation is to identify and engage with project stakeholders, both within the company and among governments, affected communities, key institutions, contractors, NGOs, etc. The essence is to know issues of interest to all stakeholders and establish a foundation for good stakeholder relations through the project's lifespan. This assessment allows for stakeholder mapping (rights and risks, culture, gender, vulnerable groups, disabilities, etc.), identifying those directly or indirectly affected by the project. It also involves evaluating the grievance mechanism put in place to enable stakeholders to bring forward their legitimate complaints and the procedures for tracking and responding to grievances.

This tool also assesses good faith engagement and negotiation (Good faith negotiation involves the willingness to engage in a process; provision of information necessary for informed negotiation; exploration of key areas of importance; mutually acceptable procedures for negotiation; willingness to modify position; provision of sufficient time to both parties for decision-making; and agreements on proposed compensation framework, mitigation measures, and development interventions. *See* Assessment Protocol (n 17)) to ensure that stakeholders' concerns have been discussed and addressed with adequate information provided. It incorporates the use of project-affected communities' representatives, stakeholder representatives, project managers, and project communication staff as likely interviewees. Evidence of compliance with this tool could be the project stakeholder mapping document, project communications and consultation plans, communications protocols, and grievance mechanisms documents showing essential practice.

Siting and Design

Siting and design seek to evaluate and determine where the dam, the reservoir, powerhouse, and other infrastructure will be located. It also examines what model it should take, what action has been taken, and what needs to be done to ensure good practice is followed to fill the gap. Siting and design considerations optimize an iterative and consultative process that considers economic, technical, social, and environmental options. The dam's design has significant implications for the use and flow of water, fish migration, and community livelihood.

In the siting and design of hydropower, the assessment considers sustainability issues such as prioritizing multiple-use benefits, minimizing community displacement and public health issues, and avoiding threats to vulnerable groups. It also considers threatened species, heritage and protected sites that complement community-supported objectives in downstream areas, and greenhouse gas emissions from reservoirs. Geological features and access issues, optimal sustainability consideration anchored on outcomes from a consultative process, also drive the assessment. Project managers and stakeholder groups should be part of the interview process, and evidence of compliance documented in a pre-feasibility study; feasibility studies; reports on options assessment, e.g., multi-criteria analyses; records of a design change to avoid or reduce impact and take advantage of opportunities; reports on stakeholder input and responses; and minutes from public meetings (Protocol Assessment (n 17)).

Environmental and Social Impact Assessment and Management

The focus here is on the assessment and planning process for social and environmental impacts that accompany the implementation and operation of the project throughout the area of effect. The intention is to identify and assess social and environmental impacts and to design and implement prevention, reduction, compensation, and enhancement measures to ensure good basic practice. The assessment ensures that social and environmental issues relating to the hydropower project and impact evaluation and management plans are disclosed publicly. It also provides inclusive and participatory stakeholder engagement with a feedback mechanism in place, incorporates impact assessment of human rights, promotes compensation for negative impacts, and assesses that there are no identifiable gaps with the social and environmental plans (ibid).

The broad consideration here is to prevent, reduce, mitigate, and compensate for any identified harm on community livelihood. Interviewees for this assessment are expected to be drawn from stakeholders' groups, government representatives, external experts, and project managers. Compliance with environmental and social management assessment should be contained in an environmental impact assessment, social impact assessment, and related reports; stakeholder consultation and involvement records; social and environmental management plans; documentation of third-party report; response to stakeholder issues; and evidence of appropriate separate expertise used for environmental and social issues recognizing that in many cases single experts may not have sufficient breadth of knowledge to cover both aspects.

Other topics, which the preparation tool covers from a sustainability perspective, include infrastructure safety and reservoir planning, project benefit to communities, livelihood, and resettlement. It also covers labor and working conditions, cultural heritage, protected sites, biodiversity and invasive species, water quality for locals, and climate change mitigation and resilience (ibid).

Like the preparation tool, the remaining assessment tools, implementation and operation, set out a graded variety of practices carefully assessed against good fundamental values and proven best practices. The evaluated performance within each sustainability topic allows for facilitating organized and continuous improvement. The scoring of each item is against criteria such as assessment, management, stakeholder engagement, stakeholder support, conformance and compliance, and outcomes, thus incorporating sustainability considerations throughout the project lifespan.

In the scoring process of these topics, various significant cross-cutting issues are embodied around human rights, climate change, resettlement and problems of public health, gender, and vulnerable groups mainstreaming, and biodiversity and integrated water resources management. They also embody issues about community livelihood, stakeholder communication, consultation, and engagement in the decision process and present stakeholders with practical steps about how the project developers plan to avoid or mitigate likely impacts from the hydropower project. The Protocol tools exemplify the inclusiveness of critical sustainability issues and how these issues connect to facilitate SLO in hydropower projects. These tools allow for project monitoring, reduce investment risks, provide the opportunity to independently review sustainability issues, meet project financing requirements, and offer a platform to obtain an SLO. When communities are involved in the decision-making process of hydropower projects and evidence of impact prevention, reduction, and mitigation is presented to them in an acceptable form, it results in an SLO (Colton et al. 2016).

4 Achieving Social License to Operate in Hydropower Projects

4.1 Innovative Solutions for Hydropower Development at Murchison Fall

We have identified necessary things to ensure that dams are developed sustainably and assist in obtaining an SLO. We consider them below, within the Murchison hydropower context. Developing a dam at Murchison requires public consultation and adequate social engagement to understand and address the possible consequences of a hydropower dam in the area before final approval is given. Vulnerable groups, gender dimensions, and interest groups, such as tourist operators, should be considered in the decision and assessment processes to establish a foundation for good stakeholder relations throughout the project lifespan (Sequeira and Warner 2007). The consultation should be free, prior, with informed consent obtained from traditional populations and stakeholders (International Labour Organization 1989).

Conducting an EIA and an SIA is essential to determine what impact the project might occasion to biodiversity and human populations, whether to halt the project or avoid, reduce, mitigate, and determine resettlement and compensation mechanisms for project-affected communities (Egre and Senécal 2003). EIAs and SIAs should be carried out with sufficient lead time to provide a reliable evaluation and should be done by independent experts. In the case of Murchison, Bonang Energy, the developers are the same people to carry out the feasibility study. This situation leads to the conclusion that the company is both the plaintiff and the judge (Takouleu 2019). This will breed distrust in the SIA and EIA reports and result in communities refusing to give their social acceptance for the project.

The proper basic practice is for independent experts or organizations not connected to the dam developers and with no conflict of interest with energy sectors, government, or construction companies to carry out EIAs and SIAs. But, the primary practice is often ignored as impact assessments are routinely carried out by the dam developers or firms they hired, and the data is seldom made public until long after the dam is constructed (Morana et al. (n 10) 11895). This practice often results in the inflation of benefit and cost minimization in SIAs and EIAs, thus causing disaffection in communities with several people in court seeking compensation for damages when benefits are not forthcoming (Egre and Senécal (n 89) 220).

The Murchison waterfall is a tourist attraction that generates income for tour operators. The argument is that a dam in the area will limit water flow, thus reducing the beauty of the waterfall, which will be less attractive to tourists and affect locals' income from tourism operations. One of the Protocol Assessment tool topics is hydropower design and siting, emphasizing sustainability to avoid, minimize, mitigate, and compensate. To achieve a truly sustainable energy source, the design of dams must transform to enable fish passage and mimic the seasonal river flows to maintain stream health, which can be classified as mitigation.

Evidence from Sweden shows that the quality of a downstream environment improved after imitating the natural flow of a stream with only a little reduction in hydropower production (Renöfält et al. 2010). Again, it has been suggested that instream turbine technology can be an alternative to hydropower generation since they do not involve damming up the river. Instead, they produce energy for local communities, maintain a healthy river ecosystem, and do not require resettlement and other negative externalities and social costs (Wang et al. 2012). Companies such as Smart Hydro Power have already sold over 40 instream turbines globally to serve energy needs in a green manner (Smart Hydro power https://www.smart-hydro.de/ accessed 6 June 2020), and several small firms are testing models and advancing toward commercialization (Voith, "Small hydro–local experts with global expertise" (*Voith*, 2016) http://voith.com/uk-en/industry-solutions/hydropower/small-hydro.html accessed 05 June 2020; Lauren Dickerson, "Lunagen: Generating electricity in slow flowing water" (Changemakers 2015) https://www.changemakers.com/globalgoals2015/entries/lunagen accessed 05 June 2020; Build It Solar, "Flow of river hydro–using only stream velocity to drive a turbine" (2015) https://www.builditsolar.com/Projects/Hydro/FlowOfRiver/FlowOfRiver.htm accessed 05 June 2020).

Transparency and trust building are fundamental in dam development. The essence is to enhance valuations, integrate community concerns, and allow for new designs that can improve livelihoods by increasing food security through crop productivity, maintaining fisheries yields, and improving access to water and energy from the project (Morana et al. (n 10) 11896). Furthermore, site selection for the Murchison hydropower should be devoid of corruption. It breeds undue influence from project developers, thus undermining the trust affected communities may have for the project and its sustainability (Sohail and Cavill 2007).

Hydropower development at Murchison waterfall needs sustainability evaluation measures that can stand public and independent scientific scrutiny. The Protocol Assessment offers that channel, especially in building the local community's confidence in the entire process and obtaining SLO. Using the Protocol Assessment tool to address community concerns will promote sustainable development and allay community fears regarding hydropower projects, and this can result in social acceptance by communities. The Protocol tool aligns with the World Bank and other international development partners' standards (Hartmann (n 49)).

4.2 Obtaining Community Acceptance in Hydropower Projects

Obtaining SLO is a function of stakeholder relations between local communities, government agencies, and project developers. Concerns about the impact of extractive or energy projects account for community opposition, expressed in the form of protests and unrest, which could lead to project delays, financial loss, or even abandonment.

To gain social acceptance in the Murchison project, project developers and government must convince tour operators, local communities, and broad stakeholders that the project will not impact the environment and livelihoods and that it will not result in adverse negative impacts for the future generation. One way to achieve this is by engaging independent experts to carry out an impact assessment of the project on the area, with contribution from the broad stakeholders' network. Again, communicating, consulting, engaging, and allowing transparent local participation in the discussion and decision process will enhance social acceptance. This aspect must consider gender dimensions, vulnerable groups, and all those directly or indirectly affected by the project. This process is a vital determinant of SLO as effective communication as engagement builds public trust and prevents social conflict (Prno (n 13)).

Precise mechanisms for resettlement, compensation, and respect for human rights (Azubuike and Songi 2020), water management and fisheries protection, and the use of innovative technology that have less impact on water and the ecology will contribute to obtaining an SLO. Bonang Energy and the Electricity Regulation Authority are encouraged to follow the part of full disclosure and community engagement, provide and publish all SIAs and EIAs, and genuinely engage with the broad stakeholders to avoid further social conflict regarding the Murchison dam construction. This process should be followed to halt the project or prevent, minimize, mitigate, and pay compensation for damages. Doing this will align with sustainability principles and ensure that no one is left behind in the development process. Fortunately, the Protocol Assessment already discussed offers a step-by-step approach, from the early stage through to the operation stage of the hydropower project.

5 Conclusion and Recommendations

Hydropower projects have social, economic, and environmental implications on communities around the project site (Moran et al. (n 10)). However, it can be part of a low-carbon future if developed sustainably, primarily as it uses zero fossil fuel and provides low-cost electricity. In addition, dam developers can utilize alternative dam designs such as instream turbines that are less disruptive to stream ecology, fisheries, and coastal communities. But developing it would require social acceptance from communities around the proposed area.

Hydropower development at Murchison waterfall needs sustainability evaluation measures that can stand public and independent scientific scrutiny. The Protocol

Assessment tool offers that channel, especially in building the local community's confidence in the entire process, which is essential in obtaining SLO. Using the Protocol Assessment tool to address community concerns will promote sustainable development, allay community fears regarding the negative impacts of hydropower projects, and achieve SLO for the project. The framework assessment can be applied throughout the project's lifespan, thus building trust and acceptance, which is fundamental to an SLO in any renewable energy or extractive industry project.

SLO can be obtained when broad stakeholders are consulted and engaged, their concerns documented, and consent sought freely and early in any extractive or renewable energy project. Also, the likely project impacts must be communicated to them to halt the project, or mechanisms for avoiding, minimizing, and mitigating the damages, and paying compensation for possible harm, presented to them. It is worth mentioning that SLO could be withdrawn by stakeholders, thus leading to project disruptions. However, the Protocol tools ensure that sustainability considerations continue to apply in the project lifetime, and this assures local communities that their concerns are mainstreamed into the project from start to finish.

As already stated, the Protocol incorporates stakeholders' consultation, engagement, and participation in every step of the way – early stage, preparation, implementation, and operation – so that their concerns are integrated into the social, economic, and environmental impact considerations. Utilizing innovative dam designs, which the Protocol encourages, will assure stakeholders of the dam sustainability and enable water flow for tourism purposes. Again, the government must employ the services of independent experts to carry out a feasibility study of the area in question. The selection process must be transparent to build trust and avoid social conflict.

Transparent communication and adherence to the Protocol framework will enhance social acceptance. When communities are confident of the measures that promote sustainable development, social license to operate becomes easy. Sustainably developed and resilient hydropower can play an essential role in allowing Africa to meet the Sustainable Development Goals (SDGs), achieve clean energy transitions, adapt to climate change (International Energy Agency, "Climate Impacts on African Hydropower" (n 6)), and enjoy national, regional, and local benefits (Hartmann (n 49)).

References

Volker Roeben and Smith I Azubuike, "Climate change and responsibility: Arctic states cooperation through the Arctic Council in climate change mitigation and adaptation efforts" in Heininen, Lassi, and Heather Exner-Pirot (eds), *Climate Change and the Arctic: Global Origins, Regional Responsibilities?* (Northern Research Forum 2020).

Arun Kumar, Tormod Schei, Alfred Ahenkorah, Rodolfo Caceres Rodriguez, Jean-Michael Devernay, . . . and Ånund Killingtveit, "Hydropower." In Ottmar Edenhofer, Ramon Pichs-Madruga, Youba Sokona, Kristin Seyboth, Patrick Matschoss, Susanne Kadner, . . . and Christoph von Stechow (eds), *IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation* (CUP 2011).

International Energy Agency, "Hydropower" (IEA, 16 June 2020a) https://www.iea.org/fuels-and-technologies/hydropower accessed 17 June 2020.
International Hydrocarbon Association, "2020 Hydropower Status Report: Sector trend and insights" (IHA, 2020) https://www.hydropower.org/sites/default/files/publications-docs/2020_hydropower_status_report.pdf accessed 17 June 2020.
International Energy Agency, "Climate Impacts on African Hydropower" (IEA Country report, June 2020b) https://www.iea.org/reports/climate-impacts-on-african-hydropower accessed 16 June 2020.
Dominique Egre and Joseph C. Milewski, "The diversity of hydropower projects" (2002) 30(14), *Energy Policy*, 1225–1230.
Eduardo von Sperling, "Hydropower in Brazil: overview of positive and negative environmental aspects" (2012) 18 Energy Procedia 110–118.
Emilio F Morana, Maria Claudia Lopez, Nathan Moore, Norbert Müller, and David W Hyndmand, "Sustainable hydropower in the 21st century" (2018) 115(47) *Proceedings of the National Academy of Sciences*, 11891–11898.
Alice McCool, "Uganda's thirst for hydropower raises fears for environment" (*Guardian*, 11 January 2020) https://www.theguardian.com/global-development/2020/jan/11/uganda-thirst-for-hydropower-raises-fears-for-environment-murchison-falls accessed 01 June 2020.
Raphael J Heffron, Lauren Downes, Oscar M. Ramirez Rodriguez, Darren McCauley, "The emergence of the 'social licence to operate' in the extractive industries?" (online 24 October 2018) Resource Policy ID 101272.
Jason Prno, "An analysis of factors leading to the establishment of a social licence to operate in the mining industry" (2013) 38(4) Resources Policy 577–590.
Richard Parsons, Justine Lacey, and Kieren Moffat, "Maintaining legitimacy of a contested practice: How the minerals industry understands its 'social licence to operate'" (2014) 41, *Resources Policy*, 83–90
Emma Wilson, "What is the social licence to operate? Local perceptions of oil and gas projects in Russia's Komi Republic and Sakhalin Island" (2016) 3(1) The Extractive Industries and Society 73–81.
International Hydropower Association, "Hydropower Sustainability Assessment Protocol" (IHA, May 2020a) https://static1.squarespace.com/static/5c1978d3ee1759dc44fbd8ba/t/5eb3e949d47d2945368419dc/1588848975609/Hydropower+Sustainability+Assessment+Protocol+07-05-20.pdf accessed 30 May 2020 ("Assessment Protocol").
Jędrzej Górski and Christine Trenorden, "Social License to Operate (SLO) in the Shale Sector: A Contextual Study of the European Union" (2020) 18(1) 115, Appendix IV at 114–115.
Govindan Kannan, Devika Kannan, and Madan K Shankar, "Evaluating the drivers of corporate social responsibility in the mining industry with multi-criteria approach: A multi-stakeholder perspective." (2014) 84(1) Journal of Cleaner Production 214–232.
Nina Hall, Justine Lacey, Simone Carr-Cornish, and Anne-Maree Dowd, "Social licence to operate: Understanding how a concept has been translated into practice in energy industries." (2015) 86 Journal of Cleaner Production 301–310.
International Finance Corporation, "IFC Performance Standards on Environmental and Social Sustainability" (IFC, 1 January 2012) https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_pps accessed 02 June 2020.
Rio Tinto, "Why Agreements Matter: A Resource guide for integrating agreements into Communities and Social Performance work at Rio Tinto" (2016) www.riotinto.com/documents/Rio_Tinto_Why_Agreements_Matter.pdf accessed 04 June 2020.
Jennifer Loutit, Jacqueline Mandelbaum, and Sam Szoke-Burke, "Emerging Practices in Community Development Agreements" (Columbia Centre on Sustainable Development, 2016) http://ccsi.columbia.edu/files/2016/02/Emerging-practices-in-CDAs-Feb-2016-sml.pdf 04 June 2020.
Columbia Centre on Sustainable Investment, "Natural Resource Contracts as a Tool for Managing the Mining Sector" (CCSI, 23 July 2015) http://ccsi-columbia.edu/files/2015/07/Natural-Resource-Contracts-as-a-Tool-for-Managing-Mining-Sector.pdf accessed 05 June 2020.

Boubacar Bocoum, Sunrita Sarkar, Alastair Gow-Smith, Tunde Morakinyo, Roberto Frau, Matthew Kuniholm, and James M. Otto, "Mining community development agreements-practical experiences and field studies" (World Bank, March 2012) no. 71299.

James M. Otto, "Community Development Agreement Model Regulations & Example Guidelines" (World Bank 2010) no. 7154096.

Raphael J. Heffron and Kim Talus, "The development of energy law in the 21st century: a paradigm shift?" (2016) 9(3) The Journal of World Energy Law & Business 189–202.

Darren A. McCauley, Raphael J. Heffron, Hannes Stephan, and Kirsten Jenkins, "Advancing energy justice: the triumvirate of tenets." (2013) 32(3) International Energy Law Review 107–110.

Darren McCauley and Raphael Heffron, "Just transition: Integrating climate, energy and environmental justice" (2018) 119 Energy Policy 1–7.

Xiaofan Zhao, Liang Wu, and Ye Qi, "The Energy injustice of hydropower: Development, resettlement, and social exclusion at the Hongjiang and Wanmipo hydropower stations in China." (2020) 62 Energy Research & Social Science, ID 101366.

Lauren M. MacLean, Christopher Gore, Jennifer N. Brass, and Elizabeth Baldwin, "Expectations of power: the politics of state-building and access to electricity provision in Ghana and Uganda." (2016) 1(1) Journal of African Political Economy and Development 103–134.

Ian Bailey and Hoayda Darkal, "(Not) talking about justice: justice self-recognition and the integration of energy and environmental-social justice into renewable energy siting." (2018 23(3) Local Environment 335–351.

Lucy Mercer-Mapstone, Will Rifkin, Winnifred Louis, and Kieren Moffat "Meaningful dialogue outcomes contribute to laying a foundation for social licence to operate." (2017) 53 Resources Policy 347–355.

Eefje Cuppen, "The value of social conflicts. Critiquing invited participation in energy projects." (2018) 38 Energy Research & Social Science 28–32.

Shivcharn S. Dhillion, "11 Benefit sharing for project risk – conflict reduction and fostering sustainable development: Current understanding and mechanisms." (2019) Natural Resource Conflicts and Sustainable Development 147.

Fabio Manzini, Jorge Islas, and Paloma Macías, "Model for evaluating the environmental sustainability of energy projects" (2011) 78(6) Technological Forecasting and Social Change 931–944.

World Commission on Environment and Development, *Our Common Future* (OUP 1987).

Ayodele Asekomeh, Obindah Gershon, and Smith I Azubuike, "Can green infrastructure development in cities be equitable? An eclectic review of Dundee City's electric vehicles strategy" in Subhes Bhattacharyya (ed) *Aligning Local Interventions with the UN Sustainable Developments Goals (SDGs*), conference proceedings 2 July 2020, Institute of Energy & Sustainable Development, De Montfort University, Leicester, UK.

Joerg Hartmann, "Sustainability of Hydropower" in Jay H Lehr, Jack Keeley, and Thomas B Kingery (eds) *Alternative Energy and Shale Gas Encyclopaedia* (John Wiley & Sons 2016).

Helen Locher and Andrew Scanlon, "Sustainable Hydropower – Issues and Approaches" in Hossein Smadi-Boroujeni (ed) *Hydropower: Practice and application* (InTech 2012).

Gabriela Hug-Glanzmann, "A hybrid approach to balance the variability and intermittency of renewable generation" (2011) IEEE Trondheim PowerTech, 1–8.

Patrick Kline and Enrico Moretti. "Local economic development, agglomeration economies, and the big push: 100 years of evidence from the Tennessee Valley Authority" (2014) 129(1) The Quarterly Journal of Economics 275–331

James Feyrer, Erin T Mansur, and Bruce Sacerdote, "Geographic dispersion of economic shocks: Evidence from the fracking revolution" (2017) 107 (4) American Economic Review 1313–34.

João Leonardo da Silva Soito and Marcos Aurélio Vasconcelos Freitas, "Amazon and the expansion of hydropower in Brazil: Vulnerability, impacts and possibilities for adaptation to global climate change" (2011) 15(6) Renewable and Sustainable Energy Reviews 3165–3177.

Esther Duflo and Rohini Pande, "Dams" (2007) 122(2) The Quarterly Journal of Economics 601–646.

Felipe de Faria, Alex Davis, Edson Severnini, Paulina Jaramillo, "The local socio-economic impacts of large hydropower plant development in a developing country" (2017) 67 Energy Economics 533–544.
Elias Biryabarema, "Uganda allows study of power project in Murchison Falls national park" (*Reuters*, 28 November 2019) https://www.reuters.com/article/us-uganda-electricity/uganda-allows-study-of-power-project-in-murchison-falls-national-park-idUSKBN1Y21RZ accessed 03 June 2020.
Mongabay, "In a flip-flop, Uganda says it'll allow a study for a dam at Murchison Falls" (*Mongabay* 6 December 2019) https://news.mongabay.com/2019/12/in-a-flip-flop-uganda-says-itll-allow-a-study-for-a-dam-at-murchison-falls/ accessed 2 June 2020.
National Environment Management Authority, "Economic Valuation Of Protected Areas in Uganda: A Case Study of Murchison Falls Conservation Area and Budongo Central Forest Reserve" (NEMA, July 2017) file:///C:/Users/DAD/Downloads/Valuation%20of%20PAS%20in%20Uganda-Murchison%20and%20Budongo-%20March%202017.pdf accessed 03 June 2020.
Francis Muegrwa, "Uganda: CSOs Reject Construction of Power Dam At Murchison Falls" (*allAfrica*, 20 January 2020) https://allafrica.com/stories/202001290748.html accessed 02 June 2020.
Chris Blake, "Community-led hydro initiatives Inspiring overview of hydro installations, funding and project profit management" (National Energy Foundation 2015) http://www.nef.org.uk/themes/site_themes/agile_records/images/uploads/Community-Led_Hydro_Initiatives.pdf accessed 2 June 2020.
International Hydropower Association, "Hydropower Sustainability Assessment Protocol: Overview" https://www.hydropower.org/topics/featured/hydropower-sustainability-assessment-protocol 01 June 2020b.
John Colton, Kenneth Corscadden, Stewart Fast, Monica Gattinger, Joel Gehman, . . . and Adonis Yatchew, "Energy projects, social licence, public acceptance and regulatory systems in Canada: A white paper" (2016) 20, *SPP Research Paper No 9*.
Debra Sequeira and Michael Warner, *Stakeholder engagement: A good practice handbook for companies doing business in emerging markets* (World Bank, 2007) No. 39916.
International Labour Organization, Indigenous and Tribal Peoples Convention No. 169 (1989) https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169 accessed 5 June 2020.
Dominique Egre and Pierre Senécal, "Social impact assessments of large dams throughout the world: Lessons learned over two decades" (2003) 21(3) Impact Assessment and Project Appraisal 215–224.
Jean Marie Takouleu, "Uganda: Government relaunches Murchison Falls hydroelectric project" (*Afrik 21*, 4 December 2019) https://www.afrik21.africa/en/uganda-government-relaunches-murchison-falls-hydroelectric-project/ accessed 4 June 2020.
Birgitta Malm Renöfält, Roland Jansson, and Christer Nilsson, "Effects of hydropower generation and opportunities for environmental flow management in Swedish riverine ecosystems" (2010) 55(1) Freshwater Biology 49–67.
Ji-feng Wang, Janusz Piechna, and Norbert Müller, "A novel design of composite water turbine using CFD" (2012) 24(1) Journal of Hydrodynamics, Ser. B, 11–16; Moran et al. (n 10).
M Sohail and Sue Cavill, "Accountability arrangements to combat corruption: Synthesis report and case study survey reports" (Loughborough University 2007) https://repository.lboro.ac.uk/articles/Accountability_arrangements_to_combat_corruption_Synthesis_report_and_case_study_survey_reports/9457172/files/17080457.pdf accessed 06 June 2020.
Smith I Azubuike and Ondotimi Songi, "A rights-based approach to Oil spill investigations: A case study of the Bodo community oil spill in Nigeria" (2020) 1(1) Global Energy Law and Sustainability 28–54.