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Climate Change Awareness and Perception amongst the Inhabitants of Bhubaneswar City, Odisha, India

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ABSTRACT

Public awareness and knowledge on climate change constitute essential background to deal with climate change and related problems. This study assesses the people's knowledge, perception and awareness regarding climate change in Bhubaneswar city, the capital of Odisha. A survey of 400 randomly sampled respondents was conducted using a standard questionnaire. A structured questionnaire was used for data collection. This questionnaire was administered to respondents who were proportionately distributed in different location. Results have revealed that public awareness is high despite some limitations on the knowledge on climate change. The study suggest that there is need to create awareness regarding climate change through different program for general public. It is also need to create awareness for adaptation and mitigation. Climate change is an area that is in need of publicity to help the public make informed decisions in its adaptation and mitigation. Results further indicate that most of the respondents have fair general knowledge about the subject.

Key Words : Climate Change, Awareness, Perception, Bhubaneswar city

INTRODUCTION

If we see the events chronologically which had put to front climate change issue was that, the global attention on climate change was highlighted for the first time by the Brundtland Report, Our Common Future, which stated about the unsustainable development practice of humankind that puts the world climate to warming trend (UNWCED, 1987). Contrary to that the public concern on climate change was not elicited by the Brundtland's report, but by the unusual northern hemisphere heat wave and drought of the summer 1988 (Christianson, 1999). Therefore, the IPCC was established in 1989 to carry out periodic assessment of global climate system and later the UN Framework Convention on Climate Change was adopted in 1992 to provide a framework for global action against climate change. Plentiful studies conducted since then reveals that the vast majority of people across the world, especially in developing countries, are not aware of climate change regardless of their high vulnerability to the impacts of climate change (Bostrom *et al.*, 1994; Bord Fisher, and O'Conner, 1998; Pew Research Centre, 2006; Pugliese and Ray, 2009; Godfrey *et al.*, 2009) as cited by Pugliese and Ray (2009). Pugliese and Ray (2009) states that climate change is more likely to be perceived as a serious problem in the developed world than in developing countries, despite developing countries being the most vulnerable to climate change impacts. Even though resources are put together to mitigate climate change, there is need to educate people on various facets of climate change. Increasing people's awareness on climate change through education is an important measure to motivate people at all levels to play an active role in mitigating and adapting to climate change.

India Youth Survey 2017 was carried out by MaRS Monitoring and Research Systems in 16 state capitals and major towns in India- Delhi, Lucknow, Jaipur, and

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Chandigarh in the north, Kolkata, Patna, Bhubaneswar and Ranchi in the East, Mumbai, Ahmedabad, Pune and Indore in the West, and Chennai, Bangalore, Hyderabad and Kochi in the South. The result of the survey reveals that more than 74% of people between the ages of 18 and 25 are not aware of how greenhouse gases cause global warming. Renewable energy is a mystery to 70.9% of the respondents.

Literature review:

Lorenzoni and Pidgeon (2006) in their study it is found that although there is widespread concern about climate change but it is of secondary importance in comparison to other issues in people's daily lives. Most individuals relate to climate change through personal experience, knowledge, the balance of benefits and costs, and trust in other societal actors. This is the conceptualization about climate change by public of Europe and USA. Rishi *et al.* (2011) stated to understand human psyche and its possible impact on future generation and their emotional involvement with climate change problem. According to them if people are not properly aware of the nature of problem of climate change and how it is going to affect them, they will never be emotionally concerned about the whole issue, therefore after cognitive understanding and affective concerns, the need for actual action or conative component arises, to resolve the problem.

There is an urgent need to sensitize the general population regarding global warming and climate change (Pandve, 2007). Motivation for voluntary mitigation is mostly dependent on perceived susceptibility to threats and severity of climate change or climate variability impacts, whereas adaptation is largely dependent on the availability of information relevant to climate change (Semenza *et al.*, 2011) Strategic action is required both from individuals and the private/public sector to prevent harmful corollaries from climate change to individuals and society at large (as cited in Pandve *et al.*, 2011)

Rishi *et al.* (2011) in their study stated about urgent need to address issues related to adaptation, vulnerability, and coping in developing nations which constitutes most of the world's urban population, includes high-risk urban sites, and the regions are very poor in adaptive capacity.

Ochieng and Koske (2013) assessed the level of climate change awareness and perception among primary school teachers in Kisumu Municipality. Findings indicate that the level of climate change awareness among primary school teachers in Kisumu Municipality is not significantly low, but there exists significant gaps in their knowledge. Results further indicate that primary school teachers in Kisumu Municipality perceive climate change as a threat. These findings necessitates capacity building to improve teachers' quality of knowledge on the subject especially if they are to be used as key actors in climate change awareness campaign in Kenya.

Considering the adverse effect of climate change and its impact on the poor, Rao and Thamizhvanan (2014) tries to explore the willingness of private sector to combat climate change through mitigation and adaptation by their voluntary involvement. By taking a sample of 350 junior corporate executives, an empirical study was conducted by them to measure the linkages between awareness to climate change, its impact on the poor and the willingness of private sector to act on adaptation as well as mitigation strategies in Chennai area. The findings of the study revealed that there is significant awareness about the impacts of climate change among junior corporate executive, however the vulnerability of the poor is not yet felt by the study population. Infact there is a significant association between awareness and willingness to mitigation and adaptation by the junior corporate executives.

Barrerd (2018) in his study on Partido State University evaluated the awareness level on climate change as experienced by first, second, third, and fourth year students. His study examines the powerful role of youth in impacting climate change and examine students' understanding on climate change caused by different societal forces. The study found that correlation between students' level of education and awareness level were positive.

Statement of the problem:

Bhubaneswar city has gone through rapid urbanization in the last few decades as this is the capital city of the Odisha state. Temperature goes 40^0C plus in summer months since last 10 years or more. The city had recorded highest temperature of 45^0C last time on April 23, 1985 (Times of India, April 11, 2016). And the highest ever temperature of 45.8^0C was recorded on 10^{th} April, 2016. In the summer of 2018, highest air temperature recorded in Bhubaneswar was 41^0C. If the current scenario continues, it creates a very terrible situation to live in the city during summer months. Awareness on changing climate motivate people to take steps towards mitigation and adaptation and change in

lifestyle can able to curb the problem to some extent.

There is an urgent need to sensitize the general public regarding global warming and climate change, still many people in urban area are unaware about the causes and consequences of climate change.

To address all these issues effectively, it is essential to assess knowledge and awareness regarding climate change among general public. In response to this issue, the present survey was conducted with the aim of assessing the awareness of the general public residing in the Bhubaneswar Development Plan Area (BDPA) of Bhubaneswar city.

Objectives of the study:

1. To assess people's knowledge and perception on Climate Change in Bhubaneswar city.
2. To understand people's awareness about climate change in the study area.

METHODOLOGY

Research design:

In this study descriptive research design is used to study the Climate Change knowledge, information and awareness and perception on climate change amongst residents of Bhubaneswar city.

Universe of the study:

The universe comprises of all the area coming under the Bhubaneswar Development Plan Area (BDPA).In total 400 respondents were selected for the study from different locations.

Sampling:

Simple Random Sampling Method used to collect information from the respondents. Age of the respondents was above 20 years.

Study area:

The Study area of present research is the Bhubaneswar city *i.e.* the operational area of Bhubaneswar Development Plan Area (BDPA). This is in fact a part of a greater urban complex formed by Bhubaneswar Municipal Corporation, Khurda Municipality, Jatni Municipality and Bhubaneswar Development Plan Area (BDPA) rural area located at boundary corners with Bhubaneswar municipality being at center. It is location between Latitude 20° 12' 46" to 20° 22' 03" N and longitude 85° 45' 24" to 85° 54' 21" E in the eastern part of Odisha state of India (Fig. 1). As per the 2001 census, Bhubaneswar is classified as a Class-I town, where as Khurda and Jatni are classified as Class-III towns of the state. As per the 2011 census, this urban complex have 1102701 total population and the overall population density of the entire BDPA is 2361 persons per sq. kilometer, However separately Bhubaneswar Municipal Corporation (BMC) has 5813 population density, Khordha Municipality (1582), Jatani Municipality (2474) and BDPA rural has 641 population density.

The age group wise representation of the respondents is clearly revealed from (Table 1), the highest percentage of respondents fall under 20-30 age group

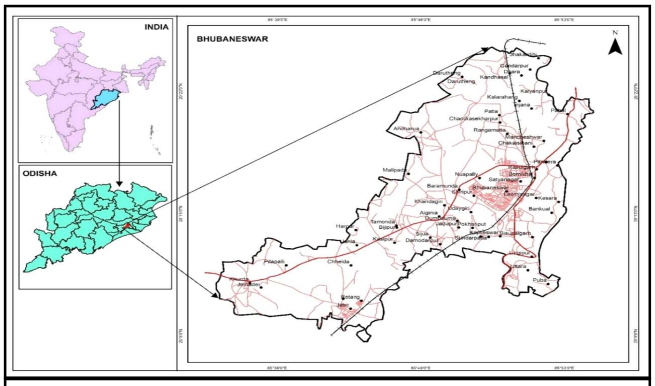

Fig. 1 : Location of Study Area

Table 1 : Social and Demographic Profile of the Respondents

Variables	Category	No	Percentage
Age	20-30 years	106	26.5
	30-40 years	91	22.75
	40-50 years	83	20.75
	50-60 years	72	18
	>60 years	48	12
Educational Qualification	No formal education	28	7
	Primary	37	9.25
	High school	46	11.5
	Intermediate	88	22
	Graduate	95	23.75
	Post graduate and above	87	21.75
	Others (Professional courses)	19	4.75
Occupation	Students	116	29
	Govt. Employee	109	27.25
	Teachers (Teaching profession)	68	17
	Administrative services	23	5.75
	Business	52	13
	Daily worker	32	8

which represent 26.5% of total respondents and people above 60 years age group constitute 12% of the respondents constituting the lowest percentage. The sex wise representation of the respondents are 122(31%) female and 278 (69%) male (Table 1).

The level of education of respondents is presented in Table 1 and Fig. 2, it is clearly revealed that 95 people (23.7%) and 87 people (21.7%) respondents are graduates and post graduates as their last educational qualification and 28 people (7%) respondents don't have any formal education.

The Fig. 2 shows the level of education of the respondents. The level of education is an important factor which influence the knowledge and perception of the people about climate change.

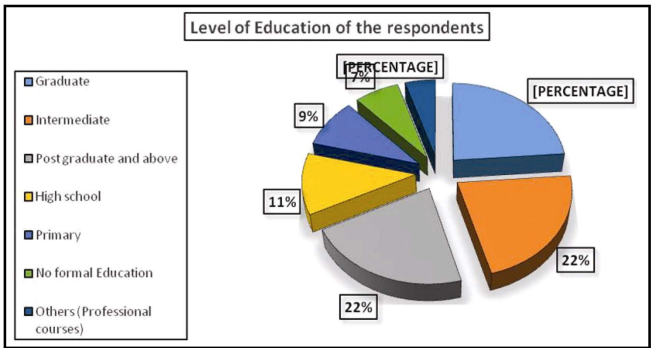

Fig. 2 : Level of Education of respondents

RESULTS AND DISCUSSION

The respondents familiarity about climate change is that, 354 (88.5%) respondents heard about or acquainted about the term where as 46 (11.5%) of respondents were not familiar about the word although they understood when we narrated it during the field survey (Table 2).

Table 2 : Respondents familiarity about 'Climate Change'

Do you heard about climate change before?	No. of respondent	Percentage of respondents
Yes	354	88.5
No	46	11.5
Total	400	100

Source: Primary Survey (April, 2017)

Perception about climate change by the respondents are presented in Table 3 which revealed that most of the respondents 112(28%) perceived climate change as change in weather condition. 12% of the respondents have no idea about this.

Table 3 : Perception about Climate Change

What does Climate Change mean to you?	No of respondents	Percentage of respondents
Change in Temperature	95	23.75
Change in weather condition	112	28
Change in rainfall	51	12.75
Change in climate due to global warming	93	23.25
Don't know	49	12.25
Total	400	100

Source: Primary Survey (April, 2017)

About the causes of climate change 266(66.5%) respondents revealed that human activities are the main cause of climate change and only 134 (33%) respondents mentioned that climate change is occurring due to natural process (Table 4).

Table 4 : Causes of Climate Change

Causes of Climate Change	No. of respondents	Percentage of respondents
Human activities	266	66.5
Natural process	134	33.5
Total	400	100

Source: Primary Survey (April, 2017)

When effect of climate change is asked to the respondents, 152 (38%) revealed it as temperature change. 19 % mentioned about change in rainfall, 18% mentioned about increase in cyclone and 14% mentioned about drought (Table 5).

Table 5 : Effects of Climate Change

What do you think about the effect of Climate Change?	No. of respondents	Percentage of respondents
Change in temperature	152	38
Change in rainfall	76	19
Cyclone	72	18
Drought	58	14.5
Coastal erosion and sea level rise	42	10.5
Total	400	100

Source: Primary Survey (April, 2017)

Table 6 and 7 represent the people's Perceptions on impacts of climate change. The questions asked in this section were intended to determine whether the respondents have observed any change in rainfall pattern and any change in atmospheric temperature and its effects. The respondents view on temperature change is

293(73.2%) mentioned about increase in temperature whereas 85(21.25 %) given their statement about decreasing temperature and 22 persons (5.5%) of respondents stated that they don't have any idea about this.

Table 6 : Respondents Perception on Change in Temperature

Direction of Change	No. of respondents	% of respondents
Increasing	293	73.25
Decreasing	85	21.25
No idea	22	5.5

Source: Primary Survey (April, 2017)

Table 7 : Respondents perception on Change in Rainfall amount and Pattern

Change in rainfall amount	No. of respondents	% of respondents
Increasing	30	7.5
Decreasing	289	72.25
Erratic	81	20.25

Source: Primary Survey (April, 2017)

The perception about change in rainfall by the respondents is that 30 people (7.5%) of the respondents stated about increasing rainfall and they cited some example like urban flooding etc. are impact of that, whereas 289 (72.25%) respondent mentioned about their observation of decreasing rainfall. Only 81 people (20.25%) state that the nature of rainfall is very erratic and unpredictable these days.

89 people (22.25%) replied that their source of information about climate change was television and radio. 84 persons (21%) respondents mentioned that Newspapers/Magazine and Books are the main source of information to know about climate change. Internet is considered as the main source of information for the respondents as 109 persons (27.25%) mentioned that they get to know about climate change from internet. 92 people (23%) of respondents mentioned that they know about climate change from their course curriculum. Only 7 persons (1.75%) of the respondents replied that, they know about climate change through their interaction with different NGOs. And 19 respondents (4.75%) mentioned that they did not get to know about climate change from any source (Table 8 and Fig. 3).

Table 8 : Sources of information on Climate Change

Source of information on climate Change	No. of respondents	Percentage of respondents
Television and Radio	89	22.25
Newspapers/Magazine/Books	84	21
Internet	109	27.25
School/college/University	92	23
Non Govt. Organizations	7	1.75
No sources of climate change information	19	4.75

Source: Primary Survey (April, 2017)

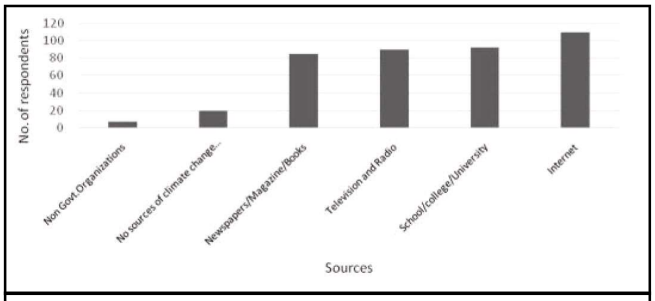

Fig. 3 : Sources of information on Climate Change

Conclusion:

The present survey reflects that a general population in urban area is aware about global climate change as well as role of human activities in climate change. The sources of information are usually non-scientific materials. A majority of respondents state that internet is main source to know about climate change information. There is need to conduct extensive survey to generate information. Through this survey most of the questions are related to perception and knowledge of people about climate change. Those people who doesn't have any formal education, they did not have any idea about the global climate change and its impact in local level. Such surveys will form the basis to establish a foundation for decision makers for climate change mitigation activities. It is also recommended that awareness campaigns/ programs regarding climate change and measures to combat to be introduced for better preparedness. The results suggest that improving basic education, climate literacy and public understanding of the local dimensions of climate change are vital for public to engage themselves in adaptation and mitigation measures.

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