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To cite this article: Katharina Wiese (2020) Energy 4 all? Investigating gendered energy justice implications of community-based micro-hydropower cooperatives in Ethiopia, *Innovation: The European Journal of Social Science Research*, 33:2, 194-217, DOI: [10.1080/13511610.2020.1745059](https://doi.org/10.1080/13511610.2020.1745059)

To link to this article: <https://doi.org/10.1080/13511610.2020.1745059>



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Published online: 07 Apr 2020.



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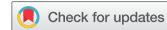
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Energy 4 all? Investigating gendered energy justice implications of community-based micro-hydropower cooperatives in Ethiopia

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(Received 24 May 2019; final version received 16 March 2020)

More than 70% of the population in Ethiopia lack access to electricity and thus rely on conventional sources of energy such as biomass that is associated with negative consequences on health and the environment. Decentralized community-based micro-hydropower plants (MHPs) are being utilized as effective means to transition to modern low-carbon energy systems providing access to electricity to communities in remote areas. However, there exist a knowledge gap regarding energy justice dimensions and gendered impacts related to sustainable energy transitions in the Global South. This research investigates the gendered justice implications of low-carbon energy projects in the case of four community-based micro-hydropower projects in Ethiopia implemented by the German Development Cooperation (GIZ). Although the projects generally achieved positive outcomes for the lives of the villager's socio-economic impacts on income; productive use, health and education affected men and women differently. The particular energy needs, uses and challenges that women face were insufficiently addressed and hence are limiting the opportunities for women to benefit equally from access to electricity. Generally, procedural justice aspects such as access to information, consultation and participation seemed to be insufficient to create a sense of ownership which in turn can jeopardize the long-term sustainability of the hydropower plants.

Keywords: Energy justice; gender; community-based; micro-grid; hydropower; Ethiopia

1. Introduction

Achieving universal energy access and transition to sustainable energy systems while operating within the planetary boundaries is one of the major sustainability challenges of our time. Energy is one of the largest sources of greenhouse gas emissions while three billion people still rely on conventional forms of energy – disproportionately affecting women and girls in rural areas (UNDP 2016).

Ethiopia is one of the countries facing this challenge. Less than 28% of the total population has access to electrical energy (EnergyPedia 2018). For the approximately 67 million people living in rural areas, this figure is only around 5% (GIZ 2017a). Consequently, the rural population depends heavily on conventional sources of energy such as biomass and charcoal with devastating effects on health and the environment

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(Sovacool 2012). In response to this, the Ethiopian Government has launched a plan to increase accessibility to rural areas such as the development and upgrading of micro-hydropower (MHP) village electricity grids in cooperation with donors (FDRE 2017). As part of the National Electrification Program (NEP), community-based hydropower plants are being explored as a viable means to harness the country's vast hydropower potential and to sustainably transition from conventional sources of energy into modern energy services and to extend the access to and availability of renewable energy to all community member with attention to vulnerable members like women (FDRE 2017) (see appendix 1).

However, several obstacles may affect the long-term feasibility of community-based hydropower plants such as poor institutional capacity, lack of coordination and inadequate implementation (Sovacool et al. 2011). In addition, while inherent injustices related to the consumption and production of large-scale carbon intense energy systems such as environmental degradation or air pollution are being widely discussed (see e.g. McCauley 2018), low-carbon energy systems in the global south such as micro solutions have new and different justice implications that need attention. Diverse power relations within the communities because of wealth, status or gender can, for instance, negatively affect an equal distribution of benefits from micro energy (Nightingale 2011). Especially in the context of the global south, it is often assumed that access to electrification primarily benefits women as they are the ones who are responsible for most of the household chores (Cecelski 1995; Winther et al. 2017). This assumption potentially simplifies distinct gender differences in terms of energy needs which produces different outcomes for men and women and are not fully reflected in energy justice debates (Bell 2016).

The setting for this paper consists of four community-based micro-hydropower projects in Ethiopia, funded and implemented by the German Development Corporation (GIZ). Despite the successful electrification of the villages, various difficulties have been identified. For example, the tariffs, set by the cooperative, are currently too low to cover the costs for maintenance and operation. The energy justice and social impacts of the electrification project, especially on women, are yet to be explored. Consequently, the aim of this paper is to critically assess these regarding its contribution to energy justice directing particular attention to gender equality. In addition, I want to highlight the importance of incorporating gender dimensions into the energy justice framework and to contribute to the energy justice debate in the global south. The particular research questions are:

- (1) **RQ1:** What are the socio-economic impacts of electricity provided by the community-based micro-hydropower plants in the Ethiopian villages on livelihoods at the local level?
- (2) **RQ2:** What are the gendered dimensions of
 - the distribution of benefits from and access to electricity services from the MHPs
 - the involvement and participation in the process and management and
 - the recognition of vulnerable groups and their needs of the community-based micro-hydropower plants?

The paper is structured as follows: Section 2 briefly describes the economic, political and social context in Ethiopia. Drawing on previous literature, section 3 presents the theoretical background. Section 4 outlines the methods used in the

paper, including details of survey, interviews and focus groups with the communities. Section 5 presents results and analysis, followed by a discussion in section 6, while Section 7 concludes.

2. Context

2.1. *Politics, economy, gender in Ethiopia*

Despite annual economic growth rates of 9,9% (GDP) (World Bank 2019), Ethiopia is still one of the poorest countries in the world and ranks 173th on the Human Development Index (UNDP 2019). One in four of the population, mostly women and rural residents, lives below the international poverty line of 1,9 US\$ a day (World Bank 2018). The economy is strongly based on rain-fed agriculture which constitutes the main source of income for nearly 70% of its population (DG DEVCO 2018).

The Ethiopian society has historically been organized throughout male-dominated power structures that place women in a subordinated position (Haregewoin and Emebet 2003). These structures are still persistent today (Bayeh 2015) and have led to economically, socially, culturally and politically gendered disparities in education, health and decision-making processes (Kassa 2015; Kumar and Quisumbing 2015; Bayeh 2016). For example, although the numbers have increased in the past, especially in urban areas, the enrollment of girls in primary education is still significantly lower in rural areas (UN 2013). This is reflected in the literacy rates of the country.¹

Even though women make up nearly half of the labor force in Ethiopia, they are still underrepresented in economic life, namely in the formal sector, in high-level positions and government employment (Demeke and Gebru 2015; Kassa 2015). Major entrepreneurial challenges for Ethiopian women include lack of policy support such as rules and regulations, misrecognition and restricted access to finance and training (Haregewoin and Emebet 2003; Bayeh 2016).

The government has been committed to achieving gender equality and enacted several laws to protect the rights of women, however, there has been no funding or capacity to implement community-based interventions targeting vulnerable women (UN 2013; Bayeh 2016).

2.2. *Energy in Ethiopia*

2.2.1. *Energy development*

Ethiopia has very rich resources of renewable energies such as hydropower, solar and biomass. Most of these resources are by no means exhausted. In the case of hydropower, the potential for large-scale is estimated to be around 45,000 MW and for small-scale between 1.500 and 3.000 MW of which only 2000 MW have been utilized by now (Tucho, Weesie, and Nonhebel 2014; Teferi Tessema 2017). Without any oil resources in the country, biomass and waste are the main source of primary energy use (91%), followed by oil (7%) and electricity from hydropower (2%) (Tucho, Weesie, and Nonhebel 2014).² The latter is by far the dominant source of electricity consumption with a share of ca. 92% (Energypedia 2018). The potential of pico- and micro-hydropower depends highly on topography and seasonality and is estimated to be around 100MW (Teferi Tessema 2017).

Despite this huge potential, only 28% of the population has access to electricity and most of them live in urban areas (Energypedia 2018). If one considers that the vast majority of the population (85%) lives in rural areas, the number is appallingly low – only about 5%

of these people have access to electricity (GIZ 2017a). Most of the Ethiopian people, especially in rural areas, heavily rely on conventional forms of energy such as biomass, kerosene, charcoal etc. For example, around 99% of rural households rely on biomass for cooking purposes (Tadesse Mengistu and Johnson 2013). The excessive use of biomass for fuelwood, agricultural activities and industrial and construction use in this country has led to estimated annual deforestation rates of 1–1,5% and a total forest cover of only 2,36% (in 2000) (FAO 2010; Tigabu 2016).³

2.2.2. Political approaches of mainstreaming sustainable energy access

The Ethiopian government established the National Electrification Program (NEP) which has the ambitious goal of providing universal access to electricity by 2025 (FDRE 2017). Simply put, to achieve this goal there are two main strategies: The Universal Access to Electrification Plan (UAEP) under the Growth and Transformation Plan (GTP II 2015-2022) targets further macro development of the energy infrastructure and increase in power production with priority of large-scale hydropower projects and grid extension (on-grid strategy) (Tessema, Mainali, and Silveira 2014).

The promotion of decentralized systems in rural areas is the second focus of the NEP. Part of this off-grid strategy is to support sustainable energy access through stand-alone solar, biomass and hydropower types in rural areas by facilitating financial and technical support to state and non-state actors through the Ethiopian Rural Energy Development and Promotion Center (EREDPC) (Tessema, Mainali, and Silveira 2014).

3. Theoretical background

3.1. Energy justice framework

This research is based on the energy justice concept – an emerging field of study acknowledging that “transformations in (low-carbon) energy infrastructures and policies may be perpetuating, or producing anew, form of inequality and vulnerability – or they may be providing opportunities for change for the better” (Bickerstaff, Walker, and Bulkeley 2013, 7). To achieve a higher level of equality, energy justice provides a contextualized analytical tool to identify (a) disparities in the distribution of benefits and burdens of low-carbon energy systems and the reasons behind (b) societal groups that are not being recognized and (c) processes or means on how to remediate potential injustices (Jenkins et al. 2016).

Historically, the energy justice concept is based on the ideas of environmental and climate justice. Originated in the US, environmental justice is advocating for the “equitable treatment of people of all races, incomes and cultures with respect to environmental laws, regulations, policies and decisions” (Todd and Zografos 2005, 484). Scholars such as Schlosberg (2004) stress the importance of fair procedures and recognition besides distributive claims.

The energy justice concept specifies the multifaceted themes covered by environmental and climate justice on the consumption and production of energy services (Bickerstaff, Walker, and Bulkeley 2013; Jenkins 2018). Although energy justice is based on the same philosophical groundings as well as analytical perspectives of distribution, procedure and recognition – which I will explain in the following lines – it stands out for its “non-activist past” (Heffron, McCauley, and Sovacool 2015; Jenkins et al. 2016) and high diversity of methods used (i.e. practice-orientated, quantitative and qualitative) (Jenkins,

McCauley, and Forman 2017) which increases the likelihood to be applied for energy policy formulation and decision-making processes (Jenkins 2018).

Because of the above-mentioned reasons and its practicability, I chose to use the energy justice framework instead of environmental justice as I am looking specifically into the justice implications of four community-based hydropower systems in Ethiopia.

3.1.1. *Distributional justice*

The allocation of benefits, opportunities, as well as costs and risks related to the outcomes of the production and consumption of energy, are the heart of the distributional justice aspect (Walker 2009). This essentially means that energy systems have social implications that go beyond mere technological and economic development. Potential outcomes for analysis can be of material nature such as the physical access to electricity as well as intangible ones such as the socio-economic impacts of the energy provided (Johnson and Hall 2014). For example, potential distributional injustices of low-carbon energy projects might involve costs of energy, ownership or employment opportunities (Huesca-Pérez, Sheinbaum-Pardo, and Köppel 2016). Scholars have pointed out that spatial factors, such as, for example, the location of a solar park, inevitably creates an equal distribution of outcomes (Jenkins et al. 2016; Liljenfeldt 2017). The focus of analysis is then on how to achieve a higher sense of fairness by, for example, identifying ways of redistribution (Liljenfeldt 2017).

3.1.2. *Procedural justice*

Procedural justice is concerned with formal and informal procedures of decision-making processes which includes access to and influence of decision-making processes as well how decisions are taken (Sovacool and Dworkin 2015; Jenkins et al. 2016). The idea is that non-inclusive procedures can then eventually lead to unfair outcomes (Schlosberg 2004). Potential discrimination on grounds of gender, religion or class should be avoided (Jenkins et al. 2016). It further has to be noted that effective participation does not equal physical involvement in decision-making (Jenkins et al. 2016). Rather, it has to be ensured that everyone can participate, has a voice in the process, is being treated with respect and given adequate information throughout the process (Gross 2007). In the case of low-carbon energy projects an important focus of analysis could include access to meaningful participation (e.g. participation in energy development and decision-making), information disclosure (e.g. the objectivity of information) and institutional representation (e.g. in the energy cooperative) (Jenkins et al. 2016; Mundaca, Busch, and Schwer 2018).⁴

3.1.3. *Justice of recognition*

Justice of recognition is strongly connected to procedural justice as someone's ability to effectively participate decreases when not being recognized (Schlosberg 2009). Furthermore, scholars such as Fraser (1995) go as far as to claim recognition to be the main source of distributional injustice. In that sense, justice implications of recognition go far beyond tolerance and emphasize the individual's freedom to exercise equal political and cultural rights without being threatened, marginalized, degraded or devaluated because of social, cultural, ethnic and gender differences (Schlosberg 2003; Fraser 2009; Liljenfeldt 2017). Fraser (2009) identified cultural domination, disrespect and non-recognition as three main categories for injustice due to misrecognition. Therefore, the interest in analysis

lies in identifying which groups are misrecognized and how this manifests in potential distributional and procedural injustices.

Although energy justice gives attention to recognize differentiated gender impacts of energy policies, it has not been fully integrated into the energy justice debate as for its own focus of analysis (Sovacool et al. 2017). In the context of a low-carbon energy transition gender is an important variable to consider as energy justice goes beyond providing energy access to people but puts a focus on the different energy needs and concerns (Ramazan et al. 2017). As energy justice is based on social justice theories incorporating gender into the framework highlights the interrelation of energy justice with other social justice issues (Sovacool et al. 2017). That is why I am expanding the energy justice framework by integrating the gender dimension into the energy justice framework.

3.2. Gender and energy justice

The concept of gender draws on socially constructed roles and identities of men and women that vary among and within societies and cultures and are variable over time (Clancy et al. 2011). Gender identities are impacted by other perceptions of social categorizations such as status, class, age, religion. The term gender relation refers to the distribution of power and access to resources between men and women within the household and the community (Clancy et al. 2011).

Energy projects have wide-ranging effects on gender relations that go beyond technological and economic impacts (Clancy et al. 2011; Farhar, Osnes, and Lowry 2014). The assumption that energy services impact the community universally might perpetuate existing gender roles and inequalities (Standal and Winther 2016). Distinct gender differences produce different outcomes for men and women (Bell 2016). On the one hand, women and men have different energy needs and perceptions of the benefits of electricity which can cause an unequal distribution of benefits of modern energy technologies (Clancy, Skutsch, and Batchelor 2003). On the other hand, women often have less access to resources such as credit, land and education and decision-making processes which limits their capacity to influence processes and resource allocation, having procedural and recognition justice implications (Clancy, Skutsch, and Batchelor 2003; Gay-Antaki 2016). For those reasons, perspectives of men and women on impacts of modern energy services should be considered in relation to each other (Clancy et al. 2011).

Furthermore, as argued by Agarwal (2001), female participation in common resource management is determined by rules, norms, and perceptions, in addition to the endowments and attributes of those affected.⁵ For example, rules of entry refer to membership rules that potentially hamper women's participation (Agarwal 2001). To further illuminate the justice of recognition dimension, I drew on Agarwal's framework of determinants of female participation to detect underlying factors such as rules of entry, personal attributes, social norms and behavior that obstruct women to effectively participate in energy decision-making processes of the cooperatives.

4. Research design & methods

My research strategy followed an integrated approach of combining quantitative and qualitative research methods which is in line with a critical realist approach (CR) call to integrate various methods to understand deeper causal mechanisms (Yeung 1997). Termed as an embedded mixed-method approach, this research emphasized qualitative methods (Bryman 2016). The use of mixed-methods is highly debated and it could be argued to

follow a purely qualitative method design as energy justice relies very much on the social perceptions around it (McCauley et al. 2013). However, quantitative methods were useful to measure access to and reliability of energy as well as socio-economic benefits of the electricity provided.

Furthermore, following CR, I approached the relationship between theory and my research in an iterative cycle. This means that I used theory to analyze the first data collected, adjusted data collection design (i.e. interviews) and continued to capture data related to my research questions. This led to a constant reflection on the abilities of my theory to explain my data and the iterative process of drawing from other concepts to make sense of data and observations which could not be explained with theories applied (Bryman 2016; Fletcher 2017).

To analyze the gender dimension and energy justice implications of community-based hydropower projects in Ethiopia in more-depth, I employed a multi-site case study design. Case studies were selected according to similarities rather than pre-existing differences which allowed me to recognize patterns within and across cases (Mills, Durepos, and Wiebe 2009). I am aware that generalizations of findings beyond the cases at hand should be treated with caution as they are context specific (Yin 2011). However, multiple case-studies seek rather for “analytical” than statistical generalization (ibid., 99). Therefore, by applying this research design, I am aiming to identify patterns and to provide valuable insights for future community-based hydropower projects in the region implemented by GIZ or other organizations.

4.1. Data collection

My data build on original data from four case studies in Sidama, Ethiopia. As of August 2018, within project phase I of the Energizing Development Programme (2009–2012), five pilot micro-hydropower plants⁶ in four villages in the south-eastern part of Ethiopia (Sidama Zone in SNNPR⁷ and Jimma Zone in Oromia) have been implemented (GIZ 2017b). In total, I spent 8 weeks (from the 23rd of February until the 21st of April 2018) in Ethiopia, as part of the GIZ Energizing Development Team in Addis Ababa. Fieldwork period was divided between 10 days in Bona and Aleto Wondo and 3 days in Hawassa. Primary data are of three forms. First, 17 surveys were conducted with household members. The survey comprised two specific parts: a questionnaire with multiple-choice and closed-ended questions to assess the socio-economic benefits of the electricity provided and a semi-structured part with open-ended questions to get an idea of individuals lived experience of access to electricity from the MHP. These open-ended questions allowed for follow up on distributional justice perceptions. The second are 14 semi-structured interviews with GIZ staff (Headquarter and Regional office), key informants in the village (such as village leader, teachers), members of the energy cooperative and government bodies involved in the process.⁸ The last one are four group discussions⁹ organized as neighborhood meetings. Focus groups complemented gendered perceptions on the distribution of electricity provided and were instrumental to understand how men and women were involved in the project implementation, how they perceived the project procedure and greater say in the management and decision-making processes of the cooperative. This was supported by secondary data obtained from literature and document reviews from data bases LubSearch, Web of Science, Scopus and GoogleScholar. All survey and focus group participants were chosen by snowball sampling (Bryman 2016).

In general, semi-structured interviews allowed me flexibility to adapt the questions if needed (Kvale 2007). Data saturation defined the size of my sample for survey, interviews

and focus groups (Bryman 2016).¹⁰ Survey and interview questions were tested and cross-checked with local GIZ staff and a translator to ensure that questions are being understood (Bryman 2016). A translator was present in all interviews with non-English participants involved, translating and interpreting Amharic and, in some situations, Sidaama with the help of a village member. Furthermore, all interviews and focus groups were translated, recorded except the ones with governmental bodies¹¹ and transcribed in English.

4.2. Data analysis

The quantitative data were analyzed by descriptive analysis. Responses and statements of my qualitative data were organized, reduced, clustered and manually coded using computer-assisted analyzing software NVivo. The codes were theoretically informed by the three tenets of energy justice and split into further sub-codes. However, I further kept an open mind and flexibility for inductive data coding for themes, important issues, and linkages that could not be directly allocated to the energy justice framework. Statements were then compared to identify obvious similarities or differences between the villages. I am presenting direct quotes as translated by the translator and modified into first person perspective. Details about ethical considerations and limitation are given in appendix 2.

5. Results & analysis

I conducted a survey to answer my first research question (**RQ1**) and to identify the socio-economic benefits of the community-based hydropower projects. Therefore, this chapter will first briefly summarize the general perceived benefits of access to electricity through the MHPs. Secondly, I refer to my second research question (**R2Q**) by presenting my results regarding the gendered dimensions of the distribution of the identified benefits, procedural aspects regarding the implementation process of the projects and cooperative model and justice of recognition. If not indicated, the results refer to the majority of responses.

5.1. General perceived benefits

Overall, the prevailing majority of the interviewees perceived the implementation of the MHPs as successful as electrification positively changed their lives. As one woman expressed “*And the life of young and adults all were changing due to electrification. We come from dark life to light life*” (Focus group 3). In all the three villages, electricity is most needed at night time and light is the most important use of electricity. That corresponds to the number of appliances households possess. Out of 13 villagers questioned, whose household is connected to the MHP, every household has at least one light bulb, whereas only five own a television and four a radio.

Access to electricity has increased the income of the villagers connected to the MHP. Eight respondents stated that this was made possible by the decrease in expenditures on energy. Prior to electrification participants were relying on kerosene, candles or firewood for lighting which cost around 36, 60 and 40 ETB¹² monthly (Wiese 2018), whereas the tariffs for one lightbulb per household are on average 12 ETB per month (Interviews 3, 14, 25). However, the majority of the people from low-income households perceived the tariffs as “too high” due to insufficient and fluctuating income (Interview 7, 22; Focus group 1,2,3). Furthermore, access to electricity has benefited previous business activities through new appliances such as TV or radio and created new economic opportunities

including barbershops, charging services, small businesses and coffee and tea shops (Interview 3, 14, 25). According to all three village leaders, electricity has led to poverty reduction. Yet, it has not improved the access to financial institutions in all three villages (Interview 3, 14, 25).

Access to electricity was perceived as particularly beneficial for women as “*they easily perform their home tasks such as cooking*” (Interview 22). Time is being saved as cooking with an electric light increases efficiency. Despite this potential benefit firewood is still the main source of energy for cooking in all three villages. Therefore, it did not significantly affect the time needed to collect firewood. Firewood collection is mainly carried out by women and children (9 out of 12 respondents) and takes them on average 2,3 h to collect within a radius of around 1,9 km. Generally, the average distance highly depends on the availability of wood on their own land. All participants of high-income households buy firewood instead of collecting it themselves (Interview 5, 16, 18, 20).

In terms of educational benefits, almost all participants highlighted the extended study hours for children to read and do homework after dark when using electric light. From all the answers the average number of hours of studying were 3,2 h per day. Prior electrification, study hours were shorter due to the high costs of kerosene and negative health impacts of wood smoke (Interview 7, 8, 12, 15). Despite the provision of light to study for the schools, electricity has not lead to the expansion of additional equipment such as TV or the availability of evening classes for adults or children. One exception is the school in Ererte which attained one radio for teaching purposes. The main reasons for this situation are the lack of financial means, availability of teachers and demand for evening classes (Interview 3, 14, 25).

Most of those questioned considered that access to information through TV and radio has increased their awareness about sanitation, family planning and diseases such as AIDS. Although villagers still use firewood for cooking purposes, burns caused by fire and kerosene were reduced as electric light simplifies cooking tasks (Interview 5,6,7,12,22). Another major health impact was seen due to reduced emission from kerosene which caused major health issues for the respondents such as respiratory and eye infections. Similar to the schools, electricity did not improve the access to health facilities or the quality of its services.¹³

Regarding environmental impacts, according to the village leaders and cooperative members, the MHPs have not negatively impacted the environment. Quite the contrary, an employee from GIZ reported reduced rates of deforestation after electrification of the villages (Interview 2). Environmental problems such as landslides and sedimentation occur instead due to population growth and agricultural expansion (Meder 2011). Cooperative members further mentioned that climate change affects the flow of the river and extends the annual dry season which impairs the functionality of the MHPs (Interview 4, 13).

5.2. Distributional justice

After generally listing the perceived benefits provided by the MHPs, I will now further elaborate on the distribution of these benefits within the following categories:

5.2.1. Income, poverty and production

As mentioned above, access to electricity has been perceived as increasing the income and enhancing new business opportunities. However, the data indicate that income has risen

mainly to those people who are technically connected to the MHP (Interview 2), “do commercial activities” (Interview 12) or have the financial means to open new businesses and shops (Interview 3, 14). Those are primary men of medium and high-income households. Men of poor households and women did not have access to the financial means to enhance additional income activities. Contrary to the statements made by male participants indicating that women are benefitting most from electricity, some women indicated to gain less than men. They further saw themselves as not being affected by income increase (Interview 10, 7). These statements corresponded with the bookkeeping lists of the cooperatives which documents the owners of SMEs that are connected to the MHP – in all three villages, only three SMEs of approximately 90 were officially owned by women.¹⁴

5.2.2. *Time and drudgery*

Reduced time for cooking due to access to electricity was valued by both men and women. However, both male and female villagers indicated that even though cooking tasks were easier it did not significantly affect the women’s (overall) working time. If it did reduce the cooking time, all the women being asked, except one, extended their working hours after dark due to the light. Work refers to household chores such as cooking, taking care of children or feeding animals and excludes taking up additional income generating activities (Focus Group 3, interview 19, 15). Only one woman used the additional time to study and read in the evening (Focus Group 2). Men, especially from high-income groups, used additional time for recreation, reading or following up with their business activities (Interview 12, 5). As wood is still required for cooking purposes no additional time was made available for women from less firewood collection. Most of the female participants would like to use electric cooking stoves, however, they indicated that they do not have the financial means to purchase it. Additionally, according to GIZ staff, the capacity of the MHPs are insufficient for the operation of electric cooking stoves (Interview 2).

5.2.3. *Education*

Extended study hours were considered as main benefits for children in electrified villages which positively impacts their grades in school. However, there were disparities between interviewed boys and girls regardless of income in all three villages. Girls do not seem to have the same possibilities to study after dark as they are assigned with more household works than boys. One woman pointed out that girls could study after the domestic work is finished whereas boys are not obliged to help out.

The research could not provide sufficient data on the correlation between electricity and improvement of girls and boys school attendance. The number of female and male student did not significantly differ from the data of the baseline study in 2010.¹⁵ One villager connected to the MHP pointed out that females do not go to school to support their family’s income (Interview 21). This, however, could also apply to boys as starting full-time work to sustain the family financially constitutes one major reason for school dropouts (Haskamp and Kassa 2010). Neither males or females benefited from evening classes as there were no classes available (Interview 3, 14, 25). Although data indicated that women tend to use additional time for household chores instead of reading, there is insufficient evidence for conclusions regarding access to electricity and increased literacy of women. The lower schooling rate is confirmed by the fact that, of all the villagers interviewed, males from all income groups had at least finished primary school. In contrast, 5 out of 12 women interviewed were illiterate (see [Figure 1](#)).

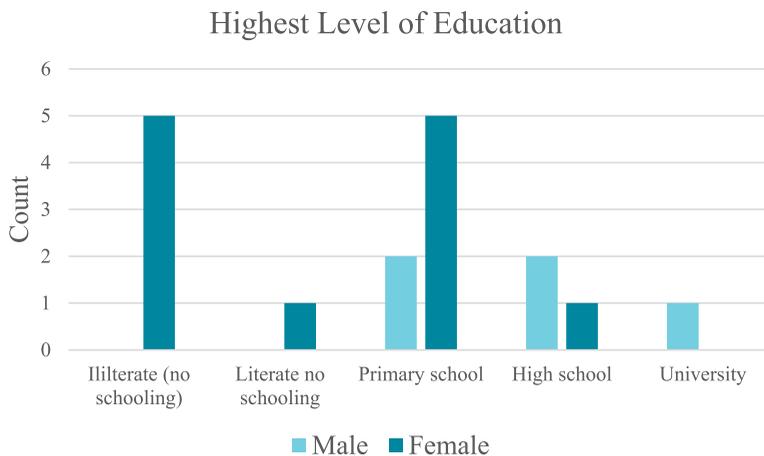


Figure 1. Highest level of education of interviewees.

5.2.4. Health

Kerosene related health impacts and accidents were reduced due to better lighting which benefited all – men, women, and children. Furthermore, females considered improved access to information due to electrification beneficial for themselves as it increases their awareness about health issues and hygiene (Interview 6, 10). However, as mentioned above, cooking still requires firewood and electric stoves are not in use. Moreover, there is generally insufficient data or information on the potential physical health impacts for women carrying heavy loads in the long term (Clancy et al. 2011). Literature suggests that improved health services due to electricity particularly favor women as better and safe conditions can potentially decrease maternal and infant death rates (Cecelski 2006). However, as the data indicate no special improvements for the health post, no distribution of benefits could be identified.

To conclude, the projects were generally perceived as successful and had positive impacts on income, productive use, health, and education. However, these benefits were not equally distributed among gender. Women were portrayed as most beneficiaries and they did value the flexibility in time, nevertheless, they benefited less from new income activities or time use for leisure. Access to electricity did not bring a transformation to gender roles as, for example, females still spent more time on household duties. In addition, there was a high consensus among the participants that villagers who run a business and own electrical devices were most benefiting, whereas poor households and the ones that only use one light were the lowest beneficiaries.

It has also become apparent that the ones who are not connected to the grid did not benefit in the same way including indirect benefits as the access to the social institutions did not significantly improve after electrification.

5.3. Procedural justice

The procedural justice aspects discussed are referring to the implementation and execution of the project as well as the cooperative model itself.¹⁶

5.3.1. *Consultation process and adequate information*

According to GIZ staff, the first step of the project procedure included a technical feasibility assessment of the sites. If the sites were suitable according to technical criteria such as discharge and power capacity, GIZ consulted focal persons of the community, mainly the kebele leaders who are male, to discuss responsibilities, expectations, ownership details and to formulate deliverables (Interview 2). The community was then informed about the project through a public village meeting open for everyone to attend (ibid.). The meeting also included awareness creation about the benefits and use of electricity which was provided by GIZ staff (ibid.). The consultation took place mainly with the village leaders, whereas the rest of the communities were provided with information which was shared through presentations. Participants in all three villages confirmed that everyone in the village could potentially attend the meeting.

Although the consultation process and information provision aligns with procedural justice aspects, especially given the political context, different conflicts could be identified. Contrary to the statement that everyone could attend the information meeting, women from Hagara Sodicha pointed out that they did not participate in the meeting and were informed by their husbands afterwards. One woman from Ererte whose household is not connected to the MHP told me that she only heard about the project after everyone was connected. A previous study reported that women in all three groups were informed at a rather late stage of the process (Rehklau 2010). Villagers from Gobecho problematized that their complaints about technical issues during the construction period were not acknowledged which indicates their voice has not been heard. Furthermore, villagers received partly misinformation about the technical system boundaries and capacity to be connected which created conflict and disappointment.

5.3.2. *Opportunity for participation and decision-making*

Community participation is valued as a “key element to attain sustainable development in African countries” (Chirenje, Giliba, and Musamba 2013, 10). Meaningful participation and community ownership can enhance social acceptability as well as the long-term sustainability of low-carbon energy projects (Gross 2007; Chirenje, Giliba, and Musamba 2013). Everyone interviewed felt that one way to participate in the implementation of the project was through unpaid labor work. Work mainly included collecting raw materials such as sand and stones, constructing the road and building the canals (Interview 2). Female participants perceived no difference in labor provision compared to men and either prepared food for the workers or participated with construction work.

Participation was further mentioned in conjunction with participation in the committees of the cooperative that manage the MHP. According to the law, at least one-quarter of the committee members must be represented by women (Interview 26). Every member of the cooperative can be elected for one of the positions in the committees. In the initial committees that were set-up, women were part of the them. However, as the law requires a replacement of the committee members every three years, women in all three villages were prevented from further participation in the new committees formed. Observations also indicate that women usually did not speak up in presence of men, which then questions the effectivity of their participation if allowed to part of the committees. The women further considered the election process as confusing and inadequate to ensure female participation. These incidents limit women’s opportunity to influence decisions regarding the management of the plants.

The decision to construct the MHPs has been met by everyone that was present at the meeting where the projects were presented and the benefits of electricity explained. None of the interviewees were opposing the project at the meeting. Decisions related to the design of the project and each step of the process were met by GIZ (Interview 1, 2). Furthermore, GIZ employees emphasized that the project process of the pilot projects has been rather focused on technical implementation than broad community participation and preparation (Interview 1). That indicates that the community was mainly involved in the implementation of the project but not actively involved in the decision-making processes. In addition, as mentioned above, although everyone could technically attend the meeting, especially women did not participate and were therefore not directly involved in discussions about the MHP implementation.

Zooming into the household level, the decisions about to connect the household to the micro grid highly depended on the household's financial capability and proximity to the micro-hydropower plant. This hindered poor households that were not able to cover the connection fee as well as households living outside the MHPs coverage area.

If the connection to the MHP grid could be afforded, both male and female participants confirmed that they decided together if they want to connect their household to electricity. The data on the purchase and ownership of appliances, however, showed that primary men were the owners of appliances, whereas females only decided in female-headed households. The findings confirmed results from previous studies that there is a need to apply a multi-level perspective and to consider intra-household power relations as the access to energy services does not equal control and can impact the distribution of benefits (Rewald 2017).

5.3.3. *Lack of sense of ownership*

The data further indicate various problems with the management of the cooperative in all three villages. Cooperative members reported incidents of mismanagement and theft, improper and irregular collection of tariffs as well as problems of knowledge transfer especially on technical expertise (Interview 4, 13, 19). Insufficient financial and limited knowledge resources reduced the ability to maintain the plant and impact the functionality and sustainability of the power plant (Gollwitzer et al. 2018) such as in Gobecho I and II. Interviewees across the sites felt that they do not have the power or the capability to act and fully control the resource. They further expressed the desire for more training. My data further suggest that cooperatives might not sense the MHP is their own. As one GIZ employee reported: *"They didn't feel it's their property, they are not protecting it as it is their own cow or farm etc."* (Interview 1). This is also underlined by cooperative members that problematized low motivation of participation in the committees (Interview 4). The allocation of responsibilities seemed to be unclear as interviewees referred to the need of technical as well as financial support from NGOs and government. The lack of a sense of ownership certainly has various socio-cultural, economic, technical and political reasons (Gollwitzer et al. 2018) which cannot be explained with my data and are out of the scope of this research. However, as Lachapelle defines the sense of ownership as "a concept through which to assess whose voice is heard, who has influence over decisions, and who is affected by the process and outcome" (2008, 52) it is strongly tied to procedural justice implications.

To sum up, the village leaders have been consulted and villagers informed at an early stage of the project. The meeting on information and decision of the project was open to everyone, however, most of the women were not attending. Conflicts due to misinformation and (insufficient) participation could be identified. Access to information, consultation

and participation seemed to be insufficient to create a sense of ownership. Although participation is required by law, women were prevented from further participation in the committees. Procedural aspects are very closely linked to justice of recognition which I will elaborate on in the next section.

5.4. *Justice of recognition*

The pilot projects followed a community-based ownership model, implying a general recognition of the community as an important actor in the rural electrification program. As mentioned above, the community was involved in consultation and owns and manages the plant. However, the villagers consulted were male and information reached mostly men (see Section 5.3).

In the given context, a lack of recognition can be evident in the consideration of women's energy need's, knowledge, participation, and decision-making in program design and execution beyond cooking and household lighting. Problematized by scholars, women in energy projects are often viewed as "a homogeneous and largely passive, benefits-receiving group" (Cecelski 2004, 25). Various stakeholders including GIZ employees, cooperative members, government officials, and male villagers perceived women as being the main beneficiaries of access to electricity from community-based hydropower (Interview 2, 26, 27, 28, 30, 31). Despite the general benefits of electricity for both men and women, the previous analysis showed distributional inequalities and unequal participation among gender. Examples of non-recognition of women on the use of electricity and technical expertise of operation and management of the MHPs (Interview 28, Focus Group 4; Rehklau 2010). There is further a lack of recognition of women's needs related to productive activities and emancipatory goals. Participants from the focus group explicitly mentioned that they do want to have the same economic opportunities than men. There is also evidence that women's needs were not recognized during project design. Women would like to use electric cooking stoves, but the technical capacity is insufficient to comply with the application (Focus group 1).

The impediment of women in the participation and decision-making processes in the management of the cooperative can be read as disrespect which is another form of misrecognition. Women were prevented from taking part in the election process even though female participation in the committees is legally mandatory and initially initiated by GIZ. Female interviewees from Gobecho and Ererte further problematized communication problems about the tasks and responsibilities of the cooperative and they did not feel involved (Focus Group 2). The women I interviewed experienced unfair treatment in the management of the cooperative and are willing to challenge their subordinate position. They seem to want to exercise their agency and participate in the committee to be an active part of the cooperative decision-making. Participants from Hagara Sodicha are exceptional as they told me they do not want to be involved as they felt they do not have the knowledge to do so (Focus Group 3).

Beyond the recognition of justice issues for women in the community, the needs and capabilities of poor households seem to have been overlooked by the cooperative. Although a few participants across the villages perceived poor households as least benefiting from electricity, the majority of interviewees did not even mention poor household in relation to winners or losers of electricity access. They mostly considered households with only one light source and no business activities as least beneficiaries. GIZ has proposed tariffs according to energy expenditures of the poor to afford electricity. Interviewees

from low-income households, however, perceived them as too high. There are further no subsidies or supporting mechanisms available to support poor households to afford the monthly tariffs and connection to the MHPs.

6. Discussion

6.1. Determinants of female participation

The lack of recognition of women's energy needs and capabilities in energy projects is widely discussed and affects the distribution of the benefits and participation in decision-making processes. This confirms Young (1990) and Frasers (2000) argumentation of the strong interrelation of a lack of recognition and respect on process and distribution of social goods. Besides the misrecognition of women's energy needs in program design and execution, statements of my interviews suggest that underlying structures such as social norms and behavior further prevented women from participation. Even if the women wanted to exercise their "agency freedom" there are structures that prevented them from doing so. For example, the cooperative is a powerful tool to influence and shape local energy decisions in the communities as they decide on tariffs and on who is being connected etc.. Thus, the women need to be included on an equal level to voice their needs and concerns. The same applies to the household level, access to electricity does not translate into women's participation in decisions about energy appliances. A staff member from the Woreda Women and Children office verified that property and purchase decisions are solely done by men (Interview 29). As Young (as cited in Schlosberg 2004, 519) argues "[...] participatory decision-making procedures are [...] an element of, and a condition for, social justice". If one want to enhance energy justice among gender in the community-based hydropower projects it appears necessary to understand the underlying dynamics and determinants behind participation.

Interviewees in Ererte and Gobecho reported about membership rules that allow only one person per household to be a member of the (energy) cooperatives which were usually men. As only the members of the cooperative can then be selected for the committees, these membership rules denied women to participate (Focus Group 1, 3). Social norms such as the gendered division of labor constrained women's ability in participating in the meetings. As women are primarily responsible for household chores and childcare, interviewees did not have the time to regularly attend the meetings (Interview 29). Men's perceptions of women's capabilities to fulfill tasks of management were one reason to neglect their participation in subsequent committees (Interview 19, 27). The findings further indicate that personal attributes and endowments such as women's level of education and self-confidence affecting them to take part in the cooperative. Women did not feel they have the knowledge or ability to participate. This varied depending on the age. In line with Agarwal's observations in South Asia (2001), I observed that older women in all three study sites were more confident to speak in front of men than the younger ones.

There is a need for gender disaggregated data to raise awareness on gendered energy justice implications and to identify pathways to remedy potential injustices. Furthermore, it is important to understand women's energy needs and concerns as well as the underlying structures that constrain women in the villages from access and use of energy services and participation on household and community level. These structures can prevent further perpetuation of gender disparities in a country with already high level of inequalities. It also became evident that access to electricity alone does not necessarily increase women's (and men's) economic and political empowerment which is confirmed by various scholars (see

e.g. Munien and Ahmed 2012). That calls for a need to coordinate energy interventions with other development objectives that target women's empowerment such as access to credit or education to enhance social equality (Winther et al. 2017).

6.2. *Beyond gender: procedural justice and the importance of participation*

Access to electricity through the community-based micro-hydropower systems certainly produces different processes and outcomes than large-scale hydropower systems in Ethiopia. For example, none of the cases created injustices related to the siting of the system such as displacement of the local communities. However, these low-carbon energy systems were not free of conflicts and injustices in the process and implementation of the project and in terms of gender elaborated in the analysis and above.

Energy justice further concerns providing safe and reliable energy (Jenkins et al. 2016). The data suggest that the long-term sustainability of the pilot projects is problematic: Both Gobecho I and II are not operating anymore and the cooperatives in Ererte and Hagara Sodicha are dealing with unreliable supply as the cooperative does not have sufficient funds for major maintenance works (Interview 4, 19). The underlying reasons are manifold and can be inter alia economic, socio-cultural, political and technical as energy systems are complex socio-technical systems in itself (Gollwitzer et al. 2018). Due to limit of the scope of this study, I am not able to state the explicit reasons for this development. However, the findings suggest that one driver might be the lack of sense of ownership (see section 3.3.3) which can be related to procedural justice aspects and be created through the degree of influence and participation in decision-making processes (Lachapelle 2008) which was insufficient in the cases. Despite the gendered dimension, consultation and effective participation in decisions took place solely with the village leader. GIZ staff further stated that the focus of the pilot projects was on technical implementation rather than broad community preparation and participation (Interview 1). The findings, therefore, support the importance of meaningful participation in the sustainable development of low-carbon community energy systems to achieve fair and sustainable outcomes. This has been expressed by other scholars who identified the potential of participation in decision-making processes for social acceptance and long-term sustainability of low-carbon energy projects (Gross 2007; Palit and Chaurey 2011; Gallagher, Action, and Wykes 2014). However, the meaning of participation is contested and must be viewed in context (e.g. in Ethiopia people were historically excluded from participation) (Cornwall 2008). It can be characterized in various levels from, for example, nominal participation¹⁷ such as membership to interactive participation such as the ability to raise your concern and opinion (see e.g. Agarwal 2001).

6.3. *Reflections on energy justice framework*

By adding the gender dimension to the energy justice framework, it served me as a useful analytical tool to understand the multiple social implications of the MHPs for men and women in the communities. It helped me to reveal who is benefitting to what extent, who is participating and who is being recognized in the process. However, I came across a few limitations.

To start off, I agree with Islar, Brogaard, and Lemberg-Pedersen (2017) who point to feasibility constraints such as biophysical, political and ethical on the principles of energy justice depending on the specific context. This can make it difficult to then actually apply energy justice in practice. This raise, for example, the question to what extent energy

justice can be achieved in socially unequal and culturally diverse developing countries such as Ethiopia, where the political structures give little space to participate. In addition, perceptions of justice depend very much on the cultural context. The energy justice framework further does not cover all aspects that influence justice implications such as national and regional political processes.

In general, my research has shown the importance of incorporating gender into the energy justice framework. It, therefore, needs to be further developed to account for gender dimensions and to be applicable to the global south.

7. Conclusion

I started this research by investigating the gendered dimensions of energy justice in the case of four community-based micro-hydropower projects in Sidama, Ethiopia. My analysis has demonstrated inequalities in the distribution of and access to benefits, in the involvement and participation as well as a lack of recognition of women's energy needs and knowledge. Rules of entry, social norms and behavior hinder women to effectively participate. In addition, I found that procedural justice implications such as meaningful participation in these projects are crucial for sustainability and to avoid further perpetuating inequalities. The implications of my research are two-fold: Practically, active participation and engagement of all groups within the community as well as the recognition and integration of women in all stages of the process are important and desirable to provide electricity for all and to contribute towards a fair transformation from conventional fuels to low-carbon energy provision in Ethiopia. Energy interventions should be coupled with other activities such as access to resources such as credit and education. Theoretically, the energy justice framework needs to be further conceptualized and linked with other justice issues in order to account for gendered and intersectional dimensions of justice implications of low-carbon energy systems in cultural and geographical diverse contexts in the Global South. Furthermore, gender inequalities can intersect with other socio-economic factors such as status, education, age, religion (Clancy et al. 2011). In the researched cases, justice implications concerned marginalized social groups that reached beyond gender. For example, poor household including men and women did not equally benefit from energy services as they could not afford the connection cost and electricity fees. Future research should incorporate these reflections.¹⁸

Notes

1. According to UNESCO men rate higher literacy rates than women in all age groups asked, 62,97% (15–24 years), 49,13% (15 years +) and 18,48% (65 years +) for men and 47,04% (15–24 years), 28,02% (15 years +) and 7,51% (65 years +) for women respectively (UNESCO 2007).
2. Due to availability of data figures are mostly from 2011.
3. Due to insufficient data on deforestation rates it is rather difficult to estimate exact numbers (FAO 2010)
4. These elements are not exhaustive. The “mobilization of local knowledge” (Jenkins et al. 2016) as well as the “lack of bias on the part of decision makers and access to legal processes for achieving redress” (Sovacool and Dworkin 2015, 437) are further elements mentioned by scholars.
5. Agarwal developed a framework consisting of six elements that can constrain female participation in common resource management (Agarwal 2001). These are personal attributes and endowments, household attributes and endowments, rules of entry, entrenched claims, social

- perceptions and social norms. The latter is further divided into gendered segregation in the public sphere, gendered behavioral norms and gendered division of labor.
6. The pilot projects are organized as community-based energy cooperatives which means that village members legally form a cooperative that owns and manages the plant informed by guiding rules of the Ethiopian Government Cooperative establishment laws & regulations (GIZ n.d.). Responsibilities include operation, maintenance, tariff decision and collection and decisions about grid connection. The management structure of the energy cooperative includes the executive and control committees for managerial and sub-committees such as technical and audit for operational activities. The work for the committees is voluntary, merely the guard and the operator are being compensated. All members of the village can be part of the cooperative by paying 10 Birr for registration and 20 Birr for share contribution. Electricity fees in form of flat rates tariffs need to cover the salaries and the maintenance and operation costs. The surplus of the revenue is meant to be allocated to community development (GIZ n.d.). The cooperatives were officially handed over to the communities in 2011 (GIZ 2011). The GIZ was mainly involved in supporting the implementation of the projects, providing technical assistance, training and financial means for investment costs. Expected outcomes of these project are presented in table 1 (GIZ 2017b). The local government authorities were assisting with the training, setting-up the cooperative, as well as supervision and follow-up of activities after commission (GIZ n.d.).
 7. SNNPR stands for Southern Nations, Nationalities and Peoples Region (Yilmaz and Venugopal 2008).
 8. These interviews served various purposes such as to (a) provide background information on the project and implementation process and to understand the socio-political and socio-technical context; (b) gather socio-economic benefits of micro-hydropower energy; and (c) understand the gendered perception regarding the distribution of the outcomes.
 9. Three female and one male group.
 10. The goal of my research was not a statistically significant representation of outcomes but rather “to get a reliable sense of thematic exhaustion and variability within the data set” (Guest, Bunce, and Johnson 2006, 65).
 11. The government agencies did not allow recording for confidential reasons.
 12. This is equivalent to 1,28\$, 2,13\$ and 1,42\$ (November, 2018).
 13. According to the village leaders, the health post in Ererte is not staffed, the one in Gobecho is not connected and the inhabitants of Hagara Sodicha are currently waiting for construction of a health post in the village (Interview 3, 14, 25).
 14. According to interviews there were 27 SMEs in Ererte, 10–20 shops, 20 tea shops, 3 barber-shops and 4 restaurants in Gobecho I and II; 20 shops, 12 carpenters and 4 barbershops in Hagara Sodicha. However, these numbers could be incorrect due to lack of transparency of the cooperatives book keeping.
 15. Ererte: Baseline study 869 M, 837 F, Fieldwork data: 814 M 836 F; Gobecho: Baseline study 2010: 978 M, 866 F, Fieldwork data: 950 M, 917 F; Hagara Sodicha: Baseline study 2010: 575 M 353 F, Fieldwork data: 533 M, 383 F (Haskamp and Kassa 2010)
 16. It must be noted that the political landscape of Ethiopia as an authoritarian regime restricts the scope for consultation, meaningful participation and decision-making.
 17. See other typologies such as Arnstein’s (1969) ladder of participation or Pretty’s (1995) typology of participation.
 18. These results confirm the need to incorporate multiple identities beyond the gender dimension into energy justice debates (Sovacool et al. 2017) as well as energy development projects.

Acknowledgements

I would like to thank GIZ in Ethiopia for giving me this incredible chance, especially Rainer, Jannik, Josef, Selamawit and Addisu for the fruitful discussions and input on the projects and Ethiopia itself and for making me feel belonging to the team. A very warm thank you goes to all the people participated in interviews, focus groups and conversations and my supervisor Sara for always having an open ear for my ideas, thoughts, doubts, concerns and questions, for your constructive feedback and criticism and for keeping me engaged and excited for my research project from the start to the end of the process whether it be via person, e-mail or skype.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

My research was carried out in collaboration with GIZ as part of the Energizing Development program. The travel costs were funded by the Right Livelihood College scholarship.

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Appendices

Appendix 1. Interrelation between access to modern energy services and poverty, health, education and environment

Poverty and productivity	<ul style="list-style-type: none"> - As especially poor households in rural areas spend around one third of their annual income on energy directly, access to modern energy services can reduce energy expenses by simultaneously enhancing additional income generating activities thereby reducing poverty (Sovacool 2012). - Modern energy services can enable productive use of electricity that create new income sources by, for example, providing lighting, TV or radio to small shops, cafes, grain or rice milling etc. (Larson and Kartha 2000)
Health	<ul style="list-style-type: none"> - Generally, health can be improved as modern energy services substitute conventional forms of energy that are negatively impact health, for example, solar water pumping to fetch water, cooking stoves as clean cooking alternatives, electricity from renewable energy sources (solar, hydropower) allow lighting through electricity instead of kerosene or firewood as means of lighting as well as refrigeration of goods (Larson and Kartha 2000; Sovacool 2012). - Electricity can improve the equipment and quality of healthcare centers and posts through, for example, provision of modern medical equipment, refrigerators as well as access to information (Sovacool 2012) - Information and communication technology such as TV, radio can enable access to education programs that create awareness about diseases, hygiene etc. (Sovacool 2012)
Education	<ul style="list-style-type: none"> - Energy services can positively impact households and social institutions, especially schools. (Sovacool 2012) - Electrification of schools potentially attracts qualified teachers and allows for new electrical appliances such as radio and TV to support teaching materials. (Sovacool 2012) - Lighting in households allows children to study/read after dark. (Sovacool 2012)
Gender roles	<ul style="list-style-type: none"> - Access to electricity is said to particularly benefit women in rural areas as they are the main responsible person for household chores and electrical power makes the household chores more effective extending the working day after darkness for education and additional income activities (Köhlin et al. 2011) - Access to telecommunication such as television and radio is claimed to influence gender roles and empowerment as the media provides information about family planning or portrays women in different ways (urban lifestyles) than rural women are used to (Jensen and Oster 2009)
Environment	<ul style="list-style-type: none"> - Environmental impacts related to access to modern energy services are mainly decrease in deforestation, land degradation and CO₂ emissions (Sovacool 2012).

Appendix 2. Ethical considerations and research reflexivity and limitation

Ethical considerations

Talking about energy justice in a political closed space is a sensitive issue and needs careful consideration. By pursuing fieldwork in a Sub-Saharan African country, I needed to be aware of specific histories of development, socio-economic and political relations, and to be mindful to ethical consideration throughout the research process (Sultana 2007). It is therefore highly important to be aware of the consequences for the communities in the way people are being approached as, for example, my appearance affiliated with GIZ created feelings of hopes (Will you be able to fix the hydropower plant?) and expectations of direct benefits (Will you come back and get help or money?). Prior each interview and focus group, I provided information about the objective of my research, asked for their voluntary participation, permission to take pictures, record the interview and to use the data obtained. I further respected the privacy by treating the data with confidentiality and anonymizing names in my paper and data (Bryman 2016).

Research reflexivity and limitations

Research is never free from a certain degree of limitations and bias as “our findings will be always interpretive and partial, yet telling of stories that may otherwise not be told” (Sultana 2007, 382). It is therefore essential to be reflexive about our own cultural background, physical appearance, identity and power relations in the field (Sultana 2007; Yin 2011; Geleta 2014) as well as data collection and analysis methods used (Bryman 2016).

First, approaching the village as a white, “privileged” female researcher from Europe under the affiliation of GIZ might have created some bias. I was considered as an outsider of the community – people referred to me as a representative of GIZ^[1] and called me “ferenji” which means foreigner. The data is open to misinterpretation as I neither speak the language nor have I been to Ethiopia before. Due to availability, I collaborated with a male translator also when interviewing the women. In addition, due to the culture, other village people and focal persons insisted on being present during the interviews I conducted. This could have impacted my data as interviewees and focus group participants, especially the women, might have not have been confident to speak freely due to patriarchal power structures within the communities.

Secondly, I visited three villages for a very brief period. I believe to substantially understand impacts of MHPs and gender dynamics within the community in a different cultural context one would need to gain peoples trust and engage with them over a period of several months. In addition, as the MHPs Gobecho I and II are not in operation for two years, I reduced my data collection in Gobecho to focus groups. The results of the survey are further not statistically significant and rather provide an idea of the benefits.

Lastly, I am not free from my own beliefs. I approached this context with a western perspective of feminist values and this guided my line of inquiry. With a longer period of time spent within this context, or working closely with researchers which are from this region stronger and more definitive analysis could be achieved.