

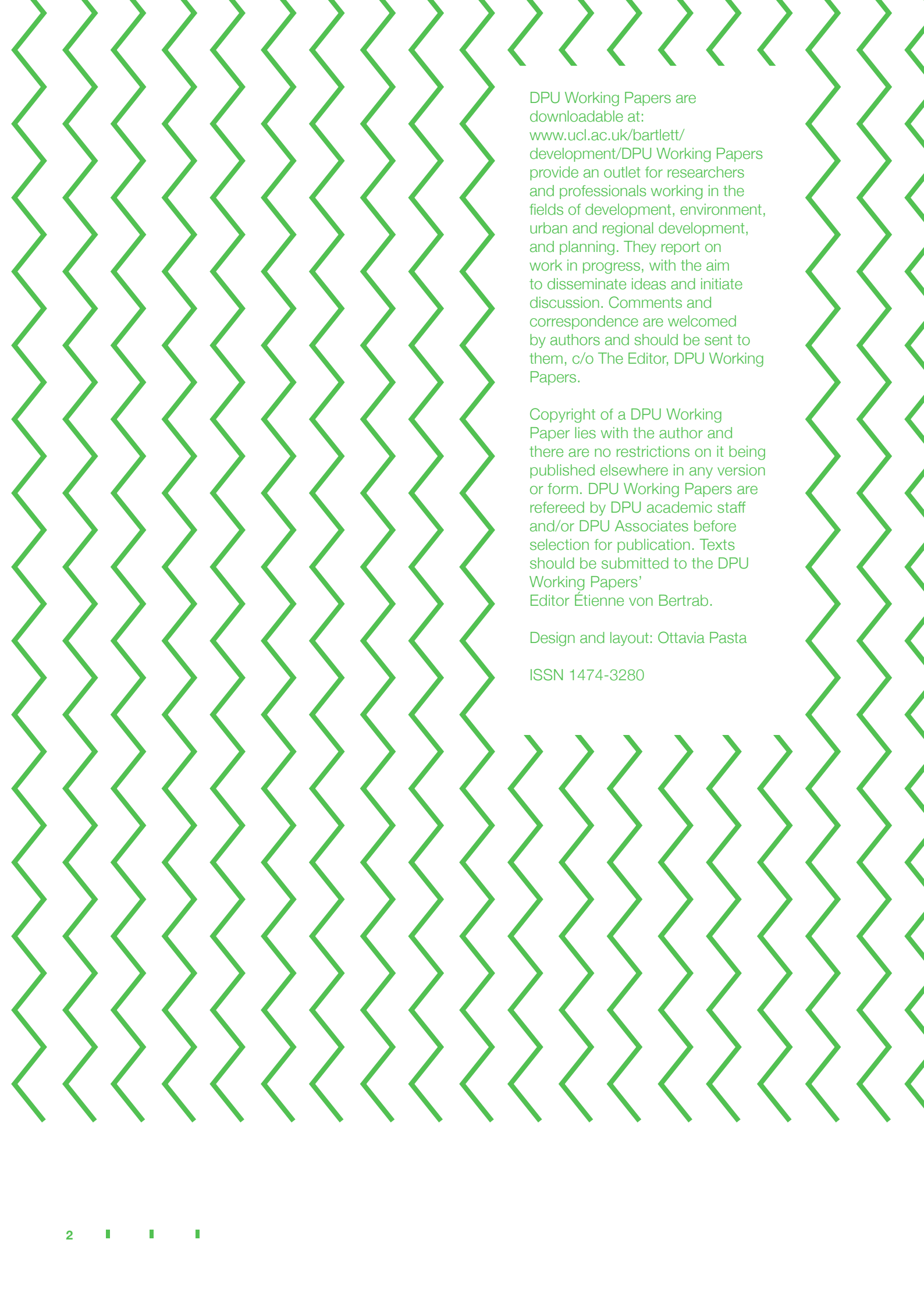
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Exploring Interlinkages –
Impact of Energy Poverty on
Students in Punjab, Pakistan

By Raana Hameed



The Bartlett
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Abstract

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Punjab is the most populous province of Pakistan housing 110 million people, approximately 53% of the total national population. Hosting the largest portion of the national population places a significant responsibility on the government to ensure adequate provision of services in both energy and education sectors. However, energy poverty is worsening with time in terms of accessibility, affordability, reliability, and quality. On the other hand, the province is already struggling to overcome the challenge of over 5 million out of school children. Intensifying energy poverty is increasing the vulnerabilities of students by adversely impacting their learning environment and inhibiting realisation of the long-term capabilities that are crucial for their well-being and development. However, inter-sectoral linkages have remained overlooked in the policy documents of the province. As such, a comprehensive understanding of these interlinkages can serve as a foundation for implementing transformative strategies, potentially leading to significant enhancements in students' educational achievements.

This paper examines the impacts of energy poverty on students in Punjab, Pakistan through the theoretical lens of Martha Nussbaum's Central Capabilities Approach. This study is qualitative and draws on secondary data from newspaper reports, government reports, journal articles and socio-economic surveys to analyse the subject. The findings of the study reveal that energy poverty is impacting students in multiple ways by restricting their physical and affordable access to modern energy services. This has long term implications for development and realisation of capabilities in students.

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Increasing energy poverty can exacerbate the educational vulnerability of the province by creating and/ or reinforcing circumstances that are non-conducive to learning and have a reducing impact on the long-term ‘capabilities’ development of students.

01. Introduction

1.1 Background

Energy is a multi-dimensional, cross cutting issue crucial for the achievement of sustainable socio-economic development of any country (United Nations, 2021). Poor performance in the energy sector can undermine development efforts as its impacts do not stay confined within the sector rather, they spill over and adversely impact the performance of other sectors as well. Against this backdrop, the concept of “Energy Poverty” has emerged as a major development concern for both developed and developing countries. There are multiple definitions of energy poverty, all differing in scope and conceptualisation. However, there is one definition that is applicable to all contexts i.e., “the inability to attain a socially and materially necessitated level of domestic energy services.” (Bouzarovski and Petrova, 2015, p. 31)

In recent years, households in Pakistan have experienced an unprecedented surge in energy poverty characterised by an escalation in energy prices, decrease in access to clean consumable energy and low reliability of energy services. In 2020, it was ranked as the 4th most “access-deficit” country of the world with 54 million people without access to electricity (IEA et al., 2022, p. 39). On the other hand, people with access to electricity are experiencing protracted, often unscheduled, power outages. Furthermore, there have been sudden and drastic escalations in energy prices due to rapid currency devaluation, reliance of power generation on expensive external energy sources and lender conditionalities with respect to pricing of energy services on account of financial instability within the energy sector and deteriorating overall economic health of the country (Kessides 2013). In the financial years 2022-23 and 2023-24, households have suffered extreme price hikes i.e., 47% and 20% per unit, in the national average tariff of electricity (Business Recorder, 2022; Ali, 2023).



FIGURE 1.1

Source: Yann Dos Santos/Unsplash (2020)

A similar situation is observed with respect to natural gas. In an attempt to conserve the depleting natural gas reserves in the country, the government has curtailed natural gas supply coupled with a steep increase in natural gas tariffs (Shair, 2024; Oil and Gas Regulatory Authority, 2024). The consequent inflationary pressures are not just limited to energy services. Households are facing overall increased costs of living as surging energy prices are driving up the prices of “non-energy” goods and services as well (Ahmad, 2020, p. 24). Yet, despite this enduring crisis, the government has not recognised energy deprivation as a “distinct” form of poverty in the country. This situation becomes even more concerning when considered against the backdrop of worsening performance of the country in the human development and human capital indices. With an HDI value of 0.540, Pakistan is already considered to be a country with low human development (UNDP, 2024). Similarly, World Bank (2020) has calculated the country’s HCI value to be 0.4 which means that a citizen has restricted opportunities to flourish and will be able to realise only 40% of his full potential within the prevailing conditions.

NOTE 01

The PSLM Survey 2019-20 defines out of school children as the children of ages 5 to 16 years who have never been to school and those children who attended school but dropped out afterwards.

Located in the central-east region of Pakistan, Punjab is the most populous province of the country housing 110 million people, approximately 53% of the total national population. Out of the total population, 36.4% of the population is living in urban areas and 63.6% are settled in rural areas (Punjab Bureau of Statistics, 2018). The provincial demand for electricity comprises 68% (almost two-thirds) of the total national electricity demand (Planning and Development Board, 2019). On the educational front, Punjab has an extensive network of 52,000 public sector and 60,000 private sector schools catering to the education needs of more than 28 million students. Out of 28 million, 12 million students are enrolled in public schools (Ibid). The education sector of the province is already struggling with an educational emergency with over 5 million out of school children¹ (School Education Department, 2019). As per the figures reported in the Multiple Indicator Cluster Survey of Punjab 2017-18, 12.9%, 20% and 33.9% children of primary, lower secondary and upper secondary school age are out of school in the province (Bureau of Statistics Punjab, 2018).

As such, increasing energy poverty can potentially exacerbate the educational vulnerability of the province by creating and/ or reinforcing circumstances that are non-conducive to learning and have a reducing effect on the ‘capabilities’ development of students. To explore such possible interlinkages, this study engages with Martha Nussbaum’s Central Capabilities Approach (CCA) as the guiding framework to study the impacts of energy poverty on students because it allows the contextual adaptability to humanise the notion of energy poverty by analysing it through the lens of human capabilities within the diverse social, economic, and political circumstances in which energy poverty is manifesting in Punjab.

1.2 Research problem & Research Questions

Article 25-A of the Constitution of Pakistan stipulates that the State is responsible for providing free and compulsory education to all children between five to sixteen years of age. Yet despite education being recognised as a fundamental human right in the country, education-related indicators have been reported to be the biggest contributors to the Multi-Dimensional Poverty Index of Punjab (Ministry of Planning, Development & Reform, 2016). The province has over 5 million out of school children (SED, 2019).

NOTE 02

SDG 7: Ensuring access to affordable, reliable, sustainable, and modern energy for all.

SDG 4: Inclusive and equitable quality education and promoting lifelong learning opportunities for all.

On the other hand, households are struggling to cope with the crippling effects of energy poverty. Intensifying energy poverty is increasing the vulnerabilities of students, but the inter-sectoral linkages have remained largely unexplored in the policy documents. This is because most of the policy efforts have been focused on the fulfilment of SDGs pertaining to energy and education.² However, the existing SDG framework is deficient with respect to identifying interlinkages (UN, 2022) and the same deficiencies are, in turn, reflected in the policies and development agenda of the province. Therefore, this working paper seeks to address the following research questions:

- How is energy poverty impacting the students in Punjab, Pakistan?
- In this regard, how can the policy gaps be addressed by the government?

Energy poverty is increasing the vulnerabilities of students; however, inter-sectoral linkages have remained unexplored within policy.

1.3 Justification and scope of the study

While a lot of work has been done on Pakistan's energy crisis and its impacts on agricultural and industrial productivity or overall economic growth through an economic perspective, energy poverty has remained under researched in the social development contexts of both Punjab and Pakistan. The few studies that have attended to the issue of energy poverty have focused on quantification and measurement (Gill et al., 2022; Sher et al., 2014; Ullah et al., 2021). Similarly, most research on education has been focused on reviewing the sector through the SDG perspective.

NOTE 03

As admitted by the Pakistan Bureau of Statistics on their website, they have amended the questionnaire to match the scope of SDGs.

NOTE 04

The New Deal 2018-2023 is the current school education policy of Punjab (P&DB, 2019).

This presents a significant issue since the only interlinkage that the current SDG framework imagines between energy and education sectors is of very basic binary nature i.e., “does an educational facility have electricity or not?” (UN, 2022, p. 30). The ensuing data collection is also binary as most data collection mechanisms have tailored the scope of their surveys to meet the requirements set forth by the SDGs. An example of note in this regard are the amendments made in the questionnaires of the Pakistan Social and Living Standards Measurement Survey (PSLM) by the Pakistan Bureau of Statistics (Pakistan Bureau of Statistics, 2021).³ Such revisions may prove to be problematic as these datasets inform several indices and policies within the country such as estimation of MPI, social protection and poverty reduction policies, and development programmes. Interestingly, even the plethora of Punjab education sector policies and appraisal reports do not investigate the interlinkages beyond availability of electricity connections in educational institutions (e.g., The New Deal 2018-2023⁴, Annual Status of Education Report 2023, Performance Evaluation of the Punjab Education Sector Programme 2021).

NOTE 05

Natural gas is a clean cooking fuel. Historically it has been used for cooking and heating purposes at household level.

This is a significant research gap considering the fact that the interlinkages between energy poverty and education are being investigated in international research and the same have been acknowledged by the United Nations in the wake of the COVID-19 crisis (UN, 2021). This paper aims to bridge this research gap by undertaking an investigation of the linkages between these two sectors through a student-centred perspective. As such, this research can serve as a starting point for reframing the scope of energy poverty by taking inter-sectoral linkages with education into account.

Given data limitations, the scope of the research has been confined to students up to higher secondary school level (Grade 12) as the provincial government is responsible for provision of education up to this level only (Asian Development Bank, 2019, p. 6). Secondly, the analysis is centred on data pertaining to the two biggest energy sources in Punjab: electricity and natural gas⁵, as these are most relevant to the study's context.

1.4 Structure of the Study

This paper comprises five chapters. Following the first chapter, chapter two reviews the existing literature on conceptualisation and dimensions of energy poverty in different parts of the world including Pakistan. The intention here is to highlight the differences of scope, scale and interpretation in conceptualisation of the phenomenon in scholarship. This chapter also reviews international studies on the impacts of energy poverty on education and learning outcomes in an attempt to establish how energy poverty can lead to adverse social development outcomes and identify recurring themes. The chapter concludes by summarising the main understanding drawn from the literature review.

The third chapter outlines the basic research design of the paper by discussing the selected theoretical framework and considerations that informed the designing process of the research including the research limitations and ethical concerns.

The fourth chapter begins by discussing energy governance within the country to develop a context for the analysis. It is pertinent to highlight here that a country-level overview of the sector is discussed since this sector is majorly controlled and regulated by the federal government. The chapter then proceeds to present the analysis through the lens of the CCA framework wherein the main propositions of the theory have been analysed along with some reflections on the role of the government. The recurring challenges faced by students due to energy poverty, as reported in newspapers, are discussed along with the causes and corroboration through the support of data extracted from the national and provincial socio-economic household survey reports, journal articles, government, and international organisations reports. The chapter ends by discussing the findings drawn from the analysis.

The last chapter concludes the paper by reiterating the key points of discussion and suggestions for future research direction.

Energy poverty is a complex phenomenon. Its elucidation cannot and should not be oversimplified and reduced to any single dimension. Instead, it is only by considering the phenomenon in its entirety with respect to the interplay of multiple dimensions that the concept can be meaningfully understood.

02. Review of the literature

2.1 Energy Poverty

Conceptualisation

An examination of the literature reveals that although the subject of energy poverty has been widely addressed, there is no single standard definition of energy poverty. It has been defined and interpreted in different ways by academics, researchers, and development practitioners (Sovacool, 2012). Conceptually, the genesis of the term can be traced back to the concept of fuel poverty which was introduced by Boardman (1991) in her book “Fuel Poverty: From Cold Homes to Affordable Warmth.” The author devised the 10% indicator as a threshold of energy poverty for households: a household is considered poor if it has to expend 10% of its income on accessing and consuming energy (Chan and Delina, 2023; Apergis, Polemis and Soursou, 2022).

Three important conceptual variations are seen in the literature. Firstly, many researchers have used the terms ‘fuel poverty’ and ‘energy poverty’ interchangeably while some contend that there is a conceptual distinction between the two (Bouzarovski and Petrova, 2015; Apergis et al., 2022; Chan and Delina, 2023; Banerjee, Mishra and Maruta, 2021). Fuel poverty is linked with household characteristics and inability to maintain comfortable temperatures (Apergis et al., 2022, p. 1) whereas energy poverty is a broader concept that goes beyond households to consider the issue in its entirety and at different scales while taking socio-economic impacts into account. Scholars who differentiate between the two concepts appear to have a consensus with regards to their respective definitions. For instance, Chan and Delina (2023) define fuel poverty as the unaffordability of clean energy and energy expenditures when constituting more than 10% of the household income. Banerjee et al. (2021) also consider fuel poverty as the unaffordability of fuel costs for households which has a debilitating impact on their living conditions. On the other hand, energy poverty has been defined in the perspective of accessibility, availability and efficiency of modern energy services or lack thereof (Chan and Delina, 2023; Banerjee et al., 2021).



FIGURE 2.1

Source: Tadeu Jnr/Unsplash (2018)

The second observation is that the scope of energy poverty varies from definition to definition: while some confine the scope of the concept, others present it as a broader issue with wide ranging consequences. For instance, the International Energy Agency confines the scope of energy poverty to a matter of accessibility to modern and clean energy services (Sovacool, 2012). Giannini Pereira et al. (2011) endorse that many international organisations conceptualise energy poverty in a similar fashion thus, limiting the scope to considerations of accessibility. González-Eguino (2015) has challenged this narrow view of energy poverty and argued that lack of access does not just mean deprivation in terms of basic energy services: it has wide-ranging implications for personal and societal development such as education, healthcare, and engagement in political activities. Similarly, Omar and Hasanujzaman (2021) elucidate that treating energy poverty merely an issue of access is rather shortsighted, as it does not consider the consequences of the same on broader social areas like health and education.

In the same vein, various definitions of energy poverty have been put forth by international institutions that have gone a step further to widen the scope and included 'choice' as the defining characteristic of energy poverty. For instance, Asian Development Bank and United Nations Development Programme have defined energy poverty in terms of lack of choice faced by individuals or households related to energy services that are crucial for human, social and economic development of consumers (Masud et al., as cited in Sovacool, 2012; Giannini Pereira et al., 2011). Similarly, the European Commission (2020) has conceptualised energy poverty as a situation that arises when a large portion of household incomes is expended towards energy bill payments or when households start rationalising their consumption drastically to an extent that harms their wellbeing. Moreover, EU has empowered member states to develop their own definitions of energy poverty as per their own experiences and circumstances (European Commission, 2020).

Thirdly, a distinction of note is that energy poverty is conceptualised differently for developing and developed countries (Hassan et al., 2022; Giannini Pereira et al., 2011; Faiella and Lavecchia, 2021; Chan and Delina, 2023). For instance, Faiella & Lavecchia (2021) note that in less developed countries, energy poverty is an existential problem with "devastating consequences" for people as they struggle to cope with lack of accessibility to clean and modern energy services (p.1). On the other hand, the situation is not as dismal for developed countries as it is more a matter of affordability or an economic strain (Ibid). Nevertheless, Bouzarovski & Petrova (2015, p.31) have reasoned that regardless of the development status of a country, both fuel and energy poverty share a common feature which is the inability to access the requisite amount of energy services for domestic use.

Dimensions

From the above discussion, it is evident that there are different interpretations of energy poverty. While some researchers and organisations confine the conceptualisation of energy poverty to one or two characteristics, others have favoured a broader scope. For instance, Apergis et al. (2022) discuss a study undertaken by Moore (2012) which made use of a 'fuel poverty framework' to isolate two determining factors as crucial i.e., affordability and accessibility (p.1). Contrarily, for many countries, 'affordability' is the only dimension to assess energy poverty using the "10% indicator" rule. For instance, Scotland, Northern Ireland, and the Welsh Governments use this rule (Faiella & Lavecchia, 2021)

On the other hand, Nussbaumer, Bazilian and Modi (2012) describe energy poverty as a multi-dimensional concept with four recurring dimensions of accessibility, quality, reliability, and affordability of clean and modern energy. The authors argue that each of these dimensions are equally crucial for those facing energy poverty. Similarly, accessibility without quality and/or reliability may serve to reinforce instead of alleviating the consequences of energy poverty. Another interesting description of energy poverty has been put forth by Chan and Delina (2023). They conceptualise it as a process and identify "accessibility, reliability, efficiency and affordability" as the stages of energy poverty. i.e., once the consumer is satisfied on account of accessibility, he can move onto the next stage and worry about reliability and so on.

2.2 Conceptualisation of Energy Poverty in Pakistan

There are two main challenges being faced by the people within the province: energy crisis and energy poverty. While energy crisis has commanded the attention of the governments, energy poverty has not received appropriate concern despite being mentioned as early as 1997 in a national statute.⁶ Succeeding energy laws and policies did not acknowledge it as a 'distinct form' of poverty. As successive governments in Pakistan became preoccupied with energy shortages, the policy focus also became increasingly confined to power generation to address 'accessibility' concerns of the public (Government of Pakistan, 2021).

While energy deprivation has found a somewhat limited representation among the indicators of the Multi-Dimensional Poverty Index (MPI) of the country, it can best be described as a "fractional contributor" (Shahid et al., 2021, p.2). It is still considered to be a subcategory of poverty and energy poverty related indicators are clubbed along with other social indicators under the dimension of 'living standards' for calculation of MPI. It is pertinent to highlight that out of the fifteen indicators of MPI, only two energy related indicators are included i.e., households are considered deprived if they do not have access to electricity and rely on solid fuels for cooking.

NOTE 06

The term 'energy poverty' was first mentioned in the "Regulation of Generation, Transmission & Distribution of Electric Power Act, 1997" in Pakistan.

This is an extremely narrow interpretation of energy deprivation which completely overlooks other aspects of energy poverty that are extremely relevant in the current context of Punjab. For instance, in 2016, the percentage contribution of electricity deprivation towards the MPI of Punjab was reported to be 1.3% only (Ministry of Planning, Development & Reform, 2016, p.18). Only in 2019 was it admitted that "electrification or connection to grid does not equate to the availability of electricity" (Ministry of Planning, Development & Reform, 2019, p.41)

Energy deprivation has found limited representation within the multidimensional poverty index of the country. Out of fifteen indicators, only two relate to energy: households are considered deprived if they do not have access to electricity and rely on solid fuels for cooking.

Secondly, physical access does not mean affordable access. Even with accessible energy, households may have to reduce consumption on account of affordability concerns. The Multiple Indicator Cluster Survey 2017-18 conducted by the Punjab Bureau of Statistics shows that 94.8% households in Punjab have access to electricity (grid connectivity) without expanding on other aspects (p.34). Such conceptual deficiencies have made their way into the policy and planning documents of the province. For instance, perusal of the Punjab Growth Strategies of 2018 and 2023 reveals that there is no acknowledgement of any inter-sectoral linkages. In the former, one can find a passing nod to the number of off-grid schools (P&DB, 2015; 2019) but that is the extent of it.

2.3 Energy Poverty & Education

As discussed in Section 2.1, definitions and dimensions of energy poverty vary. Therefore, to study the impacts of energy poverty on students and education, research studies from various parts of the world were consulted. Several studies affirm a negative relationship between energy poverty and quality of education (Nsenkyire et al., 2023; Omar & Hasanujzaman, 2021; Pellicer-Sifres, Simcock and Boni, 2021; Sharma, Han and Sharma, 2019). However, findings of all these studies highlight that the impacts of energy poverty may not be straight forward at all. Energy poverty can impede education in a variety of complex ways (Pellicer-Sifres et al., 2021). A few of these studies are discussed in the following paragraphs.

Banerjee et al., (2021) conducted a time series analysis and investigated the impact of energy poverty on health and education outcomes through a study on developing countries from Asia, Africa, Latin America, and Europe. The study established a positive relationship between energy, years of schooling and completion of primary education. The researchers also highlighted the various ways in which access to modern energy services can impact education in a positive way through enabling better infrastructure in schools such as proper lighting, better working conditions, working equipment, opportunity to use audio-visual aids and practical based learning.

Omar & Hasanujzaman (2021) undertook a similar study to investigate the impacts of multidimensional energy poverty on household education in case of Bangladesh through a time series analysis of the datasets of household income and expenditure surveys (HIES). The findings of the study confirmed that children spent more time engaged in household chores such as collecting wood for fuel rather than attending school or studying.

A comprehensive understanding of inter-sectoral linkages between energy and education can serve as a foundation for implementing transformative strategies, potentially leading to significant enhancements in students' educational achievements.

Nsenkyire et al. (2023) investigated the effects of multidimensional energy poverty at household level on cognitive development and education of children in Ghana through the capability approach framework. The findings of this study affirmed a negative relationship on both accounts. The researchers found that children have to participate in household chores such as collecting wood which is used as fuel at home. Limited access to electricity also disrupted children's study routines and they were found unable to gain help from educative television programmes and use internet for educational purposes. Hence, negatively impacting their school attendance and overall interest in studies (p. 311). The findings of this study corroborate the arguments put forth by other researchers that found that energy poverty has a negative effect on cognitive development of children and result in poor academic performance and learning outcomes and significantly increases the possibility of children dropping out of school (Zhang et al., 2021; Banerjee et al., 2021; Phoumin and Kimura, 2019 as cited in Nsenkyire et al., 2023).

Another such study was undertaken by Pellicer-Sifres et al. (2021) in four European cities. The researchers applied the Central Capabilities theory to comprehend the ways in which energy poverty can hamper well-being. The study found that as households struggled rationing their energy consumption, energy poverty constrained the ability of students to perform in schools.

Sovacool (2012) discusses a number of studies to prove that educational opportunities available to both children and adults are significantly curtailed by energy poverty. For instance, studies conducted in Philippines and Nicaragua revealed that the incidence of illiteracy increases with lack of access to proper lighting. Further, the study provided evidence that households without electricity had lower ratio of children attending school (Porcaro and Takada, 2005; Masud et al., as cited in Sovacool, 2012, p. 277- 278).

Apergis et al., (2022) discuss the “Energy, Poverty and Development hypothesis” proposed by Karekezi (2012) which establishes a linkage between energy, school attendance and conducive learning environment. The study cites different researchers who have been able to establish links between access to grid (electricity) and improved education among students, social welfare enhancements and higher literacy rates (Donev et al., 2018; Bilegsaikhani, 2016 cited in Apergis et al., 2022). The researchers further argue that energy poverty results in educational deprivation and proposed the use of multi-dimensional energy poverty measure to assess the effects of energy poverty on education deprivations, particularly within the context of living conditions at home (p. 3).

Sharma et al. (2019) attempted to explore the socio-economic determinants driving energy poverty in four income categories of households located in Mumbai, India. Limited access to electricity makes households unable to use technology and learning aids in education. Thus, eventually curbing employment and income potential of household members. The study found that loss of such opportunities leads to long-term deprivations and economic based poverty (p. 1184). The findings of this study are particularly pertinent to the investigation undertaken by this paper.

After a comprehensive review of the relevant literature, it is evident that energy poverty is a complex phenomenon that is influenced by multiple factors. Its elucidation cannot and should not be oversimplified and reduced to any single dimension. Instead, it is only by considering the phenomenon in its entirety with respect to the interplay of these dimensions that the concept can be meaningfully understood. This comprehensive understanding can serve as a foundation for implementing transformative strategies, potentially leading to significant enhancements in students’ educational achievements.

Central Capabilities Approach framework offers the opportunity to identify, isolate and explore linkages between energy and education in a guided way without getting distracted by the wide-ranging scope of these two sectors.

03. Research design

3.1 Theoretical Framework

Given the dynamic nature of the topic and the expansive scope of both energy and education sectors in Punjab, it was clear that the research design should be one that allows room for flexibility of interpretation to the author by considering the topic within a social contextualisation. Moreover, it was important to situate the perceptions and lived experiences of students within the context of their social realities and everyday life to develop an epistemological understanding of the challenges that confront them. As such, utilising an existing theory to guide the research direction and derive conclusions was found to be a suitable research approach for this paper (Collis and Hussey 2021).

This paper adapts and applies the framework of Central Capabilities Approach (CCA) to study the impacts of energy poverty on students in Punjab, following a deductive logic of inquiry, as it is context sensitive and allows the freedom to humanise the concept of energy poverty by considering it from the perspectives of different human capabilities. Secondly, the framework has expanded the capabilities approach to identify ten capabilities deemed essential for wellbeing and human development. Thus, by listing down crucial capabilities, this framework offers the opportunity to identify, isolate and explore linkages between energy and education in a guided way without getting distracted by the wide-ranging scope of these two sectors. Furthermore, it has explanatory potential because it allows the flexibility to examine both intrinsic and extrinsic factors in relation to the ten central capabilities. As such, application of CCA would not only allow identification of the impacted capabilities but also areas for intervention that have been overlooked (Day, Walker and Simcock, 2016, p. 255).

Another rationale for selection of this framework is that energy poverty is calculated as part of the Multi-Dimensional Poverty Index (MPI) in Pakistan. Interestingly, both the MPI and CCA stem from the Capabilities Approach (CA) theory of Amartya Sen (1999) (Ministry of Planning, Development & Reform Government of Pakistan, 2019).

Premise

While the CA theory postulates that material goods are not a sufficient measure of human well-being instead any such evaluation must focus on whether people possess the capabilities to achieve a certain goal or functioning (Pellicer-Sifres et al., 2021, p. 1028), the CCA further builds on the foundations of the CA and proposes that “an ample threshold level” of ten capabilities are essential for human dignity, well-being, and development. These capabilities attend to various physical, emotional, social, and intellectual aspects of an individual’s life within relevant social and political contexts. The listed capabilities include, “life; bodily health; bodily integrity; senses, imagination, and thought, emotions; practical reason; affiliation; other species; play and control over one’s environment (political and material)” (Nussbaum, 2013, pp. 33, 34). The theory posits that for an individual to realise a functioning, he must be enabled with both the opportunity and the freedom to achieve it. For instance, for the first listed capability “life”, a person should be “able” to live and enjoy life to the fullest without being marred by adverse conditions.

As such, this theory shares a strong semblance to Abraham Maslow’s ‘Hierarchy of Needs’ theory which also proposed five groups of needs i.e., “physical, safety, social, esteem and self-actualization” as essential for human life. CCA further posits that ensuring provision of a minimum level of these capabilities to people is the government’s responsibility. Failure to facilitate capability realisation in people can result in inequalities and social injustice within a society with long term implications for human development (Ibid., p. 19). Thus, it is crucial to consider how to enable these capabilities through policies and social development programmes.

Applicability

Prima facie, the theory appears to be simple enough however, its applicability in relation to students is not straight forward because the theoretical framework envisions these Central Capabilities as “adult capabilities”. As such, for students, the application would play out differently i.e., by using education as a ‘means’ of developing the faculties of students and equipping them with the knowledge and skills necessary for realisation of their capabilities in the long run. Nussbaum (2013) argues that it is precisely because of this reason that states usually play a paternalistic role by enacting legislations for compulsory education with the end goal of human capital development (p. 156). Thus, the impacts of this theory should also ideally be evident in the long term as these capabilities provide students with opportunities and choices to develop and flourish as they grow.

Failure to facilitate capability realisation in people can result in inequalities and social injustice within a society with long term implications for human development.



FIGURE 3.1

Source: Fré Sonneveld/Unsplash (2014)

Taking this application a step further and considering it within the context of energy would mean that access to uninterrupted, affordable, and reliable energy services enables a student to undertake and complete education-related tasks. The energy services serve as a ‘means’ through which the abilities of the students are buttressed. Thus, by creating an enabling learning environment, energy services would help them realise their long-term essential capabilities of enjoying life to their fullest potential with access to opportunities and freedom of choice. Furthermore, they would be able to enjoy physical health and fully developed mental faculties of senses, imagination, thought, reflection, and reasoning. They will be socially and emotionally well-adjusted adults and will hold considerable sway in shaping their own environment through political participation and material stability.

Conversely, energy poverty is an adverse circumstance that prevents the students from achieving their study-related tasks and directly or indirectly causes long-term capability deficits in students. For instance, lack of access to electricity may impact the academic performance of a student and lack of affordability may create adverse circumstances within households that result in student absenteeism or dropping out from school altogether. Such scenarios will disempower students in the long term as they will not be able to avail the opportunities that would have been available to them, had they been able to complete their education or achieve better academic scores. Furthermore, this may have long term implications on their self-esteem and confidence thus, preventing them from meaningful and active participation in social and political spheres as well-adjusted individuals and so forth. Such capabilities deprivation would further have inhibiting consequences with respect to the human development goals of a country.

In this regard, the following definition of energy poverty is particularly relevant from the perspective of CCA: Energy poverty is the “inability to realise essential capabilities as a direct or indirect result of insufficient access to affordable, reliable and safe energy services” (Day et al., 2016, p. 260).

3.2 Methodology & Data Collection

While contemplating on suitable methods and methodology which could facilitate the course of research, it became clear that utilising primary data sources or attempting any form of quantitative research, within the given time and resources, would not only be difficult but also raise many ethical concerns considering the hitherto unexplored nature of the topic in Punjab. Furthermore, the research methods and purpose had to be compatible with the overall research design (Saunders, Lewis, and Thornhill, 2007). Therefore, this study employs a qualitative research methodology to explore the impacts of energy poverty on students using qualitative methods to deduce findings and reach conclusions.

NOTE 07
Consulted news reports in Annex-A

Data collection and analysis posed a unique challenge in this research. As mentioned in Section 1.3, the topic was an under researched area and no secondary data was available that expanded on the linkages between energy and education. Furthermore, primary data sources could also not be used. On the other hand, the author was interested in capturing everyday dynamics and people's perspectives. Thus, the closest alternative to primary data in this case was using the accounts reported and recorded in newspapers.⁷ A review of literature on data analysis methods revealed that usually in studies employing media reports and newspapers, content analysis method is applied. Historically content analysis was imagined as suitable specifically for the purpose of quantitative research however, it has since been reimagined in its scope and applicability to qualitative research (Schreier et al., 2019). Furthermore, it is considered useful for identifying 'trends and patterns' in data (Stemler, 2001) and flexible in application (White and Marsh, 2006).

The data was collected through secondary data sources analysis such as peer-reviewed journal articles and grey literature such as national and provincial socio-economic surveys, newspapers, government policies, reports, and documents to develop a contextual understanding of the issue and establish connections between energy poverty and educational outcomes of students. This data was then analysed using qualitative content analysis to identify recurring themes relevant to energy poverty in Punjab. The main themes that emerged were 'price hikes', 'loadshedding' and 'protests.' In content relevant to both energy poverty and students, the recurring themes were found to be 'loadshedding', 'exam preparations', 'intense temperatures' and 'studies.' These themes have been sifted and categorised under two areas of investigation for analysis: 'lack of physical access to energy' and 'unaffordable access to energy services.'

3.3 Research Limitations & Ethical Considerations

During data collection and analysis, the following limitations and ethical considerations came to the fore:

- While a lot of secondary data could be found pertaining exclusively to both energy and education sectors, there was a dearth of data on inter-sectoral linkages. As mentioned earlier, this aspect has remained largely neglected in policy and planning documents, socio-economic survey databases and research. Since no straightforward data was available in this regard, the study had to extract data relevant to the investigation from available reports in an attempt to establish connections between access to energy, students' performance and socio-economic status.
- Given the limited availability of secondary data, the research made use of newspaper reports to capture the 'people's perspective' and develop a nuanced understanding of the subject. Even though an effort has been made to corroborate these accounts through evidence, there is still a possibility of missing perspectives and biases in newspaper reporting. Similarly, there is also a possibility of selective perception on part of the author i.e., only selecting the accounts that support my observations and arguments.
- All these factors have been important ethical considerations during the writing of this paper. To counter this possibility, reputable newspapers were used as sources.

While being data intensive, SDG indicators do not expand on the interlinkages between energy and education in a meaningful way. Thus, no datasets are available to inform coherent cross-sectoral policy making.

04. Analysis & findings⁸

NOTE 08 4.1 Energy governance

Positionality: This analysis is also reflective of the author's own lived experiences and observations as a citizen and consumer of these two services in Punjab in the capacity of a student as well as a state functionary situated within the government.

Energy has almost exclusively been a federal subject in Pakistan. Even after the 18th Constitutional amendment where ownership and management of oil and natural gas were shared between federal government and provinces, the federal government retained control over all major policies and decisions regarding electricity. Provinces were given limited autonomy to form energy departments and devise policies suitable for development of the energy sector within their jurisdictions.

The energy sector comprises of two ministries, Ministry of Water Resources (MoWR) and Ministry of Energy (MoE). The former primarily looks after hydropower generation infrastructure through Water and Power Development Authority (WAPDA) while the MoE is responsible for management and development of power through hydropower, thermal and renewable energy sources. It is organised into power and petroleum divisions that manage generation, transmission, distribution, and tariff fixation of electricity and petroleum products on recommendations of regulatory bodies: National Electric Power Regulatory Authority (NEPRA) and Oil and Gas Regulatory Authority (OGRA). Figure 4.1 gives an overview of the energy sector.

Since 2007, government has been attempting to restructure the energy sector and bring about effective power sector reforms. Consequently, a plethora of organizations exist within the sector to deal with various aspects of energy leading to lack of integrated policy and underperformance of the sector (Kessides, 2013). Within the power sector, the domain of generation has witnessed effort towards privatization from time to time and comprises of both state-owned and corporate entities however, distribution has remained monopolised by state-owned companies (DISCOs) (Nazir and Sharifi, 2024). Similarly, two public limited companies: Sui Northern Gas Pipelines Limited (SNGPL) and Sui Southern Gas Company Limited (SSGCL) supply natural gas across country under the supervision of the Federal Government.

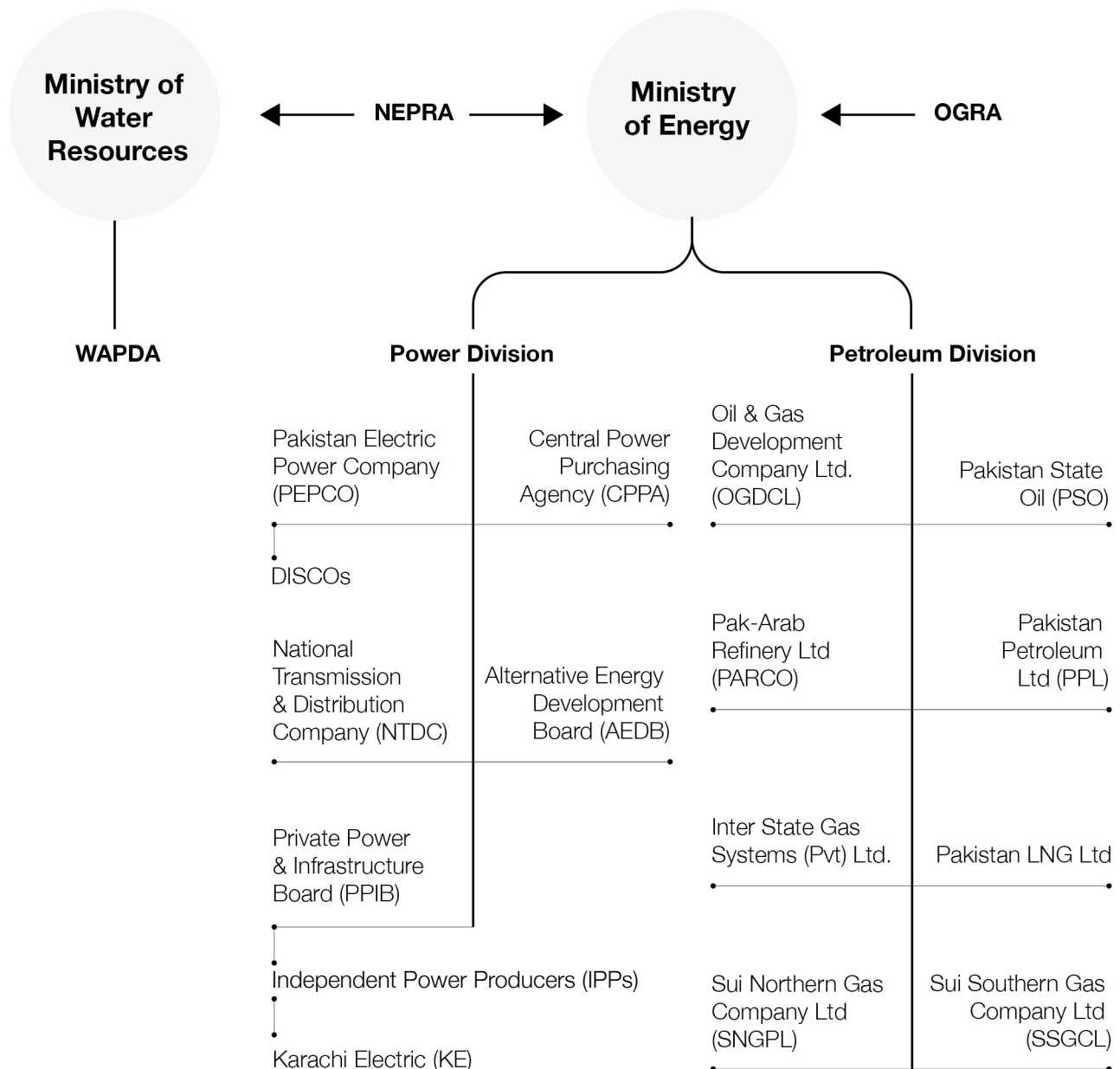
NOTE 09

Author's own work based on information given in official websites of Government of Pakistan, Ministry of Energy (Power and Petroleum Divisions); Nazir and Sharifi (2024) and Kessides (2013). It is clarified that entities operating under the ministries that deal with subjects other than energy have not been reflected in the figure.

In Punjab, transmission and supply of natural gas is done by SNGPL whereas distribution of electricity is done through five government-owned DISCOs. The provincial government has limited say in this domain despite being on the receiving end of public backlash and protests on account of excessive billing and energy supply disruptions. While the province does have its own energy department for developing new power projects within its jurisdiction, it still must adhere to the regulations of MoE and regulatory bodies.

FIGURE 4.1

Energy Sector of Pakistan⁹



4.2 Impacts of energy poverty on students

An examination of policies relevant to energy and education reveal that policy making in both sectors is taking place in isolation. Furthermore, policy direction in both sectors has been geared towards progress on the SDG indicators. Perusal of government reports and policies reveals that government has become too focused on fulfilling the quantitative indicators delineated under the SDGs framework rather than taking the broader qualitative factors into account. Although the indicators set under the SDGs are data intensive however, they do not expand on the interlinkages between energy and education in a meaningful way. Consequently, no cross-cutting datasets are available to inform coherent multi-sectoral policy making. These gaps have significant implications for the human development prospects of the province.

To examine how these deficiencies translate on ground and impact students, a detailed perusal of newspaper articles was undertaken. Content analysis highlighted two recurring aspects of energy poverty with respect to students i.e., lack of physical access and unaffordable access to energy services. Both aspects are discussed in detail as follows:

Lack of Physical Access to Energy Services

NOTE 10

Circular debt exists in Pakistan because of two primary reasons: pricing of energy at a rate much lower than the cost of electricity by the government on account of socio-political considerations (Kessides, 2013) and revenue collection/ payments crisis within the energy sector. Distribution companies are unable to collect bills effectively from consumers, consequently they are unable to pay the power producers and so on.

NOTE 11

CNG is compressed natural gas stored in cylinders for use in vehicles.

NOTE 12

LPG is liquified petroleum gas compressed in cylinders for use in cooking and heating by domestic and commercial consumers.

Newspaper accounts from different parts of Punjab have reported prolonged, unscheduled, and frequent electricity and gas outages. The duration of these outages, commonly referred to as load-shedding, have been reported to range between 10 to 14 hours per day. In addition to routine load-shedding, people are subjected to frequent system breakdowns (Hasnain, 2023; The Nation, 2023; Davies & Spender, 2023). The electricity outages are not just because of power generation shortfalls but can be attributed to several factors including decrepit condition of energy infrastructure, financially unsustainable practices and policies within the sector leading to a burgeoning circular debt¹⁰ and failure of the government to bring about timely reforms in the power sector (Kessides, 2013).

On the other hand, shortage of natural gas can be attributed to major policy missteps of the national government including cheap pricing of the indigenous natural gas (Jamal, 2023) and permitting its consumption for vehicular purposes to the CNG sector¹¹. Consequently, natural gas reserves have depleted by 69% due to over-exploration and led to acute natural gas shortages in the country (Dawn, 2023a; Shair, 2024). Owing to the electricity and gas shortages, many households have resorted to using a mix of fuels and energy sources to fulfil their energy needs (Shahid et al., 2021), such as LPG¹² cylinders, coal, firewood etc. However, even these temporary solutions are expensive for households.

With regards to students, the news reports have highlighted three major challenges for students on account of physical inaccessibility: disruptions to learning, physical discomfort and emotional stress. These challenges and their implications are now discussed.

Disruptions to the Learning Process

Students need access to electricity and natural gas for a comfortable and enabling learning environment. As such, inaccessibility or insufficient access can be disruptive to their learning process. Newspaper analysis has highlighted that students are extremely vulnerable to electricity load-shedding. Extensive and frequent outages are impacting study routines at home and preparations for examinations (Adnan, 2017; Yasin, 2023). Lack of reliability of service also impacts them as sometimes, no fixed schedule for load-shedding is followed by the supply companies (DISCOs) making it difficult for them to concentrate and plan their study routine (The Express Tribune, 2022). Students not only suffer at home from load-shedding but at educational facilities also while they take their exams in intense temperatures (Pakistan Observer, 2022). In addition to load-shedding, in some schools students face difficulties on account of inaccessibility

NOTE 13

UPS stands for Uninterruptible Power Supply. These rechargeable backup systems provide emergency power to electrical devices when the main power source fails. These systems were introduced in Pakistan in late 2000s due to frequent power outages.

to electricity due to lack of grid-connectivity, commonly clubbed under the heading of “missing facilities” in education sector reports and development programmes of the government.

Additionally, the back-up power supply solutions like UPS¹³ systems that have become a constant fixture in households, as a way of coping with outages, also get exhausted after a couple of hours and require electricity for re-charging. Furthermore, students are unable to use their laptops when batteries get exhausted (Yasin, 2023). Students also suffer from loss of connectivity as they are unable to access online resources for study-related tasks. Thus, load-shedding is causing disruptions to the learning process of students by negatively impacting their study time and restricting their use of complementary resources like laptops, connectivity to the internet, etc.

UNICEF (2013) reports that lack of basic facilities in schools does not only impact the learning environment of students but also negatively influences the working conditions of teachers and by extension, the quality of instruction being imparted to students (Mughal, Aldridge and Monaghan, 2019, p.55).

A number of studies corroborate these accounts. In 2019, a Provincial Assessment of Student Learning (PASL) was conducted by the Punjab Examination Commission (PEC) for Grade 4 students in 180 public schools from 18 districts of Punjab. Besides academic assessment, this study made an attempt to examine home, school and classroom related factors that constitute the learning environment of students. The findings revealed that students who invested more time to study at home after school performed better than the students not doing so (PEC, 2019, p. 81, 83).

Similar findings were reported by the PEC (2021) in relation to the Large Scale Assessment (LSA) for Grade 5 students which was conducted in the public schools of all 36 districts of Punjab in 2021 i.e., by allocating one hour of additional time to studies at home, the students were able to improve their academic scores by 2.23 points (p.52) Another interesting objective of this assessment was to study the impact of background factors on students’ achievements including availability of basic facilities in schools and classrooms. As per the findings of this report, students’ performance was significantly affected by the quality of school environment. In schools equipped with basic facilities (including electricity), student scores were found to be 4.97 points higher than schools without access to these basic facilities. (p.51)

These studies establish two very important facts with regards to the students of Punjab: Being able to study at home and having comfortable learning environments facilitate improvement in the students’ academic performance and learning outcomes (Ibid).

Physical Discomfort & Anxiety

Lack of accessibility is not only impacting students’ study routine and academic performance but also causing anxiety in students and by extension, impacting their parents as well (Rizvi & Ilyas, 2022). Electricity and gas shortages means that the children are going to school without breakfast or having to get ready for school in extremely hot or cold environments. Since the electricity shortage magnifies in summers and gas shortage tends to manifest in winters due to increased demand, students have had to brave these harsh circumstances by studying as per usual in extreme temperatures (Rao, 2017). Electricity load-shedding is depriving students of restful, uninterrupted sleep which can be detrimental to their health and academic performance.

Furthermore, exposure to extreme temperatures and usage of alternate fuel sources like coal and firewood have raised health concerns within families (The Express Tribune, 2013). According to the Household Integrated Economic Survey (HIES) 2018-2019, households in Punjab are using a mix of fuels. The figures reveal that the richest households (5th wealth quintile) spend primarily on electricity and gas whereas quintiles 1 to 4 use a mix of fuel sources with

maximum spending on electricity, natural gas, and firewood (Pakistan Bureau of Statistics, 2020).

According to the figures reported in Multiple Indicators Cluster Survey 2017-18, 52.3% households in Punjab rely on solid fuels for cooking and such consumers mostly belong from middle income to poorest households (wealth quintiles 1-3) (Punjab Bureau of Statistics, 2018, p. 34 and 149). Reliance on solid fuel is contributing 9.2% to the MPI of Punjab (Ministry of Planning, Development & Reform, 2016, p.18). This situation has certainly exacerbated from the year 2020 on account of intensifying energy poverty however, no disaggregated data could be found that measures the impact of solid fuels usage on the health of students.

These impacts are not just limited to students as entire families undergo significant lifestyle changes due to energy poverty. For instance, mothers have to get up at inconvenient, odd hours to cook meals and finish other household chores when the gas supply is available (The Express Tribune, 2014). Similarly, parents have to strive for arranging alternate energy and fuel sources to minimise disruptions to their daily routine. Such difficult living conditions have had negative impacts on the parent's physical and emotional well-being as well and they are less able to focus on the education of their children.

All of these factors cause significant physical and emotional stress in students leading to loss of interest and unwillingness to study. According to the figures reported in Pakistan Social and Living Standards Measurement Survey 2013-14, 56% of boys and 33% of girls dropped out of primary school because they were unwilling to attend. Upon investigating the cause of this unwillingness, various factors were highlighted among which lack of or poor basic facilities at school flagged as one of the top reasons (ADB, 2019, pp. 14,15).

From the above accounts, it is evident that shortage of energy services is causing loss of study time and interest in students. Findings of the cited studies corroborate both these points and support a correlation between access to electricity and conducive learning environments. Hence, energy poverty is "compromising" the student's ability to study effectively at home and schools.

Unaffordable Access to Energy Services

Despite the realisation that expensive access is of little value to consumers (Government of Pakistan, 2021), the prices of energy services, particularly electricity, are increasing with such speed that it has put considerable financial strain on households across Punjab. A year-on-year comparison of the national average tariff reveals that the per unit rate for electricity escalated from Rs. 16.91/ kWh (FY 2021-22) to Rs. 24.82 / kWh (2022- 23). For the current financial year 2023-24, this rate has been increased to Rs. 29.78 per unit. Thus, just in a matter of two years, the consumers have faced 47% and 20% price hikes (Business Recorder, 2022; Khan, 2022; Ali, 2023). It is pertinent to mention here that this base tariff is further subject to innumerable taxes, surcharges, adjustments, and revisions. Hence, the actual applicable tariff payable by consumers is currently around Rs. 50/KWh (Daily Islamabad Post, 2023). Moreover, the government has drastically increased the price of natural gas (Jamal, 2023; OGRA, 2024) during the financial years 2022-23 and 2023-24.

It is important to reiterate here that in terms of performance of the energy sector, the fate of the province is inextricably linked to the policies of the federal government as decisions about tariff fixations, surcharges and subsidies for energy services are made and applied at a national scale. Kessides (2013) contends that improper tariff fixations made by the national governments on account of socio-political considerations led to financial instability and circular debt within the energy sector (p. 282). According to recent reports, the cumulative circular debt within power and natural gas sectors has reached Rs. 5.73 trillion (Rana, 2024). Consequently, the provinces have had to suffer from significant energy price hikes as the federal government keeps implementing

tariff revisions to address this issue in line with the advice of International Monetary Fund (IMF) (Ali, 2023; Daily Islamabad Post, 2023) and other factors like currency devaluation, global oil price increases, over reliance of power generation on expensive external energy sources (fossil fuels) etc. Unfortunately, the burden of all these endogenous and exogenous factors is passed on to the consumers in the form of additional surcharges and revisions instead of planning and implementing effective power sector reforms. These price hikes have placed extreme inflationary pressures on households (The News, 2022; Dawn, 2023b). As such, the learning environment of students is directly and indirectly impacted by household decisions on account of affordability concerns.

Newspaper accounts highlighted three major challenges with regards to affordability. These challenges and their implications are now discussed.

Increased Cost of Education

Students are extremely vulnerable to the impacts of energy poverty, both at school and home. Rapidly increasing energy prices have diverse and multiple repercussions for the socio-economic wellbeing of households as a rise in energy prices leads to increase in the prices of non-energy goods and services as well. In such cases, a spillover in the form of increased educational expenses such as school fees, tuition fees, school supplies, and school transport takes place. Arguably public schools charge minimal fees, and this should not be a concerning factor for their students. However, there are other education-related expenses from which even public-school students are not exempt, such as transport expenses. On the other hand, the large student population of Punjab that is being serviced by private schools are certainly vulnerable to this aspect of energy poverty as private educational institutions tend to pass on the additional expenses incurred on account of backup power generators and increased energy bills to students through fee adjustments.

This is evident from an analysis of the figures reported in the Household Integrated Economic Surveys of 2015-16 and 2018-19. As the monthly consumption expenditure on “housing, water, electricity, gas and other” increased from 22.28% in 2015-16 to 23.38% in 2018-19, the education-related expenditures saw a correspondingly increase i.e., from 3.93% to 4.34% respectively (Pakistan Bureau of Statistics, 2017 & 2020). As such, the recent drastic energy price hikes are also expected to have a similar impact on education-related expenditures.

Decreased Consumption

In order to cope with the increased costs of living, the first step taken by the households is reducing consumption of modern energy services (Business Recorder, 2023). Although newspapers report some figures regarding this issue, no data could be found which specifically proves this. Nevertheless, for the purpose of analysis, it is assumed that rationalising the consumption of lighting,

Energy poverty is impairing students by creating socio-economic adversities that can reinforce and perpetuate social inequalities.

cooling, heating, and connectivity facilities within households has similar impacts as ‘inaccessibility’ on students. Furthermore, recreational activities, being secondary expenditures, tend to be greatly reduced as households struggle to rationalise their expenses. Although household surveys do contain data on the recreational expenses, the data cannot be isolated or interpreted solely with respect to students.

Adverse Socio-Economic Consequences

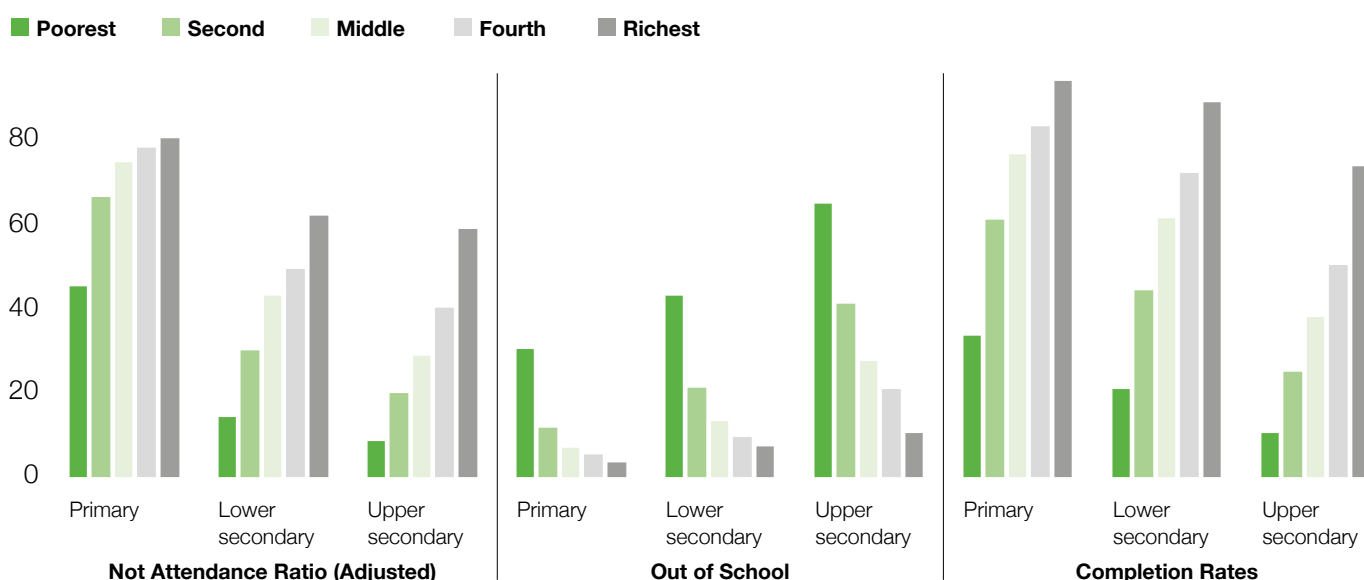
Energy poverty has grave impacts on the socio-economic conditions of households. Furthermore, it is also an acknowledged fact that adverse socio-economic background of children significantly limits their developmental prospects. As mentioned earlier, education related indicators have been reported to be biggest contributors towards MPI of Punjab with the following percentage contributions: “Years of schooling 31.1%, School Attendance 9.7% and Quality of Education 2.3% (Ministry of Planning, Development & Reform, 2016, p.18). On the other hand, almost all education related indicators are correlated with the socio-economic status of households (Punjab Bureau of Statistics, 2022). This can be corroborated by comparing the net attendance ratios, out of school children (OOSC) and completion rates for students of primary, lower secondary and upper secondary schools across wealth quintiles as shown in Figure 4.2 below.

The comparisons in the figure reveal that the percentage net attendance ratio for all levels of students is dismal for the poorest quintile and improve with increasing wealth quintiles. Similarly, the education completion rates at all levels are the lowest for the poorest quintiles and increase as wealth increases. In case of out of school children, the poorest households across all levels of education have the maximum number and it decreases as the wealth quintile

FIGURE 4.2

Education Statistics by Wealth Quintiles

Source: Author’s work based on data reported in Multiple Indicator Cluster Survey, 2017-18 (Punjab Bureau of Statistics, 2018)



improves. This argument has further been corroborated by a variety of other reports. According to the Equity Profile of Punjab, 2022; “the percentage of out of school children at primary school level was reported to be 30% higher in the lowest wealth quintile and gradually decreased towards higher wealth quintiles”. Furthermore, a similar pattern is reported relating to the net attendance ratio and occurrence of child labour (Punjab Bureau of Statistics, 2022, p. 73, 86).

Adverse socio-economic conditions also compel households to reconsider their priorities with regards to schooling such as engaging children to help out in household chores or drop out of schools altogether for earning purposes. This assertion has also found merit through corroboration. In the Provincial Assessment of Student Learning (PASL) assessment for Grade 4 students, the reasons behind student absenteeism in public schools of Punjab were investigated. It was found that child labour was one of the factors: “24.72% students were absent for earning livelihood; 31.73% students had reportedly been engaged in harvesting activities whereas 51.25% students reported that they had to stay home to take care of siblings” (PEC, 2019, p. 81, 83).

Similarly, Mughal, Aldridge and Monaghan (2019) also found household poverty to be one of the major reasons behind secondary school dropouts from public schools in District Jhelum, Punjab. By recording the perspectives of the dropped-out children through case study method, the study found that socio-economic conditions of households have a significant bearing on the educational outcomes of children. Even children that were still enrolled in schools reported that they could not focus fully on academic tasks at home as they had to participate in chores around the house and help parents work the land.

Furthermore, Ahmad (2020) argues that energy billing is regressive because it impacts poorer households more (p. 5). Therefore, energy poverty is not only worsening the socio-economic conditions of households within Punjab but also reinforcing social inequalities. This finds merit through a comparison of Grade 8 student scores in Punjab and Sindh done by Asian Development Bank (2019) which confirmed that learning levels of students from relatively better-off socio-economic backgrounds were better than their counterparts from poorer households (p.19).

From the above analysis, it is evident that energy poverty is causing an increase in educational expenditures and deterioration in the socio-economic conditions of households. This not only has significant impacts on student performance but also reinforces current and long-term social inequalities. Data from the socio-

Household poverty was found to be one of the major reasons behind secondary school dropouts from public schools in District Jhelum, Punjab.

economic surveys and the cited studies corroborate these points and support a correlation between access to energy and these challenges. However, no data could be found to prove that recreational activities are being impacted by energy poverty. Thus, energy poverty is impairing students by creating adverse socio-economic circumstances that impact their learning environment.

4.3 Findings

Analysis and corroboratory data confirm that students are being impacted by both accessibility and affordability aspects of energy poverty in Punjab. Despite increasing severity and outcry, the issue has not received due consideration in the policy documents of the province. In this regard, the government should work on reorienting the policy focus to accommodate a holistic cross-sectoral evaluation of the problem.

Considering this situation through the lens of CCA, the study finds that on account of inaccessibility to energy services, students are facing loss of study time at home. They are unable to complete their homework and assignments, prepare adequately for exams, connect to Internet for consulting supplementary material. Furthermore, they suffer from intense temperatures, sleep deprivation, and additional anxiety due to these unfavourable conditions. They have to face adverse conditions within school settings as well. Such adversities are resulting in loss of concentration, low confidence and self-esteem and decreased interest towards studies. Thus, energy poverty is preventing students from studying and learning properly.

These are considerable setbacks in terms of realisation of the capabilities of “bodily health; senses, imagination, and thoughts, emotions, practical reason, and control over one’s environment” as energy poverty is not only impacting their health but also restricting their access to adequate educational opportunities. Furthermore, as students become preoccupied with physical and emotional discomforts, they cannot effectively engage their imagination and reflexive capabilities. This impacts their development as socially well-adjusted and politically empowered individuals. In the words of Vice President of World Bank Rachel Kyte (2013), “people living without electricity have fewer opportunities to improve their lives”.

Secondly, on account of affordable access, energy poverty is creating adverse socio-economic circumstances for households and by extension, impairing the learning environment for students. This manifests in the form of increased absenteeism, poor academic performance, and school dropouts. Such circumstances have repercussions on the long-term capability realisation of students in Punjab as they will not be able to enjoy life that is unmarred by adversity. This will also restrict their ability to realise their full potential. For instance, such circumstances may severely inhibit their ability to avail better opportunities in relation to employment and so forth. In the words of Nussbaum (2013), even completing a basic form of education can unlock many opportunities, for instance, by enabling an individual to find adequate employment in the future. Conversely, lack of education can severely impair the “social, economic, intellectual, and psychological well-being” of an individual (Nussbaum, 2013, p. 154). In this way, socio-economic adversities can reinforce current and long-term social inequalities.

So far, there has not been any consideration within policy for evaluating the impacts of energy poverty on students within the context of long-term capabilities deprivation. This needs to be made an integral part of government’s policy and development agenda on priority basis because it has grave implications for human capital attainment of the province.

Energy poverty is creating and reinforcing circumstances of deprivation for students through decreased physical and affordable access to modern energy services within home and school settings.

05. Conclusion

This paper set out to explore the inter-sectoral linkages between energy and education through a student-centred perspective using Martha Nussbaum's Central Capabilities Approach.

Energy poverty is currently one of the biggest challenges in Punjab, however, there are inherent limitations in the way energy poverty is being conceptualised by policy makers. Despite increasing severity, it is yet to be acknowledged as a separate form of poverty in the country. Furthermore, even within the multi-dimensional poverty index (MPI), it has found limited representation and an even narrower interpretation. This needs to be rectified on priority basis through corrective policy action for effective treatment of the problem.

Furthermore, policy making for both energy and education sectors is taking place in isolation which is evident by the fact that despite education-related indicators being biggest contributors to the MPI of Punjab, inter-sectoral linkages have remained overlooked in the policy documents of the province. There has also not been any consideration within policy for evaluating the impacts of energy poverty on the long-term capabilities realisation in students. Analysis of newspaper accounts, government reports and socio-economic survey data revealed that students are one of the most vulnerable consumers of energy services. Energy poverty is creating and reinforcing circumstances of deprivation for students through decreased physical and affordable access to modern energy services within home and school settings.

Inaccessibility to energy services is causing mental, physical and emotional distress to students by disrupting their study routines. Students are struggling to complete their assignments and prepare for examinations due to limited access to lighting, sleep deprivation, lack of comfortable temperatures (heating/ cooling) and connectivity. Additionally, socio-economic conditions of households are deteriorating as an increasing portion of household incomes is being consumed towards payment of energy bills, securing alternate sources of energy, and coping with overall increased costs of living. All these conditions have adverse implications for students with respect to their learning outcomes, academic performance and capabilities development.

To conclude, interlinkages between these two areas must be acknowledged and factored into policy making and development planning otherwise it will have grave implications for human and socio-economic development of the province. As this study attempted to investigate the inter-sectoral linkages based on secondary data, it is subject to limitations. As such, an investigation on this topic through primary data sources would be much more insightful in highlighting how a lapse or regression in one sector can impact the performance of another sector.

Annex A: Newspaper Content

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