ENVIRONMENTAL AWARENESS OF INTERNATIONAL STUDENTS STUDYING AT UNIVERSITY OF PANNONIA

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Abstract

Climate change is a worldwide phenomenon which needs a plenty amount of publicity and measures in order to alleviate its significant impacts on climate, built environment and on the society. There are many factors that will be affected by climate change including rising sea levels, drought and loss of agricultural land. Nowadays and in the near future mankind has to face to the biggest environmental challenge what they ever seen. Therefore, environmental education plays a crucial role. Thus, well-educated and informed public will be able to make more sensible and precise decisions and reaction to climate change concerns.

In this study the degree of consciousness about climate change was examined by questionnaire between the International students of University of Pannonia in Veszprem city. Questionnaire titled as “Climate Change in view of you” contain 15 questions. Study allows us to determine the climate change perception of the young generation from all over the world. During the examination climate change awareness of different age groups and gender were compared. Regarding of the obtained results, it is estimated to make events at University of Pannonia for international students with the intention of providing more detailed information on climate change.

Keywords: climate change, environmental education, environmental awareness, environmental knowledge

Összefoglalás

Az éghajlatváltozás olyan világméretű jelenség, amely rengeteg nyilvánosságot és intézkedést igényel annak érdekében, hogy enyhíthetőek legyenek az éghajlatra, az épített környezetre és a társadalomra gyakorolt jelentős hatásai. Az éghajlatváltozás számos szektort fog érinteni, különös tekintettel a mezőgazdaságra, ahol az aszály és a mezőgazdasági területek elvesztése jelentős mértékű lehet. Az emberiségnek szembe kell néznie a legnagyobb környezeti kihívással, amivel valaha találkozott, ezért a környezeti nevelés döntő szerepet játszik. A jól képzett és tájékozott lakosság képes lesz ésszerűbb és pontosabb döntéseket hozni, és reagálni az éghajlatváltozással kapcsolatos aggályokra. Tanulmányunkban egy kérdőív segítségével mértük fel az éghajlatváltozással kapcsolatos tudatosság mértékét a Pannon Egyetemen tanuló nemzetközi diákok körében. Az „Éghajlatváltozás a te szemedben” című kérdőív 15 kérdést tartalmazott. A tanulmány

lehetővé tette számunkra, hogy meghatározzuk az éghajlatváltozáshoz való hozzáállást a fiatal generációk esetében akik a világ minden tájáról érkeztek.

Introduction

The word ‘climate’ is defined as fundamental weather conditions of the certain area, such as a change in wind flows, atmospheric pressure, patterns of rainfall, index of humidity, diversifications of temperature, increasing smog and during the particular time interval whichever statistical transformation in that weather arrangement can be characterized as “climate change” (Hussain, et al. 2018). The term climate change described in the scientific literature earlier than the term global warming. Even though these terms are used compatible in media, they have distinctive technical explanations (Leiserowitz, et al. 2004). One of the earliest investigations is proclaimed by the French physicist Joseph Fourier who showed that the Earth temperature would be colder. In 1975 the phrase “global warming” invented by the US scientist Wallace Broecker and at that time concentration was shifting to the unfavourable effects of climate change which was caused by humans (Frost, et al. 2017). As regards adjacent connection of climate change to the normal life of people and improvement of the ecosystem, during the last decades it has been progressively in the centre of people’s awareness (Zhong et al. 2017).

Climate change is undeniable fact of life and today we can obviously see the evidence of it. To take a particular example, levels of the sea are rising, glaciers are retreating, transformations in precipitation patterns and the temperature of the world is increasing gradually (Adedeji, Reuben and Olatoye 2014). According to the Third Assessment Report of IPCC in 2001, it is predicted that by 2100 global mean temperature of the surface would

increase from 1.4 to 5.8° C. By cause of this significant modification, it could have extensive disastrous results (Schneider and Lane 2006). During the last two decades, possible impacts of climate change have been inspected on the Antarctic ecosystem and this regional climate changes detected by the examination of microflora (Singh, P.Singh and Khare 2018). Beginning from the 1940s effect of climate on soil erosion also recorded and the reason for this is variations in the quantity of rainfall (Li and Fang 2016).

The major reason for global climate change is greenhouse gas (GHG) and as a consequence our planet faces with global warming (Hussain, et al. 2018). Beginning from pre-industrial level, the anthropogenic greenhouse GHG have risen continuously and has powered greatly by the growth of population and improvement of the economy (Uitto, Puri and Berg 2017). As a result of the burning fossil fuels, the concentration of GHG in the atmosphere has risen considerably (Seidenkrantz 2017). In 2008 the food production process, has delivered approximately 17 000 mega tonnes of carbon-dioxide equivalents (CO_2e) into the atmosphere that constituted to tierce of all anthropogenic GHG (Gabriella and Ferranti 2016). Rice cultivation, cattle farming, and deforestation also effected deliberately to rising GHG during the last centuries. Thus, nowadays, the amount of GHG emissions has reached the highest historical climax point (Uitto, Puri and Berg 2017).

The 21st century is distinguished by the prominent level of technical and scientific intricacy of environmental problems such as climate change (Awusi and Asare 2016). In European strategies, plenty number of directives, regulations, and discussion papers are published in order to promote the reduction of GHG emissions and to assimilate climate change (Reis and C.Ballinger 2018). Regardless great amount of studies conducted, immense part of the world population, specifically in developing countries, are still unfamiliar about climate change (Ochieng and Koske 2013). With the aim of raising the

alertness in public predominantly, education on climate change is considering one of the most crucial appliances (Paul, J and Gale 2015). The research was also designed to examine the knowledge of students mainly from developing countries at University of Pannonia on this subject.

Methodology

According to the statistical data from the Tempus Public Foundation, in the academic year 2017-2018 there were more than 15000 Stipendium Hungaricum applicants from 55 different countries all over the world. Regarding chosen study level of the applicants there were 3634 for Bachelor programme, 7004 for Master programmes, 3021 for Doctoral degree, moreover 999 for One-tier master's degree programmes and 337 candidates for Preparatory courses. The number of the students who come from Pakistan (1885), Jordan (1194), Azerbaijan (1052) and Syria (1057) remarkably higher than other countries. Statistical information also shows that almost 80% of the students give high preferences to study in English (Tempus Public Foundation 2017).

Since 2015 at the University of Pannonia continuously increasing number of international students are studying by the help of the Stipendium Hungaricum program. The university have 5 faculties, namely Georgikon Faculty (GF), Faculty of Information Technology (MIK), Faculty of Business and Economics (GTK), Faculty of Modern Philology and Social Sciences (MFTK) and Faculty of Engineering (MK). Within the framework of the program applicants are able to choose from 4 BSc/BA and 9 MSc/MA programs. They also have the opportunity to continue their studies in one of the 6 Doctoral Schools.

The questionnaire was organized in English language and it contains 6 sections and 15 questions. The research assessed international students' general understanding of climate change. The first section of the survey gives a short description to inform participants about the reason for the questionnaire, the time they will spend to fill it and keeping anonymity. The second section is about personal data, such as the participants' gender, age, origin as well as the highest level of education. The third section is named "Climate change as a phenomenon" and contains three questions. The questions investigated that whether the participants are familiar about climate change or not, from which source they have heard about it and what could be its potential dangers to our society. In the fourth section the causes and consequences of climate change was examined (e.g. activities and major gases which are responsible). The fifth section analysed the perspective of participants about activities which can mitigate climate change, who is responsible for it and individually how they can protect themselves from the effects. Apart from the first section, almost all the questions were offered a multi-response kind and fields for supplementary comments. The survey was mainly introduced to participants through email, however, some students were reached through Facebook too.

Results

The survey was sent around 80 international students of the University of Pannonia and 44 students filled it in during the given two weeks. From the first section it is visible, that the number of the females (54.5%) who filled the survey is higher than males (45.5%). Regarding age distribution, even though, almost all age groups participated in the survey, but the number of the students whose age was between 24 and 26 are significantly higher than other age groups.

Figure 1 shows the origin of the students. Most of the students who participated in the survey was from South-East Asia (23%) and from Western Asia and the Middle East (23%). The largest student groups are from India (5 students), Indonesia (5 students), Russia (4 students), Syria (4 students) and Jordan (4 students). Furthermore, participants from Cambodia and Mongolia accounted for the similar number, 3 students from each country. In comparison to the above-mentioned countries number of the participants from China, South Africa and Iraq are marginally lower and counted for 2 students for each country. Finally, there is only one participant from Tunisia, Algeria, Kazakhstan and the Philippines, Egypt, South Africa, Laos, Ecuador, Algeria and Kenya.

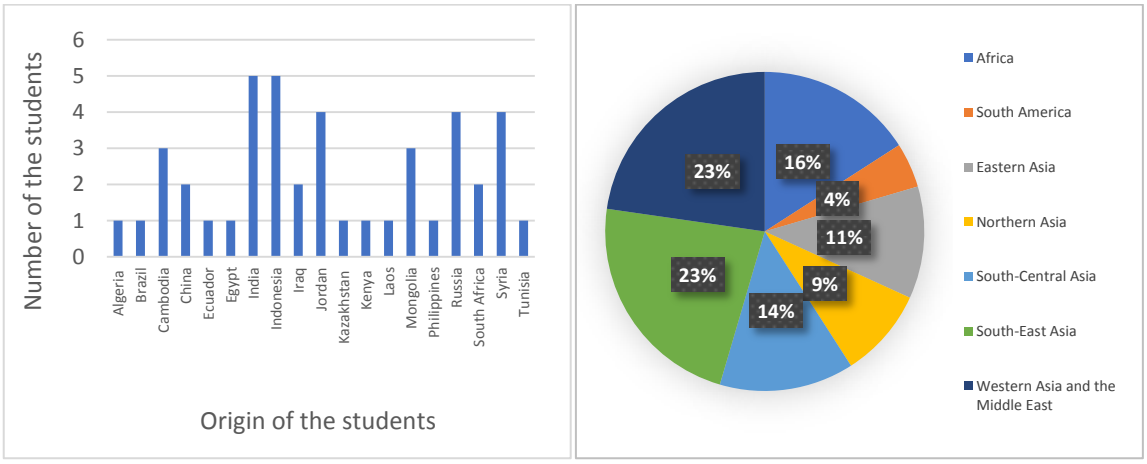

Figure 1: *Origin of the students*

More than 80% of the respondents live in a city with more than half a million inhabitants (43.2% in the capital city, 38.6% in other cities), whereas 15.9% of the responders were from small towns and only 2.3% were from villages.

The highest level of education was investigated also, but because of some misunderstanding in the question the results cannot be used. The research also analysed the majors of the participants who filled the survey and the distribution of students between different

disciplines was as follows: 36.4% economics, 22.7% social sciences and nature sciences, 11.4% technical sciences and 6.8% IT.

From the second part of the questionnaire - called “Climate change as a phenomenon” – the results indicate that all the students have learned about climate change and as it is seen on Figure 2 most them heard about it from the internet or from the television during their studies. It is also visible on Figure 2 that 77% of the students consider that climate change is an essential issue and requires to be solved. Whereas, 21% of them think that there are more critical problems which needs to be addressed.

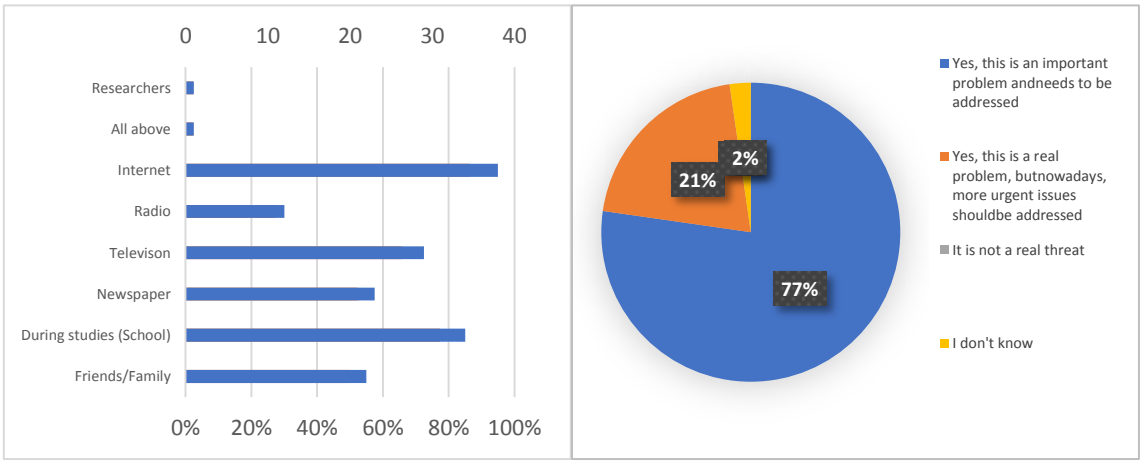

Figure 2: Climate change as a phenomenon

In the third part of the survey the causes and the possible consequences of climate change were investigated. Figure 3 shows, that more than half of the participants consider GHG emissions is one of the main causes of climate change, whilst 32% voted for deforestation, decreasing of green areas. However, the minority of participants believe that climate changes because of overpopulation (7%), changing the Earth rotational properties (4%) and volcanic activities (2%).

The gases in the atmosphere which are responsible for the greenhouse effect were examined too. According to the respondents, carbon-dioxide, methane and sulphur-dioxide are three-

main gases contributing the greenhouse effect. The respondents consider water vapor ozone and freons as less important gases for greenhouse effect.

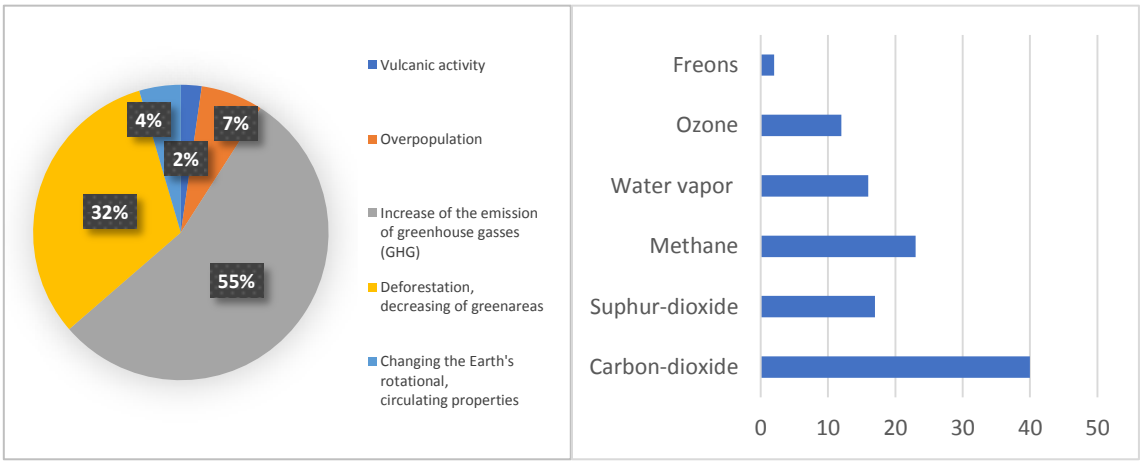

Figure 3: *Causes of climate change and GHG emissions*

For the question about what they think what could be the consequences of global climate change (Figure 4), 33 students consider that extreme weather conditions could become more frequent. Moreover, 31 students think that global climate change will cause to the melting glaciers and polar ice sheets and rise of world sea level. The number of the students who believe that climate change could lead to the decline in biodiversity and deforestation accounted for 20. However, fewer consider that it could result in degradation of agriculture productivity (15 students), acceleration of spread of diseases (14 students), migration (10 students), war (8 students) and termination of Gulf stream (6 students).

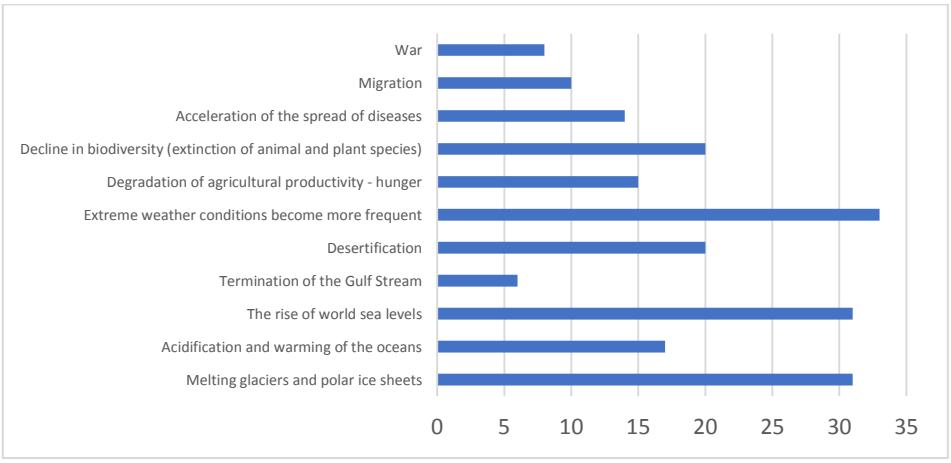

Figure 4: *What could be the consequences of global climate change*

According to the Figure 5, 63% of the participants think that each person individually should be responsible to mitigate climate change. Whereas, only the small number of the students consider that it is responsibility of government (16%), factories and companies (14%) and politicians (7%).

Regarding the type of activities which could mitigate the climate change, the great number of students say that "I turn off the lights when I am not in the room" (33 students), "Walking or biking to university" (32 students) and "I collect waste separately" (25 students). However, only fewer say that "I am buying energy saving equipment" (12 students) and "I am buying bio and organic food" (4 students).

Figure 5: *Actions to mitigate climate change*

The last question in the survey was about protection against climate change impacts (Figure 6). Two in three students protecting themselves from impacts of climate change through reducing energy consumption and more than half of the participants do it through reducing car use and reducing water consumption. Moreover, about 6 of the students protect themselves through isolation of flat or house, however, 3 participants say that climate change does not affect them. In the "other" section, one student wrote that educating people could be solution.

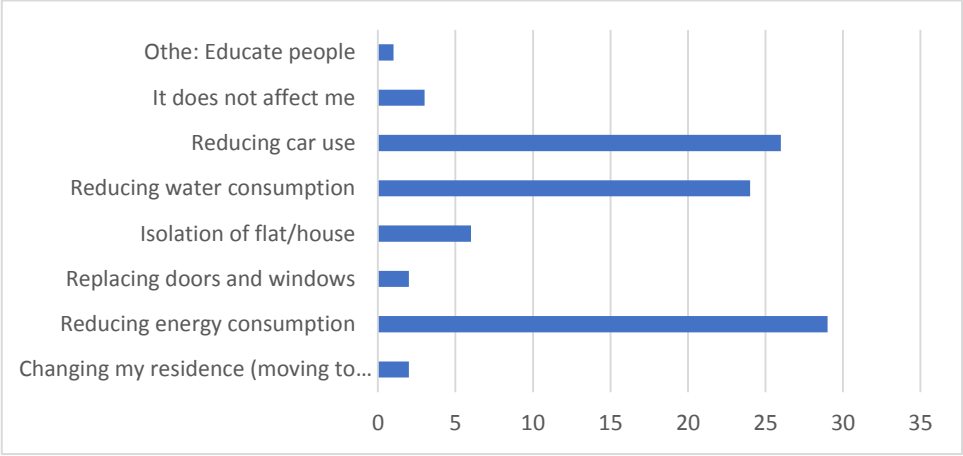

Figure 6: *How are you protecting yourself against climate change impacts*

Discussion

From the described results of the survey, we can obviously see that majority of students have knowledge and awareness about climate change and data statistics also demonstrated that female participants showed more interests then males. Similar outcomes also can be observed in a survey which was conducted in Nebraska and for Vietnamese Coastal Residents' in Ha Tinh province (Abdel-Monem, et al. 2014) (Nguyen, King and Boon

2016). Gender has a remarkable influence on climate change topics. To take a example in the survey called "Australians' views of climate change" it was investigated that women more likely to believe that anthropogenic activities are the reason for climate change (Leviston, et al. 2011).

Even though all the students come from developing countries, we can see that the majority of them have appreciable knowledge of climate change and issues related to it. For example, even though China is a developing country (Jing Gu and Messner 2008), 91.4% participants in the similar survey which was conducted in China, approve that climate change is happening and they also aware of sustainable development (Lia, et al. 2016). Survey studied that majority of participants live in the capital city in their hometown. Cities are considering especially resistless to climate change. The reason is that intense weather events are possible to be uncontrollable for compound urban systems (Gurría 2014). Probably the relatively high understanding level of most students on climate change is based on their origin and they have already experienced one of these changes. In this study, most of the participants say that they have heard about climate change from the internet, during their studies and from television. These outcomes almost reflect the results of the survey in Nigeria and the Republic of Macedonia where electronic media is one of the most ruling ways of receiving data on climate change (Awusi and Asare 2016) (Bojovic 2014). The study which is conducted in Ghana shows that television is the main source that they obtained information about climate change (Barimah, Kwadwo and David 2015).

It is noteworthy that most students consider climate change as a real threat to our society and need to be addressed. However, there were still some students who consider this problem as not urgent and 1 student out of 44 participants have no information about the danger of climate change. In respect to the knowledge about causes of climate change, we

can see from the results that most participants agree that it happens as a consequence of increasing GHG and deforestation. In Cambodia, during the survey, 67% of respondents said that they have experienced deforestation. Thus, it causes the transformations in weather patterns and all the clue informants create a connection between climate change and deforestation (Department 2011).

Survey results show that majority see the carbon dioxide and methane as major gases which causes greenhouse effect in the atmosphere. However, students have very low knowledge of ozone, freons and water vapor as GHG. This limited knowledge of participants about GHG also can be observed in similar questionnaires which are studied for climate change awareness (Paul, J and Gale 2015). According to the conducted survey in Oman, most of the respondents said that reduction of GHG has an essential role in decreasing consequences of climate change (Buloshi and Ramadan 2015).

Nevertheless, outcomes for parts which analyzed students on their knowledge of climate change impacts and climate change mitigation/ adaptation were positive, there were few students who think climate change does not affect them. Moreover, the number of students who consider through education they can protect themselves from climate change is only 2.3%. It means there is still a gap in the knowledge about climate change.

As regards, the cause of climate change, large majorities of students think that climate change can cause extreme weather conditions and an increase of sea level. According to the similar survey in Nigeria and Tanzania showed that participants think the sea level rising as major climate change impact (Paul, J and Gale 2015). The survey conducted in the USA about two in three Americans believe global warming is impacting weather in the United States (Leiserowitz, Maibach, et al. 2017).

Finally, with regard to the activities to mitigate climate change, the majority of students do it through reducing energy consumption, car use, and water consumption. Roughly same result noticed in an online survey of the citizens of the Republic of Macedonia (Bojovic 2014). In comparison to the above-mentioned survey results, in the similar survey which is conducted Oman, most of the respondents said that reduction of GHG is one the most essential solution to decrease consequences of climate change (Buloshi and Ramadan 2015).

Conclusion

Climate change awareness questionnaire tilted as "Climate Change in view of you" was conducted between the International students of University of Pannonia. Questionnaire contained 15 questions and it allowed us to determine the climate change perception of young generation from all over the world. Regarding the findings of the survey, the result was that the level of the climate change alertness between international students in Veszprem at the University of Pannonia is significantly high. It is also worth to mention that most students consider climate change as a serious issue and say it needs to be addressed. Additionally, participants approve that each person is individually responsible for mitigating climate change and the most part of participants protect themselves through reducing energy consumption and car use. Even though mainly outcomes of the research are positive, there are still considerable gaps in the student's knowledge about GHG. Understanding the importance of environmental education needs to be addressed as well. To deepen the knowledge of the international students, work-shops are recommended to

organise in the topic of climate change and GHG (types, sources, and effects to the atmospheric weather). Round-table discussion could help also, where the students can share their experiences.

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