Household lighting and children's education

Energy Briefing Paper

This briefing paper highlights the link between household lighting and after-school studying, based on primary research conducted in rural Chin State, Myanmar. In particular it highlights the potential benefits for children's education of switching from candles to solar energy for lighting.

"Children who have access to electric lighting are doing better [in school] than the ones who do not have access."

Teacher in Ma Kyauk Ar village

Spectrum
Sustainable Development Knowledge Network

Introduction

Improving lighting in rural areas can bring many benefits, including better education for children and young people. When schools and households have electric lights, students can study more easily and for longer during the evenings. While studies have been conducted on the link between lighting and improving education in other countries,[1 2 3 4] little information exists on this topic in Myanmar. Further, most of the existing literature studies the impact of electric lighting in schools rather than at household level.

Methodology

This briefing paper presents findings and analysis of primary data collected during a fieldwork trip to Kanpetlet and six surrounding villages in Chin State in November 2017. Ten workshops were held with a total of 155 participants, and additional in-depth interviews were undertaken with six parents of school children, five teachers, and two CSO representatives. Separate interviews and workshops were held for women and men.

The role of household lighting for education

Children's education was one of the most important uses of household lighting in the villages visited. A large proportion of workshop participants (86%) reported that they use candles for children's education. Furthermore, 80% of these participants identified that they mostly use candles for children's education.

The workshops and individual interviews highlighted that candles are used either as the only source of household lighting, or as a supplementary source when electric lighting is insufficient or broken.

To gain a more in-depth understanding, three households were selected from Ma Kyauk Ar, Saw Chaung and Ye Laung Pan village for interviewing. These six parents confirmed that their children study after school every day. All three households had solar panels with a battery. They use candles for education when the solar panel does not generate enough electricity due to cloudy weather, or when it is broken. Solar panels were the most popular choice of electricity source in the villages visited. Over half of the households participating in the workshops had a solar panel.

Pinewood

In addition to candles, many people in the workshops said they also use pinewood for lighting. Pinewood is collected in the forest, making it an essentially free source of lighting, and it can be lit up like a candle. However, pinewood is generally not

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used when children are doing their homework because it produces significantly more smoke than a candle. Pinewood is also less easy to control than a candle because there is no central wick and pieces of pinewood are more likely to fall over than candles when placed on a surface, increasing fire risk.

Time spent studying

All the parents and teachers interviewed said that a normal school day ends at 3:30 pm. Since the sun sets between 5pm and 6pm in the Kanpetlet area, little time is left for after-school study during daylight hours. The parents interviewed said their children study between 30 minutes and 2 hours per day after school, depending on the age of the student. Some villages had night study camps in the late evenings for the children to study together and get assistance from the teachers.

The candles used for education were typically large candles that burn for 1 to 2 hours and are available for purchase in Kanpetlet in packs of six. In addition to time spent studying, purchasing candles takes time, even if combined with other activities. Most people in the villages buy their candles when they go to Kanpetlet, which by motorbike or walking can take several hours.

All the parents interviewed said that electric lighting had made it easier for their children to study after sunset. A mother in Ma Kyauk Ar village said that her children can study more freely with electricity.

Safety issues

Many of the workshop participants were concerned about the safety of using candles for their children's study time. The houses in the villages are often made of bamboo and the roofs are made of straw thatch or grass, making them easy to set on fire. Several workshop participants said that fires had been started by candles or pinewood in the past.

"Candles are dangerous because children can accidently knock them over."

Woman from Ye Laung Pan village

"It is dangerous for children to study with [candles], especially if they fall asleep."

Man from Sam Ein Nu village

In general, electric lighting was preferred over candles and pinewood for children's education from a safety perspective. Most of the workshop participants who had access to electricity, and all the individual households interviewed, used solar panels for electricity. When asked during the workshop which option they perceived to be the safest out of candles, battery, solar, and small hydro power, slightly over 75% chose solar power.

"For children's education we try to use only solar and less candles and pinewood."

Man from Sam Ein Nu village

"Solar is safe because the fuel is sunlight."

Woman from Saw Chaung village

"We can just pull the plug of our solar, and it has less risk of fire than candles."

Woman from Sammatha village

However, some workshop participants expressed concern about having a battery inside their home. Further, one workshop participant believed candles to be safer than solar panels, batteries and small hydro power. They argued that one can teach a child how to use a candle, making it safer than many electrical options.

"…the acid [of a battery] can burn our children's skin."

Woman from Ma Kyauk Ar village

"Batteries are dangerous. If the children put the positive and negative terminals the wrong way they can get an electric shock."

Woman from Ye Laung Pan village

Quality and reliability

One interviewee pointed out that a candle will only light up a small space. Another explained that if one's house has no sealed windows, or if it has open holes, a candle can easily blow out even when used indoors. When purchasing a pack of candles, many workshop participants said they often discover bad quality ones that are broken or have a crooked wick.

Electric light bulbs produce higher quality light than candles. One family in Yen Laung Pan Village said that electric lighting had provided better education for their children. They had a small solar panel that had cost 30,000 kyats, which they had connected to a motorbike battery. However, the solar panel was currently broken. The mother said that they cannot afford a good quality one. The father believed that better lighting in the village would

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provide better overall education levels and development to the community.

A mother in Saw Chaung Village explained that her children could better understand the content of their school lessons if they could go through them again at home. The father of the family said that the children are much happier studying with solar lighting, and when the solar panel did not provide enough electricity the children were very disappointed.

Health

Many parents were concerned about the health aspects of being around candle or pinewood smoke while studying. A father from Saw Chaung village was concerned that smoke was not good for children with asthma. Another father from Yet Long Pan village said that the smoke irritated peoples' eyes and his children sometimes cried because of it. Families can reduce the amount of smoke in their houses by switching to electric lighting.

"The solar doesn't have any smoke or smell, it is clean."

Woman from Sammatha village

Cost

One workshop participant said that a family with many children can use as many as 30 candles in one night for studying. A pack of 6 large candles or 32 small candles costs 400-600 kyats. Monthly spending on candles can therefore be significant.

"Candles are expensive because they cost 500 kyats per pack so we can spend 2000 kyats per month."

Woman from Ye Laung Pan village

"Candles are expensive in the long term, even if they are cheap individually."

Woman from Saw Chaung village

Most of the households that were able to save and purchase a solar panel felt that their solar panels were good value for money. However, the head teacher of the elementary school in Par Kon village said that many households cannot afford either a solar panel or the number of candles needed for their children to study at home every day. Therefore some of the children attend night study camps held by the teachers. The light there is provided by solar panels and batteries.

"It would be expensive to burn enough candles to get the same amount of light as from solar."

Woman from Ma Kyauk Ar village

The head teacher also said that it used to be common for children to drop out of school due to financial limitations in the family, but now many school supplies have been donated to the village from development organisations. The combination of night study camps and donated school supplies has made it easier for children to pursue their education.

"Solar is expensive up-front but cheap afterwards."

Woman from Ma Kyauk Ar village

Gender aspects

Within the households visited all the girls of school age were attending school and both parents seemed equally interested in their children's education. One of the CSO representatives interviewed said that most girls in the area attend school, yet some families cannot afford it. They also said that boys are generally encouraged to pursue higher education more than girls. The research team also heard that since women often live with their husband's family after getting married, it is common for families to invest less money and time on education for daughters than for sons.

Regarding household chores, the eldest daughter is often asked to look after the younger children and help with cooking. This is something that could potentially hinder a girl's education opportunities when studying at home, yet no evidence of this was found during the research. Electric lighting can provide more flexible studying hours which could help girls to finish both their chores and their homework.

Grid electricity

Many of the parents interviewed believed that access to grid electricity would further improve their children's education. A father in Ye Laung Pan village said: "Better light, better education". Another father in Ma Kyauk Ar village believed that if the whole village had electricity, then his village could have publicly-owned computers which would help the children with their education. However, grid electricity can be expensive (the price of grid electricity in Kanpetlet is around 3000-8000 kyats per month, depending on the amount used) and it could be long time before the grid arrives in the villages around Kanpetlet.

"We want the power grid… Yes it is expensive, even in Kanpetlet people cannot afford it, but we would like it."

Man from Sammatha Village

Access to high-voltage grid electricity could also have some potential negative impacts on education. The constant presence of a television is likely to potentially distract children from their studying. This needs further study. A woman interviewed in Kanpetlet said that since the grid electricity has arrived it is common for people to sleep less due to the television or other activities. In the past, when her household had limited access to electricity, she slept longer each night. Insufficient sleep could potentially affect children's learning abilities.

Photo by Sandra Pettersson

Notes and references

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Recommendations

- **The use of candles and pinewood for children's education in rural areas has many negative impacts in terms of time, safety, health and cost. Therefore electric sources of lighting should be made available where possible.**
- **The use of small-scale off-grid renewable energy sources for electric lighting, particularly solar energy, has already improved education in some rural areas of Myanmar. In rural areas that are far from the grid, enhancing access to solar panels is likely to be a quicker and cheaper way to improve children's education than waiting for grid expansion. Policies and measures to further support off-grid renewable energy and lighting programmes in rural areas should therefore be accelerated.**
- **Education organisations and other bodies that aim to improve education outcomes in Myanmar should promote small-scale off-grid renewable energy for lighting.**
- **In addition to helping individual children, electric lighting within households can create educational opportunities for parents, families and communities.**
- **Two unintended consequences of electrification were identified from the research:**
  1. **Concerns about lower study effectiveness for children with the constant presence of television.**
  2. **Reduced sleep as a result of additional light and entertainment options.**

  The relative education impact of these needs further study.
- **For development organisations and other donors it would be beneficial to consider the community's ability to maintain their energy sources and to value the quality of lighting provided as well as the quality and reliability of the equipment purchased.**

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