

8 Not Equal Before the Energy System

Can Energy Justice Principles Lift Women in Rural West Africa Out of Energy Poverty?

Laurent Jodoin and Carelle Mang-Benza

8.1 Introduction

Sub-Saharan Africa's (SSA) countries are facing severe impacts of climate change, despite bearing the least responsibility for historic greenhouse gas emissions. These countries are being more severely confronted with the harmful effects of climate change due to their limited economic development and weaker capacity to cope with the damage caused by extreme geoclimatic phenomena, thus increasing their vulnerability. This vulnerability varies across and within each country but hits women in rural areas particularly hard due to the intersecting burdens of poverty, limited access to essential services, and normative gender roles (e.g., Energia 2017). Since energy production and its use have significant impacts on both climate change and human development, and in a context where energy deprivation disproportionately befalls the weakest communities, it is now increasingly accepted that energy issues impinge on matters of justice and fairness (Galvin, 2020; Jodoin, 2021; Jones et al., 2015; Sovacool et al., 2017).

The concept of energy justice (EJ) is gaining traction in academic and policy settings as a possible decision-support tool for policymakers. The ideal of an energy-just world promotes “happiness, welfare, and due process for both producers and consumers, distributing environmental and social hazards associated with energy production without discrimination” (Sovacool & Dworkin, 2015, p. 437). However, there is no clear path to materialize this lofty ideal into energy interventions. In light of the growing socio-economic inequalities between and within countries, also reflected in energy systems, it is opportune to accelerate the usability of energy justice by energy planners. This is particularly germane for rural SSA, where the nexus energy-poverty-gender is a daily reality and where electricity poverty and energy poverty (including, e.g., wood fuel) are bedfellows. In this context, the capability approach can provide the necessary space for a coherent interpretation of multiple justice principles and for identifying how certain groups or people (such as those in our survey) may be more vulnerable than others to certain impacts of our energy systems (Jodoin, 2021; Mang-Benza et al., 2023; Melin et al., 2021).

This chapter synthesizes findings from a three-year project, funded by the International Development Research Centre (IDRC, Canada), aiming at generating new evidence that can help improve energy efficiency, access to energy, energy justice, and climate change mitigation and adaptation in SSA. This project took place over the period 2017–2020 and focused on engaging both women and men through surveys in 2,290 rural households in Benin, Senegal, and Togo.

8.2 Energy in rural West Africa

All conventional fossil fuels and renewable energy sources are abundantly available on the African continent (IEA, 2022). However, for the majority of the 1.1 billion Africans, accessing safe and reliable energy is a daily challenge. The continent is fraught with dichotomies between resource potential and access to these resources; geographic disparities between regions north and south of the Sahara; between urban and rural areas; as well as gender inequalities between men and women, even within the same household. In rural areas of sub-Saharan Africa, energy infrastructure is cruelly lacking, and women are particularly disadvantaged, as this chapter intends to show. Our results show that the vast majority of households' heads (HH) are men (81.2 to 90.9%) with no schooling (33.3 to 73.9%) and working in agriculture (47.8 to 72.7%). The overall portrait of women heads is similar where the majority (58.9 to 78.2%) have no schooling and a main occupation in small business (23.8 to 67.9%). Dividing the average household income by the average number of people yields an average monthly income per person of approximately 15USD in the three countries. Despite the prolific body of work on gender inequalities in energy systems and the gendered face of energy poverty (Clancy et al., 2002; Lee et al., 2021; Mang-Benza et al., 2023; Oparaocha & Dutta, 2011; Pachauri & Rao, 2013), most solutions advanced to address energy deprivation in rural Africa emphasize technological fixes, cost-benefit analyses, and economic modelling. The concept of energy justice offers an opportunity to challenge this approach (Guruswamy, 2010; McCauley et al., 2013; Wilkinson et al., 2007).

8.3 A principled approach to energy justice

Incorporating many dimensions of justice, such as distributive, recognition, and procedural, *energy justice* is articulated in two main ways (Wood & Roelich, 2020). There is, on the one hand, the conception outlined in McCauley et al. (2013) and called the *triumvirate conception of energy justice* and on the other hand, the approach developed by Sovacool and Dworkin (2015), later expanded as the *principled approach* (Jodoin, 2021; Sovacool et al., 2016; Sovacool et al., 2017). We will focus on the principled approach and the operationalization of its principles presented in Table 8.1.

The EJ framework (EJF) can be seen as aiming at “a global energy system that fairly disseminates both the benefits and costs of energy services, and one that has representative and impartial energy decision-making” (Sovacool & Dworkin, 2015: 436). It includes ten principles or criteria of justice and equity, and thus several values (see Table 8.1). Whilst presenting an arguably comprehensive normative framework, the EJF still needs work before it can be operationalized, especially in developing countries. For instance, justice principles tend to be rather vague in terms of the proper metric to adopt, for example, primary goods as advocated by Rawls (1971). This study makes a contribution to the literature based on the capabilities approach (as also proposed by Jodoin, 2021). The capabilities approach (CA) offers the benefit of having been operationalized both by the UN and several local and national governments (Robeyns & Brighthouse, 2010). This approach, developed most prominently by Amartya Sen and more recently also by Martha Nussbaum, centres around liberty (Nussbaum and Sen, 1993; Sen, 1999, 2009). It sees Rawlsian ideas on primary goods as a means towards an end and considers social factors such as institutions and social norms as factors influencing the realization of capabilities.

Capabilities can be seen as a person's real freedoms or opportunities to achieve functioning, i.e., various states of human beings and activities that a person can undertake (Sen, 1999, 2009). While functionings are actual achievements, capabilities are “freedoms in terms of

Table 8.1 Energy justice principles

| <i>Principle</i> | <i>Description</i> |
|----------------------------------|--|
| Availability | People deserve sufficient energy resources of high quality. |
| Affordability | The provision of energy services should not become a financial burden for consumers, especially the poor. |
| Due process | Countries should respect due process and human rights in their production and use of energy. |
| Transparency and accountability. | All people should have access to high-quality information about energy and the environment, and fair, transparent, and accountable forms of energy decision-making. |
| Sustainability | Energy resources should not be depleted too quickly. |
| Intragenerational equity | All people have a right to fairly access energy services. |
| Intergenerational equity | Future generations have a right to enjoy a good life undisturbed by the damage that our energy systems inflict on the world today. |
| Responsibility | All nations have a responsibility to protect the natural environment and reduce energy-related environmental threats. |
| Resistance | Energy injustice must be actively, deliberately opposed. |
| Intersectionality | Expanding the idea of recognitional justice to encapsulate new and evolving identities in modern societies, as well as acknowledging how the realization of energy justice is linked to other forms of justice, e.g., socio-economic, political and environmental. |

Source: From Sovacool et al. (2017).

[a person's] actual ability to do the different things a person has reason to value doing or being" (Sen, 2009: 16). Justice is thus a matter of being in a position to enjoy and develop our own capabilities but also of devising the appropriate institutions and social arrangements that can secure this position (Jodoin, 2021). Applied to energy, the focus on individuals' capabilities within their socio-ecological environment can highlight (as we will show) how certain demographics and groups might be more vulnerable than others to adverse impacts of our energy systems (Day et al., 2016; Velasco-Herrejon & Bauwens, 2020). Consequently, what is sought is not energy *per se* but rather the services *and* global opportunities energy can provide for people striving to achieve what they value.

This project is born from a partnership between the IDRC (a public funding agency in Canada) and Econoler (a private firm), in which the first author (L. Jodoin) was the principal investigator. The main goal was to improve energy justice and capabilities in rural SSA, especially for women. The methodology mainly consisted of a quantitative survey of 2,291 rural households (640 in Benin, 1,001 in Senegal, and 650 in Togo, randomly chosen through two strata of geo-socio-economic factors) and qualitative surveys (i.e., focus groups with 8–10 persons, both males and females; 24 in Benin, 106 in Senegal, and 10 in Togo), while engaging with local governments and NGOs (e.g., Energy4Impacts). For the quantitative survey, a questionnaire of about a hundred questions was developed in French and then translated into local languages; questions were asked in local languages in the three countries to the head of the household and his wife (if applicable, or the woman head). Each interview lasted approximately 45 minutes and was held within the household in local languages. Surveyors were mainly students and were selected for both their skills (e.g., academic background in social sciences) and their knowledge of local culture and languages. As the next sections will show, the data were collected in order to assess the EJP criterion as well as the sex-disaggregated capabilities of the adults in the households (except the elders and children). These capabilities have been addressed with both quantitative and qualitative data.¹

8.4 From principles to lived experiences

As mentioned, the quantitative results (Jodoin et al., unpublished) show that the vast majority of heads of households are men with no schooling and working in agriculture. The average household monthly income for the three countries is 145 USD, with Togo's being half of Senegal's. The differences between these numbers are in line with national statistics such as the GDP per capita (World Bank, 2023). At the same time, the household average number of people is the lowest in Togo, and this may affect average monthly income (as well as the individual energy poverty level). For reasons of space here and because the research project did not investigate the global governance issues (e.g., in international forums like the Conference of the Parties, which are relevant to criteria such as "responsibility"), the following sections illustrate only five of the principles listed in the EJP, namely, availability, affordability, intra-generational equity, transparency/accountability, and due process. In accordance with the CA, the analysis acknowledges that different people need different amounts and different kinds of goods to reach the same levels of well-being, but also that the focus should be on individuals (rather than institutions) and the scope of real (rather than merely formal) opportunities. We thus believe that the results from the analysis of these five principles are sufficient to show that the bottom-up, individualistic lens of the CA reveals situations of injustice that could otherwise be overlooked.

8.4.1 Availability

Availability of energy is obviously an important principle in the EJP, but its description referring to "sufficient energy resources of high quality" is quite ambiguous and expresses the need for operationalization. Criteria can apply quite differently to different energy sources. Yet, the rural areas probably show the greatest diversity of energy sources, with an amalgam of electricity grids, solar PV, gasoline, liquid petroleum gas (LPG), charcoal, wood, dung, and so on. Therefore, electricity and cooking fuel should be kept separate as distinguished sub-criteria of availability. Additionally, this distinction brings more insight into the different issues related to electricity, poverty, and energy poverty.

Overall, our results are consistent with the 2022 Energy Progress Report (IEA et al., 2022), which indicates rural access to electricity rates of 18% for Benin, 44% for Senegal, and 22% for Togo. Not surprisingly, the proportion of households (H) connected to the national electric grid is quite low, with an average of 24.9% for the three countries, as well as the presence of individual solar photovoltaic (ISPV) installations with an average of 16.3%. Furthermore, the nominal power of electricity is, for the vast majority, less than 10 kW, and the main source of electricity (not energy) is generally dry cells for about half of the population. Finally, the majority of households have light bulbs (fluocompact or LED), cell phones, and a radio, but rarely a refrigerator (7 for every 100 H), a television (44) or a computer (4) (with Senegal doing slightly better). This lack of availability of electricity services impacts women and men differently since energy services, through technology accessibility, are unequally distributed, with men generally having more economic means and more power in the households' decisions (see [Section 4.4.](#)), while women generally face more inconvenience and risk at night from the absence of light (public or else).

For cooking fuel, the quasi-totality (over 89% in the three countries) uses biomass (wood or its derivatives or organic waste), and the vast majority uses solid wood (either wood branches collected in nearby forests or wood faggots bought at the market), with at least 75% in the three countries (see [Table 8.2](#)). Only Senegal shows a significant usage of another cooking energy source than traditional solid fuel, with (only) 3.8% of households using LPG. Our results are aligned with country-specific studies. The cookstoves mostly used are for wood and

Table 8.2 Availability of energy (cooking fuel)

| Items | Sub-items | Benin | Senegal | Togo | Total |
|--|---|-------|---------|-------|-------|
| Cooking fuel | Wood Branches | 76.1% | 18.5% | 70.6% | 49.4% |
| | Wood Fagots | 3.0% | 57.1% | 13.2% | 29.5% |
| | Wood Charcoal | 18.3% | 12.6% | 10.8% | 13.7% |
| | Agro-waste | 1.3% | 8.0% | 4.5% | 5.1% |
| | Liquid Gas Petroleum | 0.2% | 3.8% | 0.9% | 2.0% |
| Cookstoves | “Three stones” | 66.3% | 73.8% | 79.1% | 73.2% |
| | “Cloporte” | 17.0% | 11.1% | 5.2% | 11.1% |
| | Improved (wood) | 3.4% | 7.2% | 2.9% | 4.9% |
| | Ceramic (traditional) | 10.8% | 2.0% | 11.4% | 7.1% |
| Reason for choosing a cookstove | Availability | 68.1% | 70.3% | 34.6% | 59.6% |
| | Price | 21.4% | 12.4% | 14.6% | 14.3% |
| | Facility to obtain | 18.6% | 12.3% | 22.8% | 17.0% |
| | Better results | 3.0% | 0.0% | 2.0% | 1.4% |
| | Other | 7.0% | 5.0% | 25.8% | 11.5% |
| Perceptions of improved cookstoves | Available | 72.2% | 69.9% | 54.9% | 66.3% |
| | Well adapted | 76.9% | 64.8% | 72.6% | 70.4% |
| | Consider having sufficient financial resources? | 63.0% | 38.3% | 46.0% | 47.4% |
| | Amount ready to pay (USD) | 7.06 | 19.43 | 3.66 | 11.50 |
| | Amount ready to pay (USD)—if sufficient resources | 8.05 | 19.56 | 5.58 | 12.38 |
| Prevalence of health problems and accidents related to cooking | Respiratory | 0.90 | 1.03 | 0.39 | 0.81 |
| | Cataract | 0.92 | 0.86 | 0.51 | 0.78 |
| | Skin | 0.40 | 0.97 | 0.18 | 0.59 |
| | Heart | 0.12 | 0.42 | 0.12 | 0.25 |
| | With women | 55.3% | 39.3% | 41.4% | 44.3% |
| | With children | 21.3% | 24.4% | 11.2% | 19.8% |
| | With men | 12.3% | 22.9% | 9.5% | 16.2% |
| | Accidents | 3 | 26.2% | 15.8% | |

biomass consumption; at least 84% of households in the three countries use traditional, inefficient cookstoves (i.e., either “three-stones” or “cloporte”). Consequently, the penetration rates of improved cookstoves are very low, with only Senegal above 5%. These figures are even more staggering that here the category “improved cookstove” also includes a cookstove for solid fuel (i.e., without gas or electricity).²

Cooking with solid fuel on such inefficient cookstoves is really the *worst-case scenario* because it impedes several capabilities: it requires a lot of fuel due to inefficiency (only 5–20% overall thermal efficiency according to ESMAP), thus leading to more expenses and time poverty; it causes indoor air pollution and the diseases associated with it; the combined prevalence of health problems and accidents related to cooking is more than two per household. It is also an obstacle to social and economic progress for women since women and girls who must collect wood are excluded from schooling or revenue-generating activities, and traditional cooking methods are often unsustainable since uncontrolled cutting of wood for fuel can be a contributing factor in land degradation and deforestation. Furthermore, even firewood can be lacking, and this gives rise to other even more damaging practises such as using plastic as fuel, as explained by this mother in Benin: “*at certain times during the year, this is the only option we have to avoid starving our families for lack of cooking energy.*”

The main reason invoked for the choice of a cookstove was its availability, whereas price was the main factor for only 14.3% of households on average. For the vast majority of respondents, the main factor is the ease of procurement of traditional cookstoves (because of their availability) and their afferent cooking fuel (i.e., wood or plastic bags). Still, according to our survey, the majority of households admit that improved cookstoves are available and (relatively) affordable. An explanation of this situation is multifactorial: (1) low, global purchasing power (and thus low incentives in the supply chain); (2) the entry cost of improved cookstoves; (3) a misunderstanding of the comparative advantages of alternatives (especially improved and clean cookstoves); (4) an overlook of opportunity costs (especially of women's working time and health); and (5) a lack of procedural justice (particularly women's participatory power, discussed later). Consequently, the energy services that are available to rural people are inefficient and of low quality (high entropy/low exergy and present health risk), and thus provide *ceteris paribus*⁴ less capabilities (Jodoin, 2021).

8.4.2 Affordability

Affordability, which is of course important for energy poverty and is also part of the EJP, is usually determined by a simple calculation of the proportion of the household's income that goes to energy services where a threshold is established beyond which energy is considered unaffordable. However, this way of assessing affordability, despite its simplicity, has two major shortcomings. First, it does not assess energy services but rather energy supply. Thus, it poorly assesses how energy can be beneficial in terms of capabilities. Second, it evaluates expenses or direct costs more than the real capacity of a household to truly acquire energy services. In effect, a poor household can avoid paying for energy (e.g., electricity) because it is too expensive and/or spend a lot of time and effort acquiring energy by other means (e.g., collecting solid fuel such as wood). It is thus important to assess the *opportunity costs* by including the time spent collecting fuel and the distance travelled. Our findings show that taking into account these opportunity costs decreases affordability from 51% to only 22% of households with a threshold of 10% of revenues. Also, non-internalized externalities, such as effects on human health from indoor smoke exposure, forest degradation, and the impacts of greenhouse gas emissions, could also be included, but they required more empirical data. Consequently, most orthodox, expenditure-based definitions of energy poverty fall short of identifying energy-related, capability-based injustices, whereas our findings show that women suffer the most from the opportunity costs (see Gafa et al., 2022 for more details).

8.4.3 Equity

Our findings highlight many forms of intragenerational inequity. From the obvious global inequity in electricity access between developed and developing countries, to the one between urban and rural areas, and finally to inequality within villages as well as households. As expressed by Mang-Benza et al. (2023, p. 6), "intra- and intergenerational equity challenges in the studied rural areas have a definite feminine face, which translates into restrained capabilities for women, both within and outside the household." In effect, women are solely responsible for cooking with all the afferent requirements (cooking fuel and technology). This 50-year-old female respondent in Baatonu, Benin, candidly lays out her perception of the gendered roles in her community: "*Here we, women, are the ones in charge of collecting firewood. But at least people acknowledge what we are doing. Everything related to cooking at home is on the woman. On the other hand, men are the ones working in the fields.*" And sometimes women have to do both as noted by a 32-year-old female retailer from Natantchiogou, Togo: "*Back in the days, the*

field was for men, nowadays, men rest and women work.” Consequently, due to gender norms, women suffer from time poverty and the arduousness of wood fetching, which (as mentioned) can result not only in exclusion but also in the risk of being attacked by men and animals, and they have almost three times the risk of having health problems due to air pollution.

Moreover, when available and relatively affordable, electricity services are far from being equally distributed between households’ members. This 64-year-old head of household from Djougou, Benin, explains how he manages electricity at home: “*At home, I am the head of the household. Therefore, I am responsible for buying the pre-paid electricity card. My wives have nothing to do with electricity charges.*” This situation is echoed by two female respondents, who stated: “*We are not equal regarding electricity*” (52-year-old woman in Moba, Togo) and “*Since it’s the man who brought electricity at home, he installed a light bulb in his own bedroom but not in mine*” (32-year-old woman in Agbandi, Togo). A situation resulting from as well as causing a lack of empowerment for women and procedural injustice, both of which negatively impact negatively their capabilities (discussed next; see also Table 8.3).

Table 8.3 Multi-level issues and women’s capabilities

| Level | Description | Increase in women’s capabilities | Data and references |
|----------------------------|---|----------------------------------|---|
| Global | High disparities in energy access between Global North and Global South. | No | e.g., Sovacool (2016). |
| National | High disparities in energy access between urban and rural areas. | No | e.g., Jodoin (2021). |
| Regional/ local | Even when a village is connected to the grid, many households may not have access. | No | Our findings show that high disparities in energy access between same village’s households, but also that people perceive arbitrariness and indifference from energy distributors. |
| Household | Even when a household is connected to the grid, it may not be able to afford the tariff and/or the technology granting energy services. | No | The average monthly income per person is approximately 15 USD while the electricity tariff is 0.16–0.19 USD/kWh. |
| Within household (members) | Even if a household can afford the tariff and/or the technology, it may not be equitably distributed; HH’s heads generally decide who get what (ref. qualitative data). | No | Ex. “Since it’s the man who brought electricity at home, he installed a light bulb in his own bedroom but not in mine” (32-year-old woman in Agbandi, Togo; <i>qualitative results</i>). |
| | Even if a household can afford the tariff and/or the technology, women will still be responsible for collecting wood and cooking food (with the inherent risks) and they will still have less power in the household. | Maybe | E.g., “At home, I am the head of the household. Therefore, I am responsible for buying the pre-paid electricity card. My wives have nothing to do with electricity charges. They don’t contribute. Since I paid for the electricity connection, I take care of it and don’t expect anything from them, not even to top up the account.” (64 y.o. man, Djougou, Benin; <i>qualitative results</i>). |

8.4.4 Transparency and accountability, due process, and procedural justice

The EJJ includes criteria that are based on procedural justice with “due process” and “transparency and accountability” (see [Table 8.1](#)). Procedural justice deals with recognition, participation, and power; it is concerned with how decisions are made in the pursuit of social goals, and who is involved and has influence in decision-making. It requires fair, respectful, and unbiased behaviour by authorities or those in power. Though this kind of justice is usually applied and assessed at higher levels, such as government and institutions (e.g., Paavola, 2005; Sovacool et al., 2016), we assessed it at the level of the household according to our assessment stratification and the individualistic ethics of the capability approach.⁵

Being patriarchal societies, the three surveyed countries present asymmetrical gender roles and implicit biases against women’s leadership and decision-making capacities. Not only are women not represented in decisions related to politics and society, but men are also often responsible for making household purchasing decisions, including those regarding the sources and type of energy in the household. That is why this project has moved away from the assumption that households are units without any power structure and rather attempted to assess intrahousehold decision-making processes with sex-disaggregated data collection (Alderman et al., 1995; see also [Table 8.3](#)). Our findings show that, while financial decisions are exclusively made by men in an average of 61%, tasks-dispatching decisions are more evenly distributed, with 33% and 32% for men and women exclusively, respectively.⁶ However, energy decisions are (again) fixed by gender norms since men are responsible for buying electricity and gas (with the afferent technology) and women are responsible for cooking with the associated technology and energy supply (mostly biomass). Of course, this intra-household decision-making pattern is detrimental to women’s capabilities to control their environment since they are the primary energy users due to their domestic duties and are therefore more vulnerable to risks related to energy supply and use. Consequently, this should be seen as an underachievement in the “due process” (local governance) criterion of the EJJ.

Also, beyond the power relations between men and women within households, rural households are rarely consulted in decisions to build energy facilities and infrastructure. Indeed, to the question: “Have you been consulted in the past, on behalf of the government, for the consideration of your energy needs in a project/program/national law?”, the answers show that in general the answer is: “no.” Therefore, rural population is generally not consulted by authorities. Moreover, the qualitative results show that this population often feels that the whole process of grid connection lacks transparency from the energy distributors. Finally, procedural justice concerns are, as mentioned, more often than not addressed at the level of policy and international agreements. For instance, an energy policy could be assessed in order to determine whether or not it addresses the needs of all the population and especially women, who tend to be left behind in terms of advantages and opportunities of energy access and use, mainly because they are underrepresented in STEM⁷ employment and decision-making processes (this would be the topic of future work, however).

8.5 Proposed interventions

The primary focus of the CA, as mentioned, is on individuals rather than institutions; it is thus more concerned with micro-level interventions but recognizes the importance of mezzo- and macro-level factors such as social norms and energy policy. Of course, energy interventions can be performed at different levels but those able to increase energy services and the capabilities of individuals are not necessarily evident. Top-down energy or resource-based interventions

achieving grid connection for each rural village, and even each household could still be far from sufficient. In effect, our results show that even when each and every household has access to affordable energy as well as energy services, it does not necessarily follow that each and every household member see their capabilities increased, and women are generally the most disadvantaged. Table 8.3 shows different levels at which energy injustices can manifest and how supposedly fixing these injustices with macro level, resource-focused interventions can be misleading. For instance, in a house with grid electricity and electric appliances, a woman can still have less capabilities because gender roles impose wood-fetching for cooking and/or drudgery without electric lighting (because the man keeps it for himself). Furthermore, these gender roles can even reverse the beneficial factor of energy access when women are expected to work longer hours because “now they have electric lighting.” Yet, our findings show that women would prefer more time for personal activities, socialization, and remunerative opportunities.

With the empirical evidence gathered from Benin, Senegal, and Togo, we showed that rural women experience the limited availability and affordability of both traditional and modern energy services with more difficulty than men. Yet, it is important that energy interventions focus on the most vulnerable, those with less capabilities—women in rural areas. An EJF informed by the CA thus calls for a bottom-up, more individualistic approach with differentiated measures for cooking fuel and electricity targeting women more directly. First, the focus should be on eliminating the *worse-case energy scenario*—inefficient, three-stone cookstoves with fetched fuel wood or plastic packaging. The prohibition of inefficient, three-stones cookstoves in SSA (through a standard and labelling programme) should be accompanied by the promotion of women-led design and local fabrication of improved cooking solutions, as well as the implementation of information campaigns, knowing that improved cookstoves are available but also that men have the purchasing power.⁸ Fostering sustainable, community-based or women-led governance on local forests while imposing restrictions on access and collection should contribute to achieve sustainability for all while improving women’s empowerment. Also, temporarily subsidizing LPG will help with the conversion away from biomass as cooking fuel.⁹ Second, besides increasing the power of the national grid, improving women’s capabilities through modern, electric energy services could be achieved with national energy efficiency programmes, decentralized renewable energy measures, and global improvement in the cold supply chain.

An EJF informed by the CA brings home the need to focus on the least advantaged—women—with a bottom-up, more individualistic approach. While acknowledging the need to increase grid connection, it calls for the elimination of the worst-case energy scenario for women. With the challenges imposed by climate change, SSA countries should at least have the right normative tools to face them.

Notes

- 1 Basic capabilities, such as maintaining good health and being educated, have *not* been determined empirically i.e. by systematically asking the surveyed population (quantitative data). However, the qualitative data reveal that many women wanted more time to maintain social relationships, personal leisure and financial opportunities. Moreover, the material (e.g. technology) and social (e.g. norms) environment has been addressed with the survey through various EJF principles. The capabilities of the surveyed population have thereby been analyzed with (1) the scope of choice (range of possible levels of functioning that an individual can enjoy considering all the constraints and opportunities of acquiring commodities) and (2) the act of choice (the ability for people to choose among opportunities). For instance, having some air pollution-related illness or a lack of time due to drudgery has been interpreted as negatively impacting the basic capabilities.

- 2 World Bank (2014) defined clean cookstoves as stoves running on LPG, electricity, kerosene, liquid and gel biofuels, biogas, and solar energy, as well as retained-heat cookers and biomass gasifiers (ACS).
- 3 This question was not part of the survey in Benin.
- 4 All things being equal.
- 5 The capability approach adopts an ethical individualism but rejects ontological individualism. Accordingly, it seeks to improve the well-being (through capabilities) of individuals while recognizing that social norms can influence their capabilities.
- 6 The percentages associated with decisions taken by both men and women are lower in Senegal than in Benin and Togo. Religious background can justify this result: Benin and Togo are animist whereas Senegal is Islamic-oriented where patriarchy is more pronounced.
- 7 Science, Technology, Engineering, Mathematics.
- 8 As the creation of a new agency is always time- and resources-consuming, a modification of rural electrification agency mandate to incorporate the promotion of clean cooking devices is a simple and quick avenue for SSA countries to consider.
- 9 It seems as a justified trade-off between intra- and intergenerational justice since SSA countries typically produce 10 to 20 times less GHG per capita than developed countries (IEA, 2022).

References

- Alderman, H., Chiappori, P.-A., Haddad, L., Hoddinott, J., & Kanbur, R. (1995). Unitary Versus Collective Models of the Households: Is It Time to Shift the Burden of Proof? *The World Bank Research Observer*, 10, 1–19.
- Clancy, J. S., Skutsch, M., & Batchelor, S. (2002). The Gender-Energy_poverty Nexus: Finding the Energy to Address Gender Concerns in Development. *DFID Project CNTR998521*. Internet: UK Department for International Development (DFID).
- Day, R., Walker, G., & Simcock, N. (2016). Conceptualising Energy Use and Energy Poverty Using a Capabilities Framework. *Energy Policy*, 93, 255–264. <https://doi.org/10.1016/j.enpol.2016.03.019>
- Energia (2017). Energy access and gender equality: What we know so far and knowledge gaps. *Gender-Energy Programme*.
- Gafa, D. W., Egbendewe, A. Y. G., & Jodoin, L. (2022). Operationalizing Affordability Criterion in Energy Justice: Evidence from Rural West Africa. *Energy Economics*, 109, 105953.
- Galvin, R. (ed.) (2020). *Inequality and Energy: How Extremes of Wealth and Poverty in High Income Countries Affect CO₂ Emissions and Access to Energy*. London/San Diego/Cambridge/Oxford: Elsevier.
- Guruswamy, L. (2010). Energy Justice and Sustainable Development. *Colorado Journal of International Environmental Law and Policy*, 21, 231–276.
- IEA (2022). *Africa Energy Outlook*. Paris: International Energy Agency.
- IEA, IRENA, UNSD, WORLD BANK, & WHO (2022). *Tracking SDG 7: The Energy Progress Report*. Washington, DC: World Bank.
- Jodoin, L. (2021). Let Capabilities Ring: Operationalizing Energy Justice in Guinea. *Energy Research & Social Science*, 72, 101894.
- Jodoin, L., Gafa, D. W., Egbendewe, A., Domegni, L. K., Gaye, I., Ague, V. J., Lo, K., Ouendo, E.-M., Fagbémi, L., Diop, M., & Ndiaye, M. L. (Unpublished). Making Energy Justice Work for Women in Rural Sub-Saharan Africa: A Quantitative Diagnostic from Benin, Senegal, and Togo.
- Jones, B. R., Sovacool, B. K., & Sidortsov, R. V. (2015). Making the Ethical and Philosophical Case for “Energy Justice”. *Environmental Ethics*, 37, 145–167.
- Lee, J., Kim, H., & Byrne, J. (2021). Operationalising Capability Thinking in the Assessment of Energy Poverty Relief Policies: Moving from Compensation-Based to Empowerment-Focused Policy Strategies. *Journal of Human Development and Capabilities*, 22, 292–315.
- Mang-Benz, C., Jodoin, L., Onibon Doubogan, Y., Gaye, I., & Kola, E. (2023). Making Energy Justice Work for Women in Rural Sub-Saharan Africa: A Qualitative Diagnostic from Benin, Senegal, and Togo. *Energy Policy*, 173, 113–345.
- McCauley, D., Heffron, R. J., Stephan, H., & Jenkins, K. (2013). Advancing Energy Justice: the Triumvirate of Tenets. *International Energy Law Review*, 32, 107–116.

- Melin, A., Day, R., & Jenkins, K. E. H. (2021). Energy Justice and the Capability Approach—Introduction to the Special Issue. *Journal of Human Development and Capabilities*, 22, 185–196.
- Monkelbaan, J. (2019). *Governance for the Sustainable Development Goals: Exploring an Integrative Framework of Theories, Tools, and Competencies*. Singapore: Springer.
- Nussbaum, M., & Sen, A. (eds.) (1993). *The Quality of Life*. Oxford: Clarendon Press.
- Oparaocha, S., & Dutta, S. (2011). Gender and Energy for Sustainable Development. *Current Opinion in Environmental Sustainability*, 3, 265–271.
- Paavola, J. (2005). Seeking Justice: International Environmental Governance and Climate Change. *Globalizations*, 2, 309–22.
- Pachauri, S., & Rao, N. D. (2013). Gender Impacts and Determinants of Energy Poverty: Are We Asking the Right Questions? *Current Opinion in Environmental Sustainability*, 5, 205–215.
- Rawls, J. (1971). *A Theory of Justice*. Cambridge: Harvard University Press.
- Robeyns, I., & Brighouse, H. (2010). Introduction: Social Primary Goods and Capabilities as Metrics of Justice. In: Robeyns, I. & Brighouse, H. (eds.) *Measuring Justice: Primary Goods and Capabilities*. Cambridge: Cambridge University Press.
- Sen, A. (1999). *Development as Freedom*. New York: Knopf.
- Sen, A. (2009). *The Idea of Justice*. New York: Allen Lane.
- Sovacool, B. K., Burke, M., Baker, L., Kotikalapudi, C. K., & Wlok, H. (2017). New Frontiers and Conceptual Frameworks for Energy Justice. *Energy Policy*, 105, 677–691.
- Sovacool, B. K., & Dworkin, M. H. (2015). Energy Justice: Conceptual Insights and Practical Applications. *Applied Energy*, 142, 435–444.
- Sovacool, B. K., Heffron, R. J., McCauley, D., & Goldthau, A. (2016). Energy Decisions Reframed as Justice and Ethical Concerns. *Nature Energy*, 1, 16024.
- Velasco-Herrejon, P., & T. Bauwens. (2020). Energy Justice from the Bottom Up: A Capability Approach to Community Acceptance of Wind Energy in Mexico. *Energy Research & Social Science*, 70, 101711.
- Wilkinson, P., Smith, K. R., Joffe, M. & Haines, A. (2007). A Global Perspective on Energy: Health Effects and Injustices. *Lancet*, 370, 965–978.
- Wood, Nathan and Roelich, Katy (2020), Substantiating Energy Justice: Creating a Space to Understand Energy Dilemmas. *Sustainability*, 12 (1917).
- World Bank. (2014). *Clean and Improved Cooking in Sub-Saharan Africa: A Landscape Report*. Washington, DC: The World Bank.
- World Bank. (2023). *GDP Per Capita (current US\$) – Benin*. New York: World Bank.