

PERCEPTION OF CLIMATE CHANGE AND ITS EFFECT ON HUMAN HEALTH: A PRELIMINARY SURVEY AMONG THE STAFF AT EASTERN UNIVERSITY, SRI LANKA

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Abstract

Climate change has been a global issue and Sri Lanka is no exception. The projected temperature rise rainfall change impact on crops yield and human health are at alarming levels along with natural disasters. Awareness on minimizing the adverse climate change to mitigate becomes mandatory. This preliminary study among the employees of Eastern University, Sri Lanka (EUSL) aims at analyzing their perception with regard to the climate change, happening in their living vicinity. A number of fifty four staff volunteered to enroll in this study. A pre-tested questionnaire was used to gather data through statements with five point Likert scale and analyzed using descriptive statistics and chi-square-goodness of test. Among the participants 43 (80%) has educational qualifications GCE Advanced level or beyond and 61% were holding the intermediate position. 61.1% responded that there has been high level of change in the climate in their living environment during last ten years with regard to the increase of heat and low rainfall . The result was statistically significant for chi-squared-goodness- of-fit test ($p < 0.05$). With regard to the crop production in recent years, the response was that 37% said no change in yield of agricultural crops while 57.4% said reduction in the yield ($p < 0.05$). Majority, (85.1%) responded increase in the illnesses in recent years and illness such as Dengue, Bronchial asthma and common cold were the most common illnesses. The participants opinions regarding the steps taken to minimize/mitigate climate change were categorized into three topics such as Preservation of nature, Control of greenhouse gas emission and Making awareness among public. Majority of the participants prefer to know more on the climate change issues. The study thus concludes that the staff in the study are well aware on the ill effects of the climate change on the environment, crops yield and human health, measures to be taken to minimize them and prefer further training indicating that climate change education should need to be an agenda in university activities.

Keywords: Climate change, Crop production, Human health, Staff perception, Yield of agriculture.

Introduction

Climate change has been a global issue and Sri Lanka is no exception. It appears that the climatic parameters are gradually worsen in Sri Lanka along with global trend. The second national commission on climatic change report that during the 40 years period from 1961-2000, revealed that temperature increase of minimum of 0.27°C and maximum of 0.46°C per decade had been noted in Sri Lanka (Ministry of Environment, 2011). As per the World Health Organization (WHO) report, the mean annual temperature of Sri Lanka is expected to rise by 3.7°C from 1900 to 2100 under the high emission scenario (WHO, 2015). The projections of rainfall also changes which may lead even to change the demarcation of dry and wet zone with reduction in the land area of wet zone. It has also been projected that an annual average of 65,600 people will be affected by sea level rise between 2070 and 2100 (Ministry of Environment, 2011).

As projected, drought, floods, storm surges, increased rainfall variability, landslide, sea erosion and related crop destruction are the regular occurrences for the last two decades in Sri Lanka which might be the result of direct and indirect impacts on climatic condition. These direct and indirect effects ultimately have impact on agriculture and food security, loss of water resources and finally affect the economy of the county.

Apart from the effect of climate change on economy and property, impact of climate change on health system has also been reported by researchers. As noted by the WHO, the climate change not only affects the biological system but also pose 'significant and emerging threat to public health' particularly in low income countries (Dunlap and McCright, 2008; IPCC, 2001). The increased temperature may also lead to spread of vector borne diseases especially the disease like Dengue which is spread by Mosquito. Further, the polluted water, extreme weather events also increase the risk of vector-borne, rodent-borne, food and water borne diseases (Ministry of Environment, 2011). It has been predicted that diseases such as malaria and dengue will increase towards 2070 under both high and low emissions scenarios and likewise, elderly death has been predicted to increase 22 deaths/100,000 by 2080 (WHO, 2015).

In this context, it is essential to study the public perception of effect of climate change which would help designing specific programs on this issue. There are several similar studies both in developed (DeBono *et al.*, 2012; González and Da Silveira, 1997; McMichael and Butler, 2006; Preet *et al.*, 2010) and developing countries (Chaudhary and Bawa, 2011; Emch *et al.*, 2008; Haque *et al.*, 2012; Toan *et al.*, 2014) in this regard.

Objectives of the study

This study aims to analyze the perception of the staff working at Eastern University, Sri Lanka (EUSL) with regard to the climate change, happening in their living vicinity.

Specific Objectives

- To analyze perception of staff on the climate change in their surroundings

- To analyze the perception of staff on the impact of climate change on health
- To analyze knowledge of staff on the steps to be taken to minimize or mitigate climate change.

Methodology

This study was a cross sectional survey design among randomly selected minor, intermediate and executive level staff of Eastern University, Sri Lanka (EUSL) conducted in the months of August and September 2018. A self-administrated questionnaire was developed based literatures and was tested using a pre-test format among ten staff member of EUSL, who have not been included in the data collection. The final self-administrated questionnaire was then administered among those who were willing to participate in the study. Informed consent was obtained from the participants and approval to conduct this study was obtained from the Vice Chancellor of the university. The data was analyzed using descriptive statistics and chi-square-goodness of test.

Results and Discussion

A number of fifty four employees participated in the study. Out of the total number of participants 43 (80%) has educational qualifications GCE Advanced level or beyond. Thirteen of them were in the executive officers' category (24%), 33 were intermediate level (61%) and 8 (15%) were minor employees. The summary of demographic characteristics of study subjects is given in Table 1.

Table 1: Demographic characteristics of study population

		Frequency (%)
Gender	Male	32 (59.3%)
	Female	22 (40.7%)
Age (years)	20-30	11 (20.4%)
	31-40	17 (31.5%)
	41-50	17 (31.5%)
	51-60	9 (16.7%)
Educational Qualification	Up to G.C.E Ordinary Level	11 (20.4%)
	G.C.E Advanced Level	19 (35.2%)
	Diploma/Degree	19 (35.2%)
	Post graduate	5 (9.3%)
Type of Job	Minor employee	8 (14.8%)
	Intermediate employee	33 (61.1%)
	Executive employee	13 (24.1%)

Perception on Climate Change

Perception of climate change had been collected through four statements with five point Likert scale (Table 2). Among the participants, 61.1% responded that there has been high level of change in the climate in their living environment during last ten years. The result was statistically significant for chi-squared goodness of fit test ($p < 0.05$). Regarding the amount of heat during summer when compared to last 5-10 years, the 61.1% responded that there has been high level of increase and 31.5% responded very high level of increase ($p < 0.05$). In relevant to this result, 77.8% reported that there has been high level of drought ($p < 0.05$). With regard to the amount of rainfall, majority of the respondents perceived reduction. Among the respondents, 61.1% reported that low level of rainfall and 13% reported very low level of rainfall ($p < 0.05$). With regard to the crop production in recent years, the response was that 37% said no change in yield of agricultural crops while 57.4% said reduction in the yield ($p < 0.05$).

Table 2: Perception of climate change

Statements regarding perception of climate change	Percentage of response					P value
	Very low	Low	Normal	High	Very high	
Degree of change in the climate of our environment during last 10 years	3.7	1.9	25.9	61.1	7.4	0.00
Degree of severity of heat during summer when compared to last 5-10 years.	1.9	1.9	3.7	61.1	31.5	0.00
Amount of rainfall when compared to past	13.0	61.1	14.8	11.1	0.0	0.00
Degree of drought in recent years	0.0	5.6	7.4	77.8	9.3	0.00
Amount of yield of agriculture in recent years	13.0	44.4	37.0	3.7	1.9	0.00

Perception on impact of climate change on health

Perception of the impact of climate change on human health had been collected through two statements with five point Likert scale (Table 3). Among the participants 70.4% responded that people contracting illnesses had been at high level during summer and 68.5% responded that high level of illness during rainy season ($p < 0.05$).

Table 3: Perception on the health impact of climate change

Statements	Percentage of response					P value
	Very low	Low	Normal	High	Very high	
Disease condition in summer after 2013	0.0	1.9	24.1	70.4	3.7	0.00
Disease condition during rainy session after 2013	0.0	3.7	14.8	68.5	13.0	0.00

With regard to the overall opinion about the illnesses contracted due to the climate change, 85.1% responded increase in the illnesses while 8.5% responded decrease and 6.4% responded no change. According to the respondents, majority of them reported

that Dengue, Bronchial Asthma, Common cold and skin diseases are disease which had been increased due to the climatic change in their surroundings (Table 4).

Table 4: Highest prevailing disease due to climate change, according to respondents

Disease conditions	%	Disease conditions	%
Dengue	98.1	Kidney infection	44.4
Asthma	85.2	High blood pressure	42.6
Common cold	83.3	Malaria	40.7
Skin disease	70.4	Diabetes	27.8
Eye disease	64.8	typhoid	25.9
Kidney related disease	51.9	Encephalitis	9.3
Allergic	50	Stroke	5.6

For the question “Do you need training on the issues of climate change”, 88% of the participants responded ‘yes’. The respondents’ knowledge on measures to mitigate the manmade climate change was analyzed through qualitative question (What are measures which can be taken individually or collectively to mitigate the manmade climate change?). Their response can be categorized into three topics such as Preservation of nature, Control of greenhouse gas emission and Making awareness among public. The opinions of respondents among these three topic is summarized in the table 5. Over 90% opinioned on the prevention of deforestation and control of greenhouse emission by vehicle fuel. However few respondents believe that the climate change cannot be controlled but we can minimize the effect. One such response was “Climate change is a natural process which cannot be controlled. However, we can minimize the effect of climate change by good housekeeping of surrounding, not erect building in landslide prone area, prevent deforestation, encourage reforestation, control sand excavation, and maintain water ways and canals to ensure free flow of water”.

The opinions also consisted of other kind of pollution controls as well which are not directly involved in climate change. The qualitative analysis shows that the respondents have satisfactory knowledge on the climate change.

On overall analysis this study involves university employees’ perception in the changes of climate of their living vicinity, effects on health and agricultural yields; all these have direct impacts on their living conditions. Results show statistically significant impacts on the temperature and rainfall patterns, contracting illnesses mainly infectious diseases and respiratory illnesses. With regard to the yield of agriculture crops 37% of the staff feels no change is to be taken into account. This perception could be due to the fact that people engage in crop productions such as home gardening and other activities such as use of organic fertilizers.

Table 5: Respondents' Opinion on measures to mitigate the manmade climate change

Category of topic	Opinion of Respondents
Preservation of nature	<ul style="list-style-type: none"> • Prevent the deforestation • Encourage the reforestation • Encourage the home gardening • Control the land filling at wetland and erecting building
Control of greenhouse gas emission	<ul style="list-style-type: none"> • Reduce the use of fossils fuels • Decrease the fuel engine usage • Use of efficient engines • Control fuel vehicle and encourage the use of electric and hybrid vehicle • Control vehicle emission • Control the importance of vehicle • Encourage the importation of electric vehicle • Prevent the burning of waste • Avoid burning of waste instead of dumping • Manage properly the factory waste to control the greenhouse gas emission • Efficient use of electricity • Control the ozone depleting gas emission • Control the use of refrigerator • Encourage the use of solar panel • Encourage the use of biogas
Making awareness among public	<ul style="list-style-type: none"> • Make awareness about the benefits of reforestation • Forming voluntary groups to prevent deforestation • Make public awareness regarding deforestation, reforestation, setting forest fire

The opinions of the staff on the measures to be taken to minimize or mitigate climate change indicate that they are well aware of the manmade disasters to the environment and thus reforestation by tree planting activities, minimize landfilling, reduce fossil fuels and increase use of renewable energy sources (solar panels), and waste management. The staffs of EUSL involved in this study advocate on increasing the public awareness on these issues and also on forming voluntary groups to do the identified tasks such as reforestation, public awareness programs etc. They themselves too feel requiring to know more on climate change indicate that they understand the importance on this global issue which would have a direct impact on our future generation.

Conclusions

This preliminary study show that significant proportion of the staff of EUSL participated in this study was in affirmation of the climate change in their living environment. A significant proportion of staff (92.6%) perceived that there has been a

high and very high level of increase in temperature while 74% of perceived that low and very low level of rainfall in their surroundings. They also have a mixed perception with regard to yield of agricultural crops and 57.4% of them stated that there is a reduction in crop production. Majority of them (85.1%) responded that the climate change has significantly increased the illness level in their surroundings and among them 70.4% of responded that people contracting illnesses had been at high level during summer and 68.5% responded that high level of illness during rainy season. The majority of respondent stated that Dengue (98.1%), Asthma (85.2%), common cold (83.3%) and skin diseases (70.4%) are most prevailing diseases in their surroundings, due to climate change. According to the qualitative analysis, their responses for the measures to mitigate the manmade climate change can be considered into three category such as measures to preserve of nature, measures to control the greenhouse gas emission and ways to make awareness among public. These responses indicate satisfactory level of awareness among respondents. Even though there quite majority of the respondents' responses consist of other kind of pollution controls which are not directly involved in climate change, 90% of them opinioned on the prevention of deforestation and control of greenhouse emission by fuel vehicle as measure to mitigate the made climate change. A majority of them (88%) prefer to know more on the climate change and training on mitigating indicates that climate change education should need to be an agenda in university activities. This study is a part of ongoing study on the perception climate among general public at Batticaloa district, so that it has small sample size among the staff of Eastern University, Sri Lanka. However, the findings further suggest to start awareness programme on climate change initially among the staff of Eastern University and to expand to general public.

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