APPRAISAL OF KNOWLEDGE OF YOUTH TOWARDS ENERGY CONSERVATION AND EFFICIENCY IN INDIA: AN EXPLORATORY RESEARCH

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 ISSN 1923-6654 (print)
ISSN 1923-6662 (online). Available at http://www.ssrn.com/link/OIDA-Intl-Journal-Sustainable-Dev.html

Abstract: India is currently facing a mismatch between demand and supply to the tune of 8.5%. Efficient energy management and conservation is found to be the most cost effective and environmentally benign option to augment the gap between demand and supply. Planning Commission (2012) has estimated, 'nearly 25,000 MW of capacity creation through efficient energy management is possible in India'. India is young nation with 30% of population as youth; hence this sector can be empowered with knowledge and skills so that they are capable of taking appropriate steps towards the energy management measures. The research focused on prevalent awareness level of youth towards energy and related concepts, so that an effective and valid capacity building module for energy management can be developed.

Knowledge and skills of youth towards energy management was studied. The knowledge level towards energy and related issues was seen to be low with, 46.25% of sample scoring average and 33.75% scoring low on the energy conservation and efficiency knowledge test and energy auditing skill test. The prevalent awareness and application level of youth, was found to be inadequate. This lack in knowledge is seen as the first roadblock towards changing behavior and attitude of masses towards energy and its conversation Based on this criteria capacity building programme can be developed to generate awareness not only among youth, but also other stakeholders.

Keywords: capacity building; energy crisis; energy conservation; knowledge and skills; youth

INTRODUCTION

Sustainable development has become an integrating concept embracing economic, social and environmental issues. It is a pattern of economic growth in which resource use aims to meet human needs while preserving the environment. Resources such as energy, water, forests, mineral etc. are backbone of every economy. Energy is central to improved social and economic well-being, and is indispensable to most industrial and commercial wealth generation. It is the key for relieving poverty, improving human welfare and raising living standards [1].

India, being home to about 1.21 billion people and representing 17% of the earth's population, is currently facing an acute energy shortage [2]. According to Ministry of Power (2012) "the country continues to have mismatch between demand and supply and energy shortages to the tune of 8.5% and 10.3% respectively during the year 2010-11. The goal of energy policy is to provide energy security for the masses. For achieving energy security, India's energy strategy has a twofold scheme, focusing on increasing the total supply by implementation of renewable energy technologies and optimal utilization of available energy [3]. Renewable energy have become an integral part of India's growth strategy, the government has actively promoted renewable since the 1990s. But renewable energy resources continue to be scarce and unacquainted [4]. Efficient energy management and conservation is found to be the most cost effective and environmentally benign option to

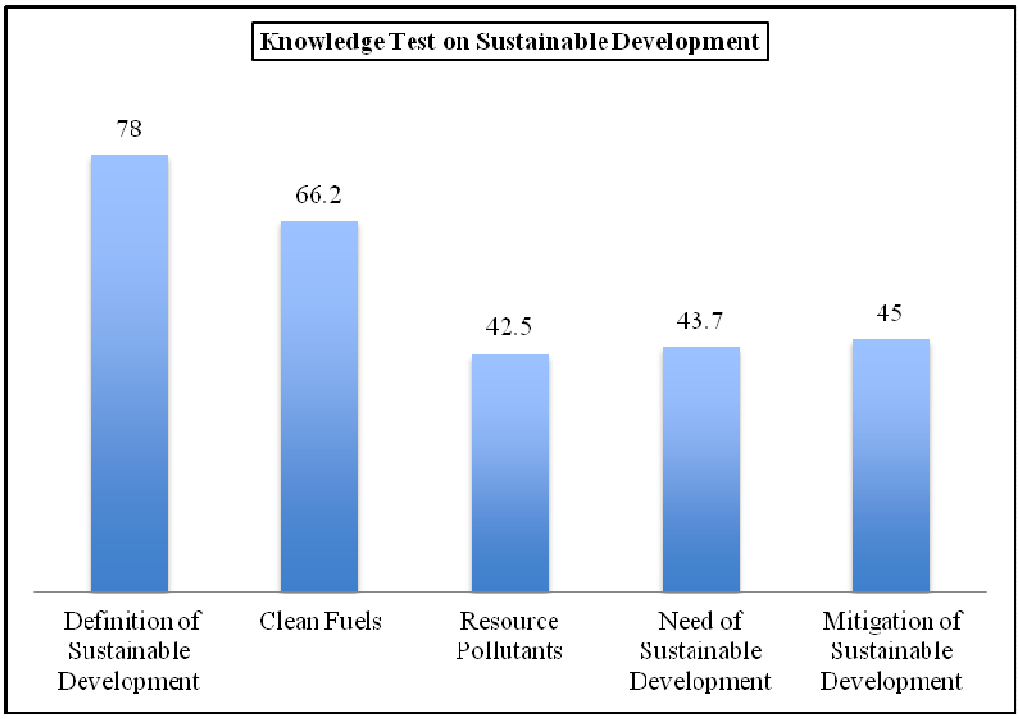

Figure 1. Distribution of Sample with respect to knowledge regarding Sustainable Development

augment the gap between demand and supply. Nearly 25,000 MW of capacity creation through efficient energy management has been estimated in India. Energy efficiency and conservation has also assumed enhanced importance with a view to conserve depleting energy resources [5]. Efficiently managing and conserving energy is therefore a relevant issue, as it not only impacts every individual's life in all realms but also represents the effort everyone can do to help the environment. By making informed choices in the process of achieving their life's goals, individuals can make a great difference by adopting energy efficient products, processes and practices, there is a need thus to 'inform' the individuals about their potential contribution towards the enhancement of earth's wellbeing.

For building momentum towards energy management movement, it thus becomes imperative to build capacity of masses so that they are capable of making decision and taking appropriate steps towards the implementation of suitable energy efficiency measures. According to the Population Council in India, (2012), "India is a young nation with 30% of the country's population being youth" [6]. High proportion of a young population, could work in India's favour of emerging as one of the four major economies of the world by the year 2020 . Their energy and enthusiasm must be guided into productive work. Their ideas and innovations should be tapped for the betterment of the society [7]. According to research done by E.ON UK and The Scout Association, (2012) "two-thirds (68%) of young people are using their 'kidfluence' to pressure parents, teachers and family members to turn off and unplug electrical appliances when not in use." [8]. The research also showed that youth demonstrates a passion for energy awareness, wherein almost two thirds (63%) of young people also pushing their peers to do the same. It also revealed that youth were extremely enthusiastic to become energy aware, with 44% of young people admitting they are annoyed by energy wastefulness. The study also exposed the gender divide, by inferring that girls were most angered by people's lack of understanding for the environmental impact of excessive energy use, whereas boys were most infuriated by the financial cost of energy waste. Using energy efficient devices will be ever more important as the younger generation's passion for gadgets shows little sign of abating. Just under half (45%) of young people claimed that they cannot live without their smartphone while a third (33%) would struggle without their TV, laptop, PC, iPad and Kindle. The

study also showed a considerable view of the future, over a third (37%) of young people believe that they will be using less energy in five years' time because of their persuasive tactics. Such initiatives needs to made more widespread for effective energy managements. Their young potential needs to be realized to accomplish goals of a sustainable tomorrow. Building capacity of youth may help to reach next four generation, the message to conserve and protect the nature. Moreover, adolescents and youth are the main stakeholders, future policy makers and a major resource group playing an important role in taking up responsibilities, revolutionizing the other stakeholders, acting as a catalyst for bringing about change.

In the given situation, assessing knowledge of youth proved to be an effective endeavor towards developing a valid capacity building module for awareness generation regarding energy management and sustainable development. The paper presents the prevalent awareness level of youth towards energy and related concepts. Based on this criterion, capacity building and training programme can be developed to generate awareness not only among youth but also other stakeholders. This research may have a threefold effect. (a) Firstly, the assessment of knowledge and perception of youth towards energy conservation serves to be the first step in conceptualizing a capacity building module for the same. (b) Secondly, on the basis of the information collected by this research, training and capacity building programmes can be garnered by various organizations striving towards inculcating energy management practices among individuals to appreciate and include the concept of energy management to their lives. (d) Thirdly, this research may prove to be a framework for furthering initiatives in training and research in the field of energy management and sustainable development.

MATERIAL AND METHODS

The study was conducted in colleges in Delhi and NCR. Delhi being a metropolitan city is the educational capital of the country and houses a number of private and government universities attended by students with myriads of background, coming from all over the country and even nationals of other countries and cultures. The sample for the study comprised of youth pursuing under-graduation in colleges of Delhi and NCR. The knowledge-testing questionnaire was administered to the students to understand their knowledge level. The tool covered the knowledge testing of respondents regarding the following concepts; sustainable development, climate change, energy conservation and energy audit. The data procured was coded, scored and tabulated in accordance with a pre-decided pattern; this was done to calculate scores and comparative data to lead to results and conclusions. The data was analyzed using Microsoft Excel Software. Mean and standard deviation were also used to support the analysis. Pie Charts and Graphs were used to represent the study findings.

RESULTS AND DISCUSSION

Energy Conservation and Energy Audit and related concepts are important tools in the hands of consumers to make a contribution in the journey towards sustainable development and therefore, it was felt imperative to assesses the current knowledge of youth which would help in developing a need based capacity building programme and bridging the gap between existing state of awareness and skill and the desired level. The sample was tested using a knowledge-testing tool to obtain knowledge scores of the respondents regarding the concerned subjects.

It was seen that the knowledge of respondents about sustainable development fairy good at 72.5% as indicated by figure 1. Also it was observed that 78.7% of the sample could correctly give the definition of sustainable development. The knowledge score of the sample about resource pollutants was 43% and 43.7%, were aware about the need of sustainable development. Only 45% sample could correctly respond with measures to mitigate sustainable indicating the application level of the sample and knowledge of the sample regarding sources of carbon emissions, which was 30%. Only 26% of respondents were aware about the technologies that would help to combat climate change.

In the table 1, it is apparent that 55% of the sample was able to enlist anthropogenic causes of climate change and 59% of the sample could correctly identify impacts of climate change, however, only 26% of respondents were aware about the technologies that would help to combat climate change and 29% correctly responded with mitigation strategies for the same. The respondent’s knowledge about sources of carbon emissions and ozone related facts was found to be 30% and 67%.

Table 1: Distribution of Sample with respect to knowledge regarding Climate Change

Awareness Criterion	Knowledge Test
Ozone Layer Information	54 (67)
Climate Change Causes	44 (55)
Technology to Combat Climate Change	21 (26)
Sources of Carbon Emissions	24 (30)
Impacts of Climate Change	47 (59)
Government Initiatives for Mitigation	30 (37)
Contribution for Mitigation	23 (29)

(Figures in Parenthesis denote Percentage)

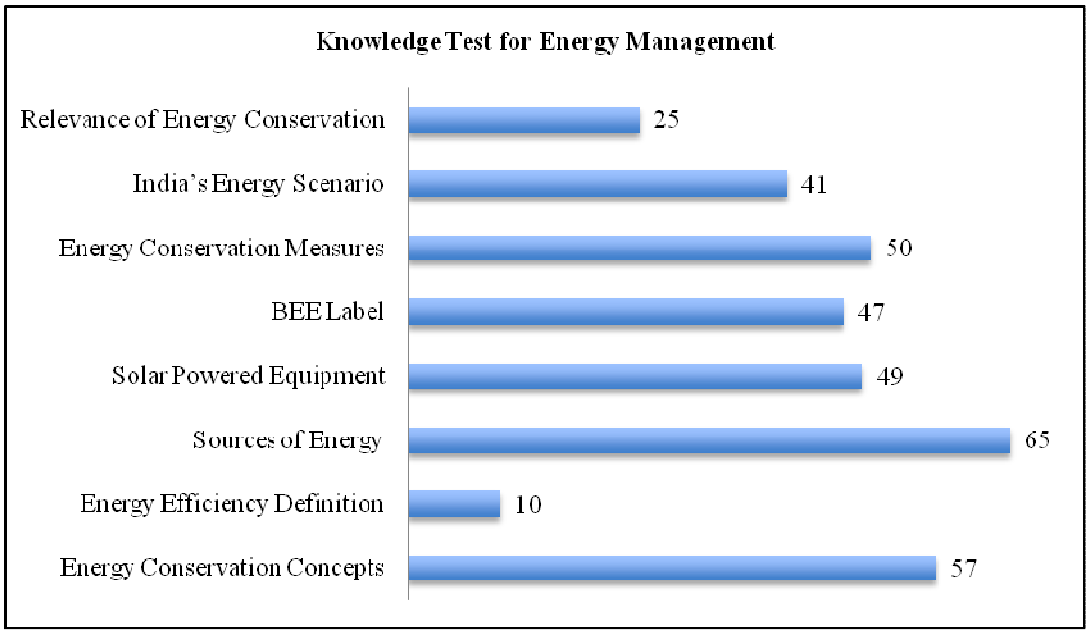

Figure 2: Distribution of Sample with respect to knowledge regarding Energy Conservation

Table 2: Distribution of the Sample knowledge and skill Pre-test and Post-test Scores

Test Scores		Knowledge test
Very Low	Below 6	2 (2.5)
Low	7 – 12	27 (33.75)
Average	13 – 18	37 (46.25)
High	19 – 24	14 (17.5)
Very High	25 – 30	0 (0)

(Figures in Parenthesis denote Percentage)

It was further noted that, 57% respondents were aware about the concepts covered in energy conservation whereas only 10% of the sample could define energy efficiency. The knowledge scores showed that 50% of the sample was aware about energy conservation measures. Also, just 41% of the respondents could correctly judge India's reliance on the various energy sources. It was seen that 47% of respondents were aware of the BEE labeling program and 49% of sample was aware about the various solar powered appliances available. However, it is pleasant to note that the sample's understanding of the different sources of energy categorized as renewable and non-renewable was 67% as seen in Figure 2.

Knowledge level of the sample regarding the concept of energy audit was 14%. Further, the understanding about the concept was found to be only12%. It was also revealed that the sample had no knowledge and application skills with respect to energy audit for basic energy calculations and practical energy auditing skill.

The overall knowledge of youth towards energy management was studied. As shown in Table 2, it was found that, 46.25% of the sample knowledge scores fell in the average category and 33.75% knowledge scores fell in the low category. Only 17.5% could score high. Therefore, it is noted that a there was considerable lack of awareness and knowledge in the concepts covered by the study.

CONCLUSION

The present study dealt with assessing the awareness amongst youth regarding energy conservation with a goal to design and validate the capacity building program, which can be used as a tool to train youth across the country. Youth are the winds of change, influential stakeholders, and future policy-makers as well as policy followers. India is a young nation and the youth of the country assumes many varied roles, to make decisions, to influence those who make decisions and assume responsibility for decisions made; therefore, youth is targeted to reach the maximum density of population and bring about desired change with minimum input.

The study involved designing and implementation a knowledge questionnaire for youth targeting issues of paramount importance i.e., sustainable development, climate change, energy conservation and energy audit, the ultimate aim was to comprehend the knowledge and understanding of students towards energy conservation and energy auditing. The paper presents the prevalent awareness and application level of the sample, which was found to be inadequate, and is seen as the first roadblock to overcome as change in behavior can only be based on existing knowledge and understanding in the group. Based on this criteria capacity building and training programme can be developed to generate awareness not only among youth, but also other stakeholders. Energy Conservation both supply side and demand side is dependent on acceptability by the consumers and a youth base which is aware about the implications of the choices will act as an asset for reaching the goal of sustainable development through energy conservation; by increasing demand and affecting supply side conservation in the near future. There is need to incorporate energy conservation in the value system of the country and capacity building of youth towards energy conservation and related concepts will be a leap towards the right direction.

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