Pastoralism and large-scale REnewable energy and green hydrogen projects

POTENTIAL & THREATS

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Brot für die Welt

HEINRICH BÖLL STIFTUNG

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by Ann Waters-Bayer (Agrecol Association) and Hussein Tadicha Wario (Centre for Research & Development in Drylands)
for Brot für die Welt and the Heinrich Böll Foundation

"The climate crisis will not be averted without a rapid expansion of the renewable energy industry. However, a net-zero carbon future can and must go hand in hand with sustainable development, poverty reduction and reducing inequality.... A narrow focus on short-term return on investments regardless of the harm to people and the environment has led fossil fuel companies to lose legitimacy and social licence to operate. If the same happens to renewable energy companies, it will only slow our expansion to a net-zero carbon future. That's why we need clean energy that respects human rights. A transition that is fast, but also fair."

Mary Robinson, Climate Justice (2020)

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Agrecol Association for AgriCulture & Ecology (www.agrecol.de) is a German-based nongovernmental organisation that promotes site-appropriate farming systems worldwide, including pastoralism as a form of agroecology suited to the drylands. It is the Northern Focal Point of the international network Prolinnova (Promoting Local Innovation in ecologically oriented agriculture & natural resource management / www.prolinnova.net). Agrecol is a member of the Coalition of European Lobbies for Eastern African Pastoralism / CELEP (www.celep.info).

The Center for Research and Development in Drylands (CRDD) (www.crdd-kenya.org) is a Kenyan-based non-profit organisation that promotes people-centred research and development. Based in northern parts of Kenya, it works with a pool of professionals from the region to develop and implement research and development that contribute to sustainable livelihoods for communities living in the drylands. CRDD is one of the East African partners of CELEP and a member of the Prolinnova network in Kenya.

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Foreword

by Jörg Haas, Heinrich Böll Stiftung

There can be no doubt that a massive expansion of solar- and wind-power generation worldwide is urgently needed. It is the number one solution to phase out fossil fuels and avert catastrophic climate change. Some of this renewable energy will be used to generate green hydrogen and its derivatives (Power-to-X or PtX) as clean fuels for industry and transport.

Governments and investors have recognised that many dryland areas are excellent sites for generating wind and solar power. However, these areas have been used for generations by diverse pastoralist peoples as well as hunter-gatherers and crop farmers as common property resources. The ventures into renewables often ignore their land rights. In the past, most governments gave little attention to the drylands, leaving them on the margins of development. When investors showed interest in setting up irrigated plantations or creating wildlife or hunting reserves for tourists, governments used the narrative of "idle" and "empty wastelands" to justify allocating land to the investors to make better use of it. With the global energy transition, there is now a trend to use the huge potential of these areas to produce energy.

We commissioned this study on how large-scale solar- and wind-power and green-hydrogen projects could affect pastoralists. It seeks to highlight this growing challenge so that: i) policymakers and civil society can shape the expansion of producing renewables in the drylands so that, at a minimum, it does no harm; and ii) pastoralists can become better prepared to deal with this expansion, and in a best case even benefit from it.

The report starts with a summary overview of the current situation, trends, and perspectives in generating solar and wind energy and producing green hydrogen in the drylands globally. Special attention is given to issues around rights of land tenure and use. This provides the context for studying the challenges and opportunities for pastoralists faced with the expansion of green-energy production in the drylands for public and commercial benefit.

There follows a review of literature (both peer-reviewed and "grey") on the impact of solar- and wind-power generation on pastoralists. The focus is on Africa, but also cases from other parts of the world are included. This literature review enabled the identification of key issues to address in the report as well as case studies. For further information about the methodology, see Annex 1.

Selected cases are presented of experiences made by pastoralists in interaction with green-energy projects. These cases are based mainly on literature but also – in Kenya – on the authors' experiences and interviews with local resource persons. Some information on the co-existence of pastoralism and renewable-energy generation in different parts of the world is given so as to show how pastoralists using common property resources could benefit from this.

The report concludes with a discussion of the threats and potentials of renewables for pastoralists, and some recommendations are given for avoiding conflict and enabling multifunctional land use in ways that recognise the rights of pastoralists to access natural resources and energy as well as the opportunities for society at large to access clean, renewable energy. It offers initial ideas as to how pastoralists could have a fair share of the benefits created from renewable-energy generation on their traditional land.

This study focusses primarily on how the large-scale generation of solar and wind power affects the lives of pastoralists who use natural resources in the same areas. The authors follow the definition of "large-scale land acquisition" used by the Land Matrix, referring to areas larger than 200 ha contracted for commercial purposes. The study gives only limited attention to current and potential production of geothermal energy and green hydrogen. It does not look into the vast literature on the generation of hydroelectric power in pastoral areas. It does not explore the considerable potential of decentralised small-scale energy generation, nor does it explore the innovative ways in which pastoralists themselves are using small- and micro-scale solar- and wind-energy installations to improve their lives and diversify their sources of income.

We are firmly convinced that the transition to 100% renewable energy worldwide in a short timespan is both a necessity and a huge opportunity for the world. But because it is urgent, this transition has to be put on a solid footing. It has to be steered in such a way that the rights and legitimate interests of the politically weaker, more vulnerable members of our global society, such as pastoralists, are respected. This starts but does not end with ensuring the free, prior and informed consent (FPIC) of the affected populations. This is not only a moral necessity: it is also a way to avoid conflict, costly delays, and even project failure and ensure that the much needed expansion of renewable energies can proceed both rapidly and sustainably.

This short study is certainly not the final word in this matter. It is meant to generate a debate both in the producer countries with pastoralist populations, and in the importer countries of the envisaged international trade with green hydrogen and PtX products. Both have a responsibility to steer the future billions of investment into this expansion in such a way that human rights are safeguarded.

Acronyms and abbreviations

ACHPR	African Commission for Human & Peoples' Rights
BHRRC	Business & Human Rights Resource Centre
CSO	civil society organisation
CSP	concentrated solar power
CSR	Corporate Social Responsibility
EIA	environmental impact assessment
FPIC	free, prior & informed consent
ha	hectare
IFI	international financial institution
IPs	indigenous Peoples
KenGen	Kenya Electricity Generating Company
KfW	formerly: Kreditanstalt für Wiederaufbau (reconstruction loan corporation)
KWP	Kinangop Wind Park
LTWP	Lake Turkana Wind Power
NGO	nongovernmental organisation
PtX	Power-to-X
PV	photovoltaic
SDG	Sustainable Development Goal
SHSs	solar home systems
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNFCCC	United Nations Framework Convention on Climate Change

Hydrogen energy storage gas tank with solar panels, wind turbine and energy storage container unit.
© petrmalinak

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– Ann Waters-Bayer and Hussein Tadicha Wario

Executive summary

This review of (primarily English) literature worldwide and case studies in India, Kenya, Morocco, and Norway confirmed that large-scale green-energy projects are being set up in the drylands without adequate consultation with the local land users and without free, prior, and informed consent (FPIC). The common grazing land is often held by the state "in trust" for its citizens, but the state may not honour traditional rights to land, even if it has signed international agreements to respect them. Narratives of making productive use of "unused" or "degraded" land are often used to justify land acquisition in the drylands.

Where solar farms were built, the pastoralists lost access to pasture; wind farms interfered less with grazing. Local people, feeling that their land and cultural rights had been violated, often resisted the energy development, sometimes violently, sometimes through the courts. In two cases (Kenya and Norway), the courts ruled that the land-acquisition process was illegal. In contrast, where good consultations were carried out, the energy company and the local community could reach agreement on benefit-sharing. In Mongolia, in contrast to the other countries, herders had full access to the pasture under wind turbines and power lines and saw no negative impacts on their pastoral system. Their concerns about the siting of solar farms were taken into account during project design.

In most cases, during the planning of the energy projects, the pastoralists were not sufficiently informed about the plans or about their own rights, and therefore could not defend them. Moreover, they received few or no benefits from the projects. This type of "land grabbing" deprived the customary land users of their access not only to pasture, but also to natural energy sources (firewood), yet they rarely gained access to electricity generated from the projects. In several cases, the projects caused serious conflict, which led to construction delays, higher costs, or even project failure.

Thus, some green-energy projects led to land and energy dispossession, reduced access to pasture, interference in livestock migration routes, disruption of pastoral cultures, and decreased resilience of the pastoral land-use system. The rush for land for generating renewable energy exacerbated the historical marginalisation of pastoralists in most countries (Mongolia being a notable exception). If the enforcement of human-rights principles and legal systems for recognising rights to common land are not strengthened, a growing number of pastoralists will lose their land to large-scale renewable energy projects and become poorer. This will fuel more conflict, hopelessness, and migration.

However, in Canada, Kenya, and Mexico, there are also examples of how local communities have benefited from green-energy projects through sharing in the revenues generated. Scientific studies have shown that green-energy generation can co-exist with grazing and even improve animal welfare. An inclusive participatory design of energy projects with multifunctional land use could optimise overall land-use efficiency for agriculture (including livestock), biodiversity, rural social and economic activities, and energy. Thus, there is a potential for win–win situations for pastoralists and green energy, but ways need to be found to strengthen the voice and agency of pastoralist communities so that they can negotiate good terms for their members.

Governments will need to manage the shift to renewable energy carefully through open discussions with informed civil society, and especially with the local people in the project areas. Only then can damage to local people's rights and livelihoods be averted and an equitable transition to renewable energy be made in ways that pastoralists can benefit from the transition.

Young herders in Niger.
© Tim Dirven / VSFB

If the enforcement of human-rights principles and legal systems for recognising rights to common land are not strengthened, a growing number of pastoralists will lose their land to large-scale renewable energy projects and become poorer. This will fuel more conflict, hopelessness, and migration.

Recommendations for facilitating a just transition to green energy in pastoral areas

Government policymakers should:

- draw up national strategies for consultation, including FPIC, with all local land users wherever a country plans for a large-scale expansion of renewable energy, including green hydrogen;
- set up country frameworks that define parameters for local community participation and benefit from renewable-energy installations;
- ensure that the pastoralists and other local land users have legal support for negotiating with energy developers and have access to independent conflict mediation;
- support participatory, integrated land-use planning for reaching several Sustainable Development Goals simultaneously in areas foreseen for renewable-energy generation;
- in the case of hydrogen-importing countries, require in their frameworks for procuring and certifying green hydrogen that it come from projects that meet global human-rights standards.

Energy companies / project planners should:

- implement existing international and national business standards and codes of conduct;
- be more aware of the project risks and costs they will face if they do not respect human rights;
- seek to understand the existing forms of land use by multiple communities with multilayered rights of land use, as well as the rationale for pastoral mobility;
- engage with local land users early in the project process and seek their collaboration in planning.

Development agencies and investment banks should:

- ensure that human rights impact assessments are carried out and all required social and environmental safeguards and remedies are met;
- continuously monitor that the projects implement the existing standards and codes, including the human-rights and land-tenure guidelines.

Development nongovernmental organisations and civil society organisations should:

- become more aware of the existing international standards and codes of conduct so that they can exert pressure on governments and investors to adhere to them;
- strengthen the capacities of local people to negotiate about renewable energy projects, including support in the registration of common land, legal advice about their human and civil rights, and access to independent conflict mediation;
- facilitate multistakeholder planning processes for land use that includes both pastoralism and renewables;
- advocate for policy change to secure pastoralists' land-use rights.

Researchers should:

- fill knowledge gaps about the multifaceted value of pastoralism and rangelands, generating these data together with pastoralists and making the information easily accessible to them;
- study environmental and production trade-offs between allocating land to solar and wind energy development versus pastoralism and other agricultural land uses, and regarding socio-economic consequences of green-energy development in the drylands;
- engage in participatory action research with pastoralists confronted by green-energy projects to enable the pastoralists' legal empowerment;
- engage in participatory research to develop ways of integrating renewable energy and pastoral land use, particularly research into how grazing can be combined with large-scale solar farms.

Box 1

Who are pastoralists?

Pastoralists are people who, as their main source of livelihood, raise livestock or semi-domesticated animals wholly or partly on rangelands in production systems that are extensive in terms of land use and involve some degree of animal mobility. They specialise in generating value out of highly variable environments by constantly adapting to fluctuations in rainfall and the availability of forage and water. Estimates of the number of pastoralists worldwide vary between 100 and 500 million, depending on definition. As pointed out in a gap analysis on rangelands and pastoralism (Johnsen et al. 2019), information on the population of pastoralists is one of the many gaps in the knowledge of scientists and policymakers regarding the rangelands.

Pastoralists at the Merille livestock market, Marsabit County, Kenya.
© Petra Dilthey / eeem.org

01

Introduction

Several megatrends foreshadow a massive expansion of solar- and wind-power generation worldwide. This is buoyed by decreased costs, especially for photovoltaics (PV) and wind turbines, making energy derived from large-scale solar and wind parks among the cheapest sources of electricity – much cheaper than energy from coal, gas, or nuclear power. In view of the world's climate emergency, more and more land will be used for large-scale solar and wind parks as near-zero-carbon sources of energy. Some of this green energy is already being used to generate green hydrogen via the electrolysis of water, and there will be a steep increase in demand for such e-fuels for industry and transport.

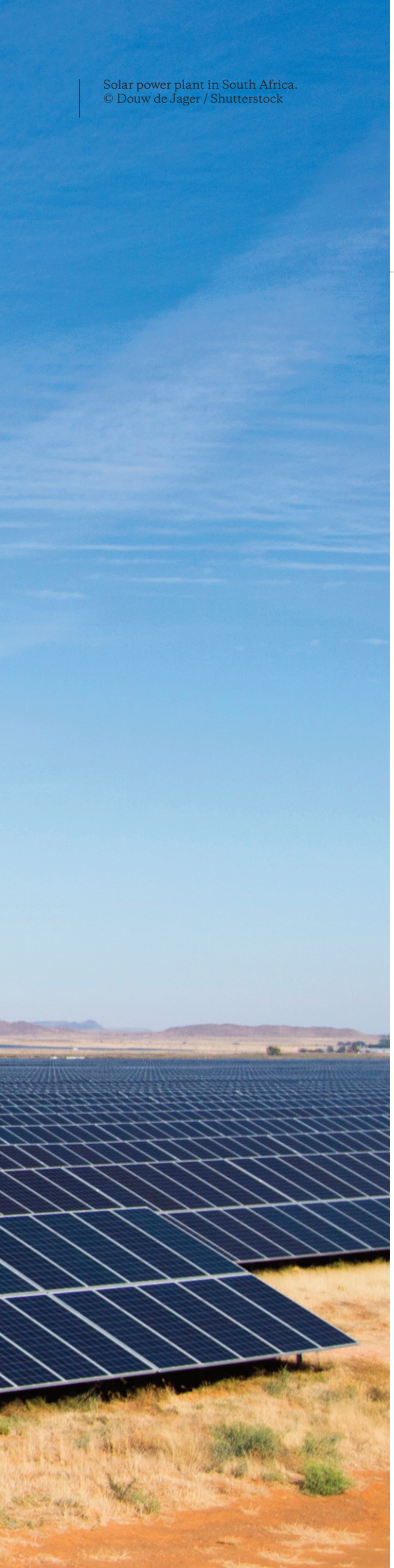
In recent years, governments and investors have increasingly recognised that many arid and semiarid rangeland ("dryland") areas are excellent sites for generating wind and solar power. Not only do these areas experience high solar irradiation and often high wind velocities, they are also fairly flat and relatively sparsely populated. Potential sites for renewable energy projects closer to more populated areas and cities frequently face resistance from inhabitants who usually have more (voting and other) influence than do those in the rangelands.

In the current global quest to reduce climate disruption, meet the growing demand for energy, and reduce or replace energy from fossil fuels, the expansion of green energy is desirable from global and national perspectives.

The urgency to make a transition to green energy is highlighted in the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). Renewables – at both large and small scale – need to be developed at the fastest possible pace if countries worldwide are to fulfil their net-zero emission objectives and keep global warming below 1.5°C.

However, the drylands targeted for the large-scale development of renewables have been used for generations by diverse pastoralist groups, hunter-gatherers, and crop farmers as common property resources. The ventures into renewables often do not respect their rights to land. This exacerbates climate injustice in areas already highly disadvantaged, according to development indices.

In the past, most governments gave little attention to the drylands, leaving them on the margins of development. When investors showed interest in setting up irrigated plantations in better-watered valleys or in creating wildlife or hunting reserves for tourists, governments used the narrative of "land degradation" and "idle" and "empty wastelands" (Anderson & Paul 2008) to justify allocation of the land to investors, ostensibly to put it to better use. Now, in light of the climate crisis, these vast "lands of the future" (Gabbert et al. 2021) have huge potential to generate energy.



Solar power plant in South Africa.
© Douw de Jager / Shutterstock

02

Current situation, trends & perspectives in generating green energy in drylands

Renewable energy is a sector of exponential growth. Global conventions – the 2015 Paris Agreement and the 2017 Sustainable Development Goals (SDGs) and Agenda 2030 – are driving national commitments to decarbonise their economies and reduce C02 emissions. A growing number of countries have set targets for 100% renewable energy, many already by 2030. According to the Climate Action Tracker, to meet the global decarbonisation target of limiting global warming to "safe" levels (below 1.5°C), renewables will need to reach 98–100% of electricity generation by 2050, mainly from solar and wind power, with a growing focus on e-fuels. The market share of solar and wind in global electricity generation grew at a compound average annual rate of 15% from 2015 to 2020. If growth continues at this rate, solar and wind will account for 45% of electricity generation by 2030 and 100% by 2033 (Jaeger 2021).

Falling costs have been the biggest factor in this rapid growth of investment in renewable energy. Since 2010, the cost of solar PV has fallen 85%, and the cost of wind energy has been cut by half. In 2021, for the first time in history, there was more growth in solar and wind than in fossil-fuel capacity (Jaeger 2021). Besides the low running costs, solar power tends to be preferred because of its modular nature, relative reliability, and avoidance of emissions or pollution. The phasing out of energy subsidies for fossil fuels has accelerated the growth of renewables (Al-Saidi & Lahham 2019).

According to the World Bank (2020), developing countries that generate solar and wind power could produce green hydrogen for export and improve their own energy security by reducing exposure to fossil-fuel price volatility and supply disruptions. The generation of green hydrogen based on solar or wind power is becoming increasingly competitive in economic terms with fossil-fuel alternatives (MPGCA 2021).

Current situation, trends & perspectives in generating green energy in drylands **continued**

South Africa, which currently uses coal for 87% of its power sources, has identified green hydrogen as an alternative to power its transport, industry, and building sectors (Engie Impact 2021). Also Namibia plans to produce 300,000 tonnes of green hydrogen from 2026 for export and has signed contracts with Germany, Belgium, and the Netherlands (Schutz 2021). Morocco has a contract with Germany for the commercial exploitation of its hydrogen potential and aims to generate solar power on more than 2,000 km2 in its drylands in order to produce 4% of the global hydrogen supply (Chaudier 2021). However, solar and wind farms need large areas and could compete with local uses and needs. There can also be competition for water: solar farms need water to clean the panels for efficient operation; water needs are especially high for concentrated solar power (CSP). Green hydrogen is being produced by electrolysis of mostly fresh water: again, this could exacerbate pressures on scarce water resources.

Large-scale land acquisition by transnational or national investors is usually welcomed by national governments, which see the investments as opportunities for economic growth and modernisation. Investors often motivate and legitimise their proposals by referring to national development goals such as improved infrastructure, technology transfer, job creation, and financial benefits (Johansson et al. 2016). Governments, for example in Africa, with visions of achieving rapid growth, reducing dependency on aid, and becoming middle- or high-income countries are attracted by these proposals.

Much large-scale land acquisition in the past was for commercial "modern" agriculture, such as irrigated or plantation farming. In sub-Saharan Africa, many of the land deals did not translate into the proclaimed income and development transformation; several projects were delayed or stopped (Chung & Gagné 2021, Gabbert et al. 2021). Although more than 22 million hectares were acquired in sub-Saharan Africa for large-scale agricultural projects between 2000 and 2014, only about 3% of this area was under production by 2014 (Johansson et al. 2016). Regardless of whether the investment led to successful production or not, the fact remains that the people who formerly used the land rarely benefitted from the investment; indeed, they usually experienced serious negative impacts on their lives. Even when land deals collapsed completely, governments often did not return the land to its prior users (Cotula 2013).

With the realisation that the drylands are prime areas for generating solar and wind power, these areas have been transformed from the historically neglected margins to the new frontier with abundant space that can be exploited to produce energy to drive industrialisation and national wealth (Mosley & Watson 2016, World Bank 2020, Lind et al. 2020). This is leading to new land values and new forms of negotiation over rights and access, and many of the land-acquisition processes are marred by disputes and irregularities (Power Africa 2018).

Especially in countries with weak governance structures, the land used under common property regimes is usually targeted for generating green energy. Governments often claim this land as state property that is being "held in trust" for its citizens. Traditional communal rights have a weak legal status. The governments regard themselves as entitled to allocate common land to investors (Alden Wiley 2011). Governments and investors initially assumed it would be relatively easy to remove the local people. In many cases, the social and environmental impact studies made for green-energy projects foresaw minimal impact. The companies therefore did not plan for investment in compensation or remedial efforts (AfDB 2014, Danwatch 2016).

The rising demand for energy for industrial and transport purposes in countries seeking economic growth will hasten the drive for the acquisition of large tracts of the drylands to produce green energy. Thus, "land grabbing" for green energy – a form of "green grabbing" (Vidal 2008, Fairhead et al. 2012) – could accelerate at rates not experienced previously (Cotula 2012, Scheidel & Sorman 2012) unless preventive action is taken.

Non-respect of human rights. Although countries differ in their laws on land ownership and processes of land acquisition, guiding principles for protecting local communities with rights to the land have been drawn up in international frameworks such as the Charter of the African Commission's Africa Charter for Human and Peoples' Rights (ACHPR), which came into force in 1986, and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) adopted in 2007. These frameworks uphold the principle of free, prior, and informed consent (FPIC); it is noteworthy that, in its resolution in 2012, ACHPR did not limit this principle to indigenous peoples (IPs) (Greenspan 2013). However, many governments do not adhere to these frameworks, despite having formally endorsed them.

Most companies involved in renewable energy projects do not perform adequate due diligence such as observing FPIC (Shah & Bloomer 2018). Particularly in countries that are weak in protecting human rights, even those companies that have defined human rights policies usually disregard these policies when implementing projects (Osano 2021). A recent meta-analysis of the land deals in the Land Matrix revealed that large-scale land acquisition investments are targeting the poorest countries with the weakest levels of governance and the highest levels of corruption (Interdonato et al. 2020).

In 2015, the Business & Human Rights Resource Centre (BHRRC 2016) surveyed 50 renewable-energy companies worldwide and found only five observed FPIC. When it made the first global human rights benchmark of the largest wind and solar companies (BHRRC 2020), it found that most of them lack the essential human rights policies on which a just

With the realisation that the drylands are prime areas for generating solar and wind power, these areas have been transformed from the historically neglected margins to the new frontier with abundant space that can be exploited to produce energy to drive industrialisation and national wealth.

energy transition depends. No company scored points for having policies to respect land rights and to govern their process of land acquisition, or on the just and fair relocation of residents. No company had commitments to respect the rights of people defending human rights and the environment. In 2019, renewable energy was the industry with the fourth highest number of allegations of attacks on defenders worldwide.

Most communities affected by the energy projects have little knowledge of policies, principles, and international and national laws to safeguard their land. As a result, when large areas are acquired for projects, the affected communities are normally excluded from land they had previously used and are forced to use smaller – often less favourable and more fragmented – land areas. This changes indigenous patterns of resource tenure and governance, and it makes it more difficult to maintain the farming systems (Anderson & Paul 2008).

Increasing conflict and resistance. With the expansion of renewables, the large-scale acquisition of land is looming and will cause increased conflict if human rights are not respected and benefits are not fairly shared. The spread of large-scale investments in drylands, the political and economic interests behind them, and the new valuing of land and resources they introduce are reshaping the politics of resource contestations. Resistance can therefore be expected in the course of these developments, especially across Africa's drylands (Lind et al. 2020).

Investors that try to counteract resistance and gain social acceptance promote the benefits of the projects: the construction of new roads that make transport and marketing easier, the provision of jobs, and making corporate social responsibility (CSR) investments in schools, health posts, and water, for example. The competition for meagre compensation for resettlement or land loss and a few poorly paid jobs heightens tensions between local groups with overlapping claims to the land (Lind et al. 2020). The projects ignite new configurations of territoriality and the negotiation of "belonging" in order to gain benefits (Cormack & Kurewa 2018). Social unrest is likely to rise because of skewed benefit-sharing.

In Central and South America, East Africa, and South East Asia, serious human rights abuses were reportedly linked to green-energy projects. Local people face the dispossession of their land, the undermining of their livelihoods as well as intimidation, killings, and displacement. Failure to consult adequately and address the potential abuse of power led to rising levels of social resistance to these projects in many countries. This has caused project delays, as well as financial, legal, and reputational penalties for companies (BHRRC 2016). Many projects try to deal with these tensions by investing more in security – calling in state security services or local police or making contracts with private security firms.

There are, however, some indications that investors are beginning to feel the pinch. Lind et al. (2020) report that large-scale investments are now advancing in a more piecemeal way, as the challenges of implementation have increased. Faber (2019) reports that, faced with increasingly organised and informed communities, project developers have started to adopt ways to engage stakeholders – particularly local communities – early in the planning process to seek social acceptance.

Some projects try to promote inclusivity and local economic growth through community engagement and CSR activities in multistakeholder consultation processes but often fail to understand the dynamic political contexts (Lind et al. 2020). The efforts to set up consultative fora, provide jobs for local people, and fund CSR activities often elevate the position of the local middlemen who broker access to these new local political spaces and associated resources. The "participatory" processes through which investors try to avoid resistance do not ensure equitable distribution or alter the social forces that perpetuate inequality.

The case studies in Lind et al. (2020) reveal how large-scale land investments are enmeshed in local politics and social relations, creating a small number of powerful local winners and a large number of local losers. The "politics of possession" among local groups and elites often also involve national politicians, who engage in land speculation in anticipation of future investment for development.

Perspectives. With the growing climate crisis, the generation of green energy will expand rapidly. Even though companies face increasing challenges with respect to acquiring land and reaching agreements with local communities about compensation and benefit-sharing, the rising demand for energy and the international pressure to meet clean-energy targets means that governments and companies will continue to seek dryland areas with strong winds and high solar irradiation for energy projects. If concerted efforts are not made – with pressure from civil society within the countries and abroad – to strengthen the enforcement of human-rights principles, for example those in ACHPR and UNDRIP, and to strengthen legal systems for protecting common-property land rights, a growing number of pastoralists, hunter-gatherers, and small-scale crop farmers in the drylands will lose their land to renewables and become poorer. This will fuel more conflict, hopelessness, and migration.

Box 2

Green-energy technologies & their different impacts

Solar power system / photovoltaic (PV) cells: Requires relatively large land area to harness energy, thus interfering with existing land use (grazing, recreational activities, conservation, etc.). Requires some water for PV manufacturing and cleaning the panels. The construction of panel stands requires land clearing and levelling, which may lead to erosion. As solar panels contain hazardous chemicals and recycling systems have not yet been developed, the disposal of the old panels poses a future challenge.

Concentrated solar power (CSP): A technology that concentrates solar power using mirrors to generate heat (400°–1,000°C), which is transformed into electricity or stored. Has currently lost out to solar PV in terms of price, but has potential to come back as technologies evolve. Needs significant amounts of water for cooling and operating turbines and cleaning. Similar to ground-mounted solar PV, it excludes grazing on the same land.

Wind power: Only a small footprint in terms of land and access roads. Compatible in principle with grazing. No relevant water needs. In some countries, however, the entire land area of the wind park is acquired without compensation for local land users, who feel that they have lost control of their ancestral lands.

Green hydrogen production: Needs significant amounts of water but little land. Can be sited some distance from where green electricity is generated, as this can be transported by power lines. Production possible with desalinated seawater; technology is being developed for the direct electrolysis of seawater. As energy for electrolysis usually comes from wind or solar parks, green hydrogen benefits from falling costs of solar and wind power.

Marsabit County, Kenya: The permanent structures of Lake Turkana Wind Power (LTWP) include 365 wind turbines, a substation and workers' accommodation. The turbines were installed one per day over a year. Each has a capacity of 850 kilowatts. They provide 310 MW of energy to the Kenya national network. © Maurizio Di Pietro / Climate Visuals Countdown

03

Impact of large-scale green-energy projects on pastoralists

The previous section looked at the impact of large-scale green-energy generation in the drylands in general. This section focusses on the impact on pastoralists in particular. In order to give a better picture of how such projects could affect pastoral production systems, Box 2 outlines the relevant characteristics of different green-energy technologies.

A shepherdess with her flock in the High Atlas of Morocco. © Eda Elif Tibet

There are several reasons why pastoralists are particularly vulnerable in the face of the expansion of large-scale green-energy production:

- **Pastoral lands are ideal for generating green energy.** Areas that are suitable for generating solar energy are particularly those with high solar irradiance and a large flat surface with slopes that have less than a 15% incline (Semeraro et al. 2020). These areas often also experience high wind velocities. From the viewpoint of governments and energy companies, if these areas are sparsely populated, seldom or never cultivated, and under common property regimes, they are ideal for large-scale energy projects. Such areas are traditionally used by pastoralists, who usually have no formally recognised use rights, and are thus prime targets in the land rush for green energy.

Impact of large-scale green-energy projects on pastoralists **continued**

- **Communication with mobile pastoralists can be challenging.** In vast and sparsely populated areas used as pasture, green-energy developers often see little or no need to try to identify and communicate with "affected communities" – and they may not even realise who are affected and how. It is easy to argue that no one is using the land if herders and herds are not present at the time of consultation. The developers may claim to have obtained FPIC from local people, but the process often consists in identifying a "traditional leader" (often a member of the local political elite and/or a sedentary group in the area) and arranging with this person to acquire land, without consent or even awareness of the land users. The "leaders" may derive private benefit from the deal, while the other land users do not benefit. In some pastoralist groups, only the "leaders" are fluent in the country's official language. If the level of literacy is low – as is often the case among pastoralists, especially among women – written communication is not effective. Depending on the local culture of "consent", consultations may not gain genuine full consent (cf. LaTosky 2021).
- **Pastoralists are in a weak position to negotiate or resist.** Most governments and investors – and also the general public – have little idea of how pastoralists produce value in the drylands and how high this value actually is. They view pastoralism as an archaic and unproductive use of land that destroys the environment. This puts pastoralist groups in a weak position for negotiations with governments and investors about the value of the resources that the pastoralists are losing as a result of large-scale projects. Moreover, many governments do not recognise the traditional organisations of pastoralists, making it difficult for them to object legally to land acquisition.
- **Large-scale land acquisition exacerbates current trends of change in pastoralism.** Land grabbing in pastoral areas is not new: as Lind et al. (2020) note, richer pastoralists have challenged the customary relations based on principles of resource-sharing and reciprocity, where identity and kinship determine access rights, and have enclosed land for private use. These pastoralists and also development projects have constructed boreholes, ponds, and cisterns. In addition, larger-scale changes in land use have come through the construction of large dams, the establishment of irrigated farming schemes, and the demarcation of conservation areas. This has led to a process of territorialisation and fragmentation of grazing land as well as the blocking of migration routes, making it more difficult for herders to move their animals between different pastures within and between seasons and access key resource areas such as water and natural mineral licks. Their capacity to deal with unpredictable fluctuations in weather and climate is thus weakened, reducing their resilience in dealing with uncertainty. These trends had already started to constrain mobile pastoralism; the rising demand for land for green energy exacerbates this difficult situation.

Why does it matter? If the integrity of the pastoral resource-use cycle is destroyed because access to certain grazing areas, water, and minerals is restricted, the entire foundation of the pastoral system can collapse. Large-scale land acquisition in pastoral areas threatens the continuation of pastoralism in the wider landscape. If this happens, not only will the livelihoods of the pastoralists be destroyed, their knowledge on how to use variability in the drylands to produce food (FAO 2021) will also be lost. Mobile pastoralists are skilled in producing food and other animal products – also for urban consumers – in an efficient low-external-input system in areas where crop farming is not ecologically or economically sound. Their livestock convert naturally growing fibrous vegetation into protein-rich food. The pastoral production system and pastoralists' skills may prove to be even more valuable when climate change obliges the world to produce food with less dependence on fossil fuels.

Here, we highlight some cases from the literature describing how local pastoralists or crop-livestock farmers were affected by the development of large-scale solar or wind farms in different parts of the world. It must be stressed that we did not make an exhaustive search for documentation on each of these cases, which may be one-sided in their reporting. Most of the cases we found in the literature on the impact of green-energy projects were largely negative. Few cases suggested that a win–win constellation could be created for green-energy generation and pastoralists.

Solar power plant in Gujarat, India. © Prajapati Karan v/ Shutterstock

If the integrity of the pastoral resource-use cycle is destroyed because access to certain grazing areas, water, and minerals is restricted, the entire foundation of the pastoral system can collapse. Large-scale land acquisition in pastoral areas threatens the continuation of pastoralism in the wider landscape.

Cases documented in India

Gujarat Solar Park, India's first solar park, was built in Charanka in 2012 on a dryland area of 2,180 ha, of which the government classified more than 1,000 ha as "wasteland", suggesting it was empty and unproductive, and therefore available for "development". The area formed part of the commons that had been used by semi-nomadic Rabari herders. During project planning, the government interacted with higher-caste groups, excluding other castes. Moreover, researchers claim that land for the project was acquired through extra-legal mechanisms (Yenneti et al. 2016). Enclosure of the common pasture for the solar park disrupted the grazing patterns of the herders, who were also not allowed to collect firewood, yet they were not given access to the solar power generated on the land (Stock & Birkenholtz 2019).

Also elsewhere in India, Chari (2020) reports that conflicts over solar projects led to higher costs and delayed completion. Most projects are in remote locations where conflicting land claims are the main contentious issue. Local farmers demand compensation for displacement, saying the land is theirs because they use it. Some approach the courts; others break solar equipment. State bodies often collaborate with the energy companies against the local people's interests: For example, part of the land allotted in Rajasthan to Adani Renewable Energy Parks had been tagged for agricultural use, but the government re-classified it as "barren land" a year before allotting it to the company. Thus, through the large-scale solar-energy projects, "low-carbon coalitions of interests can maximise their gains by dispossessing vulnerable social groups of their life-sustaining assets" (Yenneti et al. 2016).

Cases documented in Mexico

Bíi Hioxo Wind Park: Dunlap (2018) describes how wind energy development led to conflict in Tehuantepec Region, Oaxaca. Vast tracts of common land used by smallholder livestock farmers were taken from them in the name of mitigating climate change and building a "green economy". After land privatisation, the customary use for grazing was denied. This reignited old social divisions and spawned new ones as well as violent conflicts over land and natural resources. The state and private actors reportedly practised "green counterinsurgency" to break local opposition to the wind park. The tactics involved "hard" counterinsurgency (overt violence by police and military forces) and "soft" tactics of "winning hearts and minds" (community development and providing foreign aid to collaborating local elites to stabilise areas of interest). One "soft" tactic was a photo exhibition that tried to blend local Zapotec cultural symbols with wind turbines, suggesting they could co-exist.

Ixtepec Wind Project in Oaxaca Province shows how green energy can open up new opportunities for local people. It is a community-owned project: The community of Ixtepec contacted Grupo Yansa, a not-for-profit wind developer that partners with communities to utilise wind for development. Yansa proposed a site where wind could be generated and agricultural impact would be minimal, and it conducted an environmental impact assessment (EIA). It involved the community in the construction and operation of the wind park, and the community controls the energy source. The wind park comprises 44 turbines with 1,000 MW capacity. The energy is sold to the national grid at a guaranteed price, and half of the earnings from energy generation go to the community. This case reveals that a transition to clean energy can be made while respecting human rights (Sánchez-Casanova & Desilus 2020).

Case documented in Norway

Øyfjellet Wind Park: More than 150 turbines – completed in 2020 and part of the largest onshore wind park in Europe – may be torn down after a Norwegian court declared void the licences to build and operate them. The indigenous Sámi herders argued that the turbines interfere with reindeer migration paths. The court ruled that the licences issued by the government violated the 1976 International Covenant on Civil and Political Rights of the United Nations, which declares that minority ethnic people "shall not be denied the right … to enjoy their own culture, to profess and practise their own religion, or to use their own language". The court regarded traditional Sámi reindeer herding as a protected cultural practice (AFP 2021).

The number of wind turbines in Norway has increased fourfold in the past 10 years. Many of the onshore projects were built in the northern parts of the country that are home to the Sámi people. The herders are uncertain whether they should meet with energy companies. If they do enter into dialogue with them, the companies may use this and claim they have consulted the Sámi, but if they do not enter into dialogue, they will have no say in the energy projects (Strzyżyńska 2021).

Reindeer herders practising traditional nomadic husbandry. © Evgenii Mitroshin/ Shutterstock

Impact of large-scale green-energy projects on pastoralists **continued**

Case documented in Morocco

Noor Ouarzazate Solar Project: The Moroccan Agency for Sustainable Energy set up the world's largest CSP plant through a public–private partnership as part of a strategy to reduce national dependency on imported fossil fuels. The project was to be the first phase of the "Desertec" initiative to secure energy for Europe from solar and wind parks in North Africa (Fautras & Iocco 2019). The CSP technology requires large amounts of water, exacerbating its scarcity for local people in this dry region (Alami 2021, Jmad 2021, Lewis 2021). The project was set up on communal land used by a Berber clan for grazing. The Moroccan government initiated the land acquisition. According to the pre-project impact study, the local community consented, the project would not displace people, and it would create new jobs and income-generating opportunities. The site had "very little pastoral use (mainly grazing)". The herders were described as mobile: they "therefore need only change their grazing itinerary". Therefore, no compensation was foreseen for the herders (AfDB 2014).

This large-scale land acquisition led to the local people's loss of access to common land, formerly managed by local institutions (Ryser 2019). The government claimed the right to determine how the land was used for this new way of extracting value through solar energy (Cantoni & Rignall 2019, Hamouchene 2016). Local resistance focussed on claiming historical land rights but also enabling local people to extract some emergent values being created on the land (Rignall 2016), but to no avail: the local people were dispossessed of land, water, and livelihood sources (Belghazi & Sammouni 2020).

Case documented in Canada

Bow Lake Wind Farm (Chinodin Chigumi Nodin Kitagan) of the Batchewana First Nation (traditional hunter-gatherers) in northern Ontario, Canada, involved an agreement to install 36 turbines and set up a community trust fund, with the fund structure and spending to be based on community consultations. Equity ownership, combined with the trust fund, allowed for revenues to be managed collectively. This increased the chances of decision-making being based on principles of environmental stewardship and spending being based on community priorities (Smith & Scott 2019).

Hoicka et al. (2021) point to a barrier to a low-carbon and just energy transition among the First Nations that may apply in other parts of the world where mobile IPs and herders live: the lack of community organisations, charities, or social enterprises that have the collective community's best interests at heart and are therefore "moral authorities". Indigenous political organisations may be involved in green-energy projects, but this does not necessarily mean that there is widespread community support or that underlying processes were open and participatory.

Left: Ouarzazate Solar Power Station (OSPS), also called Noor Power Station, is a solar power complex located in the Draa-Tafilalet region, 10km from Ouarzazate, Morocco. © Evgenii Milanov / Shutterstock

Middle: Wind Farm with grazing livestock in Inner Mongolia. © Rachel Moon / Shutterstock

Right: Gaddi pastoral community, India. © Aayushi Malhotra

Equity ownership, combined with the trust fund, allowed for revenues to be managed collectively. This increased the chances of decision-making being based on principles of environmental stewardship and spending being based on community priorities.

Cases documented in Mongolia

Since 2000, the Mongolian government has supported decentralised rural electrification through the "100,000 Solar Ger Programme", which provides solar home systems (SHSs) to rural families, mostly herders, who transport the SHSs when moving to their seasonal grazing sites. The small SHSs meet household energy needs for lighting, radio, TVs, and satellite dishes. By 2018, largely because of this programme, about 95% of all people living in rural areas had access to electricity (Schippe 2021).

More recently, Mongolia started exploiting wind and solar energy on a larger scale. According to its "Vision-2050" (State Great Hural 2020), it aims to generate 30% of its electricity from renewable sources by 2030. It plans to use wind and solar energy to produce green hydrogen (Nilsson et al. 2021). Many documents on Mongolia's green-energy potential assume that rural families are giving up herding – implying that much of the vast grasslands will be available to generate energy. The state controls all pastureland, which cannot be privatised. All the energy projects are classified as having no impacts on IPs; the herders do not identify themselves as IPs, so the IP-related safeguards do not apply (ADB 2021). According to available reports, care is taken to address the concerns of the herders who use a project area as pasture at some time of the year.

Mongolia has three large-scale wind farms and at least two medium-scale solar farms in rural areas:

- **Salkhit Wind Farm** (50 MW, completed 2013) ca 70 km south of Ulaanbaatar on land grazed mainly in summer and autumn: After the wind farm started operation, there was almost no change in pasture use except that, at times when ice may fly from the turbine blades, the herders must keep their animals 500 m away. The turbines do not block the path of the herds to water. The local community was given the well that was drilled during construction (Sukhbaatar 2018).
- **Tsetsii Wind Farm** (50 MW, completed 2017) in the Gobi Desert: A pre-project study found that herders grazed their animals periodically and used wells and winter shelters in part of the project site. As the site was on "degraded land with poor grazing potential" and the turbines would occupy only 0.3% of the project land, minimal impacts on herders were expected. A stakeholder mapping concluded that the project would not displace herders and that loss of pasture was unlikely. The energy company held five public meetings in 2015–2016 to explain the project and to hear local concerns. It hired a liaison officer to oversee implementation of the project's environmental and social commitments (EBRD 2016).
- **Sainshand Wind Park** (55 MW, completed 2019) in the Gobi Desert: The company regarded the two winter camps on the site as residences. It helped the families find new sites, where it built animal shelters (the families already had portable gers) and wells, transported camp assets (loads of dung stored for fuel), and helped the families register their new residences. Access to the land was prohibited during wind-farm construction. As in-kind compensation, the households that normally used the pasture were given fodder, and the company constructed a deep well with a pump and power supply to open up new summer pastureland. After wind-farm operation began, herders have had full access to the pasture, except for the small footprints of the turbines, but they may not live within 500 m of them for safety reasons (Oyunchimeg & Wall 2017).
- **Darkhan Solar Farm** (10 MW, completed 2017) in Khongor District, 230 km north of Ulaanbaatar: The EIA report (Tuvaasuren 2015) states that the solar farm is sited near a railroad crossing and no herder households will be affected. Most participants in the EIA survey and discussions with local people confirmed that the solar farm would have no negative impacts on people or the environment. All 20 households living in the area expected to benefit from improved access to electricity.
- **Sermsang Khushig Khundii Solar Power Plant** (15 MW, completed 2019), which is near Ulaanbaatar's new international airport, is built on public pastureland. The district governor helped the company hold a consultation meeting with residents and identified 30 herder families to be consulted in their homes individually. After the consultation, the site of the plant was shifted away from the salt ponds, which are important for the herding system. Transmission line siting was adjusted so that a salt pond and its tributaries would not be affected and the herders could easily move their animals between water points and pasture. Operation of the plant does not disrupt grazing. The company pays land-use fees to the district administration and saw no need to pay compensation to herders, who continue to graze their animals on pasture outside the solar farm. They lost access to the 48 ha of solar farm and to the footprint areas of the transmission towers but have access to pasture below the line. In a survey, 84% of the herders said the project had no impact on pasture (TGC 2019).

According to all the reports, which were written by or for the entities promoting the green-energy projects, the wind farms have no negative impacts on herders' livelihoods. Pastoralism and wind farms appear to be able to co-exist, using the same land after construction is completed. The solar farms in Mongolia cover smaller areas compared with those in Africa and Asia. Former grazing areas now covered by solar farms are lost to the herders without compensation. Independent research is needed to probe the perspectives of the Mongolian herders who once used these pastures.

Impact of large-scale green-energy projects on pastoralists **continued**

Cases documented in Kenya

Over the years, Kenya has relied mainly on hydropower as a source of green energy. However, erratic rainfall patterns limit power production. Green-energy sources are being diversified via investment in wind- and geothermal power generation not only to satisfy Kenya's energy needs, but also to meet its obligations to reduce CO2 emissions under the Paris Agreement. Kenya is a leading green-energy investor in Africa: currently about 70% of its power comes from renewable energy sources. Kenya has more than 90,000 km2 of land with excellent wind speeds for generating power in Marsabit, Samburu, parts of Laikipia, Meru North, Nyeri, Nyandarua, Ngong Hills, Lamu, offshore Malindi, Loitokitok, and Narok Plateau (Sena 2015). Most of these areas are in the drylands used by pastoralists.

The current development of large-scale wind-power projects has cast the limelight on Kenya's green-energy development. Depending on land ownership, context, and processes used, the projects have had varied community reactions and benefits. Here, we summarise three different cases.

- **Kinangop Wind Park (KWP)**. The KWP in Nyandarua County in central Kenya started in 2004 as a joint venture between EcoGen Wind Farms and KenGen (Kenya Electricity Generating Company). Identified local landowners were to be compensated for the use of their land, and additional CSR funds were earmarked for community development. However, demonstrations by local people escalated to a point where a turbine was destroyed; the contractor withdrew for safety reasons. The protests centred on the lack of proper community consultation, engagement, and compensation; relocation; and the manner in which the land was leased. The civil disturbances and court cases led to delays and the depletion of funds. The KWP and its shareholders announced in 2016 that the project would not be completed. The KWP sought to reclaim its loss by suing the Kenyan government for failing to stop social opposition to the wind park, but it lost the case (BHRRC 2018).

  This example shows how risky and costly it can be if a renewable energy project does not come to terms with the local community. In this case, it is a crop and dairy farming area, where the inhabitants are probably better organised for protest than more mobile pastoralist communities – and this may be one reason why investors seek less populated areas where they hope to encounter less well-organised local resistance.

- **Lake Turkana Wind Power (LTWP)**. The LTWP is Africa's largest wind-power project, producing 310 MW of electricity, and it is the biggest private investment in Kenyan history (Danwatch 2016, Cormack & Kurewa 2018). It was set up on 150,000 acres (60,703 ha) of land used by pastoralists and given to the investor in 2009 on a 33-year renewable lease by the then Marsabit County Council (now replaced by Marsabit County Government). The speed and strength of the winds in this area make it an ideal site for generating wind power (Kamadi 2016).

  The land belonged to predominantly pastoralist groups – Turkana, Samburu, Rendille, and El Molo – who claim ancestral ownership. The lease transferred ownership rights of the communal land to the investors without any meaningful consultation or compensation, the excuse being that the community had no title to the land. As Kenya has not ratified UNDRIP, the energy companies and the international financial institutions (IFIs) supporting the project did not trigger IP policies during land acquisition (Renkens 2019). Contrary to the local value and significance ascribed by the local communities to their land, the LTWP investors regarded the areas as an empty landscape – investable **terra nullius** (Cormack & Kurewa 2018). This false assumption ignited conflicting local versions of socio-cultural ties and historical connections by the different ethnic groups using the land. The large new investment entwines with the politics of devolution, raising the stakes for competition and claims around territory, resources, jobs, and power.

  Local communities were aggrieved that land ownership changed and only paltry compensation was paid to people in a village on the site to cover relocation expenses, whereas private landowners in the same setting along the power transmission lines were compensated (Osano 2021). The local communities resisted the land takeover and took their case against the company to court in 2014. In October 2021, the court declared the process of acquiring land for the project as illegal. It also faulted the process for causing land speculation and acquiring additional land not needed for the project. The court directed the County Government, the National Lands Office, and the National Land Commission to "regularise" the illegal land allocation within a year. However, it remains to be seen how local communities will be involved in this process of land regularisation, that is, making a legal land contract, and whether the wrongs committed can be set right.

After facing much resistance – the wind-power developers finally realised the need for meaningful community engagement and working with grassroots institutions.

- **Kipeto Wind Power** in Kajiado County is a 100 MW energy source that started operation in January 2021. This was after the local Maasai clan in central Kajiado had delayed commencement of the project since 1993 because the wind-energy developers could not agree on a compensation scheme for the clan's land and livelihoods (Osano 2021). Despite (and perhaps because of) the long negotiation period, the project provides a good example of community engagement by investors, although the context of negotiation differs from that of unregistered community land because the Kajiado land already had private individual titles before the project was initiated.

  The identification of landowners for consultation and negotiation was straightforward, unlike in the unregistered community land in the LTWP case. In the Kipeto case, the investors decided to lease the land instead of acquiring it as company-owned land. The final deal included an impressive list of benefits for the people directly impacted by the project and additional development projects in other parts of Kajiado County (Sena 2017):

  - annual lease payments to landowners based on land area: USD 1,000 for those with 1–50 acres, USD 1,500 for 51–100 acres, and USD 2,500 for 101 acres and above;
  - 1.4% of annual gross revenue from each wind turbine, estimated at USD 12,000/turbine, to be paid to each landowner;
  - offer of 5% equity to the community, which is expected to receive USD 1 million annually;
  - 5% revenue share for the community, commencing when the project becomes operational, to be channelled through a Community Trust Fund;
  - for the 15 homesteads that had to be relocated, construction of 80 modern houses at a total cost of USD 400,000;
  - the identification of CSR programmes benefiting the local community and the rest of the county.

  After the first year of operation (2021), funds are supposed to start flowing from the wind park to the Trust. Then it will be seen whether what was promised in the agreement is delivered. This example is promising, however, as it shows that – after facing much resistance – the wind-power developers finally realised the need for meaningful community engagement and working with grassroots institutions. Thus, Kipeto Wind Power appears to have created a win–win situation for green-energy producers and local pastoralists through a process of community consultation, negotiation and agreement, but the jury is still out on whether governance of the Community Trust Fund will lead to equitable sharing of benefits.

For a more detailed account of the development of solar- and wind-energy projects in Kenya, pastoralists' land rights, and the acquisition of pastoral land for the projects, see Annex 2.

Left: Kipeto Wind Power in the hills of Ngong, Kajiado County, Kenya. © Newroh Otieno / Shutterstock

Right: Herders taking their livestock to water holes near Lake Turkana, Kenya. © JordiStock / Shutterstock

Sheep grazing within a wind park in Rajasthan, India.
© Maximillian cabinet / Shutterstock

04

Possibilities of combining green energy & pastoralism

In this section, we look into the potential for the co-existence of pastoralism and renewables: Can the interests of large-scale green-energy generation and the interests of local pastoralists be reconciled so that the latter are not pushed aside because of an energy crisis they did not cause?

Are there green-energy approaches compatible with mobile pastoral systems? Do good practices exist?

Shepherd and his flock in Oiz, Basque Country.
© Jesus Keller / Shutterstock

Possibilities of combining green energy & pastoralism **continued**

Potential for dual-purpose land use for grazing and generating green energy

Already four decades ago, research (Goetzberger & Zastrow 1982) revealed that animal husbandry under high-mounted solar panels can create a win–win situation, leading to higher overall economic efficiency per hectare. Grazing under solar panels can also improve animal welfare. This can become even more relevant as temperatures rise in the course of climate change. Field experiments in Brazil showed that grazing animals preferred shade from solar panels to shade from cloth (Campos Maia et al. 2020). Ranchers in the United States and Australia observed that livestock gathered in the shadow of wind turbines (e.g. Hall et al. 2012). Also, in several countries in Europe, animals are grazed on the same land as wind and solar installations, which provide shade to protect animals against intense solar radiation while providing a low-carbon energy source for the country and an additional source of income for the farmers with rights to the land (Campos Maia et al. 2020). A further benefit of raised solar panels could be that water used to clean the panels would not be wasted but could drip to the ground and irrigate (albeit in a small way) the vegetation below.

In Australia, the land area under solar parks is expected to increase along the Tropic of Capricorn, where very efficient energy yields are reported. Local pastoralists generally regard this additional land use as positive. They hold land in private ownership or under long-term leases from the government and decide individually if they will enter into a commercial arrangement to set up a solar park. They expect additional income and few negative environmental impacts (David Phelps, personal communication 2021).

In the United States, the Site Wind Right mapping tool (The Nature Conservancy 2021) helps wildlife conservationists, ranchers, and green-energy developers find sites that offer the best way to address the energy challenge together through multifunctional land use: conservation, livestock production, and energy production.

Sheep in the shade of a wind turbine in Sardinia.
© Claudio Marongui

In North America, Europe, and Australia, multifunctional land use is supported by legal contracts based on private land ownership, mainly by individuals rather than groups. From the perspective of land tenure, these examples may not be relevant for pastoral areas in Africa and Asia, where much of the land is common property with overlapping use rights held by different user groups. However, from the perspective of the possibilities of multifunctional land use, the examples can be enlightening. In these continents, debates focus on how renewable energy and agriculture can co-exist, looking at the trade-offs between producing energy and producing food and other agricultural commodities. This involves minimising the area of land used for green-energy installations and allowing land use for grazing livestock and crop farming (Al-Saidi & Lahham 2019).

Normally, the design of solar energy systems is focussed on optimising solar panel positioning to maximise energy generation in the most cost-effective way, giving no attention to ecological or social issues. Investors expect the energy sector to determine land use, limiting other uses of the land. In contrast, Semeraro et al. (2020) call for the inclusive participatory design of energy projects to support primary functions (producing food, fibre, etc.) and to provide other services such as conserving biodiversity, supporting rural economic activities, and generating electricity. Multifunctional land use related to green energy can refer to using the space below and between solar panels or wind turbines for grazing or harvesting but also, as in the Netherlands, for biking under solar-panel tunnels that also provide shelter from rain. The principle is that the renewable energy system is designed as an element of the larger landscape, thus increasing overall land-use efficiency. Semeraro et al. (2020) advocate for this approach as a way to reduce social and economic conflicts between energy production and agriculture – conflicts that often make the solar-energy business more costly.

Pastoralism and green energy can co-exist more easily in wind parks than in solar parks, because the land footprint of wind turbines is smaller than that of ground-mounted solar panels. The land between the turbines can be used for grazing after the turbines have been installed. Solar panels cover much more of the land area, unless mounted on high structures under which livestock can graze and/or find shade from the sun. Raising the panels adds to the costs of the solar installation, but the benefits from the dual use of land may compensate for the extra costs, particularly in areas of high grazing value.

To be able to negotiate fair terms of co-existence, pastoralists need to have a stronger position through a better valuation of dryland areas.

Challenges to negotiating the co-existence of pastoralism and green energy

Various factors may play a role in preventing energy companies and local stakeholders from communicating well with each other and reaching agreement on the co-existence of pastoralism and green energy, especially in areas where land is communal rather than privatised. These may include:

- **local perceptions of exclusion:** Even if a company states that the land between wind turbines can be grazed, the local land users may lack confidence in this offer. The change in land governance from communal to private lease gives them the impression that the company has claimed exclusive land-use rights. The local people's feelings of unfairness with regard to the process of land acquisition reinforce their perception of exclusion.
- **conflicting values regarding land:** To be able to negotiate fair terms of co-existence, pastoralists need to have a stronger position through a better valuation of dryland areas. The value of the land depends not only on the value of production generated from the land, but also on the ecosystem and cultural services of the land, the stewardship practised by the local people, and the local knowledge system on which this is based. Different stakeholders in energy projects view land differently: for governments and investors, land is a factor of production and a means to accumulate capital. In view of the large expanses of the drylands, governments and investors often assume that the relatively small fraction of land to be used to generate energy will have insignificant impacts on local livelihoods. They do not recognise how this fits into a larger land-use system: a small piece of land may be part of a larger "jigsaw puzzle" of pastoral land use, and its removal could make the whole system collapse. Moreover, for people who have used an area for generations, land is part of the embedded social, cultural, and ecological relations. For them, the value of land includes history, identity, livelihood, sanctuary, safety net, daily life space, sacred places, intergenerational inheritance, life with dignity, and gift from Nature (Kay 2019). If governments and investors do not respect these local values, there can be no basis for negotiating co-existence.
- **difficulties in identifying "the local community":** Planners of large-scale green-energy projects are often not aware of what "affected local population" really means and who the local parties to negotiate land use are. As Chung & Gagné (2021) highlight, there is no single "local community". Communities are often split in their support for and opposition to projects, based on individual motivations and resources. The politics of difference at the local level can limit the possibilities of collective decision-making and action. Additional complexities in communal land use are found in the drylands, where the high levels of variability in precipitation and vegetation demand mobility and flexible arrangements between different groups that may use the same area of land at different times and have overlapping resource-use rights. The people affected by a project are not only the few who may be settled as a "community" at the project site. Also affected are the people – possibly from different ethnic groups – who traditionally use the land for productive (grazing) or cultural purposes (e.g. major ceremonies to pass leadership to a new generation within an ethnic group).

Women's group meeting in Namarei village, Kenya.
© Margareta Lelea

Young Maasai shepherd with his livestock near Natron Lake, Rift Valley, Tanzania
© Gideon Ikigai / Shutterstock

05

Discussion & conclusions

Large-scale green-energy projects are looming and will have significant impacts on the lives of pastoralist peoples around the globe. In view of the global climate emergency, the rapid spread of solar and wind generation is desirable and inevitable, and prime land for this is in pastoral areas. Most policymakers do not value pastoral land-use systems and regard pastoral areas as unused wastelands. In many countries, pastoral land is held by the state, which does not honour traditional rights to land, even if it has signed international agreements to do so. Likewise, energy companies and investors, even if they have FPIC policies, often ignore traditional rights. Narratives of sustainability and improved use of the land are used to justify land acquisition in the drylands.

As shown in Table 1, for solar and wind farms in India, Morocco, Norway, Kenya (Lake Turkana, Kinangop), and Mexico (Bíi Hioxo), consultations with local land users were non-inclusive and of poor quality. Planners gave pastoralism little or no value. Pastoralists completely lost their traditional rights to the land where solar farms were built; wind farms interfered with grazing to a greater or lesser degree. Local people resisted, sometimes violently (Mexico), sometimes through the courts (Kenya, Norway). One wind farm in Kenya was not completed because of strong opposition from the local crop and dairy farmers. In contrast, where good consultations were carried out (Canada, Ixtepec/Mexico, Kipeto/Kenya), the energy company and the local community reached agreement on benefit-sharing.

In the cases of the wind farms in Mongolia, the consultation of herders is well documented, and there has reportedly been no impact on grazing under the turbines and power lines. Also for the solar farms, the concerns of the local herders were considered when siting the energy plant and power lines, but the land covered by the solar panels was lost for grazing. However, these solar farms were quite small compared with the other cases. Some reasons for the lack of conflict and the relatively low impact of the wind and solar farms on pastoralism may be that Mongolian herders already have government support for mobile livestock-keeping, including mobile home units to generate energy; they share the same language and mentality as the government officials in a predominantly pastoral country; and the Mongolian government holds nomadic pastoralism in much higher esteem (State Great Hural 2020) than do governments in the other countries.

Discussion & conclusions continued

Table 1 Overview of cases of green-energy projects & relevance for pastoral systems

	Project name	Country	Area	Land use	Issues relevant for pastoral systems
1	Gujarat Solar Park	India	2,180 ha	Communal land used by semi-nomadic pastoralists	• Land regarded as "wastelands" • Skewed consultation (only high caste) • Pastoralist community fenced out, losing access to the land
2	Bíi Hioxo Wind Park	Mexico	2,050 ha, 117 turbines	Communal land used by small-holder livestock-keepers	• Non-inclusive consultation process • Several cultural sites included in project area; led to violent resistance by community
3	Ixtepec Wind Project	Mexico	1,000 ha, 44 turbines	Communal land used by smallholder livestock keepers	• Positive example of coexistence • Community directly involved in planning and construction • Half of earnings to go to community
4	Øyfjellet Wind Park	Norway	150 turbines	Land culturally used by reindeer herders	• Interferes with herd migration paths • Licences to build and operate turbines declared void by Norwegian court
5	Noor Ouarzazate Solar Project	Morocco	over 3,000 ha	Communal land used by agro-pastoralists	• Planners regarded pastoral use as negligible • No compensation made to herders for loss of access to pasture
6	Bow Lake Wind Farm	Canada	36 turbines	Traditional land used by hunter-gatherers	• Participatory consultation • Community trust fund set up • Equity ownership
7	Lake Turkana Wind Power	Kenya	60,703 ha; wind farm on only ca 16,000 ha; 365 turbines	Communal land used by nomadic pastoralists	• Limited consultation • Land ownership takeover from community without any compensation • Community went to court, which declared land acquisition illegal
8	Kipeto Wind Power	Kenya	7,000 ha, 60 turbines	Semi-nomadic pastoralists but land privatised to family ownership	• Lengthy community consultation • Equity for community, with agreement on share of revenue
9	Kinangop Wind Park	Kenya	38 turbines planned	Smallholder crop and dairy farming	• Community trust fund set up • Community protested on lack of consultation and compensation • Project not completed
10	Salkhit Wind Farm	Mongolia	31 turbines	Summer & fall pastureland	• Almost no change in pasture use
11	Tsetsii Wind Farm	Mongolia	25 turbines	Periodically grazed land in Gobi Desert	• No impact on pasture use
12	Sainshand Wind Park	Mongolia	486 ha, 25 turbines	Winter pasture and campsites in Gobi Desert	• Access to pasture not affected • Relocation of campsites supported • New deep well established
13	Darkhan Solar Farm	Mongolia	25 ha	Public land	• No herder households affected
14	Sermsang Khushig Khundii Solar Power	Mongolia	48 ha	Public pastureland	• Siting of turbines and transmission line considered pastoralists' access to resources such as salt ponds • Loss of grazing land now under panels

Ways need to be found to strengthen the voice and agency of pastoralist communities so that they can negotiate the best terms possible for their members – in collaboration with state and non-state organisations trying to minimise social and ecological disruption and to prevent violent conflict.

The case studies reveal that, during the planning of most large-scale green-energy projects, the local mobile (nomadic, semi-nomadic) land users lacked information about the project plans and were not aware of their rights. The projects had negative impacts on the lives of pastoralists using common property resources, for example reduced access to and fragmentation of pasture, interference in migration routes between seasonal pastures, and loss of cultural land-related values. The pastoralists received few or no benefits from the projects, which often led to conflict not only between project and pastoralists, but also between different pastoralist groups vying for possible benefits (employment, compensation). This led to serious delays in projects, higher costs, and sometimes project failure.

Land grabbing deprived the customary land users of their access not only to pasture, but also to natural (and free) energy sources (firewood), yet they rarely gained access to electricity generated from the projects. This is often related to national regulations, such as when a government-owned power distributor holds the monopoly for connecting consumers to electric power. The energy projects are mandated to provide power to the national grid, not to the local consumers (Sena 2017).

Thus, many green-energy projects led to land and energy dispossession, disruption of pastoral livelihoods and cultures, and decreased resilience of the pastoral land-use system. The rush for land for generating green energy has exacerbated the historical marginalisation of pastoralists in most countries (Mongolia being a notable exception). The pastoralists generally face more difficulty than do crop farmers in defending their rights to common land and are not included in negotiations to be able to derive substantial benefits from the energy projects. Recent court cases (e.g. in Kenya and Norway) show that some pastoralist communities are regaining their rights through litigation, but these are exceptions. If enforcement of human-rights principles and legal systems for recognising rights to common land are not strengthened, a growing number of pastoralists will lose their land to large-scale green-energy projects and become poorer.

Even if energy companies do try to forestall resistance by offering CSR activities to provide services for local land users, these services are usually implemented in ways that are detrimental to mobile forms of pastoralism. The development "solutions" offered through CSR are conceived for sedentary populations (e.g. constructing school buildings rather than supporting mobile schooling) and encourage the settlement of pastoralists.

However, there are examples (e.g. Ixtepec Wind Park in Mexico, Kipeto Wind Power in Kenya, and Bow Lake Wind Farm in Canada) where local communities have benefited from green-energy projects through gaining equity ownership, sharing in the revenues generated, and managing community trust funds. There are also cases, for example in Mongolia, where energy companies have drawn herders into the planning process and have sited the energy installations so as to have minimal impact on herding. In the wind parks in Mongolia, the herders graze their animals under the turbines and report no damage to their pastoral system. Indeed, they benefit from the deep wells made for the energy plants. Unlike the cases in Africa, most herding families in Mongolia already have access to mobile household power units, and therefore seem not to be concerned about not receiving power from the large-scale installations. This is because Mongolia first gave attention to decentralised power supply for nomadic herders before venturing into larger-scale green-energy production.

Scientific studies show that green-energy generation can co-exist with grazing and even improve animal welfare. Investigations are being made into the inclusive participatory design of energy projects with multifunctional land use so as to optimise overall land-use efficiency for agriculture (including livestock), biodiversity, rural social and economic activities, and energy generation.

Thus, there is obviously a potential for win–win situations for pastoralists and green energy, but there is no straight and quick path that national governments and investors can take to create these situations. Large-scale land acquisition to generate green energy is adding to the many other forces that are changing the lives of pastoralists. Ways need to be found to strengthen the voice and agency of pastoralist communities so that they can negotiate the best terms possible for their members – in collaboration with state and non-state organisations trying to minimise social and ecological disruption and to prevent violent conflict.

To date, the expansion of large-scale green energy in the drylands has led to increasing resistance and litigation. This may be a sign of success in terms of a growing awareness among pastoralists and other local people about their democratic and human rights. The delays and costs for companies and investors because of these conflicts will oblige these actors to consult and negotiate directly with local communities instead of with only a few powerful individuals or local governments that make agreements without adequately informing and consulting the communities. Governments will need to manage the shift to renewable energy carefully through open discussions with informed civil society, and especially with the locally affected people. Only then can damage to local people's rights and livelihoods be averted and an equitable transition to renewable energy be made. The focus needs to be on cultivating good communication between pastoralists, governments, and energy projects on a level playing field. Possible measures to facilitate a just transition to green energy in pastoral areas – that is, to respect human rights, avoid conflicts, and facilitate fair multifunctional land use and benefit-sharing – are outlined in the following section.

Sheep grazing in a solar park in the Ukraine.
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06

Recommendations

Here we suggest some ways in which a transition to renewable energy could be achieved in a manner that treats pastoralists and other dryland users more fairly than has usually been the case thus far.

First, we need to highlight that global standards have already been developed for respecting human rights in conducting business (UN Guiding Principles on Business and Human Rights) and for assessing social risk in large infrastructure projects, for example the International Finance Corporation (World Bank Group) Environmental and Social Performance Standards (IFC 2012) and the Equator Principles (2020) adopted by several IFIs. These standards encourage companies to have policy statements on human rights and to undertake due diligence through human rights impact assessments (HRIAs). This includes recognising the local communities; applying the FPIC principle, regardless of whether or not the communities identify themselves as IPs; and recognising their customary systems, including land tenure, culture, and the overall value of their land-use systems. These principles are also enshrined in international agreements such as ACHPR and UNDRIP as well as in the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (FAO 2012), endorsed by the United Nations Committee on World Food Security.

It is not only a matter of respecting human rights, but also a matter of dollars and cents for the green-energy companies and national governments. By respecting human rights, energy companies can increase the likelihood of success of their projects and reduce their own and their investors' risk and costs (Shah & Bloomer 2018). Feyertag and Bowie (2021) report that social risk experts in project finance often struggle to convince the companies' financial or procurement teams to take these risks seriously – partly because the teams do not understand the huge financial damage that social risks can cause.

The Caravan for Water and Life exposing the rigged indigenous consultations and protesting against the Interoceanic Corridor of Mexico's Isthmus of Tehuantepec.
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Recommendations continued

For an average-sized sugar investment in sub-Saharan Africa, disputes can lead to financial losses of more than USD 100 million. For large-scale investments in green energy, the financial losses could be even bigger and could threaten a just and sustainable transition to a low-carbon economy. An energy project may not be able to continue if it sparks off or increases disputes among local people over natural resources. This can have long-term negative impacts on political stability. Thus, social risks can create lose–lose–lose outcomes for investors, local people, and governments.

According to Feyertag and Bowie (2021), the social risks can be avoided or managed: i) by giving local communities the right to give or withhold consent to a project that may affect them (FPIC); ii) by following existing guidelines on how investors can consult with local people (open communication, regular community meetings, multistakeholder mapping, etc.) in order to secure broad-based local support or "social license to operate"; or iii) by offering partial ownership or shareholding. The confidence-building and negotiation processes are lengthy and costly, but highly likely to be worth the investment for the companies and the government.

Thus, there are both ethical and economic reasons for implementing the international guidelines and codes: a project can either invest in gaining cooperation of the local people, or it can abuse human rights and feelings of fair treatment and then face resistance, which can cause costly delays or jeopardise the whole project. The success of the green-energy industry and the global transition to a low-carbon economy depends on strengthening human rights due diligence prior to investment (BHRRC 2016).

For policymakers, energy companies, and investors

Therefore, government policymakers should:

- draw up national and regional strategies for consultation with all local land users, including mobile ones, wherever a country plans for an expansion of renewable energy, including green hydrogen; the strategies should clarify procedures regarding the definition of the affected communities and should include their FPIC, also the right to say no to green-energy projects on their land;
- set up country frameworks that define parameters for local community participation and benefit (monetary or other) from renewable energy installations;
- ensure that pastoralists and other land users have legal support for negotiating with energy companies and have access to independent conflict mediation. As land users become more aware of the value of their land and their rights to defend it, and of possibilities for multifunctional use, there will be more negotiations, more conflict, and possibly long and costly litigation;
- support participatory, integrated land-use planning for reaching several SDGs simultaneously in areas foreseen for green-energy generation; these should include multifunctional land use and plans for managing and re-using water for producing energy, grazing, cropping, and potable water;
- in the case of hydrogen-importing countries, require in their procurement and certification frameworks for green hydrogen that it come from projects that meet the international standards regarding human rights.

Energy companies / project planners should:

- implement existing international and national business standards and codes of conduct;
- become aware of the project risks and costs they will face if they do not respect human rights;
- seek to understand i) the existing forms of drylands use by multiple communities that have multi-layered use rights; and ii) the rationale for mobility and how pastoralists add value to variability;
- engage with local land users at an early stage and seek their collaboration in planning the project.

When development assistance is given to promote public or private investments in green-energy projects, development agencies and investment banks should:

- ensure that human rights impact assessments are carried out and all required social and environmental safeguards and remedies are met;
- continuously monitor that the projects implement the existing standards and codes, including the human-rights and land-tenure guidelines; these endorsed standards and codes will be effective only if they are combined with monitoring how they are applied, demanding company accountability, and ensuring that local people have the power and ability to redress grievances.

A project can either invest in gaining cooperation of the local people, or it can abuse human rights and feelings of fair treatment and then face resistance, which can cause costly delays or jeopardise the whole project.

For nongovernmental organisations (NGOs) and civil society organisations (CSOs)

Development NGOs and CSOs need to become more aware of the existing international standards and codes of conduct as well as the instruments that local people can use to negotiate for energy justice so that they can then exert pressure on governments and investors to adhere to the standards. They will then be better able to: i) strengthen local people's capacity to negotiate; ii) facilitate multistakeholder planning processes; and iii) advocate for policy change to secure pastoralists' land-use rights.

i) Strengthening local people's capacity to negotiate. In areas targeted for green-energy projects, the local communities should be in a position to negotiate adequate compensation and any resettlement that may be necessary and/or to negotiate multifunctional land use. Pastoralist-support NGOs as well as government services prepared to invest in local human capital should:

- **provide better information for local people about green-energy projects.** Pastoralists and other dryland users need access to unbiased information (not only from the energy developer) to be able to avoid or reduce negative impacts on their livelihoods and to gain their fair share of the benefits from energy production. Their lack of understanding of the intervention can constrain their ability to assess its possible impact on their activities, as well as on the wider ecosystem;
- **provide civic education.** Pastoralist leaders and members of pastoralist associations, including those of women and youth, need civic education to become better aware of their democratic and human rights. The groups affected by the energy projects need to be informed about the policies, principles, and existing international and national laws to safeguard their land – and different forms of land valuation – to be able to defend their interests. Civic education includes strengthening the governance and legal recognition of pastoralist associations so that they can better engage in negotiations with energy companies. This may include negotiating access to energy for the local people as well as rights to continue to use the land for grazing and collecting fuel. Efforts to promote good governance at all levels, from national to local, will help reduce the threat of illegal or inequitable land acquisition for renewable energy or any other large infrastructure project;
- **provide independent legal counsel for pastoralist communities.** In view of pastoralists' "legal vulnerability" (Alden Wiley 2011), it is important to provide legal and procedural advice to help them prepare for meetings about a new energy project. Not only in areas with common land but also in areas where private landowners negotiate with energy companies (e.g. North America), the landowners need competent legal counsel to clarify issues such as the landowner's reserved rights concerning use of the land, for example for grazing or growing crops. The rights of the energy developer should be only those needed to produce energy (Wind & Prairie Task Force 2004);
- **provide training in financial management.** This would render pastoralist community members better able to manage and govern local trust funds set up in agreement with energy companies;
- **support pastoralist communities in registering common land.** Pastoralist communities, unless they have sons or daughters trained as lawyers, also require support to find their way through the process of collectively registering their common land – in those countries where this is possible. The land-registration processes are bureaucratic and slow, often because of chronic understaffing of the land offices, which may reflect an unwillingness of governments to implement their land policies. As a result, land-registration processes may not be fast enough to prevent pastoralists from being evicted in the rush for land to produce renewable energy (see Box 3).

Box 3

Community land registration in Kenya

In Kenya, community land registration (Republic of Kenya 2016) provides an avenue for communities to organise themselves and register their land collectively. The full implementation of this law provides communities with a governance structure that is democratically elected and the mandate to negotiate and enter into agreement with investors in consultation with the government. Indeed, having the title to the land in itself changes the value of the land in line with the country's legal dispensation. However, the process is yet to be meaningfully implemented. Only some communities that previously registered group ranches have managed to convert these into community land and acquire titles under the new law.

Recommendations continued

The capacity-strengthening should go beyond making the pastoralists better able to negotiate with external investors; it should also help them initiate and co-manage their own projects to harness solar and wind energy (such as the cases in Mexico and Canada), and to share the benefits of the energy production equitably with their technical partners in the enterprise.

The resources for this capacity-strengthening should be provided by the IFIs that support the energy projects. Not only do they have a moral responsibility to provide this support to local people; it is also a necessary measure so as to avoid investment failures that cause conflict, unrest, and migration.

ii) Facilitating multistakeholder planning processes. NGOs are in a fairly neutral position to serve as intermediaries that can facilitate the integration of pastoralist groups into planning processes together with the energy company and the local government. The planning should begin with participatory mapping that involves the company and mandated representatives of all pastoralist and other groups using the land area at different times or for different purposes. The mapping will help project planners better understand the existing land-use patterns and multi-layered rights to the natural resources. Conventional mapping may show different ecosystems and settlements, but participatory mapping can identify different types of grazing areas and their seasonal use, preferred water sources and natural mineral licks for animals, and sites of cultural importance. The next step would be co-designing land use to include green energy. An example would be asking pastoralists to identify where solar or wind energy installations best fit into their existing land-use system, so that the solar panels can be set up, for example on areas that the pastoralists do not regard as valuable for grazing.

Hoicka et al. (2021) suggest that one way to reconcile different interests is through equity ownership of renewable energy projects. Equity ownership and sharing benefits generated from the energy source allow for more control by the local people over the project. In the case of the IPs in Canada, this led to the increased delivery of social goods and local regional development, reduced ecological impacts, accelerated permit approvals, a lower risk of investment, and long-term stable revenue. Such benefits could increase the wellbeing and resilience of dryland communities.

iii) Advocating for policy change. Traditional users of common land need legally recognised rights of tenure so that they can prevent others from using the land without their permission. In some countries, such as Kenya, laws are already in place for pastoralists to register communal land. In other countries, the national laws may need to be targeted for change. Advocacy groups can also call for government policies that promote community energy projects that are collectively owned and managed to provide local energy and also feed into the national grid.

In advocacy efforts, it is useful to build coalitions within the country or even internationally. A main reason why many land deals stalled in the Tana Delta of Kenya was the opposition from different groups of local pastoralists, who formed "resistance coalitions" (Kay 2012). She adds that transforming such rural activism into a broader countermovement in support of pastoral rights to land and water, mobility and customary governance systems will be critical to protect dryland ecosystems and put pastoralists in a stronger position to benefit from the energy transition.

For researchers

Thus far, there are insufficient research findings to show how – over the long term – pastoralism and renewables could complement each other in communally managed rangelands. Most of these energy projects have begun to operate only recently. Further research and documentation of community experiences and impacts are needed. Participatory action research with a social-ecological systems approach would allow for the co-generation of evidence that pastoralists and NGOs can use in advocacy and negotiation with governments and companies. In general, researchers need to help fill knowledge gaps about the multifaceted value of pastoralism and rangelands (cf. Johnsen et al. 2019), generating these data together with pastoralists and making the information easily accessible to them. Critical knowledge gaps also need to be filled regarding environmental and production trade-offs between allocating land to solar- and wind-power development versus pastoralism, and regarding the socio-economic consequences of green-energy development in the rangelands (see also Dhar et al. 2020). Researchers should also engage in action research with pastoralists confronted by green-energy projects to enable the pastoralists' legal empowerment (Cotula 2022).

Participatory action research can also help in developing the appropriate designs of renewable energy projects so that pastoral land use can be integrated. This does not appear to be a major technical problem in the case of wind farms, as the Mongolian examples show. However, large-scale solar farms as they are currently being constructed, with closely spaced ground-mounted solar panels, do exclude grazing. Raising the structures would add to the costs of the solar installation, but the benefits from the dual use of land for generating solar power and grazing livestock could bring higher total output from the land, to say nothing of the other ecological and social benefits that this could bring.

Pilot projects for combining grazing with large-scale solar energy generation using raised instead of ground-based panels should be developed in collaboration with interested pastoralist communities. Such pilots in a participatory action research mode could provide rapid results on social research to guide other projects and help to fill some gaps in technical knowledge. At the same time, the pilots would increase the benefits that the local pastoralists gain from the energy project and provide examples of how green-energy generation can become part of multifunctional land use contributing not only to SDG 7 by providing affordable and clean energy, but also to SDG 1 (no poverty), SDG 2 (zero hunger), SDG 6 (clean water), SDG 10 (reduced inequalities), SDG 15 (life on land), and SDG 17 (partnerships to achieve the Goals).

"Companies should rapidly embed human rights due diligence that properly responds to the significant risks the industry poses to people and the environment. Investors should set a clear expectation that companies' respect for human rights and meaningful engagement with communities is not optional, and they must challenge companies that are doing too little. Governments must bring in legislation that tackles the climate crisis and lifts the floor of corporate behaviour, while ensuring their own funding for clean energy and energy access considers human rights implications."

Mary Robinson, Climate Justice (2020)

Left: Young herder in Senegal.
© Petra Dilthey / eeem.org

Right: Sheep seeking shade in Oiz, Basque Country.
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Annex 1: Methodology

The materials for this study were gathered mainly through extensive literature searches using the search engines Google and GoogleScholar and working with keywords related to renewable energy production and pastoralism. A call for relevant information via the listservs of CELEP (Coalition of European Lobbies for Eastern African Pastoralism), the FAO Pastoralist Knowledge Hub, and the International Support Group for the International Year of Rangelands & Pastoralists (IYRP) also yielded reading recommendations and personal communications about green energy and pastoralism in different countries. The authors divided the tasks of seeking and reviewing literature – one person focussed on Africa and the other on the rest of the world. Most of the literature reviewed dealt with Africa, the continent where the two authors have gained most of their experience in working with pastoralists, and with Mongolia, where one of the authors worked briefly. Primarily literature in the English language was reviewed. Relevant news articles and blogs were also included.

The search focussed on solar and wind power, but with some attention to geothermal power and green hydrogen as an emergent form of investment in renewable energy. It did not cover hydropower. The review included both peer-reviewed and "grey" literature on investment in green-energy generation, its land-use implications, and its impact on pastoralist peoples who use the dryland areas to gain their livelihoods. The main purpose of the literature review was to identify and prioritise the key issues to be addressed in the report. The review also helped to identify resource persons, especially for selected case studies, and to develop questions to explore with them.

The authors analysed the literature to identify the current situation, trends, and perspectives on the development of green energy globally. Impacts of the various green-energy projects were deduced with a specific focus on land-use rights and access, participation by communities in decisions about the projects, and the benefits they derived from the projects. The authors also sought examples that revealed opportunities for co-existence between pastoralism and green-energy development.

In order to enrich the case studies, one of the authors (based in northern Kenya) collected some legal documents related to the establishment of the Lake Turkana Wind Power project in northern Kenya and interviewed key informants about this case in one-on-one conversations in person, by telephone, and via Zoom. The informants interviewed included professionals from the area, some working for the local government, others working for local CSOs, and local politicians (members of the county assembly and senate). Some of those interviewed were directly involved in the court case against the project, while others were taking part in civil society actions in support of the affected communities. Some of the specific issues explored with the respondents included the processes following the court ruling that declared the land allocation to the LTWP project as illegal; how the processes of regularisation of land acquisition directed by the court will be undertaken; how the community members will be involved in this process; possible community demands; and what defines completion of the court's directive to reach a common agreement after negotiations within a year's time. Additionally, the respondents were asked: If compensation for land is to be pursued, what valuation system will be appropriate for adequate compensation to the community? Only a summary of the Kenya cases is included in the report. The more detailed results can be found in Annex 2.

Drafts of the report were commented on and additional suggestions were made by Jörg Haas and his colleagues in the Heinrich Böll Foundation.

Camel herder and trader in Pushkar, Rajasthan, India. © Prabhjit S. Kalsi / Shutterstock

Annex 2: Experiences of pastoralists in interaction with green-energy projects in Kenya

Development of renewable energy projects in Kenya

Kenya is a leading renewable energy investor in Africa: currently about 70% of its power comes from green energy sources. The country's primary source of green energy over the years has been hydropower. However, this is frequently affected by increased drought occurrences and erratic rainfall patterns that limit water availability for consistent power production. There has been a push to diversify green-energy sources by investing mainly in wind- and geothermal power generation, not only to satisfy its energy needs, but also to meet its obligations to reduce CO2 emissions under the UNFCCC Paris Agreement. Furthermore, it is expected that excess power produced will be sold to neighbouring countries for economic gains. Kenya has more than 90,000 km2 of land with excellent wind speeds for generating power in Marsabit, Samburu, parts of Laikipia, Meru North, Nyeri, Nyandarua, Ngong Hills, Lamu, offshore Malindi, Loitokitok, and Narok Plateau (Sena 2015). Most of these areas are in the drylands (arid and semi-arid lands) used by pastoralists and agro-pastoralists.

Previous energy developments, such as geothermal, displaced local communities to new locations that were less suitable than their former habitats; hence, as plans to develop more geothermal wells are being proposed, communities fear more mass displacements (Collins 2021). Kenya's drylands, which were formerly neglected because they were regarded as lacking economic potential, are now at the centre of the country's economic blueprints (e.g. Vision 2030). Besides the increased interest for the production of green energy, mega infrastructure development is underway to exploit the great economic potential of the drylands. However, because of a persistent limited appreciation of pastoralism, which is the dominant production and livelihood system in the drylands, and because of the lack of a formalised land-tenure system, irregular processes of land acquisition are increasing.

Pastoralists' land rights in Kenya

The drylands in Eastern Africa are home to the largest population in the world still active in pastoralism – estimated at 12–22 million people, and accounts for more than 60% of the world's total surface area supporting pastoral production systems (Lind et al. 2020).

In Kenya, the drylands cover 80% of the land area and are classified as unregistered community land used mainly by pastoralists. Since colonial times, successive governments have kept these areas marginal; therefore, they have lower development indicators than in other areas of the country. More recently, the government has developed a policy and legal framework to try to rectify this historical marginalisation (Elmi & Birch 2013). To mend the previous irregular processes of land acquisition, a resolution of historical land injustices was recommended in the revision of the Constitution of Kenya (Republic of Kenya 2010). Furthermore, the Public Participation Bill (Republic of Kenya 2019b) provides for strengthening citizen participation in every decision that affects them, with particular emphasis on marginalised communities such as pastoralists. Based on this legal and policy background, aggrieved citizens can contest in courts when they feel that their participation in decision-making was not satisfactory.

Despite these constitutional and legal provisions and Kenya's having signed international frameworks, including the FPIC principle, the land rights of the local communities continued to be infringed. With the enactment of the Community Land Act (Republic of Kenya 2016b) – a law dedicated to protection and registration of communal land rights – another layer of legal support was then provided.

The Community Land Act prohibits the takeover of registered and unregistered community lands. Any parcel of community land not registered under this act is held in trust by county governments on behalf of the communities. The county is prohibited from selling, transferring, or disposing of any parcel of community land or converting it into private land. In case land is acquired by the state for a public purpose, the constitution requires fair compensation and prompt payment of its total value (Mokku 2021). Customary tenure rights to land are recognised as equal to private and public rights. However, state authorities lack commitment to ensure implementation of the act (Renkens 2019).

Kenya's National Energy Policy and its Vision 2030 recognise the impact of energy projects on the livelihoods of affected communities, but they do not specify how human rights will be addressed before, during, and after the projects are set up. According to Koissaba (2018), the Environmental and Social Impact Assessment guidelines provided by the National Environmental Management Authority do not use a human rights-based approach. Even where regulatory requirements are in place, mechanisms to enforce the regulations are either weak or non-existent. Supervisory procedures to address the negative impacts of implementing renewable energy projects are inadequate.

Annex 2: Experiences of pastoralists in interaction with green-energy projects in Kenya **continued**

Acquisition of pastoral land for green-energy projects in Kenya

A common trend in the acquisition of communally owned lands for green energy or other investments in Kenya is a gross undervaluation of the land and an underestimation of the potential impacts on the people and their livelihoods. Often, communal pastoral land that is used seasonally for grazing is deemed "unoccupied" or "empty" land with no economic value. Its acquisition for investment is not seen to have any livelihood implications for the pastoralist communities, and therefore does not warrant their compensation for being displaced from grazing areas.

The land-acquisition challenges experienced by the communities in Kenya's drylands are rooted in the country's land valuation legal frameworks. The Land Value Act (Republic of Kenya 2019a) bases land valuation on conventional real estate and asset valuation approaches that are not applicable to communal grazing lands. It fails to recognise that "in the case of community lands, the subject of valuation varies across different communities and is highly related to the customs, practices, physical attributes, livelihoods and economic activities" (Makathimo 2019).

Government-generated indices and valuation models do not capture the total value of rangelands and their uses (Mokku 2021). As pastoralism is not considered a significant national economic activity, the economic value of mobile pastoralism is not monetised by most compensation policy documents (Osano 2021). Therefore, governments and investors perceive that generating renewable energy in the drylands puts the otherwise "worthless" land to better economic use for the benefit of the nation and – as is often also argued – for the benefit of the few local people, who will finally have a source of income (Achiba 2019). The choice of land where people affected by energy projects are resettled does not consider the suitability of the alternative land for pastoral production, as observed by the World Bank (2015) for the Olkaria geothermal energy case in Kenya.

Pastoralism and green-energy cases in Kenya

Kinangop Wind Park project, Nyandarua County

The KWP project in central Kenya started in 2004 as a joint venture between EcoGen Wind Farms and KenGen. Identified local landowners were to receive compensation for the use of their land, and additional CSR funds were earmarked for the development of the Kinangop community. However, demonstrations by local people relating to land issues escalated to the point whereby a project turbine was destroyed and the contractor withdrew for safety reasons. The protests centred on the lack of proper community consultation, engagement, compensation, relocation, and the manner in which the land was leased. The civil disturbances and court cases led to delays and the depletion of funds. KWP and its shareholders announced in 2016 that the project would not be completed. KWP sued the Kenyan government for failing to stop social opposition to the wind park, but it lost the case before the International Court of Arbitration (BHRRC 2018).

This example shows how risky and costly it can be if a renewable energy project does not come to terms with the local community. In this case, it is a crop and dairy farming area, where the inhabitants are probably better organised for protest than more mobile pastoralist communities – and this may be one reason why investors seek less-populated areas where they hope to encounter less well-organised local resistance.

Lake Turkana Wind Power (LTWP) project, Marsabit County

This is the largest wind-power project in Africa, producing 310 MW of electricity, and the biggest private investment in Kenyan history (Danwatch 2016, Cormack & Kurewa 2018). It was set up on 150,000 acres (60,703 ha) of land used by pastoralists, given to the investor in 2009 on a 33-year renewable lease by the then Marsabit County Council (now replaced with the Marsabit County Government). The speed and strength of the winds in this area make it an ideal site for generating wind power (Kamadi 2016).

The LTWP is a flagship project of Kenya's Vision 2030, emblematic of a drive to develop northern Kenya through large-scale infrastructure, including roads, railways, pipelines, airstrips, and a port at Lamu on the coast. It is registered as a "clean development mechanism" project under the Kyoto Protocol, which means that the greenhouse gas emissions alleviated by the project can be converted into certified emission reductions (carbon credits), which can be sold to developed countries. Part of the earnings from carbon trading is to be invested in the affected community via the Ministry of Energy (Danwatch 2016). One of the project lenders is the German Investment Corporation

Contrary to the local value and significance ascribed by the local communities to their land, the LTWP investors regarded the areas as an empty landscape – investable terra nullius.

(Deutsche Investitions- und Entwicklungsgesellschaft) in the KfW bank group (Kamadi 2016).

This land belonged to predominantly pastoralist groups – Turkana, Samburu, Rendille, and El Molo – who claim indigeneity and ancestral ownership. The lease transferred ownership rights of the communal land to the investors without any meaningful consultation or compensation, the excuse being that the community had no title to the land.

Kenya has not ratified UNDRIP, so the companies implementing the project and the IFIs that supported it did not trigger IP policies during land acquisition (Renkens 2019). Contrary to the local value and significance ascribed by the local communities to their land, the LTWP investors regarded the areas as an empty landscape – investable terra nullius (Cormack & Kurewa 2018). This false assumption ignited conflicting local versions of socio-cultural ties and historical connections by the different ethnic groups using the land. The large new investment entwines with the politics of devolution, raising the stakes for competition and claims around territory, resources, jobs, and power.

Local communities were aggrieved that land ownership changed and only paltry compensation was paid to cover relocation expenses to members of a village on the site, while private landowners in the same setting along the power transmission lines were compensated (Osano 2021). The local communities mobilised and resisted the land takeover. The LTWP proponents and project developers accused them of refusing "civilisation" and "development" and used state machinery to coerce them into submission (Danwatch 2016, Cormack & Kurewa 2018, Osano 2021), while arguing that the land remains accessible for grazing, thus downplaying the implications of land ownership.

Representatives of the local communities – including politicians and lobbying groups – made a legal petition to the court in 2014. The main concerns raised included limited public participation and an illegal process of change in land ownership from communal to private that deprived the communities of their ancestral land, altering its seasonal, cultural, and cyclic use, without any compensation for this loss. The community also questioned why an extra 110,000 acres (44,515 ha) were acquired when the wind-power installations required only 40,000 acres (16,187 ha). They suspected that the additional area was reserved for a possible further expansion of the project and to lock out other parties interested in establishing a similar project (interview with community representative).

The case dragged on for more than six years, but finally the court declared the process of acquiring land for the project as illegal and invalidated the land titles issued to the investors. It also faulted the process for causing land speculation and acquiring additional land not needed for the project.

The LTWP project has already been completed and is generating wind power. The pastoralists who traditionally used the areas not only lost the land; they also had no share in the benefits from the energy generated. Indeed, even the power generated on their traditional land is not made available to them. The benefits received were limited to some employment for local residents (e.g. as guards) and a few CSR projects, for example the provision or repair of health facilities, police stations, and classrooms (Danwatch 2016, Republic of Kenya 2016a). The CSR projects are actually the responsibility of the government to provide, and constructing a police station with police living quarters primarily serves the interest of the project, which requires a strong security presence to protect the power plant.

In addition to the income from the sale of energy, the wind power generates earnings through the sale of carbon credits in the international markets for permission to emit greenhouse gases. For instance, it is estimated that the LTWP earns €10 million annually from the sale of carbon credits (Danwatch 2016). Similarly, as of September 2021, KenGen has 4,617,309 tonnes of carbon dioxide equivalent (CO_2e) valued at €6,150,000 certified by the UNFCCC for sale from its six geothermal projects (KenGen 2021). The local communities do not benefit from these earnings. They are transferred into a central pool to reduce the national consumer tariff, which again does not reach the local pastoralists, as they are not connected to the national electricity grid.

The court ruling on the LTWP ushered in a rare opportunity for the communities. The court directed the County Government, the National Lands Office, and the National Land Commission to "regularise" the illegal land allocation within a year. However, if and what the communities will gain from this process is a big question. Interviews with community representatives – including local politicians – revealed that the process the land regularisation will follow, who will initiate and facilitate it, and how local communities will be involved, all remain undefined. Hence, a general lack of optimism on the possible community gains from the court ruling prevails. A major challenge is within the communities themselves, emanating from divergent interests and perceptions of territorial claims by the various ethnic groups in the area. The interviewees regarded the lack of clear community engagement structures as a major impediment that might result in a repeat of poor consultation and difficulties in raising common community demands. They reported that the County Government is expected to take the lead, but this might require a push from local politicians.

Respondents expressed pessimism regarding the scenario if no agreement could be reached. With the project completed and connected to the national grid, they felt that the energy operators may have nothing to lose; operation may continue with the status quo persisting, despite the court verdict.

Annex 2: Experiences of pastoralists in interaction with green-energy projects in Kenya **continued**

Kipeto Wind Power project, Kajiado County

Kipeto Wind Power is a 100 MW energy source that became operational in January 2021. This was after the local Maasai clan in central Kajiado had delayed commencement of the project since 1993 because the energy developers could not agree on a compensation scheme for the clan's land and livelihoods (Osano 2021). Despite (and perhaps because of) the long negotiation period, the project provides a good example of community engagement by investors, although the context of negotiation differs from that of unregistered community land because the Kajiado land already had private individual titles before the project was initiated.

The identification of the landowners for the purposes of participation and negotiation was straightforward, unlike in the unregistered community land in the LTWP case. Additionally, in the Kipeto case, the investors decided to lease the land instead of acquiring it as company-owned land. The final deal included an impressive list of benefits for the community members directly impacted by the project and additional development projects in other parts of Kajiado County (Sena 2017):

- annual lease payments to landowners based on land area, USD 1,000 for those with 1–50 acres, USD 1,500 for 51–100 acres, and USD 2,500 for 101 acres and above;
- 1.4% of the annual gross revenue from each wind turbine, estimated at USD 12,000/turbine, to be paid to each landowner;
- offer of 5% equity to the community, which is expected to receive USD 1 million annually;
- 5% revenue share for the community, commencing when the project becomes operational, to be channelled through a Community Trust Fund;
- For the 15 homesteads that had to be relocated, construction of 80 modern houses at a total cost of USD 400,000;
- the identification of CSR programmes benefiting the local community and the rest of the county.

Moreover, the project inhibits the subdivision of land in order to tame the chronic problem of land subdivision and sale that has fragmented the Maasai landscapes over the last couple of decades.

The Kipeto project also facilitated the formation of a Community Implementation Committee in 2014, ensuring that it included representatives of different local stakeholder groups (e.g. women, youth, elders) for inclusive land lease negotiations (Faber 2019, Sena 2017).

The success of this approach with respect to inclusive community benefits will depend on how the Community Trust Fund is governed. The land is leased instead of purchased or compulsorily acquired, so that the local people do not lose control of their land. A grievance system has been set up that builds on traditional conflict-resolution processes and appears to have been able to handle grievances thus far without necessitating court judgements.

After the first year of operation (2021), funds are supposed to start flowing from the wind park to the trust fund. It remains to be seen if what was promised through the agreement will be delivered. This example is promising, however, as it shows that – after facing much resistance – the wind-power developers finally realised the need for meaningful community engagement and working with grassroots institutions. Thus, Kipeto Wind Power appears to have created a win–win situation for renewable energy producers and local pastoralists through a process of community consultation, negotiation, and agreement, with land-leasing arrangements, regular income from shareholdings, and community benefits via a trust fund – but the jury is still out on whether governance of the Community Trust Fund will lead to the equitable sharing of benefits.

Camels in Laisamis, Kenya.
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A Rendille pastoralist tending to his goats.
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"The climate crisis will not be averted without a rapid expansion of the renewable energy industry. However, a net-zero carbon future can and must go hand in hand with sustainable development, poverty reduction and reducing inequality.... A narrow focus on short-term return on investments regardless of the harm to people and the environment has led fossil fuel companies to lose legitimacy and social licence to operate. If the same happens to renewable energy companies, it will only slow our expansion to a net-zero carbon future. That's why we need clean energy that respects human rights. A transition that is fast, but also fair."

Mary Robinson, Climate Justice (2020)

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