

University Students' Practices Related to Energy Conservation: A survey-based study

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Abstract—

Energy conservation is considered one of the most important measure for improving energy sector in any country, this will reduce the amount of gas emissions and energy bill.

Palestine imports all of its needs from fossil fuels and most of electrical energy from Israel, this makes the cost and consumer prices of electricity in Palestine the most expensive compared to other countries in the region.

The residential and commercial sector in Palestine comprised of about 72% of total energy consumption which makes energy conservation in this sector feasible and effective. Building a culture of energy conservation in Palestine society to engage all family members is considered the most important action than can be taken to save energy, money, reducing the energy demand and consequently reduce gas emissions.

This paper investigates the extent to how much the students' university are aware to energy conservation measures in their homes and university as well as the extent to how much they follow and respect the regulations for conserving energy.

A survey of about 200 students from An Najah National University that includes scientific and literature specialization had been conducted. The survey used 20 questions paper-based to investigate the university students practices related to energy conservation mainly in the residential sector.

The study based on 11 scientific hypothesis and each hypothesis was checked by the survey questions. It was found that students were interested in energy conservation issues and were aware to energy sources of Palestine. Most of the students were ignorant to energy conservation establishments and facilities as well as the energy labels which is considered an important energy conservation measure.

It was found that students respected energy conservation measures in their homes more than university. The documentary programs and internet were the main source of energy conservation information and culture. The students were aware to the relationship between environment and energy conservation.

Keywords-Energy conservation,energy conservation survey, energy efficiency, energy efficient technologies and energy management.

I. INTRODUCTION

Energy consumption per capita of the Palestinian population has been considerably increased and this is due to major developments in several sectors such as residential, industrial and commercial.

In the meanwhile, Palestine suffers from shortage of energy supply which is considered one of the significant problems that hinders progress and development.

The available options to overcome this dilemma are limited as Palestine is suffering from Israeli occupation and high constraints on importations of energy sources and equipment.

Palestine has to import all its needs of petroleum products from Israeli market and about 92% of electrical energy from the Israeli Electric Corporation. Indigenous energy resources are quite limited which forced the prices of energy to be relatively high [1].

Applying energy conservation is considered one of the most feasible measure that can reduce the energy consumption and consequently the energy demand. Energy conservation is defined as using less energy for implementing a specific task without affecting the standard level of life.

Energy conservation culture is still immature in Palestine. Great attention being given to energy conservation, particularly in the residential sector as most of the energy demand and consumption is allocated in this sector as shown in Figure. 1[1].

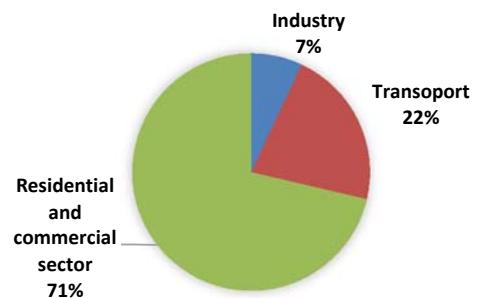


Figure 1: The total final energy consumption (TFEC) by sector.

Different studies and research papers have been published in energy conservation and all of them confirm the economic feasibility of energy conservation in all sectors [2-4].

This paper investigates and judges the level of awareness of university students in Palestine in energy conservation measures in residential sector. This is very important for assisting the decision makers for drawing the future plans to disseminate the culture of energy conservation.

This paper is based on the following research hypotheses: (1) the students are interested on energy conservation measures.(2) the students are acquainted with energy situation of Palestine.(3) The students have no idea about energy conservations establishments and facilities that care about energy conservation in Palestine.(4) The students turn off the appliances after use in their homes . (5) The students turn off the appliances in the university after use (6) The ethical factor is the main motivation for turning off the appliances by students in the university.(7) The students unplugging (turn off completely) appliances after use. (8) The students have no idea about energy labels. (9) The students link between environment and energy conservation. (10) The documentary programs and internet are the main source of energy conservation information and culture.

This paper is arranged as follows: Section 2 describes the research methodology. Section 3 presents the survey result and analysis. Conclusion and recommendation of the study is presented section 4.

II. THE RESEARCH MYTHODOLOGY

The methodology followed to test the previous scientific hypothesis was conducting a survey. The survey was composed of four items within the questionnaire which are summarized in Table 1.

TABLE 1. Items of the questionnaire sheet

	Item
Part 1	Student profile : residence, college (specialization) and level
Part 2	knowledge on energy conservation measures, energy conservation equipment and general culture on energy conservation
Part 3	The sense of responsibility towards public and private properties.
Part 4	The source of information and knowledge of energy conservation.

The size of the sample is estimated appropriately in order to cover most of the students. The questionnaires were distributed manually and filled immediately by students, this facilitates the understanding the questions of the questionnaires. The questionnaires results were filled in Microsoft excel and analyzed. The next section shows the survey result and analysis.

III. SURVEY RESULTS AND ANALYSIS

The questionnaire was conducted at An-Najah National University in both literature and scientific specialization with different levels. About 200 students had participated in filling up the questionnaires with about 100 students from literature specializations and about 100 from scientific specializations. The scientific specializations includes engineering, science, IT, medicine and heath colleges. The literature specializations

includes social, economic, fine arts, humanities and law colleges.

The analysis of the survey are illustrated as following: The students were interested in energy conservation issues regardless of their specialization, level and place of residence. This result is depicted from Figure 2.

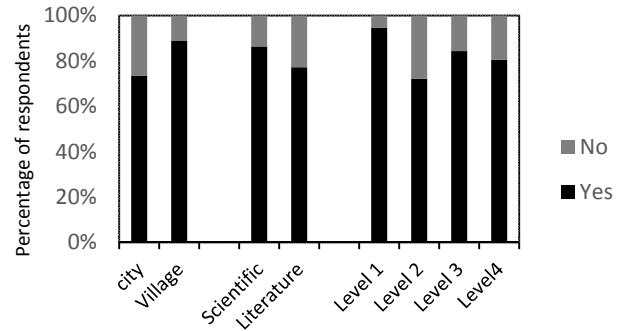


Figure 2. The percentage of respondents to the question: "Does energy conservation issues interest you ?".

The students were acquainted with the energy sources in Palestine. This result is depicted from Figure 3.

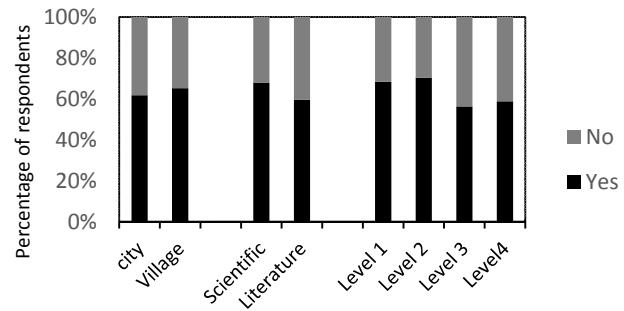


Figure 3. The percentage of respondents to the question:" Do you know the available energy sources of Palestine ?".

Most of students were not aware to establishments that are interested in dissemination the culture of energy conservation in Palestine. This result is depicted from Figure 4, this may due to insufficient efforts presented by those establishments towards this sample of people.

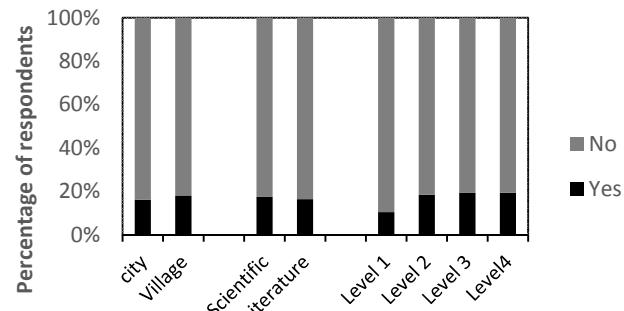


Figure 4. The percentage of respondents to the question: " Do you acquinted with the establishements and research centers that are interested in dissemination the culture and measures of energy conservation in Palestine?".

The result depicted from Figure 5 shows that high percentage of students are turning off the appliances after use.

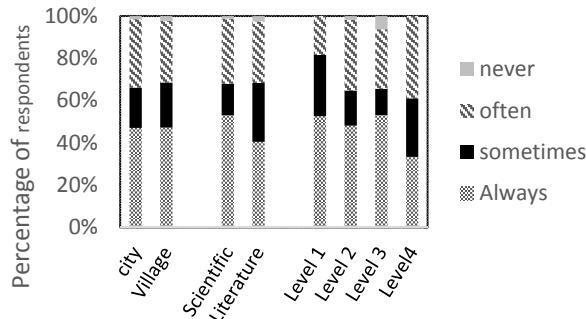


Figure 5. The percentage of respondents to the question: "Do you turn off the appliances after use in your home?"

The result depicted from Figure 6 shows that percentage of students are turning off the appliances after use in their university.

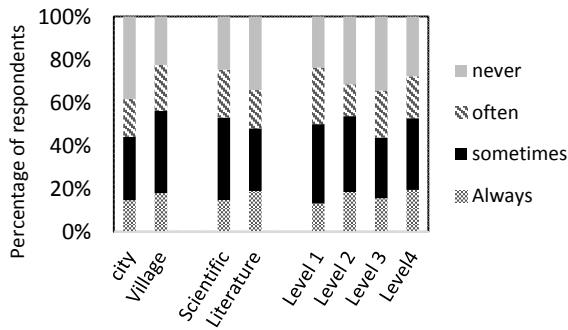


Figure 6. The percentage of respondents to the question: "Do you turn off the light after use in you're the university?"

Higher percentage of respondents had higher sense of responsibility in their homes than in their university.

The students that followed rules of energy conservation in the university had different motivations as shown in Figure 7. The environmental issue had no effect in the students' behavior.

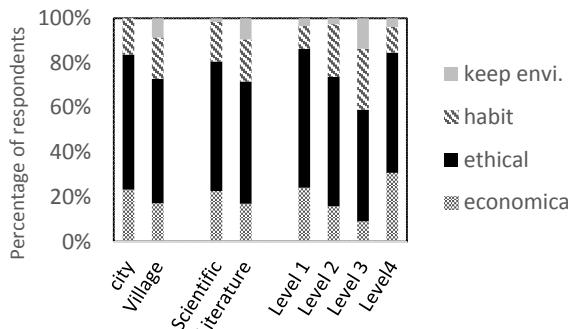


Figure 7. The percentage of respondents to the question: "What is the motivation for respecting energy conservation measures in the university?"

The result depicted from Figure 8 shows that high percentage of students didn't constantly unplug (turning off completely) the appliances after use.

The reason behind this result might due to ignorance of the amount of energy losses by keeping the appliances plugging all the time.

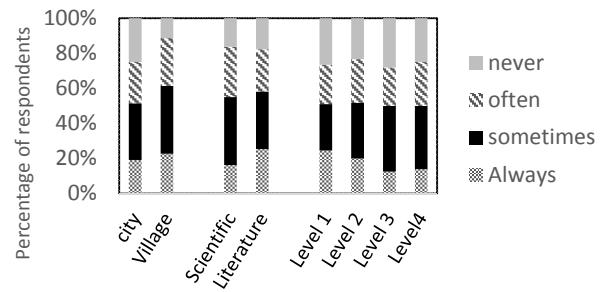


Figure 8. The percentage of respondents to the question: "Do you unplug (turn off completely) the appliances after use?"

Figure 9 shows that most of students are not aware to energy labels that are used to show up the energy consumption of an appliance.

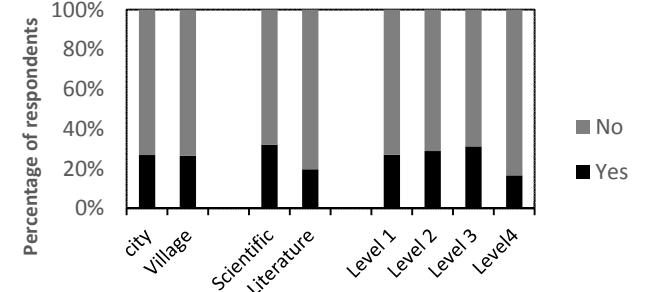


Figure 9. The percentage of respondents to the question: "Do you have an idea about energy labelling systems?"

The result depicted from Figure 10 shows that high percentage of students are aware to the role of energy conservation for reducing the gas emissions and protecting environment.

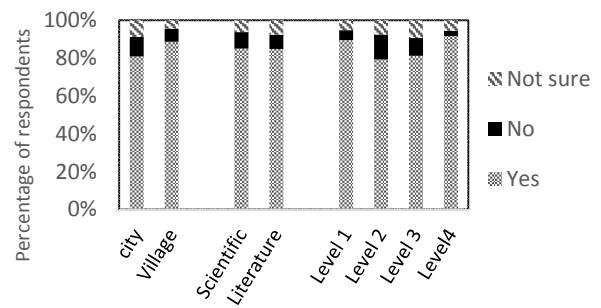


Figure 10. The percentage of respondents to the question: "Does energy conservation saves environment and reduce gas emissions?"

The result depicted from Figure 11 shows that less than 50% of students knew the appliances that consume the highest amount of energy in their homes.

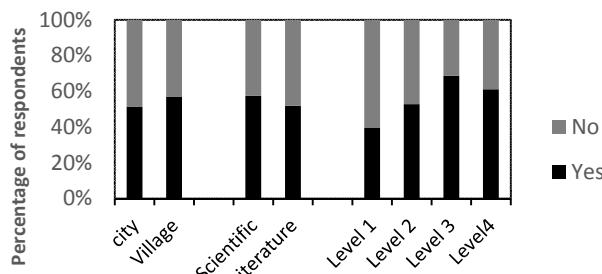


Figure 11. The percentage of respondents to the question: "Do you know the appliances that consume the highest amount of energy in your home?"

Most of the students earned their energy conservation culture from documentary TV programs and internet. This is depicted in Figure in Figure 12.

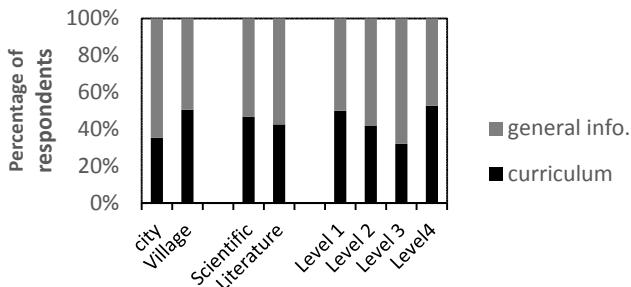


Figure 12. The percentage of respondents to the question: "What it is the source of your information about energy conservation?"

IV. CONCLUSION AND RECOMMENDATION

The students were aware to the importance of energy conservation and were acquainted with the energy situation in Palestine.

The students had no idea about energy conservations establishments and facilities that interested in dissemination of energy conservation in Palestine. The students turned off the appliances after use in their homes.

About 25% of the surveyed students didn't turn off the appliances in the university. The students' sense of responsibility should be inspired towards their university and the public property in general.

The ethical factor was the main motivation for turning off the appliances in the university. The economic and environmental factor had less effect in the students' behavior.

The students didn't constantly unplugging (turn off completely) appliances after use, the main reason for this was that some students thought that unplugging the appliances didn't save energy.

The students had no idea about energy labels, this is an indication of lack of awareness of the students in a very important measure of energy conservation.

The students were aware to the importance of energy conservation in reducing gas emissions and protect environment in general.

Half of surveyed students knew the appliances that consume the highest amount of energy in their homes. Most of the students earned their knowledge of energy conservation from documentary programs and internet.

The main recommendation of the study can be summarized as following:

The energy conservation facilities and establishments should improve and further their efforts to let more people involved in their activities specially the university and school students.

The school and university curriculum should include scientific materials that improve students' knowledge of energy conservation issues and practices. The importance of energy conservation should be addressed as well as its relation with environment and national economy.

The governmental and non-governmental establishments and facilities that care about energy conservation should cooperate and coordinate with each other. The ministry of high education should be strongly involved with the activities of energy conservation.

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