

## Does gender influence energy efficient decisions in low-income households in GMS countries?

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### **Abstract:**

*This paper studies influence of gender in energy efficient decisions in low-income households through a household questionnaire survey analysis. The study focuses on a particular consumer group, Modern Energy CONsumers (MECON), defined as those who has access to electricity but still poor with an income range of 2-5\$/person/day in the Greater Mekong Sub-region (GMS) countries, namely Cambodia, Myanmar, Laos, Thailand and Vietnam. The diversity of social structures, culture and policy regimes across GMS countries may have some gender influence in household energy decisions. Understanding influence of gender in household's energy decision will help designing strategies, targeting a particular gender, to increase uptake of energy efficient appliances in low-income households. The analysis show that in three of the four countries analyzed in this paper, those households where man takes energy decision have relatively high share of CFL lamps than that of the households where woman takes energy decisions. Analysis further shows that it was mostly men who has seen an energy label before. In contrast, analysis shows that energy labels influence mostly women in their energy decisions than that of men.*

**Keywords:** Energy efficiency; Modern energy consumers; GMS; Gender

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## **1. Introduction**

### **1.1 Energy Efficiency**

Energy efficiency improvement means an increase in energy efficiency of an appliance due to a technological change. Implementing energy efficiency measures at households will reduce the energy needed to produce the same quantity of energy services such lighting, heating, air conditioning, cooling, etc. Energy efficiency improvements offer multiple benefits, such as reduced household energy expenditure and improved productivity, thus contributing to economic growth. Getting more from existing resources due to increased energy efficiency also results in reduction in greenhouse gas emissions and enhanced energy security. The 2012 World Energy Outlook highlights the importance of energy efficiency in reducing greenhouse gas emissions (GHG) in the coming decades: energy efficiency is responsible for 75% of emissions reductions by 2020 in a 2°C temperature rises scenario (IEA, 2012). There are several factors that influence households' energy efficient decision such as income, technology availability, capital cost of technology, knowledge about technology, attitude towards environment and climate change, etc. This paper analyses whether a particular gender, among the modern energy consumers, makes a better decision regarding energy and technology choice for lighting.

### **1.2 Gender and Energy Issues**

Studies focusing on energy and gender mainly focus on the understanding of how women's well-being relates to energy poverty. This is because women spend more time and energy on unpaid care tasks, domestic and farm work than do men, they forego opportunities to engage in income-generating or livelihood enhancing activities and leisure, and they damage their health due to indoor air pollution (Cecelsk, 2004; Practical Action, 2012; World Bank, 2004). The division of responsibilities and power relationships within households and societies in developing regions, which are the most energy poor, influence the adoption and benefits of modern energy services. These divisions are embedded within wider societal, cultural and institutional structures, making it important to understand the broader context within which these are played out. Several reviews of the linkages between gender, energy and development already exist (Cecelsk, 2004; Clancy et al.

2003) and highlight many of these shortcomings in the literature.

Pachauri and Rao (2013) focused on a slightly different issue related energy and gender. The authors analysed how intra-household relations shape decisions regarding energy and technology acquisition and use. In particular, they looked at some of the factors that influence women's bargaining power, including women's control over assets and resources, female employment and earnings, and women's direct involvement in enterprises and programs that provide modern energy and technologies.

## **2. Methodology**

The primary data was obtained from socioeconomic questionnaires carried out with MECON households in both rural and urban areas in different locations in each participating country. The questionnaire was written in English and translated into local language. In order to enable a comparison across the five GMS countries, the questions were translated using a back translation approach (Birbili, 2000). This approach was taken to ensure the translation was as consistent as possible across the partner countries. Due to the novelty of the research, the complexity of the research topic and resource constraints, a non-probability sampling strategy was adopted. While a representative sample aims to accurately reflect the whole population, (i.e. through random, or probability, sampling so that each household has an equal chance of being selected), non-probability samples are not generalisable since they imply that some households are more likely to be selected than others.

A total of about 300 questionnaires were carried out face-to-face between January and May 2014 in each participating country. All surveys were carried out face-to-face in order to encourage a higher response rate and higher quality responses. The questionnaire was designed to establish an evidence base on household energy use, and to identify the opportunities and barriers to the adoption of EE technologies, measures and policies amongst new modern energy consumers in the GMS countries. This paper particularly focuses on the results related to gender influence in energy efficient decisions.

## **3. Results and discussion**

Table 1 presents percentage of households using different technologies for lighting. Though the study focused on a particular consumer group those who have access to electricity, some household still use non electricity lighting options such as candles and Kerosene especially in Cambodia where about 39% of the households still use candles and 11% of the households still use kerosene for lighting in addition to electric lamps. Further, two third of the households surveyed in Cambodia owns battery torches. This is because only two third of the households surveyed in Cambodia has access to grid electricity, while 27% is community-based connection (sub-contracted with the Electricity of Cambodia or known as EDC to supply electricity to the households). Interestingly, 5% of the households use stand-alone system (their own generators/solar) for electricity. On the other hand, over 92% of the households surveyed in Thailand have access to grid electricity leading to lower usage of kerosene lamps and battery torches.

Though the target group MECON has relatively low-income, significant number of households own at least one energy efficient lamp. Among the households included in the survey in GMS countries, 30% uses at least one incandescent lamp, 89% uses at least one fluorescent lamp, 54% uses at least one CFL lamp and 4% uses at least one LED lamp together at the regional level. These figures vary across the countries, for example in the case of CFL lamp; it varies from 44% in Thailand to 47% in Cambodia to 51% in Laos to 80% Vietnam. Table 2 presents influence of gender in energy efficient decision in different GMS countries.

**Table 1** Percentage of household using different technologies for lighting

Lighting	Cambodia	Laos	Thailand	Vietnam
Candles	39%	1%	15%	6%
Batteries/ torches	66%	4%	1%	16%
Kerosene	11%	0%	0%	2%
Incandescent lightbulbs	37%	32%	5%	53%
Fluorescent	84%	97%	92%	87%
CFL	49%	51%	46%	81%
LED	7%	1%	0%	9%

Analysis shows that energy decisions related to electrical appliances in MECON households are made by man as well as woman. Men dominate in Cambodia, Laos and Vietnam while women dominate in Thailand. The analysis shows that gender influences energy efficient decisions. It varies across the countries and technologies. For example, in Laos, Thailand and Vietnam, those households where man takes energy decisions have relatively high share of CFL lamps as compared to that of the household where woman makes energy decision while in Cambodia it is women who makes better decision on energy efficient lamp than men. We also included questions on energy labels and its influence on decision-making in the questionnaire. When the respondents were asked whether they have seen an energy label (an energy label was shown to the respondents) before, it was mostly men who said yes. In contrast, analysis shows that energy labels influence mostly women in their energy decisions.

**Table 2** Percentage of household with at least one efficient lamp by country and decision maker

Country	Decision maker	Percentage of households with efficient lamp		
		Fluorescent	CFL	LED
Cambodia	Female	82%	51%	5%
	Male	83%	47%	4%
Laos	Female	96%	51%	0%
	Male	97%	53%	0%
Thailand	Female	88%	36%	0%
	Male	90%	44%	0%
Vietnam	Female	90%	81%	0%
	Male	85%	86%	12%

#### 4. Conclusion

This paper analyzed influence of gender in energy efficient decisions on electrical appliances in MECON households in GMS countries. Only four of the five countries, where the households survey carried out, are included in this analysis. Analysis shows that there are variations in energy efficient lamps penetration levels across the households. The influence by a particular gender varies across the countries in the region. In three of the four countries analyzed in this paper, those households where man takes energy decision have relatively high share of CFL lamps than that of

the households where woman takes energy decisions. Further, analysis also shows that energy labels mostly influence women in their decision-making than men.

The study could be further improved including other electrical appliances and cooking devices in the analysis.

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